ANCIENT SCANDINAVIA

An Archaeological History from the First Humans to the Vikings

T. DOUGLAS PRICE

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PREFACE

WHY SHOULD an American archaeologist write a book on the prehistory of Scandinavia? It's a fair question, but there's a reasonable answer. I have been conducting archaeological research on the last hunters and the first farmers in Scandinavia since 1978, excavating at a number of different places in eastern Denmark. I have spent eight full years in Denmark since 2001 with my Danish wife and daughter. I now live much of the year in Copenhagen. I have traveled substantially in the larger region, visiting archaeological sites and touring different areas. The impressions left by these visits have been powerful, fostering a huge appreciation for the people of the past and their accomplishments. I am writing this book to share some of that Scandinavian prehistory, along with some impressions of the places and objects that have survived.

The archaeology of northern Europe provides a perspective on the human experience, of change and development in human society—from the initial colonists some 13,000 years ago through the arrival of the first farmers 6,000 years ago, the upheavals that accompanied the spread of bronze and iron, and the extraordinary diaspora of the Vikings shortly before AD 1000. The prehistory of Scandinavia has witnessed humans adapting to changes in the environment, both natural and cultural, that have fostered what is today a region of innovative technological, social, and political development.

For various reasons, many people—including a lot of archaeologists—are unaware of how extraordinary the past of Scandinavia really is. Much of the archaeological literature within Scandinavia is published in the native languages and frequently does not reach a wider audience. The region is often considered to be outside the mainstream of archaeological research, which tends to focus on the earliest, or the monumental, or the first civilizations of the Old and New Worlds.

But in fact, the archaeology of Scandinavia is extremely useful for understanding our human past. The occupants of Scandinavia's prehistory left traces of their presence in many different ways, from the rock art of the Stone Age to the giant stone tombs of the first farmers, the earthen burial mounds that dot the skyline from the Bronze and Iron Ages, and the massive fortifications of the Viking period. It is hard to travel in Scandinavia without seeing the evidence of that past. Moreover, archaeologists have been working here for 200 years to expose the remains, catalog the finds, display the evidence, and inform the public. Archaeology is a popular topic in museums, schools, magazines, on television, the Internet, and other outlets. There are some 80 local museums in Denmark alone that provide access to the remnants of the past.

The book will cover a period from approximately 13,000 BC to AD 1050 in a few hundred pages. I have chosen to divide this volume into chapters that follow the basic chronology of Scandinavian prehistory from the oldest Stone Age to the Viking period. I will introduce each of these periods at the beginning of the appropriate chapter and provide an overview of the context and events of the time. Any archaeological story has to contain a good bit of detail on the position of these places and things in time and space. My goal is to keep discussion of those sometimes dry facts brief and to spend more ink on the actual archaeological evidence. I have had to be selective in the choice of places and things to discuss. I have chosen to focus on what I regard as the most informative and the most spectacular. At the same time, of course, I have had to leave out a great deal. I hope you will enjoy my choices.

I took my first academic job at the University of Wisconsin-Madison in 1974 as an assistant professor of European archaeology. I began doing fieldwork in Denmark in 1978. Some 25 years ago, I married a Danish archaeologist. It is a good arrangement. We have a Danish-American daughter in Copenhagen. Since my retirement in 2009, we live primarily in Denmark. Over the years, I have had a chance to become acquainted with Scandinavian society and to appreciate some of the similarities and differences with my own upbringing in the United States.

Scandinavians are in general liberal on most issues, cosmopolitan in taste, demanding in design, frugal, family-focused, socially—rather than individually—oriented, a fascinating combination of old-fashioned morality and postmodern perspectives. Of course there are national rivalries. Danes tell jokes about the Swedes, Swedes tell jokes about the Norwegians, and Norwegians think the others laugh at them. Everyone feels superior. It is as it should be.

There are several very good books (a few in English) on the archaeology of Scandinavia or parts thereof—Haakon Shetelig's 1978 *Scandinavian Archaeology*, Jørgen Jensen's 1999 *The Prehistory of Denmark* and an English translation of his magnificent *Danmarks Oldtid* (2004) published in 2013, Göran Burenhult (1999) on *Arkeologi i Norden*, and Anders Hagen's 1967 *Norway*. These volumes are, however, largely out of date. A great deal of archaeology has been carried out in the last 25 years in Scandinavia in response to development and new heritage laws. Our knowledge and understanding of almost every period has changed substantially. There are also a number of new methods in place and technologies in action that offer new information about the past. In part, then, I hope to provide an updated view of the prehistory of this fascinating area. I also hope that the perspective of an informed and enthusiastic outsider might offer some new insight and appreciation. The archaeology of Scandinavia is simply remarkable—rich, varied, and in many cases spectacular.

I must also admit to bias in my perspective. My own focus has been on Denmark for the last 35 years, and that emphasis comes through in this volume. There are more sites and finds described from Denmark than from elsewhere in Scandinavia. At the same time, I think that many of my Swedish and Norwegian colleagues might even admit that for such a small country, Denmark is blessed with an extraordinarily rich past. There is a reason that the archaeological chronologies and perspectives on the Scandinavia peninsula tend to have a Danish flavor.

Scandinavia technically is Denmark, Sweden, and Norway. Finland and Iceland are sometimes added to this group, but will not play a role in this volume. Northernmost Germany and southern Scandinavia, however, share many commonalities in their geography and prehistory, and part of our story includes the areas of Germany that border on the Baltic and North Seas.

This book, then, focuses on the archaeology of Scandinavia and more specifically on the prehistory of the region. Prehistory, as defined by archaeologists, is the period of the human past before written records. This volume will just touch on the edges of early history and the first historical documents about Scandinavia in the later Iron Age and Viking period. Scandinavia was basically unoccupied for most of the human past—too remote, too far north, too cold. The region was repeatedly covered by huge sheets of ice over the last two or three million years of the earth's history. Around 16,000 years ago, this ice began to melt. Within a few millennia, the first people pioneered this new land at the edge of the melting ice, hunting reindeer and leaving few traces. By 6,000 years ago, the first farmers appeared and village life began to rearrange the landscape. By 1,000 years ago, the Vikings had appeared and expanded across much of northwestern Europe and the North Atlantic and conquered large parts of England, Scotland, and northwestern France.

There are myriad ways that the large and complex body of information on this early prehistory of Scandinavia could be presented. I will begin the story with a basic introduction to the geography and history of the region and a framework for understanding the past of Scandinavia in time and space. I have chosen to take a rather straightforward route through time in the subsequent chapters, beginning with the first inhabitants, and thereafter tracing the rise of sedentary foragers, the introduction of agriculture and the emergence of village farming communities, and the arrival of bronze and then iron, each associated with substantial changes in human interaction, the structure of society, and the natural environment. The era of the Vikings at the close of the Iron Age marks the end of our story. The Middle Ages follow, with historical archives, the Christian religion, and a way of life that changed little until well into the Industrial Era.

Each of the chapters on the archaeology, with one exception, is introduced with a story or anecdote about a particularly characteristic site or aspect of the period. In chapter 5 I take the liberty of expressing some outrage at commercial trade in antiquities. Each of these chapters has an introduction to the important characteristics of the period. The chapters concentrate on the major archaeological places and things that hallmark these "ages" and inform us about life in the past. Focus is on the significant changes in human behavior and society that took place on this long journey through time. These chapters conclude with a summary of those changes and their consequences, along with a discussion of some of the lessons learned and questions that remain from these slices of the past. Along the way, the achievements in design, construction, interaction, belief systems, and survival should hold your attention. It is a remarkable story.

While the focus of this volume is on Scandinavia, what has been learned there has implications across a much broader set of archaeological questions: how do humans colonize new regions, how do hunter-gatherers adapt to difficult environments, how do humans cope with dramatic changes in climate and environment,

how important was the sea for hunter-gatherers, why did foragers become farmers, what were the consequences of farming, how did hierarchical social relationships develop, how did early states operate? Insight on these questions in Scandinavia sheds light elsewhere in the prehistoric world.

Through these chapters, through these time periods, there are changes in the evidence available. Earlier periods are less visible archaeologically and more difficult to understand. The discussion is more impressionistic and generalized, and details are difficult to fill in. There are fewer sites described, and the themes are rather generic—diet, settlement, art. In more recent periods, more objects have survived, the information is better and more nuanced, interpretation is multifold, and important sites are both numerous and spectacular. The themes of life and society are more specific, with greater resolution. Important individuals can be identified. Politics, inequality, foreign relations come into focus. Large and powerful political entities leave lasting evidence of their existence, as does the human modification of the landscape.

A short note on language. Danish, Norwegian, and Swedish are more or less mutually intelligible members of the North Germanic language family. The written versions of the languages vary some, as does pronunciation. All three alphabets have 29 letters. Danish and Norwegian use æ, ø, and å as additional vowels, and these letters are listed at the end in alphabetized lists (although not in this volume). Swedish uses å, ä, and ö, in that order, at the end of the alphabet. Norwegian actually has two official written forms, Bokmål and Nynorsk. The vast majority of Norwegians use Bokmål. There is also the ancient Runic writing system that came into occasional use in Scandinavia after AD 150, prior to the adoption of the Latin alphabet that arrived with Christianity after AD 1000. More on this in the chapter on the Iron Age. The Scandinavian spellings are used throughout this volume for the names of people, places, and things, with a few exceptions like familiar country and city names.

The chronology of events in the prehistory of Scandinavia is based largely on radiocarbon dating. Calendar years BC, calculated from radiocarbon years, will be used throughout this book. I find the presentation of a range of years for a single date (the current convention in archaeology) to be rather confusing and will instead provide a single average calendar date from the middle of the range where appropriate.

Archaeology is a very visual field—things, places, landscapes, maps, photographs, drawings, and graphs are a major part of the archives of fieldwork and follow-up investigations. The illustrations in this book are intended to convey this aspect of archaeology and to provide the reader with a sense of the nature, complexity, and beauty of the remains of the past. This volume is heavily illustrated for that reason. A picture is worth much more than a thousand words and leaves a deeper impression than a lengthy narrative. I think these illustrations are a very important part of the book's message, and I hope you will enjoy them. There are several artist's reconstructions of archaeological scenes in the volume, identified as such. These are intended to be thought-provoking and are not always accurate representations of the past.

I have tried to write in a style that would flow and hold the interest of the reader. For most of my life I have written in an academic mode that tends to be

rather formalized and stilted, requiring extensive documentation of argument and evidence. It is also rather dry and boring. In this book I have tried to write with some flow and less interruption, but I cannot completely avoid the demands of academe. This is perhaps most visible in citation—parenthetical authors' names and years of publication that refer the reader to a list of publications in the bibliography. I have tried to limit the number of citations to the more essential, while at the same time providing a bibliography for each chapter that includes a number of references not necessarily cited in the text, but useful for learning more about the subjects that have been discussed.

Almost any project such as this is the product of friends, colleagues, specialists, museums, libraries, and universities, as well as professional editors and publishers. This volume has been a number of years in concept, research, and development and is the result of the efforts of many people and institutions. There are a great many people to thank for their help. I have tried to list all of these individuals below and regret any names I may have omitted. Per Poulsen, excavator extraordinaire at the National Museum of Denmark, has been a good friend for many years. Thanks also to Kim Aaris-Sørensen, Christian Adamsen, Niels Andersen, Søren Andersen, Magnus Andersson, Jan Apel, Magnus Artursson, Pauline Asingh, Sveinung Bang-Andersen, Jens-Henrik Bech, Knut Andreas Bergsvik, Pia Bennike, Hein B. Bjerck, Svante Björck, Karen Margrethe Boe, Marie Brinch, Jan Piet Brozio, Göran Burenhult, Claus v. Carnap-Bornheim, Charlie Christensen, Tom Christensen, Sheila Coulson, Charlotte Damm, Torben Dehn, Andres Siegfried Dobat, Ellen Grav Ellingsen, Per Ethelberg, Fredrik Fahlander, Siv Falk, Ingo Feeser, Anders Fischer, Sven Follin, Barbara Fritsch, Ingrid Fuglestedt, Martin Furholt, Anne Birgitte Gebauer, Rupert Gebhard, Lars Erik Gjerpe, Håkon Glørstad, Zanette T. Glørstad, Elisabet Green, Anna Gröhn, Kurt Gron, Fredrik Hallgren, Niels Hartmann, Sönke Hartz, Lotte Hedeager, Anna Hedenström, Sveinulf Hegstad, Knut Helskog, Volker Hilberg, Martin Hinz, Lisa Hodgetts, Flemming Højlund, Sandie Michelle Holst, Bryan Hood, Karen Margrethe Hornstrup, Björn Hulström, Steen Hvass, Staffan Hyll, Lisbeth Imer, Lone Klint Jakobsen, Helle Juel Jensen, Ole Lass Jensen, Jens Jeppesen, Mads Dengsø Jessen, Lykke Johansen, Lars Jørgensen, Sven Kalmring, Per Karsten, Claus-Joachim Kind, Lutz Klassen, Stefan Klatt, Susanne Klingenberg, Kjel Knutsson, Kristian Kristiansen, Lars Larsson, Thomas B. Larsson, Randy Law, Peter Leonard, Gundula Lidke, Johan Ling, John Ljungkvist, Trond Lødøen, Gerhard Milstreu, Tinna Møbjerg, Kevin Mullen, Johannes Müller, Ulf Näsman, Elise Naumann, Finn Ole Nielsen, Jens Nielsen, Jens N. Nielsen, Poul Otto Nielsen, Jenny Nord, Johan Norderäng, Bengt Norqvist, Chatarina Ödman, Debbie Olausson, Lis Helles Olesen, Asle Bruen Olsen, Einar Østmo, Xenia Pauli-Jensen, Heidi Peter-Röcher, Sophia Perdikaris, Henrik Pihl, Lukasz Pospieszny, Per Ramqvist, Klavs Randsborg, Peter Rasmusen, Bodil Bundgaard Rasmussen, Flemming Rieck, Felix Riede, Ken Ritchie, Peter Rowley-Conwy, Elisabeth Rudebeck, Henrik Schilling, Lou Schmitt, Stig Asbjørn Schack Pedersen, Niels Schrøder, David Score, Karl-Göran Sjögren, Marianne Skandfer, Birgitte Skar, Henrik Skousen, Dagfinn Skre, Jan Steffans, Martin Stoltze, Anita Synnestvedt, Thomas Terberger, Sten Tesch, Tina Thurston, Chris Tilley, Peter Vang Petersen, Helene Victor, Leo Webley, Matthias Weniger, Julian Wiethold, and Peter Woodman.

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T. Douglas Price
Akademiet, Copenhagen

CHAPTER ONE

PLACE, TIME, AND ARCHAEOLOGY

Although occupied only briefly in the long span of world prehistory, Scandinavia is an extraordinary laboratory for the investigation of past human societies. The area was essentially unoccupied until the end of the last Ice Age, when the melting of huge ice sheets left behind a fresh, barren land. That surface was gradually infiltrated by vegetation, then entered by animals, and eventually occupied by people sometime after 13,000 BC. The first human arrivals were hunters of large game, primarily reindeer.

As the climate warmed and the environment improved, these groups shifted to a more varied diet that included both plants and animals. As sea levels rose with the warming temperatures and melting ice, these hunter-gatherer folk turned to marine resources for a larger part of their diet. Co-residential human groups became larger and more sedentary. Cemeteries became part of the landscape.

By 4000 BC, the first domesticated plants and animals came into northern Europe as cultivation and herding were added to subsistence activities. The arrival of agriculture brought monumental changes. A variety of new social, economic, and religious practices were adopted along with new foods. Farms expanded at the expense of the forest, and a human landscape of houses, fields, trails, tombs, and earthworks became visible across the landscape. By 2000 BC, the fundamental components of farming in northern Europe had been established, destined to continue well into the Industrial Age.

Copper was introduced in northern Europe with the arrival of the first farmers; bronze, requiring higher temperatures for smelting, came into use after 3000 BC. Bronze was used primarily for weapons and jewelry. Along with these new metals, the Bronze Age brought pan-continental trade, greater social inequality, and more warfare as wealth increased in the hands of fewer individuals. The social, economic, and political trends that began in the Late Neolithic and Bronze Age continued into the Iron Age, after 500 BC, at a greater pace and larger scale. Ores were widely available in Scandinavia, and iron quickly became the preferred material for many kinds of tools and equipment in addition to weapons.

During the first millennium AD, Iron Age societies grew in size and influence, with larger and more powerful political entities emerging across the region. Settlements grew in size. Although the Roman legions never entered Scandinavia, the impact of Rome on northern Europe was substantial. The first towns appeared. By AD 750, Scandinavian marauders appeared along the east coast of Britain, beginning a period of expansion and colonization outside the homeland that

defined the extraordinary events of the Viking Age. Christianity, historical documents, and the Middle Ages came to Scandinavia around AD 1050, essentially ending the prehistoric period and the coverage of this volume.

ORGANIZATION OF THE BOOK

This book is about the prehistory of Scandinavia, from the first inhabitants to their Viking descendants. Scandinavia in this study includes the modern countries of Denmark, Sweden, and Norway (Figure 1.1). The Scandinavian Peninsula per se includes only Sweden and Norway. This first chapter is intended to provide some frameworks for understanding the prehistory of Scandinavia, concentrating on place, time, and archaeology. The subsequent chapters are organized by the major archeological divisions of the time between the arrival of the first inhabitants, sometime after 13,000 BC, and the end of the Viking period, ca. AD 1050. Chapter 2 concerns the end of the Pleistocene—the Paleolithic—and the arrival of the reindeer hunters following the melting of the continental ice sheet across Northern Europe. Chapter 3 focuses on the Mesolithic, or Middle Stone Age, and the emergence of sedentary foragers along the coasts of Scandinavia. Because the Neolithic (New Stone Age) is such an important time in Scandinavia, there are two chapters for this period; chapter 4 concerns the early Neolithic and the introduction of agriculture, while chapter 5 follows the story of the consequences of the shift to farming in the Middle and Late Neolithic. The sixth chapter, on the Bronze Age, deals with the introduction of this new metal and the major changes in mobility, trade, and social organization that took place at that time. The seventh chapter focuses on the Iron Age and developments between 500 BC and AD 750, including the impact of the Roman Empire. Larger and more power political units characterize most of southern Scandinavia in the Iron Age, and major centers emerge as the focal points of economic and ideological power. The Vikings, at home and abroad, are the topic of chapter 8, which documents the rise of powerful states in the region and their impact on other societies across large parts of Europe. A final chapter contains a brief review of the prehistory of Scandinavia and considers some of the lessons of that past in the larger context of human society.

It is also important to state here at the outset that most of the book deals with southern Scandinavia (Figure 1.1). North of the limits of cultivation, there are simply fewer changes taking place, smaller numbers of sites, and less spectacular archaeological remains. Most of the major developments that took place in Scandinavia happened in the south. It is also important to remember that our knowledge of the past increases as we come closer to the present. Preservation is better, and there were more people, more sites, and more materials surviving to the present. We know much more about the later Iron Age and Viking periods, for example.

Each of the following chapters (save the last) begins with a story, an anecdote from the past, a distinctly characteristic find or place that tells us about that time. The focus of the chapters changes through time. The Paleolithic chapter emphasizes the various archaeological cultures that have been identified in Scandinavia in this earliest period of human presence. The chapter on the Mesolithic highlights

the regional differences that emerge across the region in the period following the close of the ice ages. There was relatively little human modification of the landscape until the Neolithic, when large stone tombs were erected across most of southern Scandinavia. The Bronze Age was dominated by the acquisition of power and wealth, displayed in tombs and hoards. Politics became a part of social interaction. Landscape changes in the Iron Age and Viking periods were pronounced as farms and fields filled the countryside; villages and eventually towns became a new form of community. Major earthworks were raised in many parts of southern Scandinavia. Warfare and conflict are documented in many ways, including fortifications and weapons offerings. The Viking achievements involved the formation of a state, conquest of parts of Britain, Ireland, and France, the colonization of much of the North Atlantic, and the integration of northern Europe with the rest of the continent.

Beginning with the Neolithic, there is substantially more evidence regarding human behavior and activity and more to be said about the themes of past life, such as raw materials and equipment, households and homes, death and burial, beliefs and rites, trade and interaction, and conflict. These themes have varying significance and detail in the different ages. More archaeological sites are described in the later chapters, as more evidence is available. Because not all of the archaeology of the past fits into a structure focused on sites, there is also a section at the end of each chapter which features some of the spectacular artifacts or objects from the period, items that often fall into the category of treasures. A summary of each chapter includes some thoughts on the changes that took place and the consequences of those changes for life in Scandinavia.

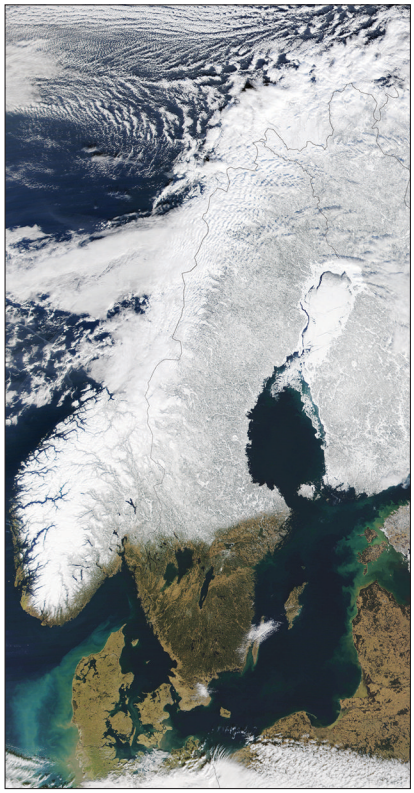


Figure 1.1. Satellite view of Scandinavia. Norway, Sweden, Denmark, and northern Germany surrounded by the Arctic Ocean, North Sea, the Kattegat, and the Baltic. Intriguingly, the snow line in this photo closely matches the limits of cultivation.

But for now, I turn to the geography of Scandinavia and the frameworks of time used to characterize the past in this region. This first glimpse provides a general overview of the place in which prehistoric human populations lived. More specific details of the dramatic changes in the environment that took place during and following the close of the Pleistocene are provided in subsequent sections, after a consideration of the periods of archaeological time that have been defined.

SCANDINAVIA TODAY

Take a seat at the North Pole, high enough above the earth to look across Europe. The view is dazzling (Figure 1.2). The first third of the continent below you is Scandinavia, incorporating some 814,700 km^2 (315,500 square miles, roughly twice the size of the state of California). Note the northern situation. From deep inside the Arctic Circle, it is more than 2,000 km (1,250 miles) south to the border of Germany. It is further from the northern tip of Norway to Copenhagen than it is from Copenhagen to the boot heel of Italy. Surprisingly, the far northeastern corner of Norway lies east of Istanbul.

Figure 1.2.
Europe viewed from the north. Scandinavia comprises almost one-quarter of the continent.

Note the dominant features of this landscape—the seas, the mountains, and the lowlands. The landscape varies from the many mountains of Norway to the rolling forested highlands and rivers of central and northern Sweden and to the lightly undulating moraine landscape of Denmark and southernmost Sweden. The Fennoscandian Shield makes up the mountains and bedrock of the northern 80% of Scandinavia. These ancient deposits date from early in the history of the earth and are heavily eroded. Later tectonic activity during the Paleozoic raised the Caledonian-era mountains of Norway, creating the high relief that characterizes this area today. The bedrock of southern Sweden and Denmark, on the other hand, is much younger, of Mesozoic and Tertiary age, and deeply buried beneath the Pleistocene sediments of several glaciations. Bedrock is almost nowhere exposed across southern Scandinavia, with the exception of a few chalk outcrops and the island of Bornholm in the western Baltic. The differences between the northern three-quarters of Scandinavia and the south are seen in many different ways: in wilderness versus cultivation, in the availability of raw materials, in the preservation of prehistoric organic materials, and in the distribution of archaeologically known groups of people.

Today the limits of cultivation mark the boundary between these two very different parts of Scandinavia, defined by a wandering line running from approximately Bergen on the west coast of Norway north of Oslo in the east of the country and including approximately the southern third of Sweden, defined by a border north of Uppsala and Stockholm (Figure 1.1). This boundary extends in a narrow, patchy band up the west coast of Norway because of the warming effects of the Gulf Stream. Some cultivation along the coast is even possible above the Arctic

Circle. A wilderness of forest and tundra lies north and east of the limits of farming. This region has lain virtually unchanged over the last several thousand years. Southern Scandinavia, to the south of that boundary, is heavily agricultural, with fields of wheat, barley, rape, corn, and sugar beets. The landscape is one of the more domesticated on earth—the opposite of wilderness—manifesting the ordered and serene beauty of a land intensively farmed, pruned, and cultivated for 6,000 years.

There are several major aspects of the geography of the region that have been important in the development of human society (Figure 1.3). Scandinavia

Figure 1.3.
Scandinavia with some of the places mentioned in chapter 1.

is surrounded by large bodies of water—the Arctic and Atlantic Oceans, the Norwegian and North Seas, the Baltic Sea, and the Gulf of Bothnia. These waters have been a preeminent factor influencing the character of the land and the people. The seas are also a major route of communication and transport for the inhabitants and a major part of the Scandinavian outlook. Boats have been in use in this area since the first inhabitants arrived and continue to be of major importance. Scandinavians often win medals in Olympic sailing championships. There are more boats per capita in Scandinavia than elsewhere on earth, a statistic that serves to highlight the importance of the sea in the life of the inhabitants.

To understand the landscape of Scandinavia, you must see it from the water. The glaciers left southern Scandinavia without mountains, but rich in a maritime environment. The area is epitomized by coastlines. Most of the population lives on or near the coast, both today and in the past. The sea is a constant in human life. No spot in Denmark is more than 75 km (less than 50 miles) from the sea. The seas also provide important routes of transportation and communication throughout Scandinavia and must be considered in any overview of the subject. There are probably more ferries in Scandinavia than in any other comparable region on earth. The west coast of Sweden and the south coast of Norway are a boater's paradise, with hundreds of rocky islands and inlets. There are important islands in the Baltic, often at strategic locations along the seaways. Bornholm is a Danish island, situated between the south coast of Sweden and the north coast of Poland. Öland, just off the southwest coast, and Gotland, in the middle of the Baltic 100 km (62 miles) from the mainland, are the two largest islands of the thousands that dot Swedish waters. The Åland Islands of Finland extend toward Sweden as an archipelago across the mouth of the Gulf of Bothnia. There are thousands of islands in Scandinavia, many of them uninhabited.

Europe lies far to the north on the globe compared to the United States. In fact, a line drawn straight east from New York City crosses the coast of Portugal and runs near Madrid, Rome, and Istanbul. The northern parts of Norway and Sweden lie inside the Arctic Circle. Scandinavia, if moved directly west, would fit nicely inside Hudson Bay in northern Canada. It is the Gulf Stream that makes much of Scandinavia inhabitable, bringing warm waters from the south to ameliorate the climate of Denmark, southern Sweden, and the northern and western Norwegian coast.

The climate in Scandinavia today varies from north to south and from west to east. Temperatures and precipitation decline to the north and east. A mild, maritime climate, fashioned by the Gulf Stream, is found to the west and south. Average temperatures in Denmark vary from ca. 0°C (32°F) in the winter to 17°C (62.5°F) in the summer. Average annual precipitation is around 700 mm (27.5″). The interior parts of Norway and Sweden experience a continental climate, with more extreme annual temperatures between –5°C (23°F) and 16°C (61°F) and annual precipitation of ca. 550 mm in Uppsala, for example. To the north, away from the coast, subarctic conditions prevail, with seasonal temperatures averaging between –10°C (14°F) and 12°C (54°F) in places like Tårnaby in inland, northern Sweden, where the annual precipitation is ca. 625 mm (24.5″). Tundra conditions are present in the highlands of the Scandinavia Mountains and in the far north. These mountains also create

a rain shadow to the east, so that northern Sweden and northernmost Norway receive little precipitation.

The daily weather in much of Scandinavia is rather unpredictable and cool, with frequent showers in many areas. The rain is usually light, but lasting. Once upon a time, an offbeat candidate was elected to the Danish parliament because he promised better weather. It is always a good idea to travel with a couple of layers of clothing. Southern Scandinavia in the winter is cool and damp, with temperatures around freezing and little or no snow in most years. Long nights and heavy cloud mean short, dark days that lead to melancholy. Summer is often cool, but the long days and light nights offer a reprieve from the less pleasant winter months. In northern Scandinavia, above the Arctic Circle the sun doesn't set in June. In the south you can read outdoors after 10 PM in midsummer.

Geographically, southern Scandinavia forms a distinctive part of the region. This area includes Denmark, southernmost Sweden, the Oslo Fjord area, and the northernmost part of Germany, which belonged to Denmark until the nineteenth century. Southern Scandinavia is different from the north, both today and in the past. This is the lowland zone. Rising from the sandy stretches of the North European Plain, the peninsula of Jylland extends as an entry point from the continent toward the rest of Scandinavia. Denmark and southern Sweden were leveled by the glacial ice, leaving a flat, hummocky topography with narrow, small rivers and numerous bogs and lakes inland. The highest elevation in Denmark is 171 m (560′). The streams draining this area flow quietly into the Baltic and Skagerrak.

The name for Sweden in Swedish is *Sverige*, which literally means the kingdom of the Swedes, the term for some of the people who lived there. Denmark is called *Danmark* at home and refers to the flat land where the Dani people lived. (There is some question whether Dan refers to the people or a specific individual.) Norway, or *Norge*, simply refers to the north and the people who live there.

The countries of Scandinavia today have distinct regions. Denmark is made up of the peninsula of Jylland and more than 400 islands, mostly in the eastern half of the country. Bridges, causeways, and ferries connect many of these islands to the rest of the country. The two largest and most populous are Fyn and Sjælland. More than half the population of 5.5 million lives on these islands. The capital, Copenhagen, lies on the eastern edge of the eastern island of Sjælland.

Götaland is one of the three former "lands" of Sweden and basically defines the southern part of the country (Figure 1.4), including the islands of Öland and Gotland in the Baltic. Middle Sweden is defined largely by the old "land" of Svealand, a broad band which crosses the country east to west 150–200 km to the north of the boundary of Götaland. The capital, Stockholm, lies in the southeast corner of Svealand. Northern Sweden (Norrland) comprises about 60% of the country and is largely mountains and forest. Ninety percent of Sweden's 9.5 million people live in Svealand and Götaland. Sweden today is divided into named provinces that serve as administrative districts, and their location is useful in understanding the archaeology of the country. Figure 1.4 shows these provinces. The focus in this book is on the central and southern areas, with occasional mention of the northern zone.

Norway can be divided into five major regions. The outline of the country resembles a spoon. The handle of the spoon includes Middle Norway (or Trøndelag) and Northern Norway. One province of particular importance in our discussions is

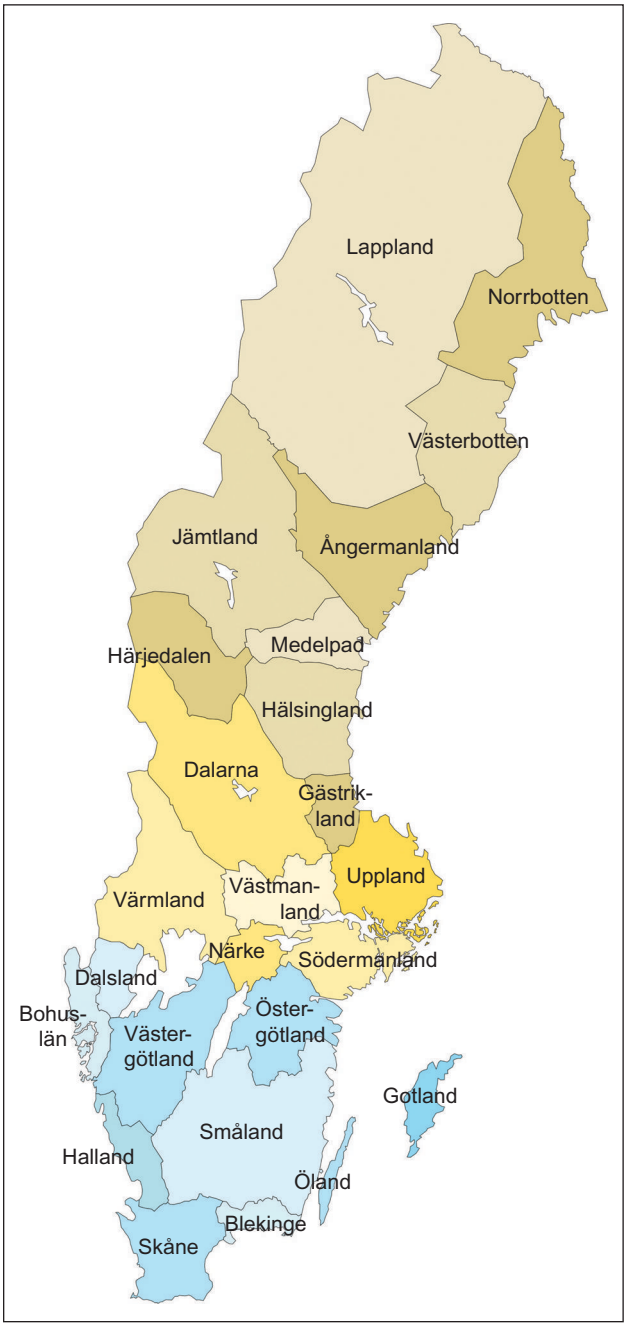


Figure 1.4.
The lands and provinces of Sweden. Blue = Götaland, yellow = Svealand, brown = Norrland.

Finnmark, the northern end of the spoon and Norway's largest province. The bowl of the spoon contains Western Norway, Southern Norway, and Eastern Norway. The capital, Oslo, lies in the southeastern corner of Eastern Norway at the head of a deep fjord. Most of the almost five million people in Norway live along the coasts, with the vast majority in the southern third of the country.

The word *Scandinavia* probably derives from the Latin term *Skåne* (Helle 2003). This word was used in the early centuries AD to identify the southwestern corner of Sweden, today's province of Skåne, and the lands further north that were believed to be part of a large island. The Scandinavian countries share similar social and political agendas today. These social democracies have managed to create a governmental system with free education, healthcare, and welfare. The economy of the region runs strong, even in recent times of financial stress, and is very competitive in spite of some of the highest taxes in the world. This economic strength is also surprising given the relatively low number of work hours and lengthy vacation time (about five weeks per year) that people enjoy. These policies and attitudes appear to be highly successful and can perhaps be understood as a mix of freedom, equality, socialism, and a market economy. The Nordic region is among the richest in the world in GDP (gross domestic product) per capita. Moreover, these nations are annually ranked among the world's happiest. (This survey must have been done in the summer.) Norway often tops the lists for quality of life, but falls out of the top ten in the happiness index. Certainly there is much to be learned from the Scandinavian model.

But Scandinavia is not utopia. There are problems. There is a certain sense of kismet, almost resignation, that one's role and options are determined by social mores and legislation. A massive social safety net protects the needy, but may also limit options for some. There is a large group of individuals, including young people, who opt for a government-supported life on the dole. There is also a certain fatalism, a sense that the future is already determined, that no matter what

your efforts you can only achieve so much in life. The American dream that hard work will take you far does not seem to resonate in Scandinavia. Another important issue involves the anti-immigrant sentiments that have grown in recent years. More thoughts on some of these matters in the final chapter.

HISTORY IN VERY BRIEF

It is also important to know a bit of the history of Scandinavia to understand the region. The countries of Scandinavia first appeared as larger political entities in the tenth century AD. Harald Bluetooth was celebrated as king of Denmark, Norway, and the southern third of Sweden at Jelling, Denmark, in AD 970. Sovereignty shifted between Denmark and Norway several times until the end of the fourteenth century, when Queen Margaret I established the Kalmar Union of Denmark, Norway, the Faeroe Islands, Iceland, Greenland, and parts of Finland and Sweden. In 1520, Christian II of Denmark completed the conquest of Sweden and had himself crowned as ruler. Shortly thereafter, in 1523, Sweden and Finland, led by Gustav Vasa, revolted from the Kalmar Union, breaking ties with Denmark and forming a separate political entity ruled from Stockholm.

By 1645, there were two kingdoms in Scandinavia. To the west lay Denmark, including Norway, Iceland, and Schleswig-Holstein. The frontier of Denmark extended to the Elbe River in Germany. To the east, both Sweden and Finland were ruled by the Swedish crown. Following another war and defeat, Denmark ceded Skåne to Sweden at the peace of Roskilde in 1659. In 1814, following the Napoleonic Wars, Denmark was forced to give Norway to Sweden and Helgoland (a small group of islands in the North Sea, ca. 60 km northwest of the mouth of the Elbe) to England. Sweden lost Finland to the Russian tsar. In 1864, Schleswig-Holstein was taken from Denmark after another war with Prussia. Norway was granted autonomy and a constitution on May 17, 1814, but remained in union with Sweden until it became peacefully independent in 1905. Iceland received its independence from Denmark in 1945, and Greenland obtained home rule from the Danes in 1979.

This long shared history has resulted in a distinctive homogeneity across Scandinavia, reflected in the term *Norden* (the North), which refers to the commonality of society, language, expectations, and behavior. *Norden* includes Finland, Iceland, Greenland, and the Faroe Islands. The opening of a bridge across the Øresund connecting Copenhagen and the Swedish province of Skåne in 2000 provided the first fixed link between Sweden and the continent of Europe (through the Great Belt Bridge between Sjælland and Fynen in Denmark). Southern Sweden shares more similarities with Denmark than with the rest of Sweden because of proximity and common history.

SCANDINAVIA IN PREHISTORY

The prehistory of Scandinavia began more than 13,000 years ago at the end of a long series of ice ages. The region underwent dramatic changes as the climate

warmed, sometimes erratically—the seas rose, and plants and animals invaded this new ground. To understand the past of this region, it is essential to have some sense of these changes and their impact on the human inhabitants. This section will cover various aspects of the past in Scandinavia, including the issue of time, how geologists and archaeologists have created frameworks for dividing the past into smaller, more comprehensible units. In addition, there is an introduction to the changes in the land and sea that have taken place over the last 15,000 years or so. As global warming continued in the early part of the postglacial period, a sequence of species of flora and fauna entered the area and established themselves on the landscape. This changing environment of geology, geography, plants and animals, and natural resources provided the context for human adaptation and activity in the prehistory of Scandinavia.

Time: Chronology and Culture

Time is a difficult dimension to comprehend. It is almost impossible for us today to look back even a hundred years and understand the conditions of life. Archaeology is trying to look back thousands of years. It is a demanding task.

Because time is so vast and mostly incomprehensible, it is usually divided into more manageable units—minutes, hours, days, months, years are one way to divide time. Time is understood in different ways by different people. The Maya of Middle America had a calendrical system more accurate than the one we use today. Geologists tend to view time as a series of major natural events, and they subdivide the 4.6 billion years of the earth's existence into units that reflect changes in climate and environment. Archaeologists, on the other hand, tend to think of time in terms of changes in technology and the artifacts that people made—the use of stone, bronze, and iron, for example. Each of these views is useful and important for understanding the past.

Climate plays a major role in the geological divisions of the last 15,000 years. The period of concern here involves the two most recent geological epochs in the earth's history, the Pleistocene and the Holocene. The Pleistocene began almost three million years ago, but it is only the very end of this epoch that witnessed the arrival of humans in Scandinavia. The boundary between the Pleistocene and the Holocene is based on changes in temperature and the melting of glacial ice; geologists have conventionally drawn this boundary at 9750 BC (International Commission on Stratigraphy 2009). Since the end of the Pleistocene, the earth's climate has seen gradually warming summer temperatures. Figure 1.5 shows average summer and winter temperatures in northwestern Europe for the last 12,000 years (Davis et al. 2003). Summer temperatures have increased significantly during this period and especially in the last 1,000 years.

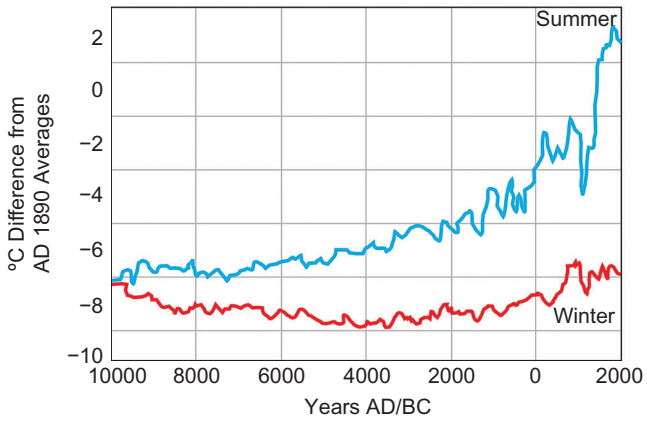


Figure 1.5. Average summer and winter temperatures (°C) in northwestern Europe for the last 12,000 years (Davis et al. 2003). The 0 temperature line is the average for AD 1890 and is used as a baseline.

There are a series of subdivisions at the end of the Pleistocene and through the

Holocene that are important for understanding environmental changes in the region. Figure 1.6 is a general chronological framework for the geological and archaeological periods used in this volume. In this chart, time is shown in years BC and AD in the left column. All of the dates used in this volume are given in calendar years BC, usually based on the calibration of radiocarbon measurements. Tree ring dates are also available from some later periods of prehistory.

The two major geological epochs of the late Pleistocene and Holocene appear in the next column in Figure 1.6. Subdivisions or periods of the late Pleistocene

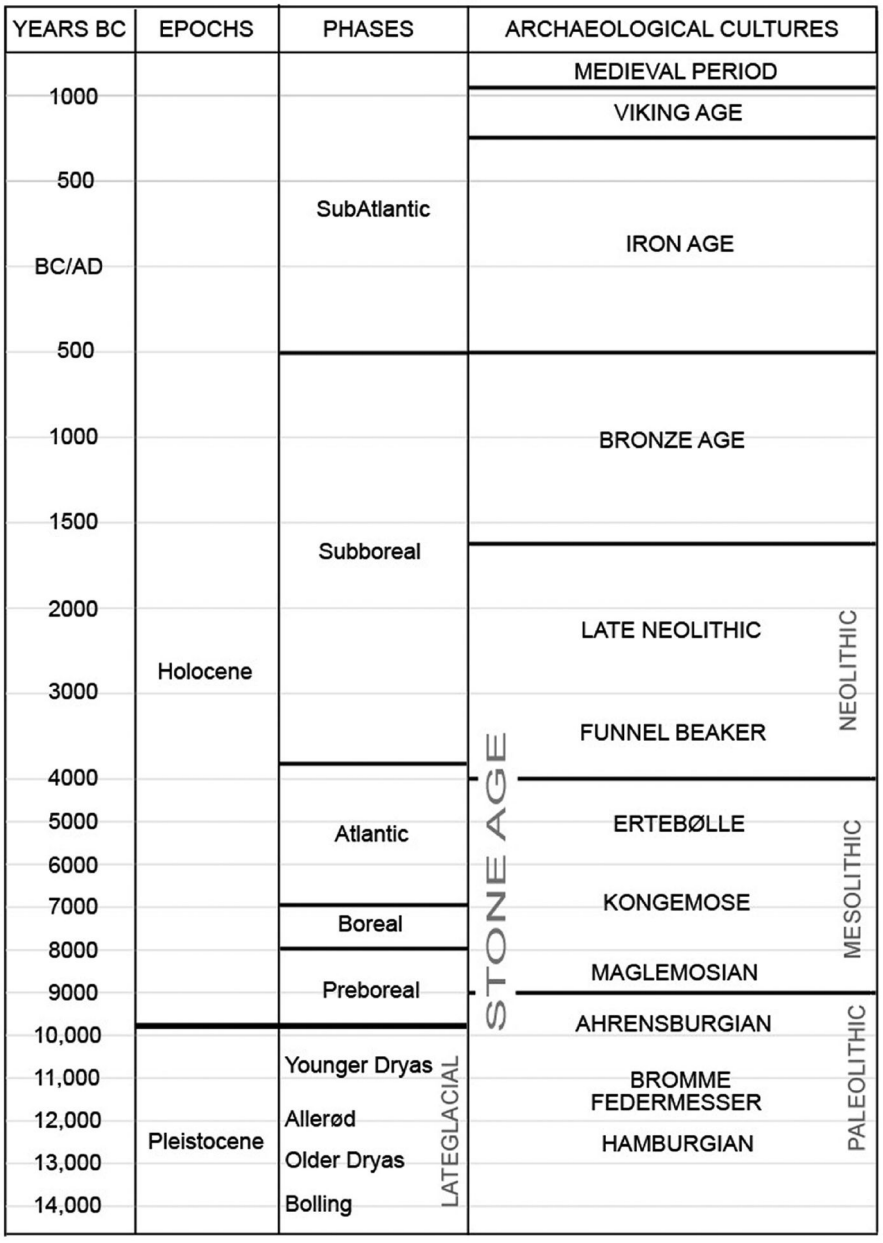


Figure 1.6.
A simplified chronological chart of geological epochs, climatic phases, and archaeological cultures in southern Scandinavia. Note that the time scale on the left is compressed toward the bottom of the chart. Related terms are shown in gray.

and Holocene are provided in the third column, based on recent data from the Greenland ice cores and work on pollen and other climatic indicators in Denmark and elsewhere (Schrøder et al. 2004). These climatic phases were originally based on environmental studies in Scandinavia that identified changes in vegetation that were assumed to correlate with changes in climate. These phases are known as the Blytt-Sernander sequence, first defined in 1876 (Blytt 1876, Sernander 1908). The Bølling, Older Dryas, Allerød, and Younger Dryas phases were thought to represent a series of warmer and colder episodes at the end of the Pleistocene.

Today it is clear that warming was largely continuous until the cold snap of Younger Dryas, which may have resulted from the sudden outpouring of cold meltwaters from the glaciers of North America into the North Atlantic (Broeckner 1989, Condrona and Winsor 2012). Climate during the first part of the Younger Dryas was cold, dry, and windy, with periodic permafrost on the European Plain (Isarin and Bohncke 1999). The coasts of western Sweden and southwest Norway had a subarctic environment with fauna that included seals and polar bears (Berglund 1991). The latter part of the Younger Dryas was generally warmer, and the ice began to melt once more. The end of the Younger Dryas appears to have been very rapid, marking the end of the Pleistocene, with a 7°C increase in annual temperature over a period of roughly 10 years.

The major archaeological cultures of southern Scandinavia are shown on the right in Figure 1.6. The Stone Age has three phases, old, middle, and new—the Paleolithic, the Mesolithic and the Neolithic, marked vertically on the chronological chart. By convention, in Scandinavia the older Stone Age refers to both the Paleolithic and Mesolithic, while the younger Stone Age is synonymous with the Neolithic. The older Stone Age is sometimes referred to as the Hunter Stone Age, and the Neolithic as the Farmer Stone Age. In actual years, the Stone Age in Scandinavia lasts from approximately 13,000 to 1700 BC.

The Bronze Age is a relatively brief period between the Stone and Iron Ages and dates between 1700 and 500 BC. The Iron Age begins at 500 BC and continues until the emergence of the Vikings ca. AD 750. This archaeological framework is centered on southern Scandinavia. Northern Scandinavia has a somewhat different chronology, because certain changes came more slowly or did not appear at all. For example, agriculture was not possible outside the limits of cultivation, so that a true Neolithic never arrived in most of the north. More details on these events and on the terminology will be provided in subsequent chapters.

The chronology of past human activity in northern Europe is known in some depth, based on distinctive changes in artifact styles, radiocarbon dating, pollen analysis, and changes in sea level. In the last 20 years, hundreds of radiocarbon dates have been obtained using accelerator mass spectrometry (AMS) methods, providing much higher resolution and reliability for these chronologies (e.g., Sjögren and Persson 1996, Persson 1999, Hinz et al. 2012). In addition, corrections for variation in the amount of ^{14}C (carbon-14) in the atmosphere and for marine and freshwater reservoirs have greatly improved the dating process (e.g., Turney et al. 2006). The statistical remodeling of large numbers of dates is also providing higher resolution results (e.g., Whittle et al. 2011).

It is important to understand the concept of "archaeological cultures" in a discussion of the prehistory of Scandinavia. Archaeologists don't directly study people or society. Their evidence is dead, lost, or discarded, and often broken. They study

the remains of the activities that have survived to the present from individuals and groups in the past. Those remains found together at archaeological sites constitute a set of artifacts (an assemblage), features, burials, and sometimes architecture that are typical of a particular time, place, and people. Archaeologists use the term *archaeological culture* for a series of similar assemblages from the same time period and region. The size of the region and the length of time involved vary greatly and tend to be larger the older things are. Archaeologists assume that a cluster of related assemblages in a definable geographic region represents a group of people with shared needs, goals, and beliefs—in other words, a society. In the archaeology of Scandinavia, terms like Ahrensburgian Culture, Ertebølle Culture, Funnel Beaker Culture, and many others are used to describe these distinctive groups of similar material remains. Archaeological cultures are a kind of pseudonym for groups of people, even if the precise size, nature, and structure of such groups remain obscure.

It is also important to understand that the archaeology of the various periods of Scandinavia's past differs considerably. The objects and constructions that were made and what has survived until today vary over time. The kinds of evidence available, and the kinds of things that can be learned from that evidence, change. Through time, the archaeological record grows richer. There are more kinds of artifacts, treasures, features, and structures in the later periods, providing a more detailed and nuanced picture of life and death in the past. The further back we go in prehistory, the more the mists of time cloud the details and allow only broad generalizations about those early ancestors.

The Stone Age is just that—stone artifacts dominate the archaeology of this period. The peoples of the Paleolithic were hunters of reindeer and seals who moved around the landscape and colonized the coasts of western Scandinavia. The Paleolithic is almost invisible—a few widely scattered, often deeply buried, stone tools and even less often seen bones and antler. Mesolithic groups lived in small groups along the coasts, utilizing the resources of the sea. Masses of flint artifacts, bones and shells, pits, a few huts and graves are known from this period. The only changes in the landscape during the Mesolithic still visible today are the large piles of oyster and mussel shells and, in the north of Scandinavia, occasional house foundations and rock art. Pottery was added to the mix late in the Mesolithic and became much more common in the Neolithic.

Neolithic farmers established farmsteads inland, created pastures and fields for their animals and crops, and buried their dead in monumental stone tombs. Groups of people from the past—households and societies—became more visible as we move toward the present. Stone takes on new roles as polished axes and querns. A few objects of copper began to appear in the early Neolithic, and metal was not uncommon later in the period. More houses and monumental tombs characterized the landscape of the early farmers as well, with tens and sometimes hundreds of bodies in the tombs. Some of these large stone tombs are still in place on the landscape of southern Scandinavia.

The Bronze Age is best known for the metal, of course. Bronze Age chiefs were buried in rich mounds with treasures from across Europe. Large timber halls housed these leaders, while scattered small farms held the majority of the populace. Individuals become apparent in these large tombs, and families can sometimes be identified. Pottery and stone continue to be important, but have been given less

attention by archaeologists. Metal objects are found in large, visible earthen burial mounds, as well as in hoards and offerings hidden in the ground and wetlands. Connections across Europe are witnessed in foreign artifacts and materials that appear in these tombs and hoards. Ancient field systems from this period can be seen today in a few places. Art was carved into smooth rock surfaces across middle and northern Scandinavia. Farming settlements with some rich farms and smaller scattered farmsteads are known, but it is the elite, with their large residences and burial places, who were most visible in this period.

The Iron Age brings a new metal, and flint becomes less common on archaeological sites. Large, rich farms and small villages have been excavated. True villages emerge in the Iron Age, along with more powerful political leaders who direct economic, military, and religious activities. Distinct groups or classes can be noted in society—warriors, craftspeople, artists, perhaps shamans, or priests. More changes in the landscape are visible—walls, roads, fortresses, canals, bridges—as well as more large burial mounds and ship graves.

The Viking period is the most recent and best known of Scandinavia's deep pre- and protohistory. The Vikings are highly visible, recorded in history, a fascinating story of the expansion of people from Scandinavia conquering distant places, colonizing new lands, and exploring much of the European continent. A few buildings, documents, and artifacts of wood, cloth, glass, and other fragile materials still survive from this period. Christianity brings medieval times to Scandinavia, and the rest is history. In the Viking period, towns, magnate estates, and common farms have been found in the archaeological record. A runic form of writing was introduced in the Iron Age, and inscribed rune stones appeared as standing monuments, perhaps the equivalent of legal documents. Scandinavia started to become a dynamic part of European society.

With all the discussion of the landscape above, it is important to remember that the sea played a fundamental role in Scandinavia, as both a source of food and a route of movement and communication. Dugout canoes are known from the Mesolithic and Neolithic. In the Bronze and Iron Ages, more sophisticated boats were constructed. Viking ships are famous for their innovative design and seaworthiness.

This issue of increasing visibility and detail through time will be apparent in the chapters of this book as we move from the Paleolithic to the Viking period. In the older parts of the past, we have limited information on artifacts, diet, and certain activities. In more recent periods, there is elaborate and well-preserved evidence of individual lives—the bog people, for example—and sophisticated technology, such as the ships of the Iron Age and Viking period. The focus of our story changes through time from cultures to communities to individuals as the details of the economic, social, and ideological aspects of their lives become more visible.

Past Environments: Ice, Land, Sea

The effects and consequences of Pleistocene glaciers dominate the land- and seascapes of postglacial northern Europe. This story begins around 110,000 years ago with the onset of the last major cold stage of the Pleistocene, known as the

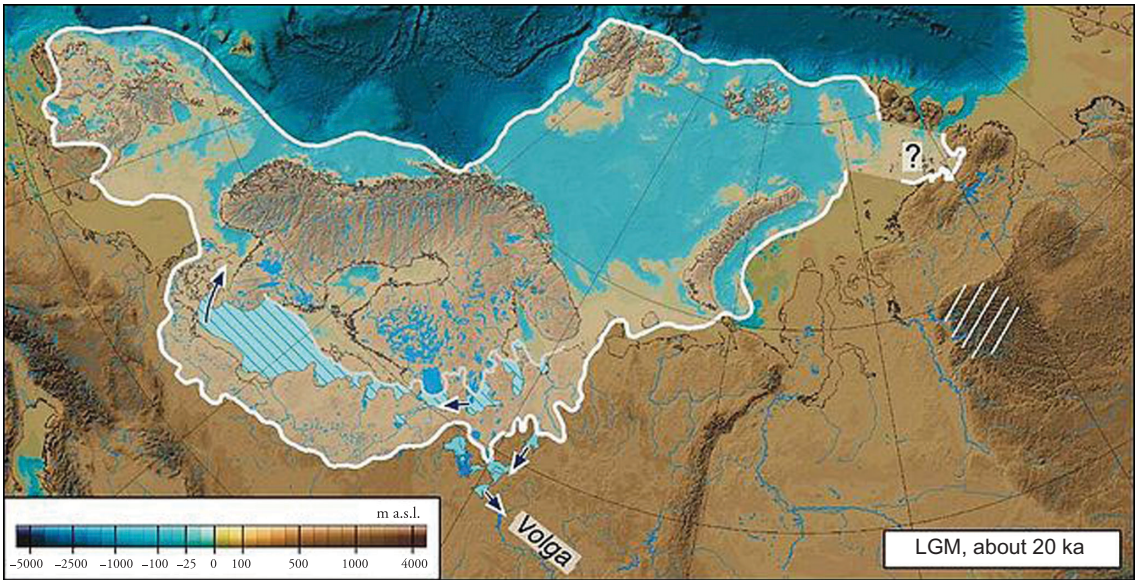


Figure 1.7.
The extent of the Late Glacial Maximum ca. 20,000 years ago (Mangerud et al. 2004).

Weichselian Glaciation. As temperatures dropped, a mass of snow and ice centered on the Gulf of Bothnia began to form, eventually rising more than 2 km (1.2 miles) in height. Its weight caused the frozen mass to spread at the edges. In such a manner, a huge glacier of almost unimaginable proportions expanded horizontally as more snow and ice accumulated. This ice sheet moved across the landscape as much as 150 m (almost 500′) or more per year. In a period of several hundred years, the front of this continental ice sheet moved more than 1,000 km (620 miles) across Norway and Sweden, and by the late Weichselian it covered more than half of Denmark. The ice extended across the Baltic basin and crossed the northern coasts of Germany and Poland. To the east, it covered Finland and much of northwestern Russia.

The Late Glacial Maximum (LGM) is the name given to the coldest part of the Weichselian glacial stage, around 20,000 years ago (Figure 1.7). Annual temperatures were 8°–10°C (14°–18°F) colder than today, and the ice sheets reached their furthest extent. Only the western parts of Jylland and the west Norwegian coast were ice-free in Scandinavia. A large part of what is today the North Sea was ice-covered, connecting Jylland with Britain.

The weight of this continental ice sheet pushed down the landmass of northern Europe, often to great depths. As an example, the Greenland ice sheet today is more than 3 km (1.9 miles) thick, and the land surface under that ice resembles a very deep bowl, higher at the edges where the ice is thinner. This land under the ice in the interior of Greenland is almost 300 m (almost 1,000′) below present sea level, the lowest spot on earth today. The mass of ice in Scandinavia during the LGM depressed parts of the land surface as much as 600 m (almost 2,000′).

The ice began to melt in northern Germany and Denmark after 16,000 years ago. The melting of the ice was rapid, if not constant, during the Late Glacial. Denmark was free of glacial ice by 12,000 BC. Skåne was the first part of Sweden where the ice disappeared by about 11,500 BC, and then the ice mass disappeared across middle Sweden until 9000 BC at a rate of 50 km (approximately 30 miles)

per century (Björk and Digerfeldt 1982, Larsson 1991). The 59° parallel marks the approximate edge of the ice at the end of the Pleistocene. The melting of the ice in the Preboreal and Boreal was very rapid, with the edge of the ice sheet retreating on the order of 500 m/year (1,640′) in northern Sweden and 300 m/year (almost 1,000′) in southwestern Norway (e.g., Andersen 1980, Nygaard 1989). Most of Sweden and Norway were ice-free after 8,000 years ago. Even today, however, the ice is not completely gone, as the numerous small mountain glaciers in the highlands of Norway attest.

Since warming, melting, and the disappearance of the ice sheet, the surface of the land in northern Europe has been rebounding from the removal of that enormous weight. In some areas, particularly in Norway and Sweden, rebound has gone on at a very rapid rate, with significant consequences for archaeology. Mesolithic rock carvings made along the coast of the Oslo fjord some 6,000 years ago are found today more than 150 m (almost 500′) above sea level. Quarries and scatters of quartz artifacts from coastal Mesolithic sites in the Stockholm region are now found at elevations above 70 m (230′). This rebounding process continues.

The mass of glacial ice around the globe incorporated a substantial portion of the earth's water, captured from the oceans. During the time of maximum cold and huge continental ice sheets, sea level was reduced as much as 120 m (almost 400′) or more, completely changing the outlines of the continents and often creating connections between former islands and separate land masses. The coastline of northern Europe was dramatically changed during times of lower sea level. This shrinkage of the sea left large areas of the sea floor around Scandinavia as dry land. Today, the North Sea Basin and the English Channel are relatively shallow, often with water depths of 50 m (165′) or less.

Doggerland is the name given to the large piece of the North Sea floor that was dry land. During the LGM, with sea levels much lower than at present, this area would have been part of the European continent, connecting Britain to Belgium, the Netherlands, northern Germany, and Denmark (Figure 2.1). A variety of artifacts from the Late Paleolithic and Mesolithic, left by the early inhabitants on the bottom of the North Sea and Baltic in this now submerged region, have been found in the dredge nets of fishermen (Long et al. 1986, Vang Petersen and Johansen 1996, Verhart 2004). The human presence on Doggerland during the Late Paleolithic was dramatically documented when a fishing vessel dredged up a barbed point made of antler from deep water in the North Sea in the 1930s. This artifact has been radiocarbon-dated to approximately 11,700 BC (Bonsall and Smith 1989).

The total area, about the size of the state of California, was submerged by rising seawaters as the late Pleistocene temperatures warmed and sea levels rose. As the ice sheets began to melt, sea level rose through the early Holocene, and Doggerland was gradually submerged beneath the waters of the North Sea. Around 6150 BC, a huge underwater landslide off the coast of Norway triggered a massive tsunami, or tidal wave. This tsunami, with waves estimated to have been 3–10 m (10′–35′) high, would have impacted coastlines throughout the North Sea region and drowned the remaining parts of Doggerland (Gaffney and Smith 2009, Weninger et al. 2008).

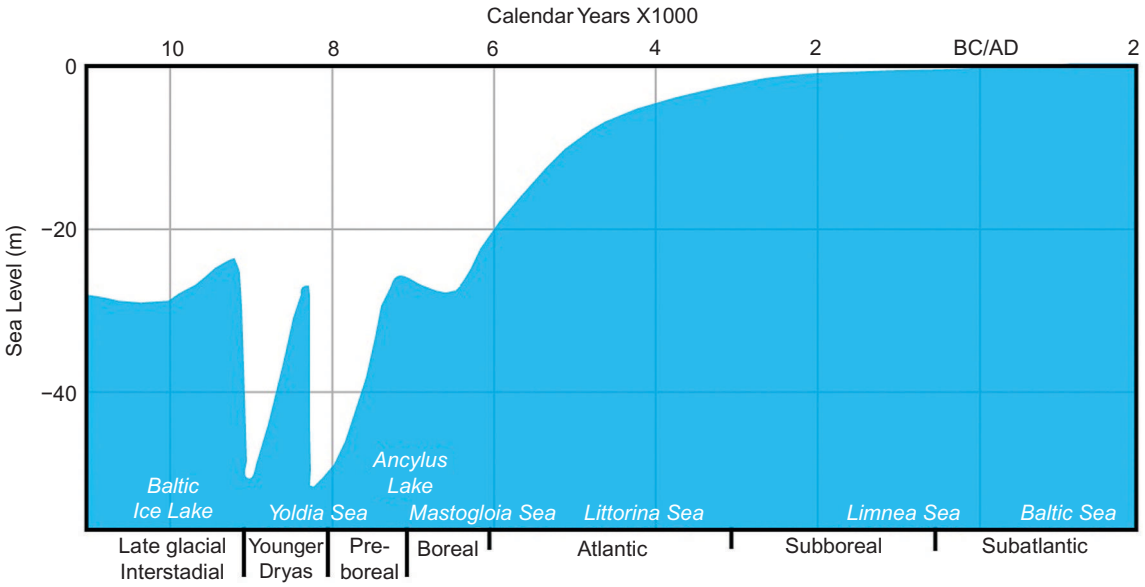


Figure 1.8.
Changes in sea level in the southern Baltic Sea for the last 13,000 years (after Uscinowicz 2006). The names in white are stages of the Baltic, which shifted between fresh and salt water in this period. The climatic phases at the bottom of the graph are the conventional divisions of the late Pleistocene and Holocene in northern Europe.

A major consequence of increasing temperatures and the melting of the continental ice sheets at the end of the Pleistocene was the return of water to the oceans. This process appears to have accelerated during the early Atlantic episode (Björck 1995). The maximum rate of sea level rise during the Holocene has been estimated as almost 3 cm (more than one inch) per year between 6500 and 6000 BC, i.e., 3 m (10′) per century (Niekus 2006). Rising waters encroached on the lowlands of southern Scandinavia, changing the shape and juxtaposition of these areas. Many of the settlements from the earlier part of the Mesolithic must have been inundated. This situation was reversed in the northern two-thirds of Scandinavia, where land rebound outpaced the rising sea level. Early Holocene sites are found at high elevations in that region today.

In one sense there was a very drawn-out race between the rebounding surface of the land and the refilling seas, rising higher and higher against the land. The changes in the Baltic basin (Figure 1.8) neatly document this race (Björck et al. 1998). Initially, melt water from the retreating ice sheet filled the southern Baltic basin with a freshwater lake, dammed by higher ground in the Øresund and the remains of the ice sheet located between Stockholm and Lake Vänern in central Sweden. Rising water in this Baltic Ice Lake began to spill over the Øresund at 10,700 BC and possibly eroded this outlet down to bedrock. However, continuing uplift of the Øresund, due to the removal of the weight of the ice, raised the level of the Baltic Ice Lake to 10 m (35′) above sea level. When the ice sheet receded further north, the Baltic Ice Lake drained to sea level around 9300 BC through an active drainage channel across the Middle Swedish lowlands connecting the west coast and the Baltic (Bergsten and Nordberg 1992). This drainage, lowering the water in the Baltic basin by 25 m, may have been catastrophic in nature (Berglund et al. 2005). The Baltic basin became brackish through this connection to the North Sea. This stage of the Baltic is known as the Yoldia Sea, which lasted for about 900 years.

The continued rise of the land surface eventually raised the outlet in central Sweden above sea level. Closure of the outlet meant the accumulation of fresh water in the Baltic basin, and the Ancylus Lake gradually filled the basin. After 6500 BC, the rising waters of the North Sea and Kattegat opened a new outlet through the Øresund and Great Belt as southern Sweden separated from Denmark. The brackish waters that formed at that time have been designated the Littorina Sea, which eventually became the present-day Baltic. Postglacial seas reached the present beaches of southern Scandinavia by approximately 4000 BC, a time marked by a series of transgressions and regressions of the sea, in some instances several meters higher than today. Over time, the coasts of Scandinavia had become a place of peninsulas, archipelagos, and islands.

Although climate has been generally warm and stable through the Holocene, there have been several cooler episodes. One of the most prominent of these is a short-lived cool, dry, and windy event around 6000 BC, known as the "8.2 ka event" (Alley et al. 1997, Seppa et al. 2009). A more recent episode in the Baltic and North Sea was a cooling event known as the Little Ice Age that lasted from approximately AD 1350 to 1850. The Little Ice Age had a major impact on the Vikings in the North Atlantic and likely hastened the abandonment of the Greenland settlements. More on this story in a later chapter.

Past Environments: Vegetation

Vegetation is a major component of landscape. Fourteen thousand years ago, the landscape of southern Scandinavia was largely denuded, freshly exposed by the melting of glacial ice (Figure 1.9). The ice masses of the Pleistocene acted as enormous bulldozers, grinding down the earth's surface as they advanced and leaving behind huge blankets of homogenized earth and rock as they disappeared. The undulating layers of sand, gravel, and till that were left are the present topography of southern Scandinavia. To the north, the melting ice exposed the Precambrian shield, patchily covering it in some places with deposits of moraine and gravel. Detailed records of the succession of plants spreading into this new, empty landscape have survived as deposits of pollen in lake and marine sediments (e.g., Iversen 1944, Odgaard 1989).

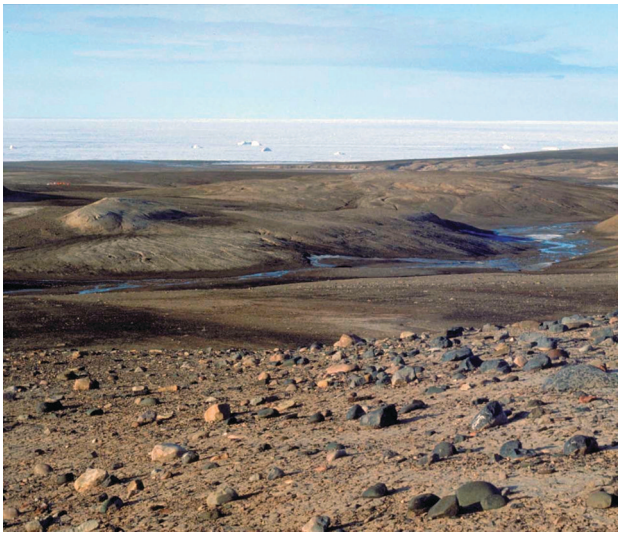


Figure 1.9.
The barren land remaining after the ice has left. This recent photo is from Greenland.

One example of such a pollen record from the Roskilde Fjord in Denmark is shown in Figure 1.10 (Schrøder et al. 2004). The succession of vegetation in southern Scandinavia is well documented in this diagram. The fresh surface was colonized initially by steppe tundra, with a variety of herbaceous vegetation—sedges and grasses, with some dwarf birch. The first arboreal species to migrate into this region were juniper and birch along with aspen, prior to the Younger Dryas. Continued warming was responsible for the expansion of open birch forest with juniper, aspen, and willow across much of the

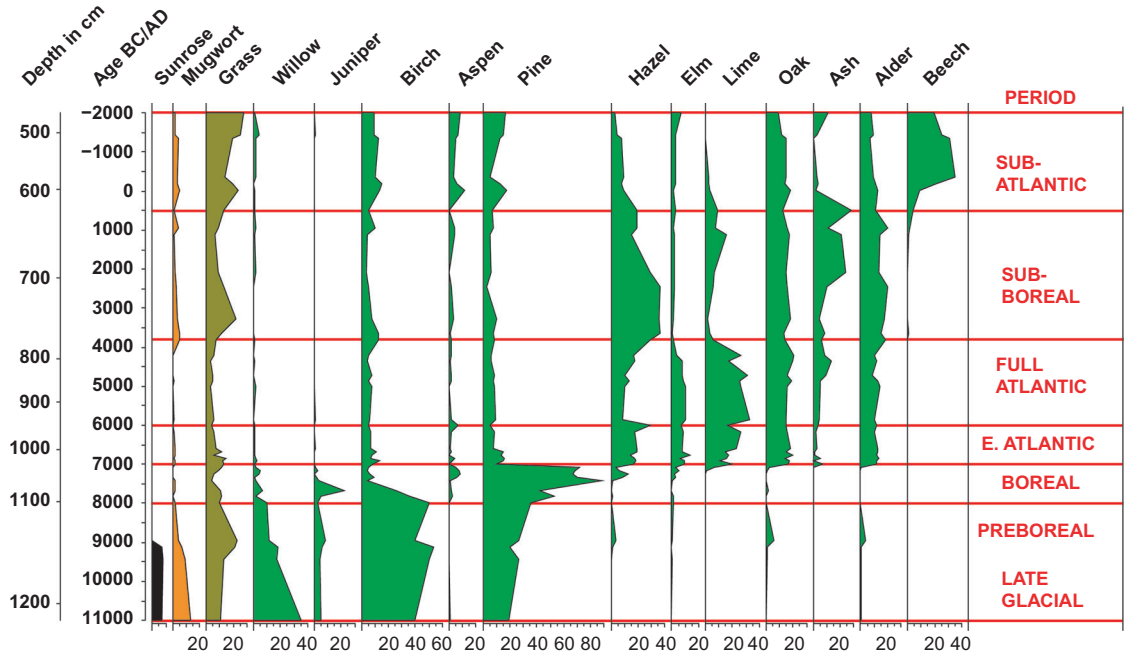


Figure 1.10. A diagram of the percentages of pollen by species found in deep layers of sediments in the Roskilde Fjord, Denmark (Schrøder et al. 2004). The boundary between the Late Glacial and Preboreal was not clear in this sample and is not shown on the diagram.

area. The cold snap of the Younger Dryas forced many of those species either to refuges within southern Scandinavia or further south in Central Europe.

The Preboreal and Boreal were dominated by birch and pine, which disappeared rapidly at the end of this period. Both summers and winters were likely warmer than today and the climate more maritime (Berglund 2003). Average July temperatures in this early part of the Holocene reached ca. 15°C (59°F), and the warming continued. Elm, oak, alder, lime, hazel, and ash were in place by the beginning of the Atlantic phase. A dense, mixed deciduous forest dominated in this phase as the arctic tree line moved north.

One of the striking patterns observed in the pollen diagram in Figure 1.9 is the precipitous decrease in elm pollen at the transition from the Atlantic to the Subboreal phase around 4000 BC. Declines in the numbers of lime trees are also apparent at that time. The cause of this "elm decline" has been the subject of debate since its recognition more than 75 years ago, with either climate change or human interference viewed as the likely culprit. The elm decline was close in time to the arrival of agriculture in southern Scandinavia. Human interference with elm was a popular explanation for many years. Suggestions included tree felling for field clearance and the clipping of elm branches to use for animal fodder, resulting in an absence of pollen.

A study by Peglar and Birks (1993) may have resolved this issue. Studies of pollen in deep lake sediments with annual layers in England and Sweden demonstrate that the elm decline actually took place within a very short time, perhaps a decade or two. It is difficult to imagine that human interference could cause the decline of elm over most of northern Europe within a period of 10 to 20 years. Finally, discovery of beetle tunnels in elm wood have confirmed that bark beetles were present at the time of the elm decline. These insects carry the fungus that is responsible for Dutch elm disease. In all probability, the rapid disappearance of elm trees across northern Europe was caused not by climate or humans but by disease.

Forest composition during the Atlantic and Subboreal climatic episodes was generally similar, with some differences caused by human activity and the decline in elm and lime. Oak and hazel were more abundant in poorer soils and lower areas where the forest was more open (Aaby 1988). Alder was frequent in wet areas with rich soils. Beech became a forest species during the Subboreal phase. More continental conditions prevailed in the Subboreal, with somewhat colder winters and warmer summers. The forest was substantially reduced by human activity during the Subboreal. The cutting of trees for the expansion of field systems and the grazing of herds of domestic animals reduced the extent of the forest and created larger and larger openings for fields and pasture.

The story of vegetation succession outlined above applies only to the southern half of Scandinavia. The northerly regions above the limits of cultivation experienced a very different vegetation history. There are two boundaries of particular interest in this region, the limit of cultivation and the tree line. Both boundaries moved substantially following the close of the Pleistocene. The glacial ice retreated across northern Scandinavia and was largely gone after 7000 BC. At Abisko, near the Norwegian border in northern Sweden, pollen studies near the modern tree limit provided a record of vegetation changes in this area (Berglund et al. 1996, Sonesson 1974). Since deglaciation, the vegetation has been dominated by subalpine birch woodland tundra. More temperate conditions prevailed between 3500 and 1500 BC and witnessed a pine-birch forest in the area, with tree growth 100 m (330′) or more higher than present. Cooling conditions after 1500 BC led to an expansion of a nearby glacier and a significant drop in elevation of the tree line.

Past Environments: Animals

Animals followed the spread of vegetation across the fresh landscape of Scandinavia after the melting of the ice mass. A pattern of succession is seen in changes from arctic and subarctic species to more temperate climate animals in the environments of northern Europe from the Pleistocene to the Holocene. These changes in mammal species over time are shown in Figure 1.11 (Aaris-Sørensen 2009).

The succession of fauna during the late Pleistocene and early Holocene is of critical importance for human hunters of that time. Reindeer arrived in southern Scandinavia, followed immediately by wolves. Seasonal data from the antler indicate that reindeer were resident throughout the year (Larsson 1991). Other large ungulates came quickly, notably the European elk, wild horse, bison, aurochs, giant Irish deer, polar bear, and beaver. Mammoth became extinct in this area and across Europe before the end of the Pleistocene.

Continued warming during the Preboreal saw the disappearance of bison and giant deer. The distribution of reindeer and other arctic species was limited to high elevations and latitudes in Scandinavia. New species to the region document the temperate, forested conditions that began to prevail at this time, including wild boar, red deer, roe deer, wild cat, and marten (Bratlund 1996). In essence, large migratory herds of cold-adapted species were replaced by the more territorial and sedentary game animals that are still found across much of Europe today. Faunal evidence indicates that aurochs (wild cattle) and elk (European moose) were predominant during the Preboreal and that red deer (North American elk), wild pig, and roe deer had become the terrestrial animals of major economic importance by

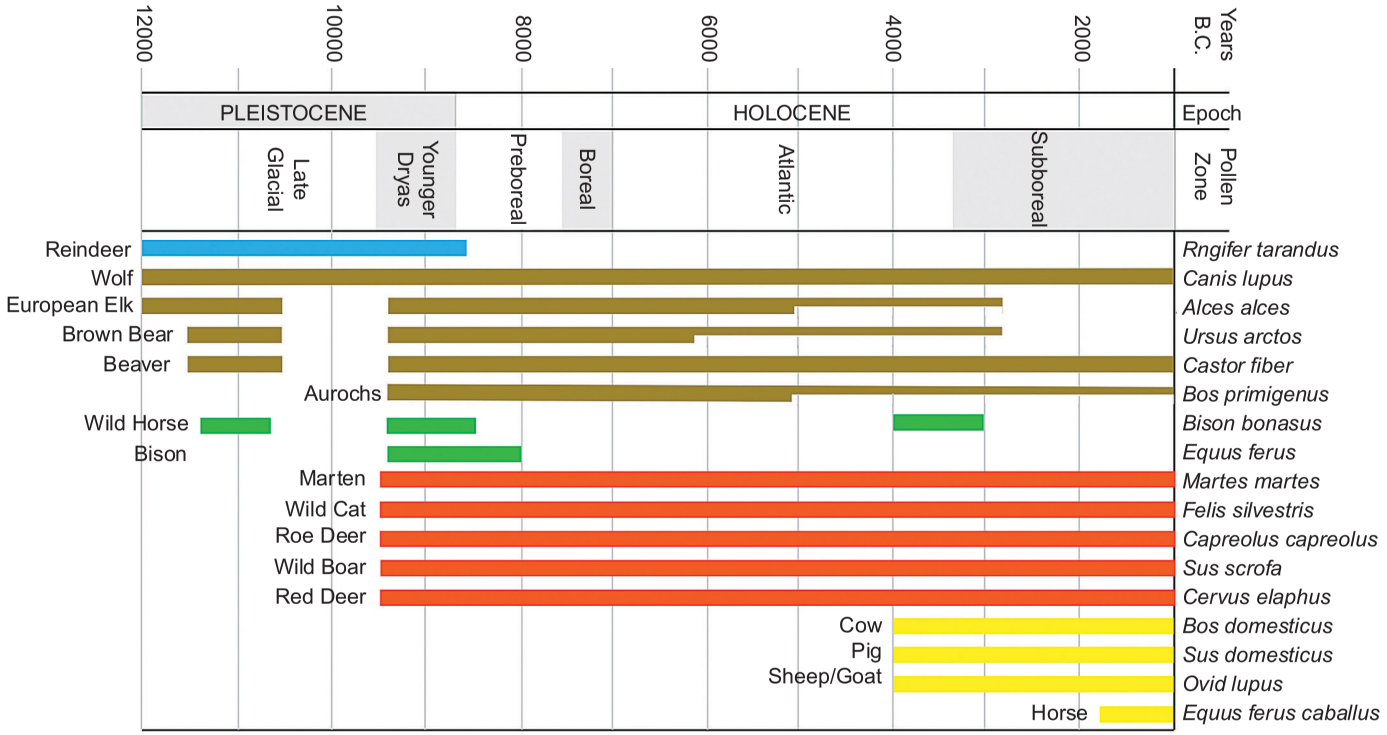


Figure 1.11.
A chart of the presence of larger mammals in southern Scandinavia 12,000—1 AD (after Aaris-Sørensen 2009). Aurochs, elk, and bear disappear from the Danish islands after 6000 BC, indicated by the reduction in line width. Dotted line indicates only intermittent appearance. Blue line = tundra species, brown = woodland species, green = steppe species, red = temperate woodland species, yellow = domesticates.

the time of the Atlantic climatic episode. The latter three species were ubiquitous throughout much of Europe in the early Holocene.

There are important changes in the distribution of certain species during the Holocene. Bears, elk, and aurochs disappeared from the islands of southern Scandinavia, due to a combination of overhunting and limited carrying capacity on the islands. Aurochs were likely also absent in Sweden by this time. These species remained in Jylland and the rest of continental northern Europe. Red deer on the islands became noticeably smaller in size during the Holocene, likely a consequence of limited food resources on small islands (Foster 1964). The temperate species such as red deer, roe deer, and wild boar are found almost exclusively in the southern half of Scandinavia. European elk continue into central Scandinavia, and reindeer are the primary large-game species in the far north.

A variety of small fur-bearing species have also been found at archaeological sites, including marten, otter, squirrel, wildcat, and others. Approximately 55 species of fowl, both aquatic and terrestrial varieties, are known from Holocene sites in northern Europe. The dog was domesticated and present in Scandinavia by the end of the Pleistocene. The introduction of agriculture brought additional species of animals in the form of domestic cattle, pigs, sheep, and goats. Domesticated horses appeared by the beginning of the Bronze Age.

Following the end of the Pleistocene, the warming waters of the oceans were full of food. Mollusks, crustaceans, fish, and sea mammals were all important resources for coastal-dwelling hunter-gatherers. Although water temperatures in the early postglacial may not have supported a variety of shellfish, their numbers and range expanded greatly through this period. Seals, porpoises, and whales are all found among the fauna at archaeological sites. Many species of fish from a wide range of habitats were taken with a variety of equipment.

It is important to remember that the melting of the ice and the expansion of flora and fauna are time-transgressive phenomena. This is perhaps best visualized by a series of bands stretching from north to south, from the ice sheet and its front, across a zone of fresh, raw sediments and rocks to a more distant zone of pioneer herbs and shrubs, and further south zones of birch and pine woodlands. The expansion of these zones to the north took thousands of years and was dependent on changing climatic conditions. During the Younger Dryas, southernmost Sweden and eastern Denmark were tundra, while to the south and west birch woodlands covered western Denmark and pine forests likely extended across central Germany. These contemporary, yet different, environments invoked distinctive human responses.

Past Environments: Resources

Although prehistoric Scandinavia was not imbued with a wealth of natural resources, there are several materials that were critically important for tools and trade. These materials provide a part of the spectacular archaeology of the region. The most important of these was flint (Vang Petersen 2008). The chalk bedrock across northern and eastern Denmark and southern Sweden contains large deposits of this raw material, highly valued for the production of stone tools (Figure 1.12). Flint nodules were also scattered from their original sources by the glaciers and

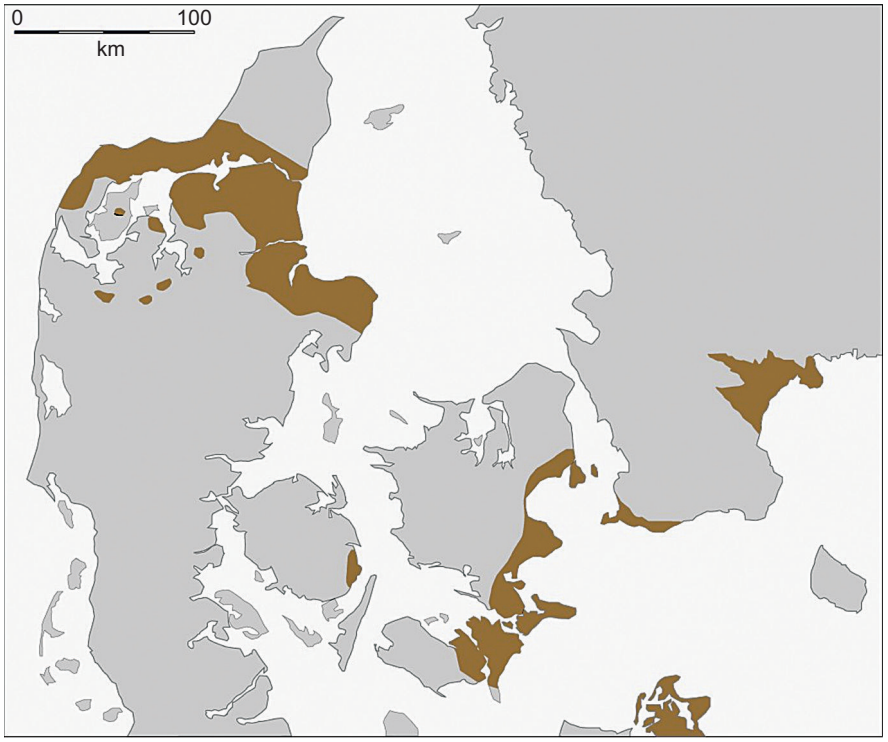


Figure 1.12.
Sources of in situ flint in southern Scandinavia.

occur in some quantity on much of the ground surface and many of the beaches of southern Scandinavia. Stone Age sites in southern Scandinavia are dense with flint artifacts and waste material from the production of stone tools.

These flint deposits are particularly important for the production of large polished flint axes, which began to appear in the Neolithic period (e.g., Knarrström 2001). These beautiful axes—once thought to be the tips of thunderbolts thrown by the gods—are found in the tens of thousands across the landscape of southern Scandinavia. Virtually every modern farm has a collection of these polished flint axes—a pertinent and immediate reminder of the past. This flint was also traded long distances across Scandinavia and shows up in huge quantities in central Sweden, on the island of Bornholm, in Norway, and in other places without natural flint sources.

Outside southern Scandinavia, good materials for flaked stone tools are rare, and a variety of less desirable materials such as quartz, quartzite, and slate were put to use. The assemblages of fine blades and large flint tools that characterize the Stone Age of southern Scandinavia take on an entirely different appearance when translated into other materials. Other stone, however, such as diabase for ground stone axes and slate for ground stone artifacts, is more common in assemblages in the northern parts of Scandinavia. Sources of soapstone for carved containers and other stones for grinding grain and sharpening tools were important at various times in the prehistory of Scandinavia.

Amber, another valuable resource, washes up along the beaches of northern Europe, eroding from deposits on the floor of the Baltic and North Sea. Amber is found in many places along the coasts of southern Scandinavia, but abundantly on

the North Sea coast of Jylland. This petrified resin is a beautiful dark yellow, almost golden, in color sparkling with trapped air chambers and debris. The material sometimes floats, holds charges of static electricity, and is the essence of magic. Amber was used throughout most of prehistory. Large decorated pendants and small animal figurines of amber are known from the Mesolithic; thousands of large amber beads and ornaments have been found cached or buried in the Neolithic. Literally tons of amber were exported to the Aegean region in the Bronze Age, funding Bronze Age society in Scandinavia.

High-quality animal fur—beaver, marten, wildcat, and other species—may have been another exportable product of the region.

Iron ore in the form of what is called bog iron is found across much of the region and provided an important raw material in the Iron Age. Other metal resources in Scandinavia are limited or nonexistent for much of prehistory.

ARCHAEOLOGY IN SCANDINAVIA

The past of Scandinavia is one of the richest and most detailed in the world for several reasons—a long history of research, extraordinary preservation, exceptional raw materials, and an abiding contemporary interest in the past. The depth of information that is available makes it possible to answer questions that cannot yet be asked in many other places.

The visibility of archaeology on the landscape of Scandinavia has played a major role in national identity, in public interest, and as a focus for study in this area for many years. The stark standing stones of the megalithic tombs of the Neolithic are scattered throughout the region, and the distinctive earthen barrows of the Bronze and Iron Age dot the skyline—constant reminders of the ancient past and magnets for the curious. These features certainly piqued the interest of dilettantes in the eighteenth century as collecting antiquities began as a kind of hobby among the elite. The king of Denmark participated in excavations into these barrows in the middle of the nineteenth century.

This fascination with the past has continued to grow in Scandinavia and has led to strong public support for archaeology along with a well-informed cadre of amateurs who contribute significantly to knowledge and regularly report new finds to the authorities. The preservation of archaeological materials in northern Europe is sometimes extraordinary, providing an added dimension to the archaeological record. This organic component of the past records many of the more exciting and unusual aspects of human technology and behavior and vividly enriches our perspective.

Several factors are responsible for the excellent conditions of preservation that are sometimes encountered. The chalky soils of much of southern Scandinavia are neutral or basic rather than acidic, so that organic materials remain intact for longer periods. Human actions in the past also improved conditions for exceptional preservation, particularly the burial of objects in large earthen mounds and the deposition of artifacts and other objects in bogs and wetlands. The remarkable bog bodies of northern Germany and southern Scandinavia are testimony to the preservative powers of the wetlands. The peat deposits in the bogs have provided fuel

for heating for centuries. Peat-cutting activities to quarry this fuel have exposed countless bog deposits from the past.

Some appreciation of the history of extraordinary research that has taken place is essential for an understanding of Scandinavian prehistory. The term *prehistoric* was in fact originally coined in Denmark (*forhistorisk*) in 1834 and published by Christian Molbech (Rowley-Conwy 2006). Scandinavia also played an important role in changing archaeology from the collection of curiosities to a science of culture history (Graslund 1987). The early assembling of antiquities under royal auspices led to the beginnings of museums and the emergence of descriptive systems, bringing classifications and order.

An essential figure in the history of Scandinavian archaeology is Ole Worm. Born in Aarhus in 1588, he became the king's physician and professor of pedagogy at the University of Copenhagen. Worm had a great curiosity about all things, including antiquity. He compiled a six-volume work on the ancient monuments of Denmark, published in 1644. Most importantly, he was a collector who assembled prehistoric artifacts and other objects of natural historical interest from Denmark's past in his Museum Wormianum (Figure 1.13). This collection was the precursor of the National Museum of Denmark, founded in 1849.

Archaeology began in earnest in Scandinavia at the beginning of the nineteenth century following land reforms and major agricultural expansion that led to the destruction of many monuments and the discovery of large numbers of antiquities. In Denmark, for example, archaeology originated under the auspices of the king.

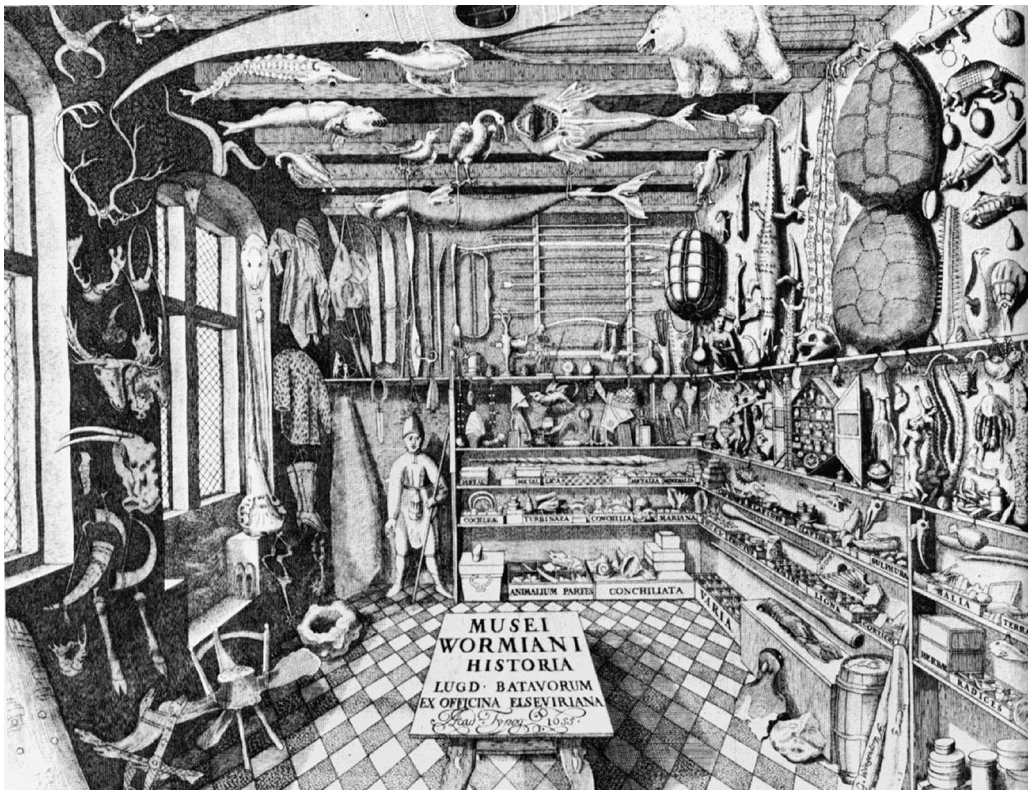


Figure 1.13. Museum Wormianum in Copenhagen ca. AD 1650.

A Royal Antiquities Commission was established in 1807 to determine the state of the remaining monuments and what could be saved from further destruction. Archaeology was thus established as an independent discipline focused on prehistoric artifacts and monuments (Jensen 1982).

In 1816, that same commission appointed Christian Thomsen, a 28-year-old businessman, to organize and display some of the materials that had been recovered. Thomsen thus became the first archaeologist in Denmark. He devised an intuitive, yet effective, system for displaying the artifacts by material of manufacture—stone, bronze, or iron—thus defining the three major ages of European prehistory still in use today (Rowley-Conwy 2007). Thomsen's book on the three-age system was originally published in 1836 and was translated into English to spread the word in 1848. In 1849, Thomsen oversaw the creation of the National Museum of Denmark, one of the world's oldest museums for archaeology and ethnography. Thomsen's interests were largely in the artifacts—how they were made and used, and what they could say about prehistoric life.

The study of human diet and subsistence economies in the past was promoted by a Swedish professor of zoology, Sven Nilsson, who also published one of the first reports on the animal remains at an archaeological site in 1822. The second director of the National Museum in Copenhagen from 1865, J. J. Worsaæ, demonstrated the validity of the three-age system through stratigraphic excavations and artifact analysis and authored a widely popular volume on the archaeology of Denmark (Worsaæ 1849). Worsaæ was the first professor of archaeology at the University of Copenhagen. He also served as president of an international archaeological congress that convened in Copenhagen in 1869 (Gräslund 1987).

An important development in the middle of the nineteenth century was the integration of the natural sciences into the investigation of archaeological sites. A collection of stone tools found in a heap of oyster shells near the Limfjord was sent to the Royal Antiquities Commission in 1837. Their arrival initiated a debate about the shell heaps, whether natural or human in origin. In 1848, a research group—the kitchen midden (*Køkkenmødding*) committee—was created to conduct investigations and resolve this issue. The group of researchers included a geologist, a zoologist, and an archaeologist. Their report confirmed the human creation of these shell heaps, which can extend several hundred meters in length. A second kitchen midden commission was formed in 1893 to learn more about the phenomenon, and a botanist was added to the research group. The publication of the investigations of this commission (Madsen et al. 1900) had a major impact on archaeologists elsewhere in Europe and also led to the division of the Stone Age into an earlier and a later phase.

A series of exceptional individuals followed Thomsen at the National Museum and continued the advancement of archaeology as the twentieth century got underway. Worsaæ's successor at the National Museum from 1895 to 1921, Sophus Müller, emphasized systematic excavations, classifications of artifacts and monuments, the publication of finds, and standardizing and professionalizing the field of archaeology in Denmark (Kristiansen 1981).

Another important figure in this period was the German Gustav Schwantes (1881–1960). Schwantes's interests turned early to archaeology, and he began digging up Iron Age urns at age 16 and corresponding with the museum director in

Kiel at 18. He studied ethnology, geology, and botany in Hamburg and taught himself archaeology. In 1926, he became curator at the Hamburg Museum of Ethnology and Prehistory, and in 1928 was the first professor of prehistory in Hamburg, later holding a similar post in Kiel. With his background in geology and botany, Schwantes emphasized a multidisciplinary approach to the study of the past, and he mentored a number of other archaeologists, including Alfred Rust, who conducted the excavations at the Late Paleolithic site of Stellmoor, discussed in chapter 2.

In Denmark, Johannes Brøndsted was made director of the National Museum in Copenhagen in 1951, and he emphasized new kinds of research, the protection of sites and monuments, and the popularization of archaeology (Kristiansen 1981). Regional surveys of archaeological remains were one example of new research in that period. Therkel Mathiassen directed the registration of thousands of sites in different parts of the country (e.g., Mathiassen 1948). Brønsted also single-authored a remarkable three-volume compendium of Danish prehistory, *Danmarks Oldtid*, that remains an important reference work to this day.

Departments of archaeology were created at the University of Copenhagen in 1941 and at the University of Aarhus in 1950. P. V. Glob was director of the National Museum from 1960 to 1981 and greatly popularized archaeology in Denmark with accounts of the discoveries of bog people (Glob 1965) and the Danish archaeological expeditions to the island of Bahrain in the Persian Gulf (Glob 1965). The Radiocarbon Laboratory at the National Museum in Copenhagen was one of the first in Europe, and its director, Henrik Tauber, conducted groundbreaking research on Stone Age diets. Archaeology in Denmark today is managed from the central agency Kulturstyrelsen, and regional museums are responsible for the management of cultural resources within their domains.

Johan Bure—a contemporary of Ole Worm—began the study of antiquity in Sweden under the auspices of the Swedish royal court, and was appointed as the Royal Antiquarian in 1603. The Swedish Academy of National Antiquities was eventually established in 1786 as a repository for objects from the past. Bror Emil Hilldebrand played a major role in the development of archaeology in Sweden in the nineteenth century. Hildebrand was at the University of Lund in 1830. He visited with C. J. Thomsen in nearby Copenhagen and learned of the three-age system Thomsen had formulated. Hildebrand became the Custodian of Ancient Monuments in Sweden in 1837 and founded the Museum of National Antiquities in Stockholm in 1847 (Baudou 1995). Hildebrand was a pioneer in archaeological fieldwork and began the practice of stratigraphic excavations in Sweden. He undertook the first excavations at the royal mounds at Gamla Uppsala, one of the most important sites in Sweden. Hildebrand was also the teacher and mentor of Oscar Montelius.

Montelius is probably the best-known Swedish archaeologist (Figure 1.14) and was one of the leading figures of his generation in European prehistory (Baudou 2012). He spent his professional career at the Historiska Museet (formerly the Museum of National Antiquities) in Stockholm and served as director from 1907 to 1913. His major interests were in typology and chronology. The very rich archaeological remains of southern Scandinavia provided a body of information that could be used to identify different artifact types and to study changes

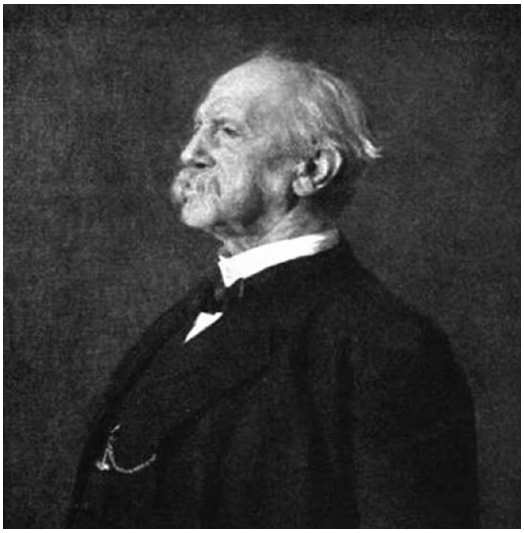


Figure 1.14. Oscar Montelius (1843–1921), Swedish archaeologist.

through time. Montelius used association to construct assemblages of artifact types found together that could then be seriated—arranged in an order that reflected change—to determine the sequence of materials in various archaeological periods. He was able to divide the artifacts of the Bronze Age into a sequence of six stages, for example. Montelius also sought to date various finds from around Europe through their association with Egyptian artifacts of known calendar date. Montelius pursued a controversial theory that both material culture and plant and animal species follow the same evolutionary processes. His major publications included *Om tidsbestämming inom bronsåldern* (*On determining the periods within the Bronze Age*, 1885), *The Civilization of Sweden in Heathen Times* (1888), and *Die älteren Kulturperioden in Orient und in Europa* (*The older cultural periods in the Orient and Europe,* 1923).

Swedish archaeology, like archaeology in other parts of Scandinavia and the Western world, underwent major changes in the twentieth century. A Department of Scandinavian Prehistory was established in Uppsala in 1905 in the main building of the university in connection with the antiquities collection in the Gustavianum. In 1938, the Swedish National Heritage Board (Riksantikvarämbetet) assumed responsibility for the care of ancient sites, monuments, and historical buildings.

Archaeological science has a long history in Sweden as well, continuing from the archaeozoological work of Sven Nilsson in the eighteenth century. The first systematic use of phosphate analysis for archaeological site identification was successfully performed in Sweden (O. Arrhenius 1929); the study located a number of previously unknown archaeological sites through soil testing of large areas. The Archaeological Research Laboratory at the University of Stockholm was established in 1976. Its first director was Birgit Arrhenius, professor of archaeological science.

The best-known Swedish archaeologist of the later twentieth century was probably Carl Axel Moberg (1915–1987). Moberg was based in Göteborg and played a primary role in the development of both the Archaeology Museum and the Department of Archaeology at the University. Moberg was unusually open-minded and had a deep interest in the nature of archaeological enquiry (Malmer 1988). A few of his many publications include *Studier i bottnisk stenålder I–V* (1955, Studies in the Bothnian Stone Age), *Ekonomisk historisk borjan: Forsorjning och samhalle* (1973, *The beginning of economic history: Supply and society*) and *Introduction à l'archéologie* (1980, *An introduction to archaeology*). Moberg was also a novelist and poet.

The early history of archaeology in Norway is a bit more obscure, owing to the fact that the modern country was part of Denmark until 1814 (Klindt-Jensen 1975). Nevertheless, the founders of the Norwegian Royal Society in Trondheim—P. F. Suhm and G. Schøning—assembled a collection of antiquities that opened to the public in 1787. Suhm later moved to Copenhagen, where he wrote a massive history of the Scandinavian people in which he suggested a sequence of stone, copper, and iron weapons in the ancient past.

A significant archaeological collection was established in Oslo in 1810 when an Antiquities Commission was created to care for the remains of the Norwegian past. Rudolph Keyser, professor at the university, was responsible for the museum, and he visited Thomsen and arranged the collections in Oslo using the three-stage model. A museum of antiquities was created in Bergen in 1825. In 1845, the Society for the Protection of Ancient Monuments in Norway was created to prevent the destruction of the country's prehistoric heritage. By 1900, there were five regional museums in Norway involved in protecting and preserving the past.

In 1862, Oluf Rygh succeeded Keyser in Oslo and was appointed Chair of Scandinavian Archaeology in 1875 (Klindt-Jensen 1975). A Swedish archaeologist, Gabriel Gustafson (1853–1915), played an important role in Norwegian archaeology at the beginning of the twentieth century. Gustafson was in charge of the construction of the building for the University of Oslo's archaeological collections that opened in 1904; he was also responsible for the excavation in 1904 and 1905 of the Oseberg ship, one of the treasures of Norwegian archaeology. Gustafson has been called the founder of scientific archaeological research in Norway. He was assisted by Haakon Shetelig (1877–1955), who eventually published the remarkable results of the ship excavations along with Anton Brøgger and other colleagues (Brøgger et al. 1917). Brøgger was also responsible for the extraordinary Viking Ship Museum in Oslo that houses the finds from these discoveries. Brøgger played a major role in Norwegian archaeology in the first half of the twentieth century as the founder of the Norwegian Archaeological Society and of the archaeological journal *Viking*, and as president of an international congress of archaeologists held in Oslo in 1936. He was imprisoned by the Germans during the occupation in the Second World War for defending the independence of the university.

One of the most influential Norwegian archaeologists in the second half of the twentieth century was Anders Hagen (1921–2005), appointed as Professor of Scandinavian Archaeology at the University of Bergen in 1961. Hagen published numerous volumes on Norwegian prehistory, including *Norges oldtid* (1967) and *Norway* (1967), an English-language survey of Norwegian archaeology. He was one of the founders of the journal *Norwegian Archaeological Review* in 1968. Another important figure was Gutorm Gjessing, who was both an archaeologist and an ethnographer. His early career focused on Stone Age settlements in northern Norway, and his publications included *Yngre steinalder i Nord-Norge* (*The young Stone Age in northern Norway*, 1942) and *Norges Steinalder* (*Norway's Stone Age*, 1945). His later career concentrated more on ethnographic studies and important cultural issues, including relations with the Sami peoples of northern Norway (e.g., Gjessing 1948).

A significant general trend in recent years has been the growth of archaeological sciences in Scandinavia and elsewhere. Scandinavia in fact witnessed the birth of scientific archaeology with the work of Christian Thomsen (Trigger 1990). Archaeozoology, archaeobotany, archaeometry, dating, molecular archaeology, and isotopic archaeology are varieties of the larger branch of archaeometry, and huge advances in these areas have been made in recent years. Scandinavia was a leader in this field for many years, particularly in terms of radiocarbon dating, pollen analysis for environmental reconstruction, and phosphate analysis for finding sites without digging.

One important thing to keep in mind is that the number of archaeologists in Scandinavia (and elsewhere) has grown exponentially in the last 25 or 30 years. There were only a handful of archaeologists in any one country in the nineteenth century. Those numbers grew only very slowly in the first half of the twentieth century. For example, there were only 21 archaeologists in permanent positions in all of Norway in 1970. Today archaeologists in Scandinavia number in the thousands. This increase has come about for several reasons—population growth, the expansion of universities, an increase in specialization within the discipline of archaeology, and the enactment of legislation for the protection of cultural resources requiring archaeological fieldwork prior to development and construction.

The legislation has also resulted in many more and much larger-scale archaeological projects. Broad, horizontal excavations are now often the norm, in contrast to an earlier "small deep hole" style of digging. This expansion, along with concomitant increases in archaeological activities, has resulted in many new discoveries and an enormous amount of new information. Knowledge of the past has at the very least doubled in the last 25 years in Scandinavia. Some of that new information is presented in the following pages as we turn to the Paleolithic and the first inhabitants of the region.

CHAPTER TWO

THE FIRST INHABITANTS, 13,000–9500 BC

THE FOUNDERS

Ten thousand years ago. Northern Norway. Inside the Arctic Circle. A small band of foragers arrived by sea and set up camp along the shoreline. They probably traveled in skin boats and were perhaps the first people ever to reach this distant, isolated place. This coastal environment was rich in the resources of the sea, however, and very attractive to such small mobile groups. The site of Slettnes in Finnmark, northern Norway (Figure 2.1) holds the evidence for that encampment and is described later in this chapter. Within a few generations, the descendants of these maritime hunters also began to exploit the interior, preying on reindeer at higher elevations next to still active glaciers.

What is all the more remarkable is that these first pioneers, who spread north among the islands of western Sweden, west across the coast of southern Norway, and north along the coast of western Norway, colonized this entire zone within the span of a few hundred years. These mobile maritime hunters bypassed large sections of icebound coast along the way and settled in areas that had become ice-free several thousand years earlier. The camp at Slettnes was one of the last stops on this long voyage that began in southwestern Sweden. The total distance by sea from the modern city of Göteborg in western Sweden to Slettnes is 2,250 km (1,400 miles).

The story of the early inhabitants of Scandinavia is a fascinating one. Our human ancestors arrived in Europe more than a million years ago, but most of the early evidence of a human presence comes from the southern half of the continent. The first humans to occupy northern Europe are poorly known. There are vague hints before the end of the Pleistocene in southern Scandinavia. A few controversial flaked stone tools from Denmark are thought to be older than 100,000 years (Holm 1986, Hartz 1986), but we know very little about these people except that they may have entered northern Europe during a period of warmth between the cold glacial periods, and then abandoned the area with the increasing cold of the last ice age. The first reliable evidence of human occupation in northern Europe dates from around 13,000 BC. The archaeological record from that same time in western and central Europe provides information on the origins of these early inhabitants. There is even some

Figure 2.1.
The location of the continental ice sheet, the Yoldia Sea, and Doggerland ca. 10,000 BC. Locations of some of the sites mentioned in this chapter are also shown.

evidence from modern genetic studies for this homeland to the south (Torroni et al. 1998).

ORIGINS IN WESTERN AND CENTRAL EUROPE

The absence of radiocarbon evidence suggests that large parts of the European continent may have been uninhabited during the very cold Late Glacial Maximum period that ended around 18,000 years ago (Housley et al. 1997). Human population was concentrated in a few pockets—sheltered areas with sufficient food resources, such as southwestern France, the Cantabrian coast of Spain, and the major river valleys of the Ukraine. These areas became refugia during this period of extreme cold. Elsewhere, population appears to have been lightly scattered or simply missing. There is a noticeable absence of finds across the Northern European Plain prior to the beginning of Late Glacial warming.

The later Upper Paleolithic period in Europe is known as the Magdalenian to the west and the Gravettian to the east. Magdalenian groups in southwestern France are well known from painted caves, exquisite portable art, and deep archaeological deposits. Faunal remains from this time period are dominated by reindeer, the primary prey in western Europe (e.g., Pike-Tay 1993). Horses were also an important source of food (Bignon 2008, Bratlund 1996). To the east, mammoth provided a substantial portion of the diet (Svoboda et al. 2004).

The first inhabitants of northwestern Europe originated in the Magdalenian of the Franco-Cantabrian region, based on the similarities in artifacts and the radiocarbon dates that document their spread to the north (e.g., Eriksen 1996a, Fischer 1996, Housley et al. 1997, Weber et al. 2011). Late Magdalenian sites have been found in the Paris Basin, the Meuse Basin, the southern Netherlands, the Rhine Valley, southwestern Germany and Thuringia in central Germany, and the Polish and Moravian uplands. A few transitional sites are known, like Schweskau in Lower Saxony (Veil 1987, Veil and Veil 2004). Schweskau is a small lakeshore site with stone tools that are typologically and technologically intermediate between Magdalenian and the earliest artifacts in southern Scandinavia (Breest and Veil 1991).

THE END OF THE PLEISTOCENE

There are two separate chronological systems used to record the sequence of events in northern Europe during the close of the last ice age. The geological chronology is based primarily on changes in climate that took place during this time. The archaeological chronology is focused on changes in artifacts and technology.

The geological chronology at the highest level distinguishes between the Pleistocene—the ice ages—and the Holocene, the last 12,000 years of the earth's history (Figure 2.2). The boundary between these two epochs is conventionally set at 9700 BC. The changes in climate before and after this boundary are important for the archaeology of Scandinavia. The Pleistocene ended with a warming period that began ca. 16,000 years ago causing continental ice to melt and sea levels to rise. This period of increasing warmth is called the Late Glacial Interstadial. In an earlier chronology, this time was divided into cooler and warmer phases called the Oldest Dryas, Bølling, Older Dryas, Allerød, and Younger Dryas. This chronological scheme was based on pollen analysis and vegetation changes.

The more recent system is based on marine sediments and layers of ice that accumulated in annual increments that can be dated precisely. Oxygen isotopes in the sediments and ice are used as a proxy for atmospheric temperature and thus climate. The temperature curve in Figure 2.2 is based on the Greenland Ice Cores, where annual layers of ice were deposited in the glacier for tens and hundreds of thousands of years. Both the calendar dates and the terminology for the geological chronology have changed significantly in the present system.

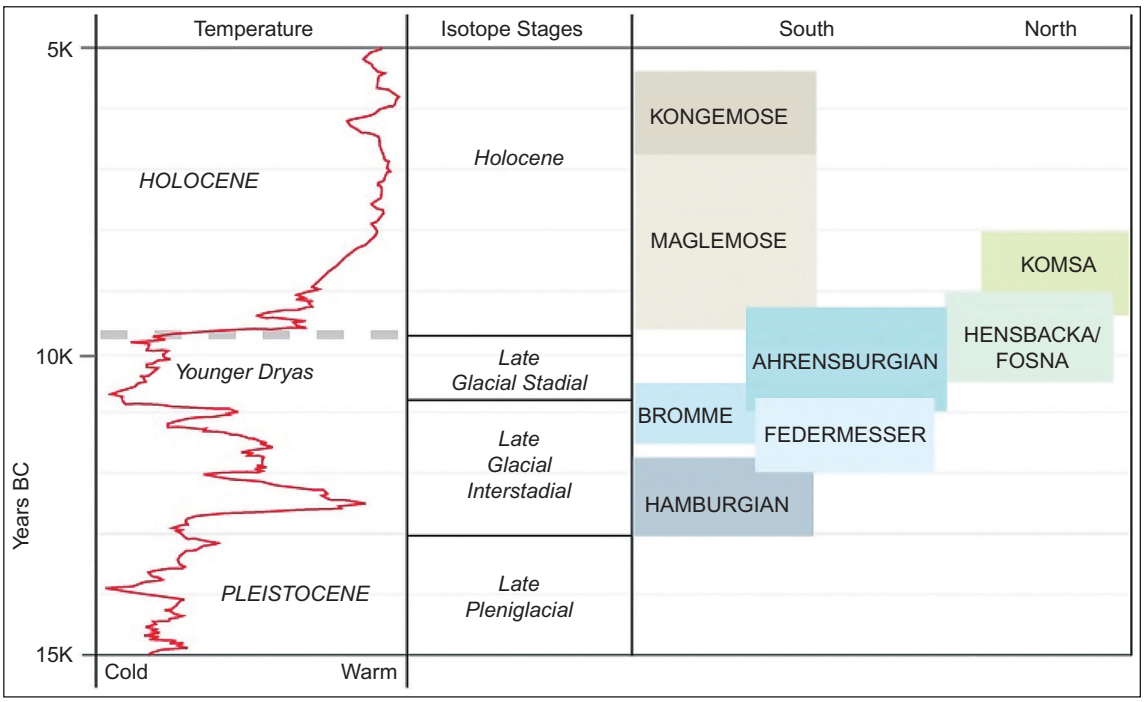


Figure 2.2. Isotopes and cultural groups at the close of the Pleistocene in Scandinavia. The temperature curve in the left column is based on the Greenland Ice Core data.

The Younger Dryas cold oscillation at the end of the Pleistocene appears to have lasted for 1,000 years or so. Isotope stages (Björck et al. 1998) are now used to provide a numbered sequence to describe the major changes in temperature and climate that have been recorded at the end of the Pleistocene. Shifts between colder and warmer temperatures appear to have happened very quickly, according to the isotope data.

This Late Glacial Interstadial warming trend at the close of the Pleistocene was interrupted by a sudden episode of cold climate between 11,000 and 9700 BC, now known as the Late Glacial Stadial, previously called the Younger Dryas period. The end of this cold snap also marked the end of the Pleistocene and the beginning of the Holocene. More details on climatic events in the early Holocene are provided in chapter 3.

THE LATE PALEOLITHIC OF NORTHERN EUROPE

The Paleolithic of Scandinavia has been described in a number of excellent publications (e.g., Bang-Andersen 2012, Brinch Petersen 2009, Larsson 1991, 1996). The archaeological periods at the end of the Pleistocene in southern Scandinavia are generally termed Late Upper Paleolithic and Late Paleolithic. These two major periods have distinctive archaeological cultures or groups that have been identified in the last 100 years or so. These cultures are usually named after the original sites or places where they were discovered.

Four major cultures of the Paleolithic are known in southern Scandinavia. The distinctions are based largely on differences in the flint projectile points associated with each culture (e.g., Figure 2.3). The term Hamburgian is used for the Late Upper Paleolithic in northern Europe. The Hamburgian is sometimes divided into an earlier classic phase and a later Havelte phase (Brinch Petersen 2009). The Late Paleolithic cultures (in contrast to the Late Upper Paleolithic Hamburgian) include the Federmesser, Bromme, and Ahrensburgian. The Federmesser (pen knife) culture (Schwabedissen 1954) followed the Hamburgian and is characterized by small backed blades, curved-back points with a basal truncation. These small points were probably used as the tips of arrows. Federmesser appeared during a warmer climatic episode and the beginning of the expansion of forest into northern Europe.

Two of these groups—the Bromme and the Ahrensburgian—are generally known as "tanged point" cultures, characterized by stone points with distinct basal tangs to facilitate hafting as tips on spears or arrows. The Bromme culture in southern Scandinavia and parts of northern Germany, with large tanged points as a characteristic artifact, was at least partly contemporary with the Federmesser Culture. The Ahrensburgian is the final Late Paleolithic culture of reindeer hunters on the North German Plain and in southern Scandinavia. The Hensbacka, Fosna, and Komsa cultures in Sweden and Norway date largely to the early postglacial period and are often treated as Mesolithic. However, they are derived from the Late Paleolithic Ahrensburgian and are thus included in this chapter on the first inhabitants of northern Europe. They were the first groups to occupy much of western Sweden and Norway.

The chronological sequence for these groups at the end of the Pleistocene is complex and somewhat controversial. Nevertheless, a provisional chronology for these cultures is provided in Figure 2.2. There is substantial overlap between the four major Paleolithic cultures based on radiocarbon dates. Most of the sites for these cultures have been found in northern Germany. In Scandinavia per se, these four Paleolithic cultures are found only in the south—Denmark and southwestern Sweden. As noted earlier, although the Hensbacka/Fosna and Komsa cultures date to the Holocene, because they are related to the Ahrensburgian they are included in this chapter on the Paleolithic. The Maglemosian and Kongemosian cultures shown in the figure belong to the early Mesolithic in southern Scandinavia and are discussed in chapter 3.

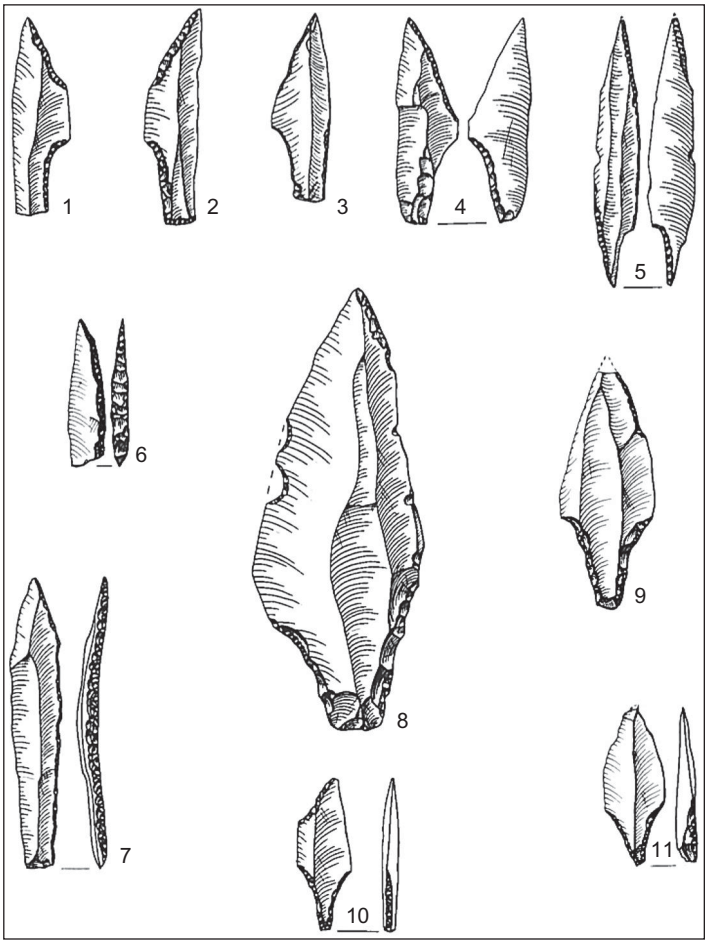


Figure 2.3.
Point types from the Late Paleolithic in northern Europe. 1–4. Hamburgian shouldered points, 5. Havelte point, 6. Federmesser backed point, 7. Gravette point, 8, 9, 11. Bromme tanged points, 10. Ahrensburgian tanged point. All points drawn to the same scale. The large Bromme point (8) is 7 cm in length.

The arrival of humans in central and northern Scandinavia followed a somewhat different scenario than in the south. The peoples who first occupied the southern part of Scandinavia—the tanged point cultures and the Federmesser group—were big game hunters, primarily after reindeer or other large species. There is little evidence of mammoth hunting in this region. These groups walked to the region from further south.

The initial inhabitants of central and northern Scandinavia arrived by boat and were maritime peoples focused on the resources of the sea. They began to take advantage of the large herds of reindeer in the inland areas of the region soon after their arrival, but much of their livelihood came from the sea. The Hensbacka culture, found in Sweden and eastern Norway, was closely related to and partially contemporary with the Ahrensburgian and was responsible for the first human entrance into central and northern Scandinavia. Fosna and Komsa are two other early cultures that are closely related to Hensbacka; they are found along the southern, western, and northern coasts of Norway respectively. It seems the entire coastline from western Sweden to the Varanger fjord in northernmost Norway was settled in a 200- to 300-year period (Bjerck 1995). These groups will also be discussed in more detail later in this chapter.

Thus, it was in the context of a dramatically changing climate and newly formed landscapes at the close of the Pleistocene that these early inhabitants of northern Europe began to enter the region. The effects of the climate change at the end of

the Pleistocene on the landscape and its human occupants cannot be exaggerated. In fact, a series of abandonment and reoccupation events, corresponding to shifts in climate and environment, probably best explain the changes in archaeological cultures that took place during the initial phases of human presence in this area at the end of the Pleistocene. In the following pages, each of these late Pleistocene cultures will be discussed in more detail, and a few important sites will be described. The locations of places mentioned in this chapter are shown in Figure 2.1.

At the same time, it is important to remember that the information we have for this time in northern Europe is limited. Most Late Paleolithic sites lack any kind of organic material or charcoal. There are few reliable radiocarbon dates. Sites are often located on higher ground at strategic hunting locations in the landscape. Stratified deposits are extremely rare. There are few caves to accumulate and protect archaeological remains. The open-air sites of these early inhabitants have in most cases been disturbed initially by soil movement in the permafrost and later by thousands of years of plowing.

Hamburgian, 13,000–11,800 BC

The Late Upper Paleolithic of northern Europe was originally identified in the last century with the discovery of old flint artifacts and tools made of reindeer antler. The archaeologist Gustav Schwantes reasoned that excavations of these Late Paleolithic flint scatters near the bogs and lakes in this region of tunnel valleys might result in the recovery of well-preserved materials in the clay subsoils (Schwantes 1928). The tunnel valleys of Schleswig-Holstein and southern Denmark were formed beneath the ice sheets of the last glaciation as channels for meltwater that drained out through the Elbe River.

In order to determine the stratigraphic position of these materials and to look for preserved organic material, Schwantes and a colleague, Alfred Rust, began a series of excavations near the town of Ahrensburg. Alfred Rust was a remarkable individual, an electrician turned archaeologist, whose interest in the Paleolithic led him to both cave deposits in Syria and the boggy valleys north and east of Hamburg (Figure 2.1). The Ahrensburg valley contained small dead ice holes and at least one narrow lake, some 3.5 km (2.2 miles) in length (Bokelmann 1991). These tunnel valleys likely contain many deeply buried sites from the Late Paleolithic, but only a few have been excavated with well-preserved organic remains. Excavations at the site called Meiendorf in 1932–1934 (Rust 1937) exposed the first deposits of the Hamburgian culture.

Later excavations at the nearby site of Stellmoor demonstrated the relationship between the lower, earlier Hamburgian layers and upper, younger Ahrensburgian culture (Rust 1943). The publication of the Meiendorf and Stellmoor materials inspired an extensive discussion of the Late Upper Paleolithic in northern Europe (e.g., Bokelmann 1991, Bratlund 1996a, Grønnow 1985, Sturdy 1975, Weber et al. 2011). Stellmoor is the best known and is discussed in more detail below.

These sites, because of the large numbers of artifacts and the remarkable preservation, have provided the definitive materials for the Late Paleolithic of northern Europe. The Hamburgian flint industry created large blades in an efficient and careful fashion (Madsen 1996, Vang Petersen and Johansen 1993).

Figure 2.4.
Typical artifacts from the Hamburgian site at Solberg, Denmark. Upper left, two burins; upper center, shouldered points; upper right, two zinken; lower left, two cores; lower right, two blade scrapers. The blade scraper in the lower right is approximately 12 cm long.

Assemblages are characterized by distinctive point types, scrapers, burins, and zinken—beaked or nosed scrapers for working reindeer antler (Figure 2.4).

The classic Hamburgian culture has been radiocarbon-dated from samples of reindeer bone and antler (e.g., Fischer and Tauber 1986, Grimm and Weber 2008). The earliest radiocarbon dates for the Hamburgian slightly predate the onset of the Late Glacial warming that began 12,700 BC. The majority of dates fall in a tight cluster between 12,500 and 12,200 BC, contemporaneous with the late Magdalenian Culture of central Europe. Several different types of shouldered and tanged points have been identified and are used to distinguish earlier and later Hamburgian sites respectively (Figure 2.2). The so-called Havelte tanged points generally date to the younger half of the Hamburgian culture. The classic Hamburgian with shouldered points is found in the northern Netherlands, northern Germany, and Silesia in Poland. The younger Havelte Hamburgian is found in Denmark, Schleswig-Holstein in Germany, the northern Netherlands, and parts of the United Kingdom (Ballin et al. 2010). Several Hamburgian sites also contain examples of Federmesser points, suggesting a connection between the two cultures (Brinch Petersen 2009, Weber 2012).

Almost 200 Hamburgian sites are now known, from Poland across northern Germany and southern Scandinavia, north of the Rhine River (Hartz 1987). More than 30 of those come from the classic tunnel valley of Ahrensburg. Very little material from this period is known from northeastern Germany. Poland has a large

number of these flint assemblages. Bone is present at the site of Olbrachcice, where a few fragments of reindeer have been identified (Burdukiewicz 1986).

Apart from a few stray finds, there are only a handful of late Hamburgian occupation sites in southern Scandinavia, all excavated in the last 35 years. The sites of Jels and Slotseng are located in the eastern part of southern Jylland (Holm and Rieck 1993). Sølbjerg on the southern island of Lolland has provided substantial additional information (Vang Petersen and Johansen 1994). Worked reindeer antler dredged from the bottom of Køge Bay in eastern Denmark, along the shore line of the former Baltic Ice Lake, has been dated to 12,140 BC, documenting the presence of Hamburgian hunters in this area as well (Vang Petersen and Johansen 1993). As yet, there are no finds from northern Jylland, Fyn, or northern Sjælland. The site of Mölleröd in the Swedish province of Skåne also belongs this time period. The sites of Stellmoor, Jels, Slotseng, and Mölleröd are described in more detail below.

Stellmoor, Germany

Alfred Rust's excavations at Stellmoor document the activities of these reindeer hunters in deposits of bone, antler, wood, and stone. The actual settlement area lies next to a small pond into which bones and other debris were thrown. The lacustrine portions of the site are buried very deeply, beneath the modern water table, and pumps were needed to keep the water out of the excavations. The excavations revealed two distinct episodes of occupation at Stellmoor, separated stratigraphically in time. There was an earlier settlement at 6.5 m (21′) below the modern ground surface and a younger one 3.5 m (11.5′) in depth. The older materials at Stellmoor belong to the Hamburgian culture, and the younger are Ahrensburgian. Both layers have numerous stone tools and hundreds of animal bones and other artifacts. The distinctive shouldered and tanged points of the Late Paleolithic are common.

There were a variety of bone and antler objects, including antler axes, antler clubs, and a decorated reindeer rib (Figure 2.5). The decorated rib is described near the end of this chapter. In the Ahrensburgian layer, over 100 wooden arrow shafts of pine were found. Some were simply whittled to a point, while others were slotted; a few even contained the base of tanged points, likely broken during the hunt (Bokelmann 1996). No arrow shafts were found in the Hamburgian, however, and the specific weapons used in hunting game—whether bows or spears—are unknown. Shouldered points could have been used as arrow tips, but no bow or arrows have been found from this period, even though conditions for organic preservation were excellent. A broken tip of a Hamburgian point was found embedded in the vertebra of a reindeer (Rust 1943).

Analysis of the animal bones from Stellmoor provides a bounty of information about the use of these animals and the activities of the hunters. These were big-time reindeer hunters. This species comprises more than 98% of all the animal bones from the site. Over 1,000 individual animals are represented in the upper, Ahrensburgian layer. Other species were represented only by a single individual or a few animals. In the Hamburgian levels, those included badger, fox, and wolverine, along with several hares. The Ahrensburgian levels included two elk, one horse, one bison, one wild boar, three beavers, two foxes, and two lemmings. Some of these species have been dated to more recent periods and may not belong with the Paleolithic levels at Stellmoor (Benecke and Heinrich 2003). The smaller numbers

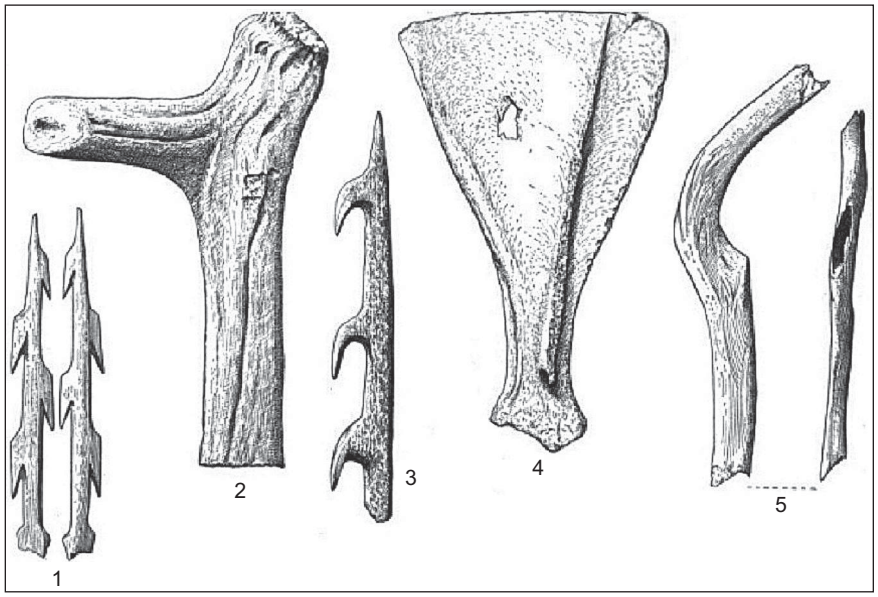


Figure 2.5.
Antler and bone artifacts from the Hamburgian and Ahrensburgian sites at Stellmoor. 1. Two-sided barbed antler harpoon, 2. Antler axe, 3. One-sided antler harpoon, 4. Reindeer shoulder blade with perforation from harpoon, 5. Two views of a slotted reindeer antler club for inserting a large flint blade.

of animals from the Hamburgian period suggest only small drives or stalking. On the other hand, in the Ahrensburgian period large herds of reindeer appear to have been ambushed and butchered on the spot.

Reindeer feces in the water deposits at the site suggest that animals were sometimes killed in the lakes (Bokelmann 1991). This is corroborated by the location of wounds and the many wooden arrows found on the lake floor. The Hamburgian animals had primary wounds in the side and back; Ahrensburgian reindeer were also wounded in the head and upper back region. The angle of these latter wounds suggests that the blow came from above, likely from a boat or a platform on the water.

The faunal remains provide substantial information about the herd and the time of year when hunters used this location. Careful analysis of the season of death of the reindeer involved study of tooth wear and eruption in the preserved mandibles. Although humans and reindeer appear to have been present year-round in the tunnel valleys of northern Germany, the animals were slaughtered primarily in the fall of the year (Bratlund 1996). The Late Paleolithic hunters may have subsisted in other seasons by consuming dried meat or bone grease and marrow obtained from the fall hunt. However, sites from seasons other than autumn are virtually unknown. One option may have been for these hunters to move to the former coasts of the North Sea, at that time some 250 km (155 miles) to the northwest, when sea levels were much lower. These areas today lie deep under the waters of the North Sea.

Whole skeletons of individual reindeer have also been found at Stellmoor, submerged beneath the water of the pond. The abdominal cavity of these animals may have been filled with large stones to weight them down. Originally considered some form of ritual, this practice is now thought to be a form of cold storage. Animal carcasses submerged in the cold lake waters might keep for a long period of time. Meat might also have been easily stored in the colder months in pits in the permafrost or simply by freezing.

Reindeer provided these hunting groups with most of the necessities of life. The meat, fat, marrow, and stomach contents of the animal would have supplied

essential nutrients. Lichens in the stomach contents, for example, contain important vitamins and iodine. The animals' hides could have been used for clothing and to construct tents and even skin boats. Antler was used for a variety of tools as well. In the Hamburgian period, long splinters of antler were pried out and carved into large barbed harpoons. The technique for this removal is known as "groove and splinter"—a pair of deep, parallel grooves were carved into water-softened antler until a narrow strip could be pried out. These barbed antler points were also used for hunting. The distinctive keyhole-shaped wound they leave can be seen in several of the scapula (shoulder blades) of reindeer from the site. Large pieces of antler were also used as handles to hold a large, sharp piece of flint.

The distribution of late Paleolithic sites in northern Europe is likely related to the seasonality of settlement and the behavior of reindeer. All of the known sites are inland, usually located along riverbanks or lake shores that may have intersected annual routes of animal migration. Site locations appear to have been chosen for strategic reasons, sometimes for view and sometimes at natural bottlenecks or places of forced passage in the terrain. Settlements were located on higher spots on islands, promontories, and coastal ridges that would have provided excellent viewpoints in the treeless tundra of the area.

Based on myriad information from the analysis of the Stellmoor materials, Bokelmann (1991) reconstructed the patterns of activity around this site (Figure 2a). The area just at the lakeshore is thought to have been the primary killing zone where the arrow shafts were found. Hunters may have stood on the slope of the hill, or next to their prey in boats, shooting the swimming animals. Animals were moved from the killing zone to a butchering area along the shore. The meat and other animal products were likely removed to a base camp, which Bokelmann suggests may have been on the hill at Stellmoor.

There is a final, intriguing find of a reindeer skull with large antlers mounted on the end of a wooden post 2 m (6.5′) long. The base of the post had been sharpened. When discovered, the post lay flat in the lake deposits, but it is likely that this sentinel once stood in the lake overlooking the campsite. Perhaps it was a decoy to attract reindeer, or perhaps a reminder of the importance of this animal which provided life for the hunters.

Rust's discoveries at Stellmoor and other sites in the Hamburg region provided essential new information on these reindeer hunters. Even 75 years after his excavations at the site, his work stands tall as a masterful investigation of the end of the Paleolithic.

Jels and Slotseng, Denmark

Hamburgian materials in Denmark were first recognized in 1981 at the site of Jels in central Jylland (Figure 2.1) and subsequently at the nearby site of Slotseng (Holm 1996). Both sites are located on higher spots in an open landscape with good visibility, next to narrow passages between valleys or lakes. These places are likely strategic intercept points along the migration routes of reindeer. Vang Petersen and Johansen (1996) have plotted Paleolithic site locations in northern Germany and Denmark. Reconstructed hypothetical routes of movement for the herds were drawn where sites show a linear distribution.

The several concentrations of artifacts at the site of Jels sit on a sand terrace about 10 m above a small lake in the Jels tunnel valley in central Jylland (Holm and Rieck 1992). Most of the material lies in the plow zone. Jels I covered approximately 350 m^2 (3,750 ft^2), with two distinct concentrations of flint artifacts, 8 × 9 m (26′ × 29.5′) and 6 × 7 m (20′ × 23′) in area. The larger area was likely the remains of a dwelling place, while the smaller zone appears to have been a flint-working area. The artifact assemblage includes 128 retouched tools with a high proportion of zinken. Tanged points are rare. There are no pits, posts, organic remains, or charcoal present, which is typical of most Late Paleolithic sites in northern Europe. Radiocarbon dates are thus often not available; a thermoluminescence date on burned flint provided an estimate of about 10,500 BC (Holm and Reick 1992). Periglacial phenomena such as permafrost and solifluction, as well as plowing, are responsible for substantial disturbance at such sites.

Jels II is one of the largest and richest Hamburgian assemblages in northern Europe. A 6 × 6 m concentration of flint artifacts and stones probably marks the location of a former dwelling, likely a tent, within a larger scatter of material covering 215 m^2 (2,315 ft^2). There are more than 700 retouched tools, including 130 zinken, 136 points, 136 scrapers, 125 burins, and 39 borers. The excavators of the site, Holm and Reick, argue that this concentration is a longer-term residential camp compared to the short-term hunting camp represented by Jels I.

The site of Slotseng lies 5 km southeast of Jels. Excavations here in 1990 revealed another group of Late Paleolithic sites (Holm 1996). The site location is on a small elevation with a good view of the surrounding region. Slotseng C was a Hamburgian concentration some 8 × 11 m (26′ × 36′) in size with 200 tools, including 37 zinken, 29 borers, 35 tanged points, 42 scrapers, and 22 burins. A few artifacts from the Bromme and Federmesser cultures also were found. Again organic materials were missing, but bog deposits in a kettle hole 70 m (230′) from the site contained both worked reindeer antler and flint artifacts. Kettle holes are small lakes or bogs in round depressions left by the melting of a block of buried glacial ice as climate warmed at the end of the Pleistocene. One of many radiocarbon dates on antler from the site was ca. 12,500 BC, one of the earliest for the Late Paleolithic in Scandinavia.

Mölleröd, Sweden

Finds in northern Skåne and Böhuslan in Sweden also appear to document a Hamburgian presence in southwestern Sweden. The site of Mölleröd, on the slope of a sand hill directly adjacent to Lake Finjasjön in northern Skåne (Figure 2.1), was excavated in the early 1990s by Lars Larsson (1996). Artifacts from several cultures have been found at the site, including Bromme and Ahrensburgian materials. Among the recovered tools are several zinken and distinctive tanged points. No radiocarbon dates are available. The site is dated on the basis of typology and appears to belong to the Hamburgian (Larsson 1996). The site location and the Late Paleolithic material closely resemble other sites in Scandinavia and likely reflect positioning along a route of reindeer migration. The general similarity of late Hamburgian material across northern Europe suggests mobility, contact, and the sharing of ideas between human groups in this period.

Federmesser, 12,000–10,800 BC

Federmesser means penknife in German and refers to the small, curved-backed flint blades characteristic of the stone tools of this culture. This same complex is described as the Arched Back Piece (ABP) technocomplex in Poland (Bratlund 1996b, Schild 1996). The diagnostic artifacts of the Federmesser are blades and steeply backed points with an obliquely retouched base (aka *Rückenspitzen*). Other distinctive types include gravette points, backed knives, burins, and short scrapers, along with several forms intermediate between backed knives and shouldered points (Holm and Rieck 1992). An amber elk head from the Federmesser Culture has recently been discovered at the site of Weitsche in northern Germany.

These small backed pieces are likely parts of projectile points for the bow and arrow, which appears to have been in use at that time. Assemblages show considerable variation. Blade technology was not as refined as in the tanged point cultures. Irregular flakes and blades were made into scrapers, burins, knives, and points. Federmesser materials are known from northern France, Belgium, and the Netherlands, throughout Germany, and into Scandinavia (Holm and Rieck 1992, Schwabedissen 1954, Taute 1968).

Federmesser materials in southern Scandinavia are known largely from scattered surface finds; there are very few actual concentrations. In 1990, Slotseng B in south-central Jylland was the first Federmesser site to be excavated in Scandinavia (Holm 1996). The excavated area of 111 m^2 (1,195 ft^2) contained a 6 × 8 m (20′ × 26′) concentration of artifacts around a central hearth indicated by a cluster of burned flint. The assemblage included 300 tools, including backed points, end scrapers with steep side retouch, burins, and various other pieces. Organic materials are only rarely preserved in Federmesser artifact concentrations. One exception is the site of Klein-Nordende in southern Holstein, Germany, where the faunal remains included elk, reindeer, and snow hare (Johansen 2002).

The relationship of Federmesser to other Late Paleolithic cultures has been debated for some time because of its widespread distribution and the mixed nature of many of the surface-collected assemblages. Federmesser materials date from before and into the beginning of the Late Glacial Stadial (Younger Dryas). The earliest evidence for Federmesser is contemporary with the latest Hamburgian phase. Later phases of Federmesser were contemporary with Bromme, and the latest perhaps with the beginnings of the Ahrensburgian (Holm and Reick 1992). Holm and Reick suggest that both Federmesser and Bromme originated in late Hamburgian and ended before the end of the Late Glacial. They see Federmesser as an independent culture with a distinct geographic distribution south of Bromme, overlapping due to occasional expansion to the north. Larsson (1996) argues that the presence of Federmesser materials at a number of Danish sites of Hamburgian or Bromme context, along with the few radiocarbon dates, indicates that Federmesser is a link between these two cultures. Federmesser may also have originated in the final Magdalenian as originally suggested by Schwabedissen (1954).

Bromme, 11,500–10,500 BC

The first recognition of the Paleolithic in Denmark came in 1889 from the find of a reindeer antler axe from Nørre Lyngby in northwestern Jylland (Holm 1996).

A tanged point was found some years later at the same spot. The Lyngby culture (later renamed Bromme), however, was not defined until 1944 at the type site near Bromme on the island of Sjælland, Denmark (Mathiassen 1947, Westerby 1985).

Holm and Reick (1992) suggest the origins of Bromme culture lie in the Hamburgian. Others see Bromme as an offshoot or relative of Federmesser that developed in the early or middle part of the Late Glacial Interstadial (Fischer 1996). The Bromme culture dates from the end of the Late Glacial Interstadial and the early part of the Younger Dryas. Sites generally lack organic remains, but one radiocarbon date from the early Younger Dryas is available from the site of Trollesgave (Fischer 1993). The type artifact is the massive tanged Bromme point. Bromme sites also contain burins, scrapers, and heavy blades. The absence of smaller projectile tips suggests that the bow and arrow was not in use. The flint working techniques of the Bromme culture, in contrast to the Hamburgian, were simple and wasteful in the context of the abundant raw materials of southern Scandinavia (Madsen 1993).

Bromme assemblages fall into two groups, those containing more tanged points and those with fewer (Fisher 1993). Small hunting sites, located on elevated spots in the landscape, have a high proportion of tanged points and low quantities of debitage (flint waste material). The larger assemblages are rich in debitage and the tools are dominated by scrapers and burins; points are a low percentage of total tools. These larger sites (ca. 50 m^2, 540 ft^2) appear to have a central hearth and are likely residential in nature, perhaps housing a nuclear family (Fischer 1996).

The Bromme culture is known today from more than 100 sites in Denmark, Skåne, Sweden, and parts of northern Germany (Holm 1996, Madsen 1983). All of these sites occur in inland contexts, often on large lakes near streams, suggesting that fishing may also have been an important subsistence activity. Several important sites document this period, including the type site of Bromme in western Sjælland, Stoksbjerg Vest on Knudshoved in southwestern Sjælland, and Segebro in southern Skåne. Bromme and Stoksbjerg Vest are described briefly below. The absence of organic remains at these sites makes detailed interpretation difficult.

Bromme, Denmark

The Bromme type site was originally excavated in the mid-1940s to mid-1950s (Mathiassen 1947). New excavations and a re-analysis of the material was undertaken in the 1970s (Fischer and Nielsen 1987). The richest of three cultural layers at the site yielded a variety of tool types, including tanged points, end scrapers, burins, blade knives, and borers. Organic materials are normally absent at Bromme sites, but preserved bones at this site included European elk and a few fragments of reindeer, beaver, wolverine, swan, pike, and perhaps red deer.

Stoksbjerg Vest, Denmark

The sites at Stoksbjerg Vest in southwest Sjælland are located on small, sandy hills next to the mouth of a river at a large lake (Johansson 1996). A ford at this location was likely used by migrating herds in the Late Paleolithic. Excavations in the 1970s uncovered several concentrations of artifacts. Area I was interpreted as the location of a structure with a central hearth containing ash and burned flint. The distribution of artifacts suggests a 4.5 × 5 m (14′ × 16′) nearly square outline and

an entrance way. A smaller rectilinear concentration of 3.5 × 5 m (11.5′ × 16′) was noted about 12 m (40′) to the south. These concentrations likely represent the small, short-term camps of hunters.

Ahrensburgian, 11,000–9000 BC

The Ahrensburgian culture began shortly before the start of the Younger Dryas ca. 11,000 BC (Kaiser and Clausen 2005), but the majority of the radiocarbon dates fall between 10,100 and 9400 BC in the late Younger Dryas and early Preboreal period of the Holocene (Weber et al. 2011). A few early dates are also known from Western Sweden (Schmitt et al. 2009). Ahrensburgian groups were widespread across the western part of the North European Plain and the northern slope of the upland zone of Central Europe and into southern Scandinavia. Tanged points of Ahrensburgian type have been found in Great Britain as well (Barton and Roberts 2001).

The Ahrensburgian culture was originally defined by Schwantes and Rust from materials found at Stellmoor in the tunnel valleys of northern Germany. The Ahrensburgian is 1,500 years younger than the Hamburgian, and despite their obvious similarities, there is no indication of direct continuity between the two (Holm and Reick 1992). The Ahrensburgian at Stellmoor has been radiocarbon dated to 10,200 BC (Fischer and Tauber 1986). Wood and antler artifacts from this period were preserved. Distinctive Ahrensburgian double-sided harpoons and hammers of reindeer antler were uncovered.

The German tunnel valley sites are very unusual. Only a few other localities from this time period contain preserved organic remains. Sites are usually very small and found in elevated spots on the landscape. Artifact scatters are low density. The diagnostic tanged projectile points are small and light, with the tang at the distal end of the blade (Fischer 1991). Small Bromme points are occasionally found in Ahrensburgian assemblages, along with obliquely retouched blade forms known as Zonhoven points.

Forty years ago, the Ahrensburgian was unknown north of the German border. The Ahrensburgian is still only sparsely represented in Denmark and southern Sweden, primarily by stray finds of small tanged points, reindeer antler hammers, and antler harpoons (Holm and Reick 1992). There are only a few excavated occupation sites, including Dværgebakke in Denmark and Hässleberga in Skåne.

Dværgebakke, Denmark

The site Dværgebakke I, in the middle of Jylland near the Bølling Lake (Figure 2.1), sits in a location very similar to Stellmoor (Møbjerg 2005, Møbjerg and Rostholm 2006). The lake is at the end of a long, narrow valley. Migrating reindeer herds likely moved along the valley and would have had to cross the lake. The animals could easily have been killed by bow and arrow before entering the water or from boats. No organic materials have been recovered. Radiocarbon dates on charcoal from the site fall in the ninth millennium BC. Two distinct cultures are represented in the stone tools at the site, one typically late Ahrensburgian and one early Mesolithic, reflecting two different periods of occupation.

Hässleberga, Sweden

Although organic materials are extremely rare at Late Paleolithic sites, there is good evidence in the faunal remains from Hässleberga in Skåne (Larsson et al. 2002). These materials date from the Allerød through the Younger Dryas. Radiocarbon dates from the reindeer bones fall largely in the second half of the Younger Dryas. The youngest date of 9650 BC was from a Preboreal reindeer skull. Stone tools from the sites include both Bromme and Ahrensburgian materials. The species present include freshwater fish, birds, mountain hare, arctic fox, and quantities of large game, especially wild horse and reindeer.

Hensbacka, 10,500–9000 BC

The Hensbacka culture represents the earliest evidence of a human presence in western Sweden and the Østfold (Oslo Fjord) region of southeastern Norway (Kindgren 1995). The Hensbacka dates from the end of the Younger Dryas to the end of the Preboreal across the Pleistocene/Holocene boundary and is contemporary with the later Ahrensburgian. Since its discovery, there has been a growing recognition that Hensbacka is closely related to the Ahrensburgian (Schmitt 1999).

The coastal focus of settlement and the similarity of stone tools suggest that Hensbacka was a maritime component of the Ahrensburgian that has not been seen along the submerged coastlines of southernmost Scandinavia and the North Sea basin where sites may lie under meters of marine sediment. In central and northern Scandinavia, on the other hand, coastlines rebounded faster than the rise of the sea. Hensbacka sites are found on raised beaches, tens of meters above modern sea level.

The Hensbacka culture was ultimately responsible for the rapid colonization of the west coast of Sweden and most of the Norwegian coast from south to north. Hensbacka is closely related to, if not synonymous with the Fosna culture of western Norway. These materials are described as early Mesolithic in Norway, but their typological and chronological affiliation with the Ahrensburgian means that they are Late Paleolithic in origin, even though their chronology belongs to the Holocene. The Hensbacka/Fosna culture in western Norway is dated from 9500 to 8000 BC. In addition, the early phase of the Komsa culture—the first human presence in northern Norway—is also largely contemporary with Hensbacka and closely related. Hensbacka, Fosna, and Komsa all contain tanged points, flake axes, and several other similar artifact types. Fosna and Komsa cultures are briefly discussed following this review of the Hensbacka evidence.

The diagnostic Hensbacka lithic artifacts are distinctive tanged points with continuous retouch along one side and large flake axes. There are many kinds of axes from the Stone Age and it is important to distinguish flake axes, core axes, and polished flint axes. Flake axes appear with the Hensbacka culture, core axes first are found in the Mesolithic, and polished flint axes are known from the Neolithic. Flake axes have a broad straight edge and were usually made from a single large flake. These axes were flaked on one side only and along the edges. The distinguishing characteristic of the flake axe is that one side of the original flake or nodule surface remains unchanged. These tools may have functioned as an adze rather than an axe, i.e., with the blade perpendicular to the shaft. Schmitt (1995) suggests that

the flake axes were implements similar to the Inuit, *ulu* (a long, crescent-shaped knife) for butchering seals.

There are also microburins and a few microlithic points found at some sites, foreshadowing the technology of the Mesolithic. Kindgren (1994) divides Hensbacka into two phases, with the younger Hensbacka appearing after 9000 BC. Tanged and single-edge points, microburins, and burins are found in the older Hensbacka along earlier coastlines above 65 m (210′); core axes are present in younger assemblages at lower elevations.

Some mention should be made of the use of flint in the Hensbacka/Fosna culture. As noted in chapter 1, there are very few local sources of in situ flint in Scandinavia outside of Denmark and Skåne in southwest Sweden (Högberg and Olausson 2007). There are a few other locations near Kristianstad in northeast Skåne, and small amounts on the islands of Öland, Gotland, and Bornholm.

There were two kinds of flint commonly in use in northern Europe during the Late Paleolithic. It is likely that prepared cores of flint from sources in southern Scandinavia, ready for tool production, were being carried or exchanged to the north. A second source of flint came from the high-quality nodules found for the most part in beach gravel along the west coast of Sweden and the south coast of Norway. This latter flint had been transported from the south by icebergs and deposited along the shoreline. This beach flint was utilized in the Late Paleolithic and Mesolithic. By the end of the Mesolithic, only golf-ball-sized pieces remained on the beaches. This ice-transported flint is occasionally found along the west coast and in the far north of Norway. It occurs as nodules and lumps on former beaches. Because of the general scarceness of flint, however, a number of other materials were employed throughout Norway for making stone tools, including tuff, chert, rhyolite, jasper, fine-grained quartzite, and rock crystal. In eastern Sweden, quartz and quartzite were commonly used as substitutes for flint.

The land and sea relations in the North Sea and Baltic region at the end of the Pleistocene are critical for an understanding the Hensbacka colonization of northern Europe. Northern Scandinavia was separated from the rest of the European continent, including southern Scandinavia, by a broad body of water that connected the North Sea and the Baltic through Middle Sweden and prohibited passage by land to Norway until ca. 10,000 BC. Western Sweden, with the exception of a series of island archipelagos, was completely submerged. Moreover, the land connection between Sweden and Norway was blocked by the Scandinavian ice sheet which extended to the North Sea through eastern Norway until approximately the end of the Pleistocene. Any inhabitants of Norway prior to that date must have come by boat. The nearest part of continental Europe at that time would have been 100–150 km (60–90 miles) across a wide body of water to the south (Figure 2.1).

There are hundreds of Hensbacka sites in the maritime region of western Sweden. These sites are known almost exclusively from coastal locations, which strongly suggests that the colonizers of this region were maritime hunter-gatherers focused on the resources of the sea. This coastal zone was a very rich environment in term of fish, shellfish, and sea mammals. The distribution of early Hensbacka sites was either along the straits (for marine and terrestrial resources) or in the outer archipelago (marine resources only). Later Hensbacka occupations are more evenly dispersed from outer archipelago to the interior and reflect a more typical

Mesolithic pattern of settlement. Artifact densities are high in these coastal situations. There were no comparable sites along the east coast of Sweden, so the location of sites in west Sweden must be a result of the rich coastal waters of the Kattegat and North Sea and an abundance of marine mammals and fish.

The oldest Hensbacka assemblage probably comes from Ramesdalen at an elevation of 120 m (400′), with a date of perhaps 11,500 BC (Fredsjö 1953, Schmitt et al. 2009). Two sites at Uddevalla were investigated in 1969. The elevation of the sites points to a date of ca. 10,200 BC. Both sites consisted of small concentrations of flint artifacts, located on a promontory on the north side of the Uddevalla strait at its narrowest part in an area of large islands. These artifact assemblages are distinguished by soft hammer flaking technique and the presence of flake axes. These sites also contain numerous points, microburins, and burins. Artifacts indicate an emphasis on hunting, probably for marine mammals.

The long distances from the mainland to the islands in this region of West Sweden required some form of water transport. The site of Nösund on the island of Orust on the coast of west Sweden provides some evidence of this (Carlbom and Schmitt 1991). The site lies at an elevation of 42–55 m asl (140′–180′ above sea level) today and is estimated to date from 8000 BC. At the beginning of the Holocene, this island was part of an outer archipelago in the center of the broad straits between southern and northern Sweden. The distance to the mainland in southern Scandinavia at that time was on the order of 40 km (25 miles).

Two additional Hensbacka sites, Rørmyr II and Almeö, are discussed below. It is important to remember that most of the western Swedish Hensbacka sites have been found in coastal settings on islands in the waters between the North Sea and the Yoldia Sea in the Baltic, some distance from the mainland of southern Sweden or northern Sweden and Norway. The site of Almeö from the late Hensbacka is an exception in the interior.

Rørmyr II, Norway

The site of Rørmyr II was excavated in the 1960s and reanalyzed by Birgitte Skar and Sheila Coulson in the 1980s. The site is located on a former island near the mouth of the Oslo Fjord, not far from the Swedish border. At that time, the melting Scandinavian ice sheet was only 70–80 km (43–50 miles) to the north. The isostatic uplift of the land in this area averaged 6.5 m (21′) per century in the early part of the Holocene. The site is located at an elevation of 155 m (500′) above sea level in an area abandoned by the ice sheet around 8000 BC. The early Hensbacka occupation at Rørmyr II likely dates to ca. 7500 BC.

The artifact assemblage from Rørmyr II contained a number of microliths, some similar to examples known from southern Scandinavia, as well as distinctive single-edge points known from the Hensbacka. Skar and Coulson (1987) focused on refitting back together more than 600 artifacts found at the site to answer questions about potential mixing of occupations and to determine patterns of manufacture and discard (Figure 2.6). The refitting study indicated that the site represented a single, short-term occupation without mixing. The location of burnt flint artifacts evidenced the presence of two hearth areas at the site. At least two individuals were suggested to have been making flint tools that included projectile points, a

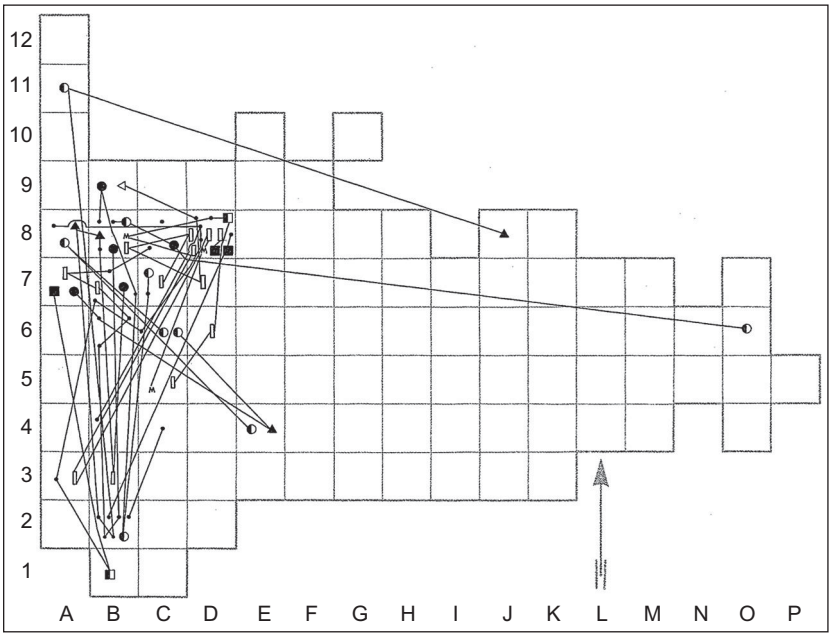


Figure 2.6.
The location and connections among refitted flint artifacts at the Norwegian Hensbacka site Rørmyr II (Skar and Coulson 1987). The various symbols represent different types of tools.

flake axe, scrapers, and burins. These activities seem to reflect the maintenance and repair of equipment, including arrows.

Based on the distribution of artifacts at the site, Skar and Coulson (1987) suggest that there were two main activity areas where the manufacture of blades and tools took place and a third area with only tools, described as the "butchering area." Projectile points like those made in the primary activity areas were found in the butchering area, with impact fractures indicating use. Skar and Coulson proposed that Rørmyr II was visited by a small group of people who, after building fires, perhaps camping for a night or two, making arrow points, and repairing equipment, left and went hunting.

Almeö, Sweden

Almeö is a late inland Hensbacka site on the shore of Lake Hornborgarsjön, 150 km northeast of Göteborg. The site was excavated in the mid-1980s and radiocarbon-dated to ca. 8700 BC, in the early Holocene (Kindgren 1996). The artifact assemblage was composed of typical Hensbacka material, including flake and core axes, lancette points, unifacial cores, and many blades and microburins. Preserved faunal remains included elk, aurochs, and beaver as primary prey along with boar, red deer, roe deer, bear, fox, and wolf. Fishing was important, and pike and perch bones were abundant. The fish bones make up ca. 30% of all bones at the site and are no doubt underrepresented. Analysis of bones and scales from perch suggests they were caught in the winter-spring of the year. The absence of hazelnuts at these sites suggests they were not occupied in the autumn. In addition, several ochre-covered dog burials were found (Nordqvist 1999). The site probably contained three or four small huts, based on the size and distribution of flint and bone scatters. The general picture is one of a cold-weather base camp for a group of one or more families.

Fosna, 10,000–9000 BC

The early settlement of Norway is a particularly fascinating topic because of changes in the relationship between land, sea, and ice in this area at the end of the Pleistocene. This northerly region was originally thought to have been ice-covered and inaccessible until the early part of the Holocene period. New studies, however, have shown that parts of southwestern Norway were initially deglaciated between 16,000 and 14,000 BC and that the region along the coast in the far north province of Finnmark was clear of ice ca. 12,500–12,000 BC (Amundsen 1996). As Bjerck (1995) has pointed out, these coastal areas were probably habitable for several thousand years before the first recorded presence of human groups. He suggests that the delay may be related to the development of watercraft or arctic marine adaptations.

There are no definite sites in Norway prior to 10,500 BC. Available radiocarbon dates indicate that the entire Norwegian coast was settled very quickly (Bang-Andersen 1995). The earliest dates from the north of Norway are the same as those from the south. The earliest archaeological materials in Norway are termed Fosna (Bjerck 1995, Nummedal 1929) and occur in southern and western Norway and the Oslo Fjord area (Bang-Andersen 1995). As we have noted, today a very close relationship between Fosna and Hensbacka (and ultimately Ahrensburgian) has been recognized and the term Hensbacka/Fosna is often used for this culture. Fuglestvedt (1999) has even suggested that Fosna materials be renamed coastal Scandinavian Ahrensburgian.

Hensbacka/Fosna in west and middle Norway is characterized by the presence of flake and core axes or adzes, large burins, single-edged tanged points, lanceolate points, unifacial blade cores, heavy macroblades, and microburins (Figure 2.7) (Bjerck 1986). This is basically the same assemblage as the Hensbacka materials in western Sweden and the Oslo Fjord area. Many new sites from this period have been found in recent years, dated by shoreline displacement and radiocarbon. All but one or two Hensbacka/Fosna sites are located on islands, emphasizing the importance of marine resources (Nygaard 1989). Around 90% of the Fosna settlements found in a sea-to-mountain survey in northwest Norway were coastal, and most of those were situated in the outer archipelagos, facing the open ocean. Obviously, marine resources were a significant factor in subsistence during the Fosna period (e.g., Bang-Andersen 2003, Bjerck 1995).

In fact, the coast of Norway and western Sweden in this period was dominated by hundreds of small islands. Several types of sites have been discovered, including small hunting camps, small residential camps such as Rørmyr II, and very large residential areas such as those found at Galta and Nyhamna (below). A few small camps in the highlands of Rogaland in southwestern Norway document the use of the mountains during the Fosna period (Bang Andersen 1988). The inland sites at Myrvatnet, for example, lie at 600 m (2000′) elevation and are approximately 50 km (30 miles) from the Preboreal coastline of Norway. The several concentrations excavated there contained small tanged points, lanceolate microliths, scrapers, and burins, very similar to coastal Fosna. These sites date to ca. 9800 BC and appear to have been small short-term camps for reindeer hunters located very close to the glacial ice.

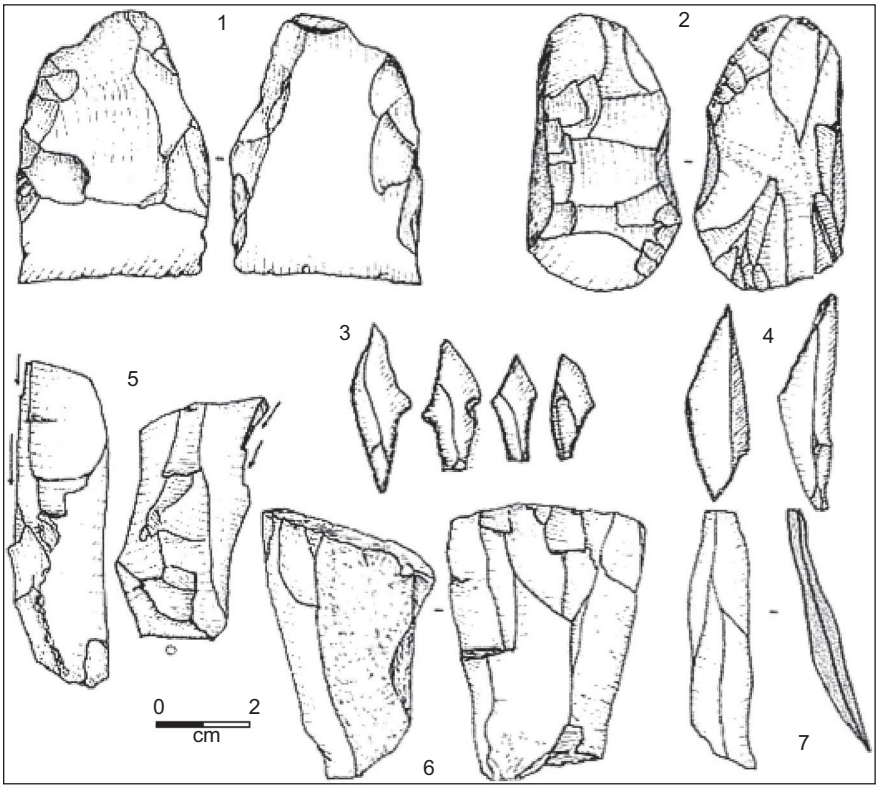


Figure 2.7.
Diagnostic artifacts from the Fosna culture in Norway. 1. Flake adze, 2. Core adze, 3. Burin, 4. Single-edge points, 5. Microliths, 6. Unifacial blade core, 7. Irregular blade with acute flaking angle.

Galta 3, Norway

Galta 3 is part of a site complex located on the northwestern side of the island of Rennesøy in southwest Norway (Prøsch-Danielsen and Høgestøl 1995, Fuglestvedt 2007). The site contains numerous artifacts mixed with beach deposits at 16–20 m (53′–66′) above sea level. Shoreline displacement curves suggest a date of ca. 10,000 BC for this elevation, contemporary with the Ahrensburgian materials at Stellmoor in northern Germany.

The settlement area at Galta 3 is estimated to cover about 1,000 m^2 (10,750 ft^2), a very large site if the size estimate is accurate. Galta, with more than a thousand projectile points, is also one of the richest sites known from this time. Fuglestvedt (2007) has argued that the materials from the Galta site are identical with Hensbacka both typologically and technologically, in terms of the techniques of stone tool manufacture, and ultimately originated with the Ahrensburgian. The early part of the Hensbacka/Fosna period (ca. 10,000–9500 BC) included the use of tanged points.

Nyhamna, Norway

Exploitation of a large undersea gas field off the west coast of Norway near Ålesund, between Bergen and Trondheim, was begun at the start of the twenty-first century. The plan was to build a pipeline to move the gas from the undersea field to the island of Gossen, where a huge filtering and pumping station would send the gas via another pipeline to Britain. Prior to the start of construction, archaeological

fieldwork was undertaken on Gossen in 2003 and 2004 to locate archaeological or historical remains and excavate places of importance (Bjerck et al. 2008). This was a huge project, funded at ten million dollars by the gas company, to rescue and record the archaeological and historical remains on the island. The project uncovered 32 sites dating from the late Paleolithic to the Medieval period in the area of planned construction, called Nyhamna.

One of the sites, Location 48, was an area of settlement from the Fosna culture, dating from approximately 9000 to 8800 BC. Almost 600 m^2 (6,500 ft^2) were excavated over a large area, exposing 17 fireplaces and tent structures marked by large stones to hold down the edges of a tent cover (Figure 2.8). More than 70,000 stone artifacts from the Fosna culture were found, including a large number of tanged projectile points (Figure 2.8). The tent structures were generally uniform in size, and the occupation appears to have been rather short given the low density of artifacts. Each of the concentrations has the same general set of tools and artifacts present, reinforcing the impression of similar residential units. The small size of the structures and scatters of artifacts suggests that only a few people were using these structures, perhaps a family or a few hunters.

The excavators concluded that the large number of tent circles at Location 48 and similar sites on the island probably represented the repeated use of the same place over time, rather than a larger encampment of more people. An argument was made that these small groups may represent a boatload of people, as travel by water appears to have been the primary means of movement in this region. Although no evidence has been found, the authors suggest that skin-covered wooden frames may have served as watercraft. The resin pieces from the site of Huseby Klev in Sweden

Figure 2.8. Excavations at Location 48 at Nyhamna, Norway. The yellow areas are concentrations of artifacts and stone tent rings (Bjerck 2008: fig.3.214).

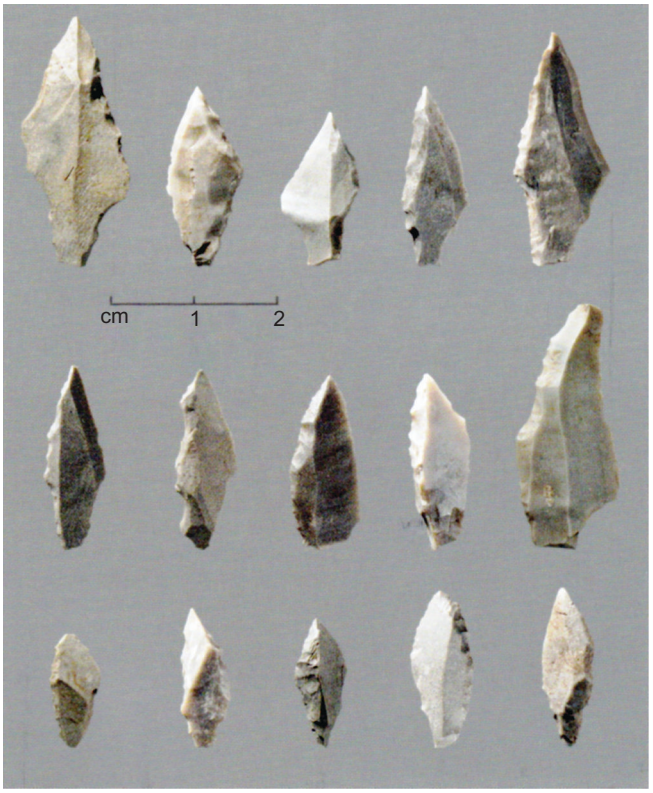


Figure 2.9. Tanged points from Location 48 at Nyhamna, Norway (Bjerck 2008: fig.3.222).

(see chapter 3) may support this argument as a material used to waterproof the openings and tie-downs on such a construction.

Komsa, 9500–8000 BC

The northern part of Scandinavia has often been ignored in discussions of the Stone Age, even left off maps of northern Europe in publications. This region lies well within the Arctic Circle and was assumed for many years to be ice-covered and uninhabitable during the Stone Age. Only in the last 25 years has the antiquity of habitation in this region been recognized. Interior areas were in fact ice-covered until near the end of the Stone Age, and glaciers still crown the higher elevations. However, the coastal zone of Finnmark was ice-free very early, ca. 12,500 BC (Amundsen 1996, Woodman 1993).

Hunter-gatherers in fact arrived north of the Arctic Circle very early following the end of the Pleistocene. This period is defined by the Komsa culture (Englestedt 1999). Early Komsa sites are generally small in size and located along the coast (Woodman 1999). The location of settlement directly adjacent to narrow straits either on the outer coast or in the inner fjords (Odner 1966) closely resembles the pattern known from Fosna and Hensbacka sites to the south and emphasizes the importance of marine resources in the diet.

The first evidence for human occupation appears with the early phase of the Komsa culture. The radiocarbon dates for the earliest occupations demonstrate a significant human presence in northernmost Scandinavia before 9000 BC (Woodman 1999). These early dates originally suggested to some that the first human groups in this area may have come from the east (Anundsen 1996). However, there is no evidence for a human presence in northern Finland or Karelia until after 9500 BC at the earliest. It should be pointed out that the distribution of Komsa cultures ends at the entrance to the White Sea, also the terminus for the Gulf Stream current (Woodman 1999). The close relationship between early Komsa and the Hensbacka/Fosna argues for an origin along the coast to the south.

The Komsa culture is known almost exclusively from the northernmost Norwegian province of Finnmark and the coastal zone to the east along the Kola Peninsula in Russia, fully within the Arctic Circle. Komsa is characterized by tanged points and related types, large backed pieces, flake axes, crude scrapers, and burins (Woodman 1999). One reason for the rather coarse character of the Komsa industry is the raw material—quartzites and cherts of different types, as well as rather poor-quality flint (Woodman 1999). Typologically and technologically, this material closely resembles the Fosna materials of southern Norway, and ultimately the Hensbacka and Ahrensburgian.

These sites are typically small concentrations of quartz and quartzite artifacts and larger natural stones. Organic remains are not preserved, and very little specific information is available regarding food resources and raw material use. Artifacts are commonly tanged points, flake adzes, and blades and flakes with a straight or convex backing. Structures are rare at most of the earliest sites, although hearth areas have been identified. Toward the end of the phase, however, numerous depressions—the remains of residential structures—have been observed at a number of sites (e.g., Schanche 1988, Simonsen 1961). The earliest rock art in Northern Europe was found at the site of Dyreberget in the province of Nordland, dated to roughly 8000 BC, at the end of the Komsa period (Figure 2.10).

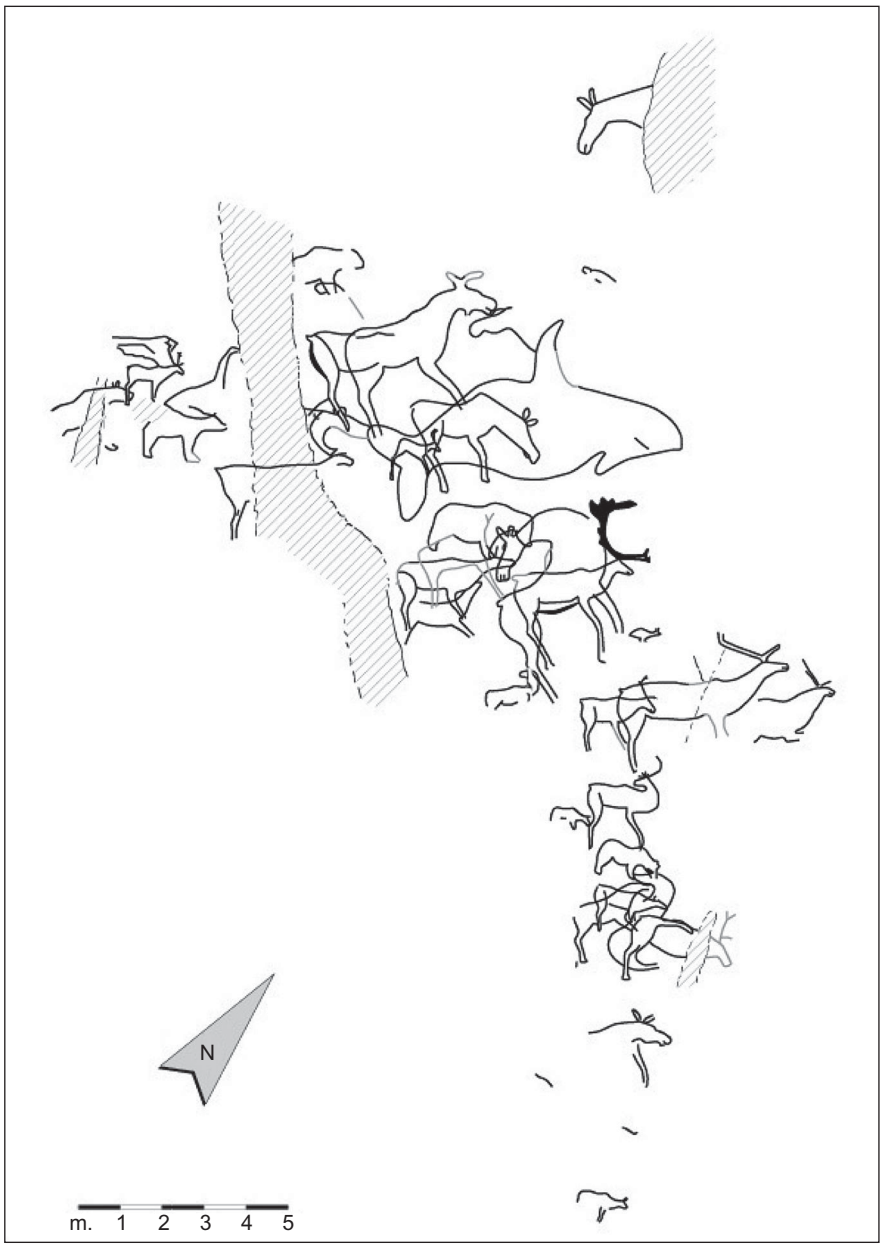


Figure 2.10. Dyreberget near Liknes in Nordland, Norway. The oldest dated rock art in northern Europe, 8000 BC. The animals shown include reindeer, elk, killer whale, and bear (Bjerck 1994).

Slettnes, Norway

The sites of Slettnes VII on the island of Sørøya, with a date of 9000 BC (Hesjedal et al. 1996), and Evjen III near Saltstraumen on the Nordland coast, ^{14}C-dated to 8980 BC (Thommessen 1996), provide some of the earliest traces of human activity in northern Scandinavia. The locations of these settlements directly adjacent to narrow straits either on the outer coast or in the inner fjords (Odner 1966) is similar to the Fosna and Hensbacka sites to the south and emphasizes the importance of marine resources in the diet.

The site of Slettnes lies just off the north coast of Finnmark, inside the Arctic Circle in northern Norway (Figure 2.11). Survey and excavations revealed a number of archaeological sites on the Slettnes peninsula, dating from all periods in the prehistory of this area (Hesjedal et al. 1996). There were two sites from the Early Mesolithic, including Slettnes VII, which dated from approximately 9000 BC, and Slettnes IVA, dating to ca. 8000 BC. Slettnes VII was a concentration of stone artifacts, including a large number of tanged points. The excavations at Slettnes IVA revealed a concentration of ash and soot, designated as Feature 45, that may mark the location of a structure of some sort. This area is approximately 2 m (6.5′) in diameter and contains two large burned stones as well as a number of stone artifacts. There was also a small scatter of charcoal and ash to the east of the larger concentration. The artifacts included a number of blades, several cores, and a few ground slate points and a knife. Organic

Figure 2.11.
The sites at Slettnes are located along the coast of this peninsula in northern Norway.

remains are not preserved, and very little specific information is available regarding foods or raw material in use.

Dumpokjauratj, Sweden

Although the majority of Komsa sites are on the Norwegian coast, this culture is also known from a few inland settings. One of the best examples of an interior Komsa settlement comes from northernmost Sweden in the province of Upper Norrland, at a site called Dumpokjauratj. Archaeological investigations have revealed a site dating from 7800 BC (Bergman 2002, Liedgren 1995).

Dumpokjauratj is located on a small lake, and excavations exposed artifacts, burned bones, two hearths, and a small pit. The occupants of this small camp made fires, manufactured stone artifacts, and cooked some of their prey. A slate knife and a whetstone were among the artifacts found at the site. The slate artifacts at Dumpokjauratj point to connections with the Finnish Mesolithic, with documented slate use in this early period. The animals represented in the bones included fowl and fish in addition to larger mammals, probably reindeer.

TREASURES

The Late Paleolithic in northern Europe did not leave behind spectacular art or elaborately decorated objects. Perhaps because of the pioneering nature of the settlement or perhaps due to the absence of organic materials at most sites—whatever the reason—there are only a few examples to include in this section. A recently discovered amber animal head from Weitsch, Germany, is an excellent candidate, along with carved or decorated antler and bone objects from Stellmoor and Poggenwisch.

Stellmoor, Germany

Among the many finds from the Late Paleolithic at the site of Stellmoor was one enigmatic piece of elk rib with a variety of marks and lines (Figure 2.12). The object comes from the Ahrensburgian layer at the site and is 16.2 cm (6.4″) long. The function of this object is not at all clear—tally stick, rhythm stick, graffiti, art? But it is one of the few clearly decorated objects from the period and raises a number of intriguing questions. If it was a tally stick, what were they counting?

Figure 2.12. The tally stick on a reindeer rib from Stellmoor, Germany.

Figure 2.13.
The decorated antler rod from Poggenwisch. Scale is in centimeters.

Poggenwisch, Germany

Poggenwisch was one of the several tunnel valley sites excavated by Schwantes and Rust in the 1930s where the remains of early reindeer hunters in northern Europe were uncovered. This carved antler piece (Figure 2.13) from the Hamburgian site is approximately 16 cm (6.3″) long and decorated with elaborate carving on all sides. The function of this piece is unknown, but it reflects the continuing application of art and decoration to various objects of equipment and personal use.

Weitsche, Germany

A new find from this period has come from northern Germany at a place called Weitsche in the Elbe Valley (Veil et al. 2012). Scattered small fragments of amber were found and reassembled into the head and body of an extraordinary elk effigy that appears to have been attached to the top of a wooden staff. The head alone is approximately 4 cm (1.6″) in length.

SUMMARY: LATE PLEISTOCENE HUNTERS

The archaeology of the Late Paleolithic of Northern Europe provides insights on several important more general issues, including the colonization of uninhabited landscapes, the role of large game hunting, and the impact of climatic change on human groups. Human response to open landscapes and colder temperatures can be seen in subsistence activities, settlement, group size, and mobility in the sequence of Late Glacial cultures in this area. These issues are resolved in archaeological information about the size and season of site occupation, the location of settlement, the remains of food and non-food resources, and technology.

One of the more interesting patterns to be noted is the pulse of human groups and fauna moving in and out of southern Scandinavia as the climate oscillates substantially between warmer and colder during the last two or three millennia of the Pleistocene. The initial occupation of the new land of northern Europe was a gradual process and likely involved only small numbers of people. The Hamburgian culture of the first inhabitants was characterized by a wide distribution across much of northern Europe, but only a slight presence in Scandinavia. Climate improved during the Late Glacial Stadia, and new groups—Federmesser and Bromme—occupied a more temperate, lightly wooded landscape with somewhat less migratory fauna. The large numbers of Bromme sites in Denmark and southern Sweden evidence a substantial human presence at this time. Bromme sites have been found in different parts of the landscape and do not appear to be focused solely on reindeer migration routes. The return of colder conditions

during the Younger Dryas witnesses the expansion of Ahrensburgian groups hunting reindeer across the region and the disappearance of Federmesser and Bromme.

In addition to the pulsating nature of human colonization in response to climatic change in northern Europe, the archaeological evidence also documents a very rapid expansion of population into new, unoccupied spaces, covering enormous distances in short periods of time. Humans filled up the empty coasts of northern Europe at the end of the Pleistocene within a few hundred years. The early Holocene and Mesolithic periods got underway with human groups settled in most of the coastal regions of the area.

Ahrensburgian coastal settlements are unknown in southern Scandinavia, where the land has been subsiding since the end of the Pleistocene. Any possible coastal sites from that period are deeply submerged. While there may well have been a coastal facies of the Ahrensburgian culture, there is no direct evidence. To the north, however, isostatic rebound of the land has outpaced the rise of sea level, and the remains of the earliest human inhabitants are found tens of meters above modern sea level. In western Sweden and southern Norway, a coastal adaptation, known as Hensbacka, closely related to the Ahrensburgian, is commonly found on islands and peninsulas. It appears that Ahrensburgian-related people moved into this area almost as soon as the ice had melted and food sources had filled the seas.

These Hensbacka groups moved quickly by sea from southern Sweden along the coast of Norway from south to north, covering a great distance in a relatively short time. The colonization of this enormous area is estimated to have taken no more than a few hundred years. This pattern of rapid colonization is known from other species introduced into new environments without major predators; rabbits in Australia provide one of many examples.

These human groups are termed Fosna in western Norway and Komsa in the far north, but their origins in Hensbacka and the Ahrensburgian are obvious in their stone tool traditions. Although these groups had an initial focus on marine resources and the coasts, within a short period they were also beginning to hunt reindeer and other species in the interior and to develop a more broad-based subsistence system that continued for millennia in the area beyond the limits of cultivation.

It is also of interest to contemplate the relationship between humans and their prey in the Late Paleolithic. Relatively little is known about the reindeer hunters of the Hamburgian and Ahrensburgian. One of the mysteries of the Late Paleolithic in northern Europe concerns the location and activities of these hunting groups during various times of the year. Cultural horizons with preserved faunal remains often point to the autumn as the primary period of site use and reindeer hunting. Places of residence during other seasons of the year are unknown. One of two explanations is usually proposed: either hunters followed the reindeer herds year-round (Sturdy 1975), or they may have lived elsewhere in other seasons, perhaps the North Sea coast, and exploited a variety of other resources (Bokelmann 1979, 1991, Fischer 1991).

It is unlikely that Late Glacial groups simply followed reindeer herds around the landscape. Hamburgian sites are found almost exclusively at intercept points along the probable paths of reindeer movement in the major river valleys of northern Germany and southern Scandinavia with direct access to the sea (Fischer 1996).

It is important to consider the archaeological visibility of Late Upper Paleolithic human groups and to recognize that potential coastal habitats from this period are completely unknown. The sea was more than 100 m below modern levels along the coasts of Europe during the Late Glacial Maximum (Shackleton 1987). Any coastal settlements of the Late Paleolithic would have been submerged under the rising seas of the Holocene.

Almost everything we know of the last Paleolithic hunters in Europe comes from inland areas and may not be at all representative. Fischer (1996) has argued that Late Paleolithic reindeer hunters probably came to southern Scandinavia primarily for coastal resources such as seals, fish, and whales rather than reindeer, and that they probably arrived by boat. Certainly the island and coastal location of many of the Hensbacka/Fosna/Komsa sites in Sweden and Norway argues for a coastal aspect of these cultures and strongly suggests that watercraft were in use. This coastal adaptation may in fact have been characteristic of much of the Late Paleolithic in Northern Europe (Fischer 1991). Questions regarding the use of the coast in the Late Paleolithic in southern Scandinavia, however, can only be answered by underwater archaeology.

Typological and technological similarities and differences among the various Late Paleolithic cultures provide a fascinating study in tradition versus function. Federmesser and Bromme assemblages replace Hamburgian as the warmer conditions of the Late Glacial Interstadial. This period would have offered a more propitious environment with warm temperatures, more vegetation, and large herds of animals (Fischer 1991). With the advent of the Late Glacial Stadial (Younger Dryas), however, conditions deteriorated rapidly. A large part, perhaps even the whole, of southern Scandinavia was depopulated during the harsh climatic deterioration of the early Younger Dryas. Ahrensburgian reindeer hunters return with the warming conditions of the later Younger Dryas. Ahrensburgian artifacts resemble the materials of the Hamburgian, although 1,500 years separates the two cultures. There does not appear to be any linear development taking place among the groups occupying northern Europe at the close of the Pleistocene; rather, different traditions and different cultures seem to be moving in and out of the region.

Different kinds of Late Paleolithic sites suggest variation in activity and mobility among these groups as well. Fischer (1991) has identified four types of sites in the Late Paleolithic: (1) flint working areas, (2) temporary hunting stations with abundant projectile points, (3) camps with a focus on hunting activities located on higher elevations and containing more domestic artifacts, and (4) settlements near lakeshores with numerous domestic tools. Settlement sites have more tools and a greater variety of tools. Nevertheless, all of these types of sites appear to represent short-term stays by mobile human groups. The lithic technology that is preserved is largely simple and expedient. Thick layers of archaeological material are unknown. The complete absence of human skeletal remains from Late Paleolithic sites also supports this picture of ephemeral encampments.

Hamburgian sites are generally larger (Bokelmann 1979). Bromme and Federmesser concentrations are half the size of Hamburgian sites, with a central fireplace in what were apparently single-family structures. Bromme sites are small but rather densely distributed (Fischer 1976, Madsen 1982, Andersen 1988).

Larger camps may also have existed, such as the hill at Stellmoor or the extensive site of Galta in the Hensbacka/Fosna culture of Norway.

In sum, the Late Paleolithic groups of northern Europe document several important aspects of human behavior and hunter-gatherer adaptation. There is in human nature an inherent curiosity and an urge to explore. This trait has been seen many times in prehistory, from the expansion of early hominids out of Africa to the peopling of Australia and the New World. The colonization of the newly opened landscape of northern Europe would seem to be another example. Hunters from central Europe moved to the north and expanded into new, unoccupied habitats.

Late Paleolithic groups document the flexible and adaptive way of life that characterizes most hunter-gatherers. Using a simple lithic technology and bone, antler, skin, and other materials, these groups survived successfully in a region of abundant food resources, exploiting herds of large game and the riches of the sea. There is little art or ornamentation associated with this period. Sites are small, and group size was likely limited to one or a few families. Shortly after the beginning of the Holocene, however, these animal herds left the area for good. The tundra disappeared and trees prevailed. Forest-dwelling species came to dominate the fauna of this region, and human behavior changed dramatically to succeed in this new environment. Those changes and their consequences are the story of the Mesolithic, discussed in the next chapter.

CHAPTER THREE

THE LAST HUNTERS, 9500–4000 BC

THE OLD BULL

Sometime in the late fall of the year 6460 BC in eastern Denmark, an old wild bull aurochs broke through the forest edge and painfully made his way to the shore of a small lake. The huge animal, some 1.85 m (6′) at the shoulder and weighing almost a ton, was mortally wounded. At least a dozen arrows had struck him, mostly in the rear, as he fled a group of hunters. The dying bull staggered into the cool waters to escape both the hunters and the torment of his wounds. Eventually his body sank slowly to the bottom of the lake and lay there hidden from the hunters and the elements. Over time, the lake sediments covered his remains and the arrows that had slain him. Those bones and the stone tips of the arrows lay undisturbed until AD 1983, when they were unearthed near the village of Prejlerup in Denmark (Figure 3.1).

But what of the hunters themselves, the occupants of northern Europe prior to the introduction and spread of farming? What was life like for those individuals? Was it severe, harsh, and brief—or did those foragers live well and prosper? In a world that today is almost totally dependent on domesticated plants and animals, it is easy to imagine that the life of hunting-fishing-gathering people—before farming—must have been very difficult.

Recent investigations of this period between the Pleistocene and the advent of farming, however, are changing our perspectives. In the last twenty-five years, there has been a substantial amount of research on this pre-farming period, correlated both increasing rescue archaeology in Europe and with growing questions about the events that took place during the early Holocene, or Postglacial, period.

The Mesolithic of northern Europe is a large and complex topic. In this chapter, I first discuss the meaning of the term *Mesolithic* and briefly review the major environmental changes that occurred during this time in Scandinavia. Next, the transition from the Paleolithic to the Mesolithic is outlined, followed by a discussion of regional differences in Holocene Scandinavia. There are significant differences, as usual, between southern Scandinavia and the north. With this background, some of the distinctive aspects of Mesolithic adaptations are examined under the headings of subsistence, settlement, cemeteries, exchange, and art. This chapter concludes with a consideration of foraging adaptations as seen from northern

Figure 3.1.
The remains of the Prejlerup aurochs from a peat bog in northwest Sjælland, Denmark.

Europe, and specifically what the archaeology of this area can tell us about prehistoric hunter-gatherers.

THE MESOLITHIC IN SCANDINAVIA

The term Mesolithic ("Middle Stone Age") is used to designate those societies of hunter-gatherers present during the period between the end of the Pleistocene and the beginnings of agriculture. The end of the Pleistocene is conventionally set at 9700 BC. In Scandinavia, the end of the Mesolithic is marked by the introduction of agriculture ca. 4000 BC. This period is also referred to as the Hunter Stone Age. In the more northerly areas of Scandinavia, above the limits of cultivation, hunter-gatherer adaptations continued until recent times and are often simply referred to as "stone age." The terminology for the various stages of the Mesolithic varies regionally in Scandinavia (Figure 3.2). These differences are discussed in more detail and important sites are described in the following pages.

The chronology for the Mesolithic of northern Europe is based primarily on lithic typology, shoreline displacement, pollen analysis, and radiocarbon dating and is one of the more detailed sequences for Holocene hunter-gatherers anywhere in the world. Flaked stone tools are usually the basis for chronological studies in the Mesolithic of Scandinavia. Various tool types dominate this discussion, and a few of the more important are briefly described here. Points, core axes, and flake axes are the main focus of attention. Scraping tools, engravers or chisel tools (known as burins), and borers or perforators are generally common in assemblages but are less diagnostic. Projectile points change rather quickly through time and provide

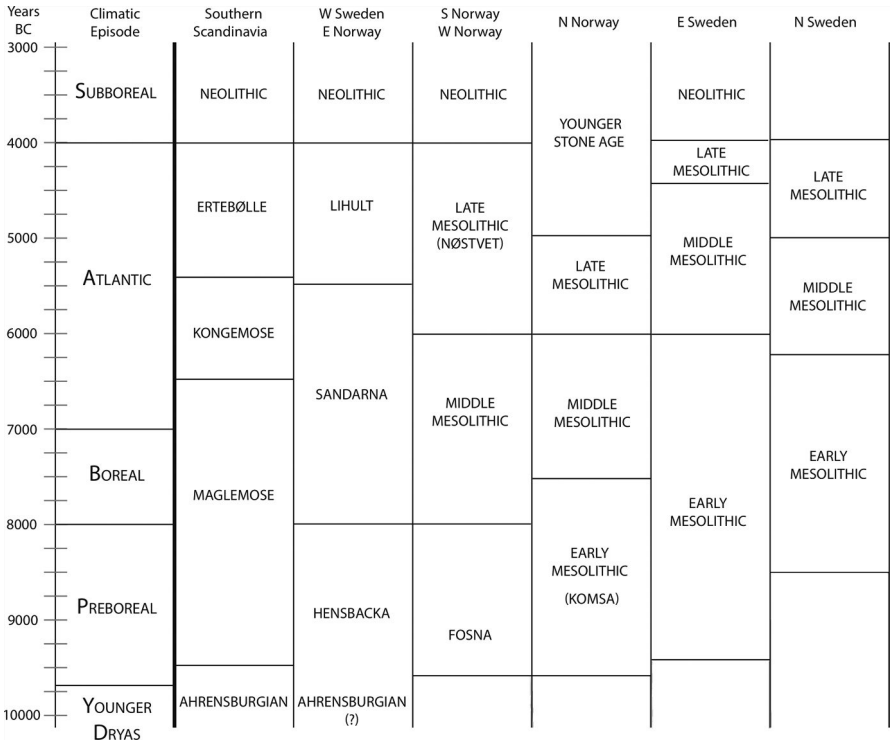


Figure 3.2. Regional Mesolithic chronologies in Scandinavia.

useful chronological markers. These points evolve from triangular to trapezoidal to transversal forms (Figure 3.3). Two processes are apparent: (1) the projectile tips become narrower and more symmetrical around the shaft of the arrow, and (2) a narrow pointed tip evolves toward a broader cutting edge for the leading end of the arrow. This emphasis on a broader edge provides more killing power. Arrowheads with a broad leading edge drive bone and other tissue ahead of them, causing additional damage, rather than slicing cleanly through tissue like a knife.

Axes are another important diagnostic artifact in the Mesolithic, and a variety of both flaked and ground stone axes are present in the different regions of Scandinavia. Flaked stone axes occur in two general types, core axes and flake axes. Both types are made from flint and range in length from roughly 10 to 20 cm (4–8″), although smaller forms of flake axes are not uncommon. Flake axes were previously discussed in the Paleolithic chapter. Core axes were flaked on both sides and have a rounded symmetrical leading edge that can be resharpened by additional flake removals (Figure 3.4).

Although the focus in chronological studies is often on flint artifacts, a wide variety of raw materials were used for flaked stone tools in northern Scandinavia because of the scarcity of flint. As noted earlier, materials such as rhyolite, jasper, fine-grained quartzite, and rock crystal were often employed in these areas. Slate was also used for a variety of artifacts, including cutting-edge tools such as projectile points and knives. This technology involved grinding rather than flaking, and produced some spectacular artifacts.

In addition to the flaked stone technology that predominates in the Mesolithic, there are various types of ground stone axes and other objects that have generally

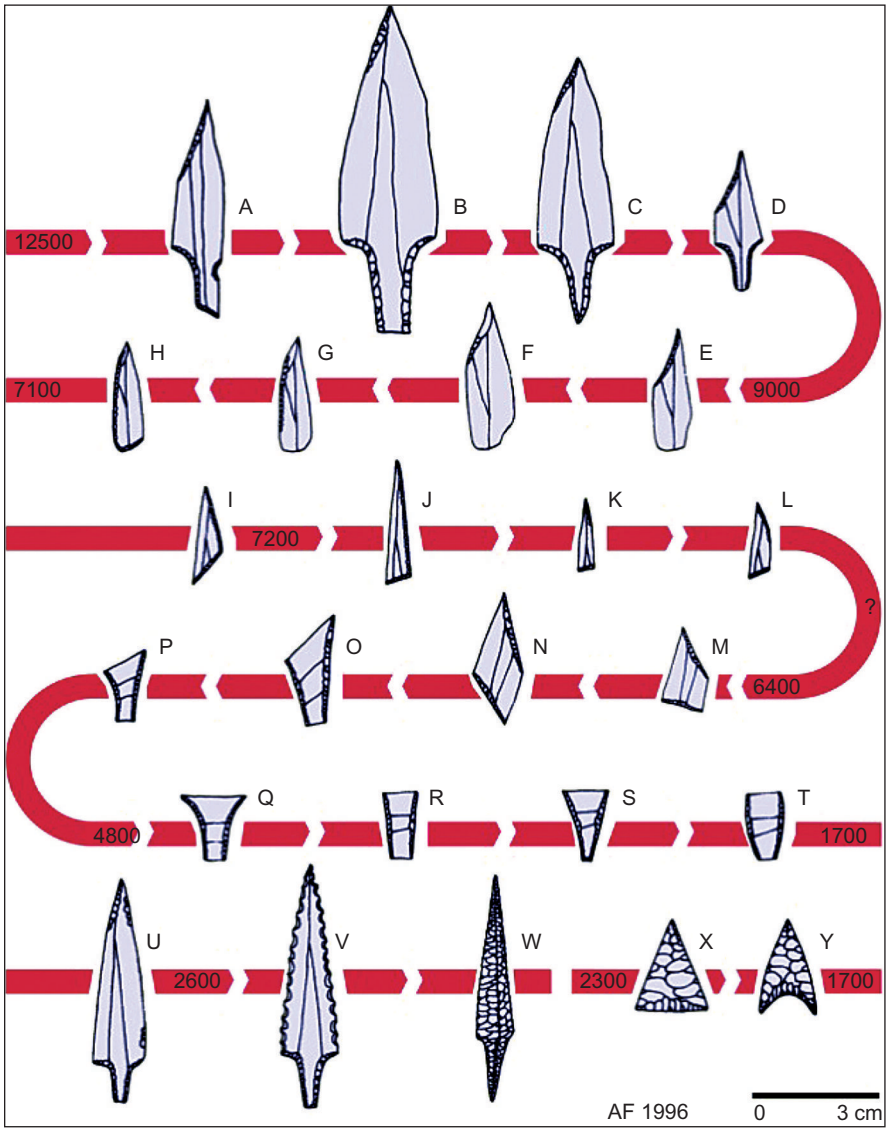


Figure 3.3.
The evolution of projectile points in Stone Age southern Scandinavia with Paleolithic varieties at the top, three rows of Mesolithic forms, two Mesolithic and two Neolithic forms on the fourth row, and other Neolithic type on the bottom row (Fischer 1985).

received less attention. The ubiquitous *trindøkse*, or stump-butted pecked stone axe, is common throughout southern Scandinavia and beyond in the later Mesolithic (Figure 3.5). These are for the most part ground and/or pecked stone axes with a single cutting edge and rounded base. Other forms of ground stone axes have a variety of names based on where the raw material comes from or the site where they were first identified: Lerberg, Lihult, Limhamn, Nøstvet, Sandarna. Other ground stone tools, such as chubby adzes and shaft-hole pick axes, are found in the northern parts of Scandinavia. There are also occasional mace heads and picks of ground stone from this period. These axes and other ground stone objects were made on a variety of rock types; greenstone and diabase were commonly used.

Stone tools are not the only diagnostic artifacts in the Mesolithic. Pottery appears for the first time toward the end of this period (Figure 3.6). Ceramic containers are seen in the later Ertebølle in southern Scandinavia after around 4800

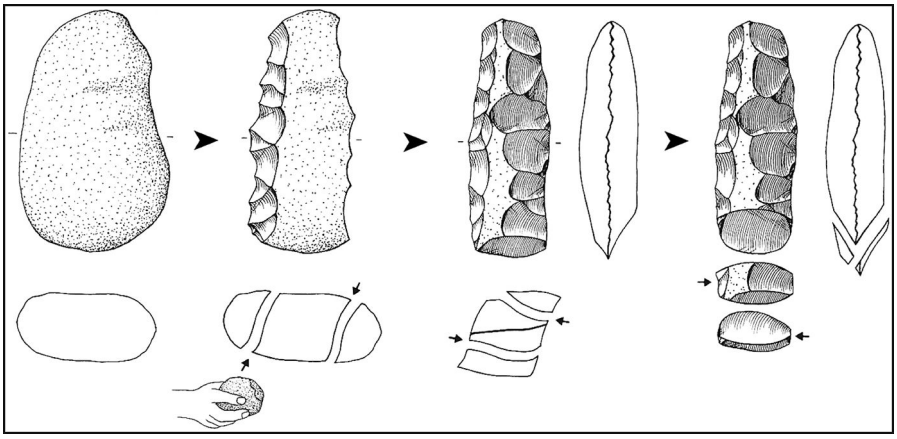


Figure 3.4.
Core axe production and waste products. The last removals are resharpening flakes.

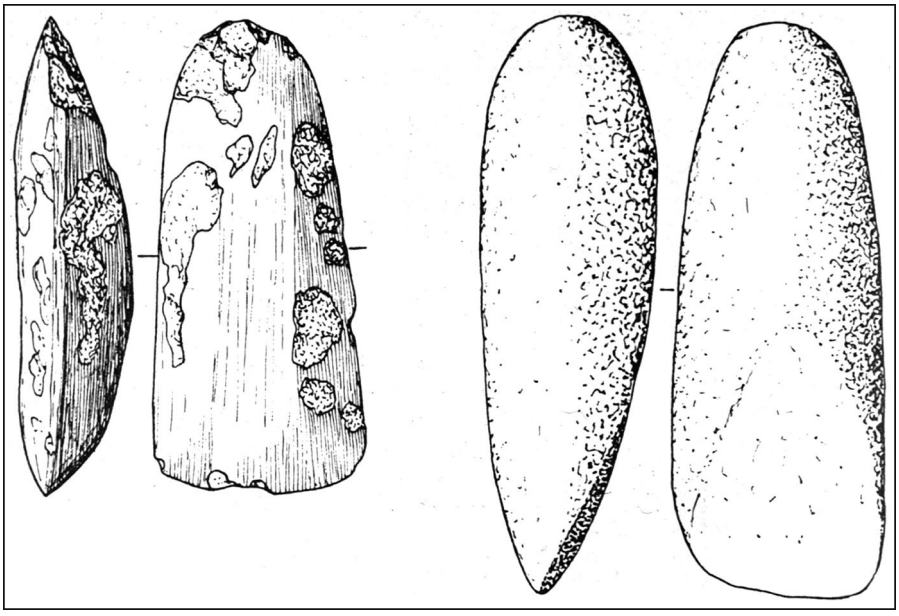


Figure 3.5.
Two types of ground stone axes from Mesolithic Scandinavia, a Limhamn axe from Sweden and a stump-butted, pecked stone axe (*trindøkse*) from Denmark. The length of (*trindøkse*) is approximately 20 cm (8″). (Clark 1975, Figure 46).

BC. For many years, the inspiration for these vessels was thought to have come from the south, where Neolithic groups in central Europe had been using pottery for centuries. Recent evidence, however, points to the north and east as the place of origin for these ceramics (Hallgren 2003). The earliest known pottery in the world comes from East Asia, probably from China, and dates to approximately 20,000 years ago (Xiaohong et al. 2012). Early ceramics in northwestern Russia and Finland predate the ceramics in the Ertebølle and closely resemble them technologically (Hartz et al. 2011). It now seems clear that ceramic technology spread from east to west along several routes, one of which appears to have been across northern Eurasia.

In places where preservation is good, primarily in southern Scandinavia, there are a variety of other materials and objects found at Mesolithic sites, including bone and antler tools, tooth and amber pendants and other jewelry, wooden tools and equipment including paddles and dugout canoes, bark, fungus, fiber for nets, mats, and other equipment. Wood was a resource of major importance and utility. Some of these materials will be discussed later in this chapter. Before going there, however, it is necessary to consider the early Holocene environment in Scandinavia and the context of change in the Mesolithic period.

Figure 3.6.
Ertebølle pottery from southern Scandinavia. Height 35 cm (14″).

ENVIRONMENTAL CHANGES IN THE EARLY HOLOCENE

In contrast to the Pleistocene, the Holocene appears to be a period of climatic stability and warmth. Temperatures continued to warm through the first half of the Holocene. The climatic episodes associated with the Mesolithic are the Preboreal, the Boreal, and the Atlantic (7200–3900 BC). Temperatures began to decline slightly and precipitation increased in the following Subboreal (3900–1000 BC), associated with the Neolithic period.

The landscape of northern Europe underwent dramatic changes in terms of vegetation, fauna, and sea/land relationships during the early Holocene as a result of the warming trend that began in the late Pleistocene. These changes were of substantial import in the lives of Mesolithic people. The transition from tundra to birch, pine, and hazel to the mixed deciduous forests of elm, lime, and oak of the Atlantic episode was a gradual succession that took place over the first 2,500 years of the Holocene.

The environment of northern Europe during the Holocene was generally rich and diverse in terms of resources for human subsistence. Red deer, wild pig, and roe deer were terrestrial animals of primary economic importance during the Mesolithic and by 8,000 years ago were ubiquitous throughout most of Europe. The dog (*Canis familiaris*) was domesticated by the end of the Pleistocene and was present at many Mesolithic settlements. Numerous species of fowl and other small game are recorded in the Postglacial archaeological record. A variety of small fur-bearing species—marten, otter, wildcat, squirrel—have also been found at Mesolithic sites.

The most important environmental change in early Holocene Scandinavia involved the rising seas, which must have affected all aspects of human life in the region. Later Mesolithic populations in Scandinavia were for the most part focused on the coasts and marine resources. At the beginning of the Holocene, however, the coasts of southern Scandinavia were some distance from the present beaches of this area, and they now lie tens of meters beneath the sea. The coasts

of northern Scandinavia, because of the uplift of the land surface following the disappearance of glacial ice, were much lower in relation to sea level than they are today.

During the first half of the Holocene, with rapidly rising sea levels, coastal populations in the south had to regularly move further inland to escape the rising waters. In the case of northern Scandinavia, the rise of the land outpaced the seas, and the earliest sites are at the highest elevations. Here coastal dwelling groups would have had to move down as the land continued to rise. In the case of southern Scandinavia, the sea reached modern levels shortly before 4000 BC, when the outline of the modern coasts came into focus (Figure 3.8). A series of oscillations in sea level at that time, known as the Littorina transgressions (Rößler et al. 2011), brought the seas a few meters higher for a few centuries.

The situation is even more complicated because of differential uplift in Denmark and southern Sweden. The northern half of Denmark and the Swedish province of Skåne, like the rest of northern Scandinavia, are rising due to the isostatic rebound of the land following the removal of the glacial ice. The southern half of Denmark and northern Germany, however, are gradually sinking because of the North Sea salt dome. Thus, former coastlines from the late Atlantic climatic period in the northern Jylland and Sjælland are on dry land today, while those same coastlines to the south are submerged (Figure 3.7).

It is equally important to remember that the warming oceans were full of food. Fish, mollusks, crustaceans, sea mammals, and fowl were all dinner for coastal-dwelling hunter-gatherers. Fish species from a wide range of marine and

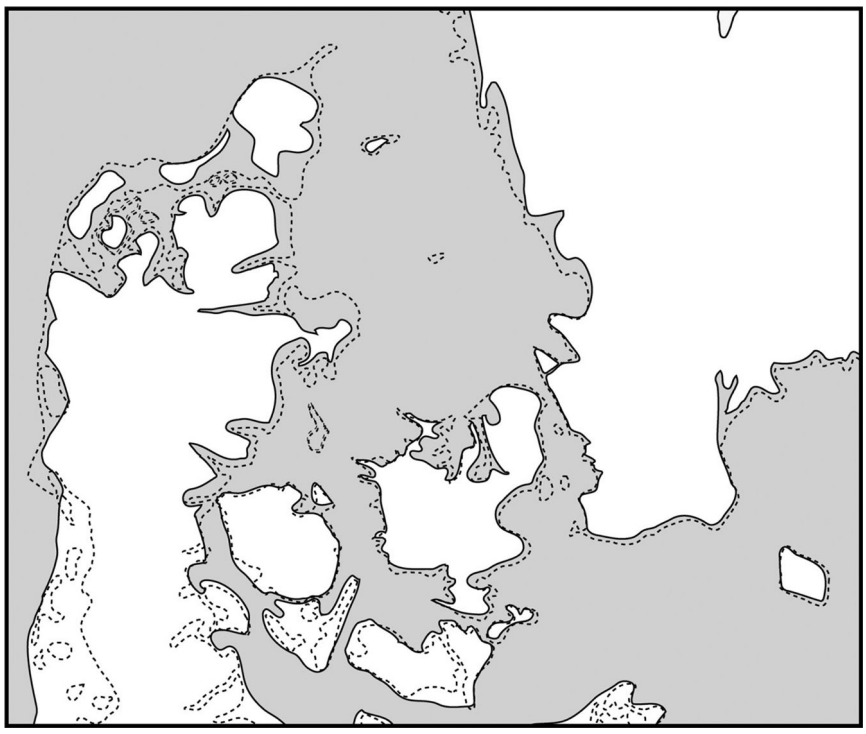


Figure 3.7.
Higher sea levels at the end of the Atlantic climatic episode (solid line) reduced the land area in the northern half of southern Scandinavia. In the northern half, continuing uplift means that former coastlines are now on dry land. The sinking of the ground surface in the south means that sites from the same time period are now underwater. The modern coast is shown by the dotted line.

freshwater habitats were taken with a variety of elaborate equipment. Shellfish were incorporated into Mesolithic diets, as documented by the large shell heaps along some coasts. The bones of seals, porpoises, and whales are found among the animal remains at coastal sites from this period.

These changes in sea level have a significant impact on the archaeological record, particularly in southern Scandinavia. Mesolithic sites from the Maglemose and Kongemose were normally small, seasonal camps in inland regions. Coastal settlements from these early phases of the Mesolithic were submerged by rising seas and today are underwater in the Baltic and North Seas. Coastal settlements from the late Kongemose are found today above water and are well represented during the Ertebølle phase. These sites are often quite large and rich in comparison to the small inland camps from the earlier phases.

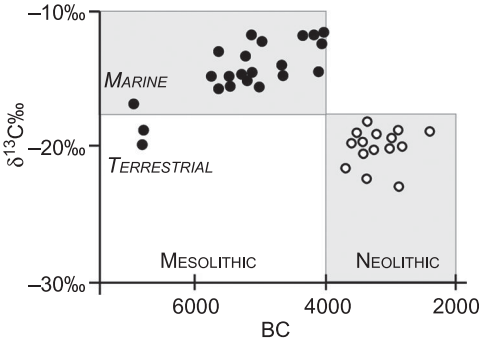


Figure 3.8. Carbon isotope ratios in the bone collagen of Mesolithic and Neolithic human burials from Denmark. The graph shows an increase in the use of marine foods during the Mesolithic and a dramatic shift to terrestrial foods in the Neolithic. Black dots are Mesolithic burials, circles are Neolithic.

The location of Mesolithic settlements is best understood in terms of subsistence activities. Until 40 years ago, the primary prey for Mesolithic hunters was thought to be terrestrial species, based on the ubiquity of their bones at archaeological sites. Although a variety of marine foods, including fish, seal, and whale bones, were also found on sites from this period, their contribution to the diet was thought to be relatively small.

A study of the isotopic composition of human skeletal remains from the Mesolithic, however, completely flipped this conventional view. Henrik Tauber of the National Museum in Copenhagen measured carbon isotope ratios in human bone as an index of marine foods in the diet (Figure 3.8). The carbon in bone tissue comes from the foods we eat. Sea foods have a more positive ratio of ^{13}C to ^{12}C than terrestrial foods because of older carbon in the oceans. The ratio in the bones from Mesolithic humans (an index defined as $\delta^{13}C$) reflected a large marine component in the diet (Tauber 1981) that increased during the Ertebølle. The carbon isotope ratios in Mesolithic hunter-gatherers were comparable with those of Greenland Eskimo, where marine foods contribute more than 75% of the diet. Carbon isotopes in the bones of Neolithic farmers, on the other hand, came largely from terrestrial foods, documenting a dramatic shift away from seafoods and the importance of domesticated plants and animals in the diet.

THE BEGINNING OF THE MESOLITHIC

Northern Europe probably witnessed a brief episode of abandonment at the end of the Pleistocene. Late Paleolithic reindeer hunters disappeared from the southerly parts of the region, and soon afterward Mesolithic groups entered. There are very few archaeological sites or radiocarbon dates from the millennium after the start of the Holocene, between the latest Paleolithic and the earliest Mesolithic materials (Larsson 1996). Indeed there are relatively few Mesolithic sites in Scandinavia during the entire Preboreal period (Larsson 1991). This relative absence also has been

Figure 3.9.
One of the Early Mesolithic deposits of marrow-split elk bones in Lundby Mose (photo by Charlie Christensen).

noted across the North European Plain and in Great Britain. There are probably several factors responsible for this hiatus. Sea levels were still quite depressed, the seashore was distant, and after the disappearance of the reindeer herds, settlement may have been largely in coastal areas that today are buried beneath the waves.

In spite of this gap, there is little doubt that the Mesolithic of northern Europe developed from the Late Paleolithic. The transition is seen clearly in a change toward smaller and more geometric artifacts. In northern Germany and Poland, for example, the large blade industries of the Late Paleolithic shift toward smaller cores of lower-quality flint in the Mesolithic. In southern Scandinavia, there is a change from the large and regular blades of the Bromme period to the smaller and less regular blades of the Maglemosian culture (Fischer 1989). A similar transition is seen in those areas of Sweden and Norway where Ahrensburgian-related assemblages are replaced by Mesolithic assemblages with microlithic points.

The transition from the late Paleolithic to the early Mesolithic in Scandinavia can be seen at several sites. The Late Paleolithic site of Deimern in northern Germany, for example, contains an assemblage transitional to the Mesolithic (Taute 1959, 1965). One of the very first Mesolithic sites in northern Europe is known from Duvensee in Schleswig, Germany, dating to ca. 9000 BC (Bokelmann et al. 1981). The oldest Mesolithic site in southern Scandinavia is probably at Lundby Mose in southern Sjælland, Denmark (Hansen and Pedersen 2006). The bones of various animals (elk, red deer, aurochs, and wild boar) had been split to extract the marrow, arranged in small bundles with a few artifacts from the earliest Mesolithic Maglemose culture, and placed underwater close to the shoreline of a lake (Figure 3.9). These deposits date to 9800 BC, at the very end of the Pleistocene, and must relate to some ritual practice of these early hunters.

REGIONAL TRADITIONS

As noted, there are substantial differences in the composition and appearance of archaeological remains from various parts of Scandinavia during the Mesolithic, along with differences in terminology. In the following pages, the archaeological evidence from northern Germany and southern Scandinavia is considered first, followed by western Sweden and southeastern Norway, south and west Norway, northern Norway, and Middle and Northern Sweden. Aspects of chronology, typology, and a few important sites are discussed. The locations of sites mentioned in the text are shown in Figure 3.10.

Figure 3.10.
Location of sites mentioned in chapter 3.

Southern Scandinavia

Northernmost Germany and southern Scandinavia share a common trajectory in the Mesolithic period. With a few minor exceptions, the same chronology, artifact classifications, and terminology apply throughout this region. The chronology is divided into three major periods. The early Mesolithic is known as the Maglemose, the middle Mesolithic is the Kongemose, and the late Mesolithic is termed the Ertebølle. Intriguing shifts in the techniques of manufacture, classes of raw material, and types of artifacts are seen as these periods change. For example, bone

scrapers replace flint ones during a period of several hundred years in the middle Mesolithic; techniques for making blades alternate over time between the use of hard and soft hammers; forms such as flaked stone axes from the very earliest Mesolithic fall out of use, but reappear again in the later Mesolithic.

Maglemose

Early excavations in the bogs of Sjælland first documented the Maglemose (Brinch Petersen 1993). The term *Maglemose* (big bog), in fact, comes from the name of a bog in western Sjælland. The Maglemose extends over a long period of time, dating from approximately 9800 to 6400 BC during the Preboreal and Boreal climatic phases. The period is characterized primarily by the appearance of microlithic points, the use of the microburin technique, and flaked flint core axes for woodworking. The microburin technique is a special way of fragmenting long blades into geometrically shaped pieces. The youngest Maglemose dates to the beginning of the Atlantic climatic episode, when rising sea levels entered the Øresund and Great Belt and many of the Danish islands, including Sjælland, were formed.

Material remains related to the Maglemose are known from Poland to England along the former coast of the North Sea and Baltic, and they must have been common on the floor of the North Sea when it was dry land throughout most of this period. Maglemose coastal sites are largely unknown, having been submerged by rising sea level.

The majority of Maglemose sites in southern Scandinavia are found on peninsulas and islands in former lakes that today are bogs or peat lands. Preservation of organic materials is rare at Preboreal sites from this period but better during the Boreal, as ground water levels rose with the seas. Bone and sometimes wood are encountered in addition to lithic artifacts. These inland sites sometimes contain large fishhooks and fragments of leisters (fish spears) for taking pike and wels (sheatfish). The bog sites occasionally contain remnants of bark floors; other sites on sand have flat, shallow, artifact-filled pits. Both features likely represent hut floors. Most of the sites were small with only one or two huts, and in almost all cases they appear to represent short summer occupations. Finds of burials are rare in this period.

Kongemose

The Kongemose period, also named after a bog in central Sjælland, dates from 6400–5400 BC, during the early part of the Atlantic climatic episode. The Kongemose is known only in southern Scandinavia, but the distinctive trapeze-shaped projectile points occur all over Europe at this time. Fine, symmetrical blades were produced from conical channel cores using soft hammer techniques. Diagnostic artifacts include trapezoidal and rhombic points made from the ends of wide blades. A few small triangular microliths continue to appear in the early part of this period. Small blades, known as microblades, made from handle cores (so called because of their shape) were common and used as edges for bone points and daggers. Flake axes were rare. Blade knives and borers were common; scrapers and burins were rare. Long heavy pointed core tools were used, perhaps as weapons.

Early coastal sites from the Kongemose are submerged today beneath 1–10 m (3–33′) of seawater. Known examples include the Blak site in the Roskilde Fjord. Later Kongemose sites are known primarily from northeastern Sjælland, where the land has isostatically rebounded to expose the older submerged surface. Aurochs, elk, and bears were extirpated from Sjælland at this time, due perhaps to overhunting or the small size of the islands (Aaris-Sørensen 1999).

Sites from this period contain thick, rich cultural layers that suggest more permanence. Depressions in the cultural layer and intermittent traces of pointed posts put into the ground are present, but only a few definite structures are known (Jensen 2006, Sørensen 1996). Burials appear at sites from this period. Some graves are known, along with a few cremations. Both adults and children were buried at settlements.

Nivå, Denmark An extraordinary Mesolithic site was uncovered on a small island at the mouth of the former Nivå fjord in northwestern Sjælland in 1990s (Jensen et al. 2003, Jensen 2006, 2009). Nivå 10 contains at least four shallow, round circular pits 2–3 m (6.5–10′) in diameter that are the floors of semi-subterranean huts. There are also numerous other pits at the site, at least 12 graves, and a very rich refuse layer along the former coastline where the site was located (Figure 3.11). This is an unusual situation where both the actual living area and the refuse deposits are preserved. At most Mesolithic sites, either one or the other has disappeared because of erosion, disturbance, or poor conditions for preservation. The site was used intermittently from the middle of the Kongemose to the early Ertebølle, around 5600 BC. The island was flooded by rising seas several times before it was finally abandoned and disappeared beneath the rising water.

The remains from the site provided lots of interesting information. Stone tools were typical of the time and place, with numerous projectile points, burins, blades, and axes. The house excavations were most revealing. Dwelling 2 was particularly interesting.

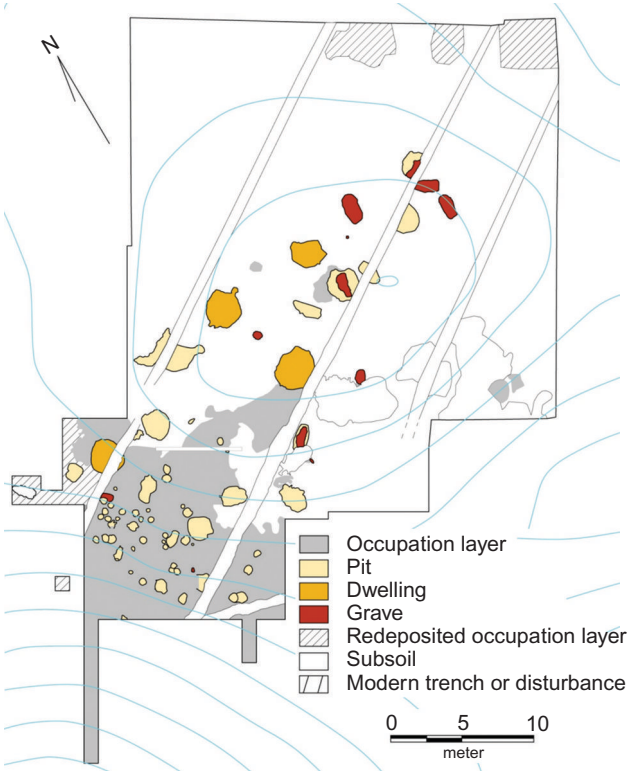


Figure 3.11. Ground plan of the excavated archaeological features at Nivå 10. The shaded occupation layer is a rich refuse deposit left by the site occupants. The site sits directly on the former coastline. The refuse layer was deposited for the most part on dry land. The dwellings and graves are on the higher ground. Dwelling 2, discussed in the text, lies in the southeast of the excavations. Contour interval is 10 cm.

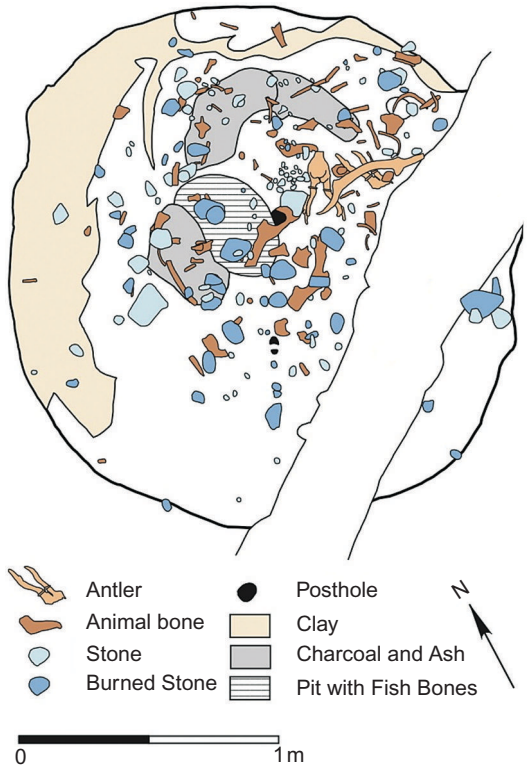


Figure 3.12.
Dwelling 2 at Nivå 10. Plan of the second floor with bones, stones, postholes, clay and ash deposits, and a pit with fish bones. The linear disturbance through the east side of the house is a historical drainage ditch.

The excavation of the house structure was done with great care, and all finds were mapped in their original place of discovery (Figure 3.13). The house pit was 2.4 m (8′) in diameter and 40 cm (16″) deep. The pit was surrounded by stake holes which must have supported a superstructure of some kind. These stake holes were placed half a meter or more from the edge of the pit. This area must have provided a shelf around the interior of the structure, perhaps a sleeping or storage place (Jensen 2009). Three house floors were found in Dwelling 2, one atop the other, and each about 10 cm (4″) thick. Each of the floors held a concentration of charcoal, fire-cracked rocks and burned flint that marked a hearth. The presence of a layer of water-deposited clay between the hut floors suggests that the structure was abandoned for some period of time and that fine sediments washed into the depression before the structure was rebuilt and the next floor level created.

The contents of the three house floors varied somewhat. Flint waste was abundant, suggesting that stone tools were being manufactured inside the structure. The flint artifacts included a number of blades, projectile points, burins, a core axe, and several backed pieces. The lowest floor contained unworked antlers from roe deer. The second floor (Figure 3.12) was the richest in terms of contents, with more stone tools, roe deer antler, and charcoal and ash deposits. In the upper floor, several human bones, including two pieces of cranium, a vertebra, and an arm bone of an adult male, were found. These bones may come from a small grave just 1.5 m (5′) to the south of the hut. This grave had been disturbed in antiquity, and several of the bones were missing. It is entirely possible that the missing bones had been removed by the site inhabitants and moved for display or deposition in the nearby house. The skull fragments were found near the hearth and may have been kept there for some time. The presence of unusual objects, including the human bones, sets of deer antlers, and a flint phallus, in several of the dwellings at Nivå suggests that the center of the hut was a place of ritual deposition. It seems clear that these houses had both residential and ritual functions.

The animal bones in Dwelling 2 represent the usual mix of Mesolithic prey. The remains include 13 species of mammals and 15 kinds of fish, with a predominance of roe deer, flatfish, and cod. The fish include both salt- and freshwater varieties. The importance of marine foods in the diet is reiterated by the more positive carbon isotope ratios in the human bones found in the dwelling and in the grave outside the hut. The seasons of occupation at the site have been estimated from the faunal remains and point to autumn-winter-spring as periods of residence and hunting and fishing activities at the site (Enghoff 2011).

Figure 3.13.
Grave of man and child at Nivå 10. The stone phallus lies left of the man's head.

The 12 graves at Nivå 10 contained at least 15 individuals. Three of the graves were used for cremations, and at least two of the graves each held the skeletal remains of a man and a woman. One of the graves contained the skeletons of an adult male and a four-year-old child. Near the head of the man a large stone had been placed in the grave, and beneath the stone a flint phallus was found (Figure 3.13). Pendants of red deer teeth were placed with both individuals in the grave. The skull of the man presented a massive, unhealed fracture that was the likely cause of death. The bones of his ankles exhibited extensive wear facets from long hours in a squatting position. The stomach contents were partially preserved and included fish scales and bones from flounder and eel.

The photograph in Figure 3.14 shows the reconstructed face of a five-year-old boy who died at Nivå around 7,500 years ago (Jensen and Hansen 1999). The cause of death is unknown. His body had been wrapped in an animal skin and placed in a shallow grave. A flat stone had been placed beneath his head, perhaps as a pillow, and a small, tongue-shaped stone placed in his mouth. Ochre, a reddish mineral powder, was sprinkled on his corpse. Over time, as with us all, his body returned to the earth. Fortunately, his bones remained.

Figure 3.14.
A reconstruction of the buried boy at Nivå, based on the features of the skull.

The excavator, Ole Lass Jensen, drew several conclusions based on the finds from Nivå 10. The small circular type of house was in use for at least 700 years in the sixth millennium BC in this area. Based on the size of these houses, households probably included only a few people, perhaps a nuclear family. Dwellings and graves were intermixed in the settlement area, and ritual deposits seem to have been an integral part of the dwelling structures.

Ertebølle

The Ertebølle culture is found across the coastal areas of northern Germany, Denmark, and in the provinces of Skåne and Halland in Sweden. One of the earliest sites to be excavated, located near the modern village of Ertebølle on the Limfjord in northern Jylland, gave its name to this culture. The Ertebølle dates from approximately 5400–3900 BC (Blankholm 1987, Brinch Petersen 1973, Price 1985, 1991). This late Mesolithic period is characterized by both flaked and ground stone technologies. An elaborate blade technology, projectile points, and flake and core axes are hallmarks (Figure 3.15). Projectile weapons were armed with an array of specialized tips made of bone, wood, antler, and stone. A wide range of fishing gear, including nets, weirs, leisters, hooks, and harpoons, is known from this period. Pottery appeared during the Ertebølle after 4800 BC and takes two major forms: pointed base vessels in three sizes and small oval bowls that likely served as oil or blubber lamps (Andersen 1987, Heron et al. 2013).

Figure 3.15.
Flaked stone artifacts from the Ertebølle in Denmark. Top, left to right, two cores, two blades, burin, and burin spall. Row 2, various flake tools. Row 3, flake borer, flake axe, edge sharpening flake. Row 4, core axe, projectile points.

The Ertebølle period represents the culmination of several trends in the Mesolithic of southern Scandinavia. Technological elaboration accompanies the development of the Mesolithic in southern Scandinavia. More artifact types and facilities, and more complex facilities, are known than from earlier periods; previous forms become more functionally specific. A great array of wood, bone, and antler tools were in use by the Ertebølle period. Watercraft in the form of dugout canoes up to 10 m (33′) in length provide for the movement of people and goods along the coasts (Figure 3.16).

A wide range of site types are known from the Ertebølle; coastal settlements with and without shell middens and both coastal and inland hunting and fishing stations are the most common. Some examples are discussed in the following pages, including the submerged coastal settlement at Tybrind Vig and the large inland site of Ringkloster.

Figure 3.16. Remains of a Mesolithic dugout canoe found near Kalundborg, Denmark. Black traces of a fireplace in the canoe can be seen near the middle; the red and white rod at the base of the canoe is 40 cm (16″) long.

Tybrind Vig, Denmark Sports divers have been finding and recording submerged archaeological sites and historical wrecks off the coasts of Denmark for decades. Archaeological sites from the Mesolithic period and even fossil landscapes from that period remain largely intact in some places on the Danish sea floor. Tybrind Vig is a submerged late Ertebølle site found by divers some 250 m (800′) off the west coast of the island of Fyn in approximately 3 m (10′) of water. The site appears to have been in almost continuous use during the fifth millennium BC (Andersen 2013).

The site was carefully excavated by divers over the decade between 1977 and 1987. The archaeological deposits at Tybrind Vig represent only a part of the former human use of the place. Although most of the actual dry land settlement with fireplaces, huts, and activity areas had been destroyed by wave erosion millennia ago, several graves were found at Tybrind Vig beneath the zone of wave erosion. One largely complete grave was uncovered containing the skeletons of a girl, 12–13 years of age, along with a young baby; a second grave held two adults.

Because the original settlement was directly at the seashore, artifacts and waste material were often deposited in the water in what are called refuse deposits. These remains today lie in waterlogged, oxygen-free, organic sediments that accumulated to a meter or more in depth during the period of human occupation. Tybrind Vig has remarkable conditions for the preservation of organic materials such as wood, bark, fibers, and bast. The remarkable conditions there is a bit more at Tybrind Vig than at most other sites.

It is important to remember that almost everything found at the site was originally lost, tossed, or intentionally deposited in the water. And it has remained there ever since. Most of the objects at the site are connected in one way or another with getting food: equipment for hunting and fishing, travel and transportation, the animals that were prey, and the plants that provided nourishment and raw materials. The artifacts from the site document a simple, functional technology designed for efficiency. The flaked stone tool inventory is made of flint and based on blade production. Artifact types include points, axes, scrapers, borers, burins, truncated pieces, and saws. Transverse arrowheads were used as projectile points. Both flake and some core axes were common, along with a few ground stone diabase axes.

A complete wooden bow and several fragments were found, made of elm. The complete bow is 3 cm (a bit more than one inch) in diameter at its midpoint and tapers to a narrow rounded tip at each end. The total length is 1.66 m (5.5′), the average height of a Mesolithic man. Fishing was extremely important, and a variety of gear was used, including canoes, paddles, hooks and traps, nets, and other equipment. A scatter of large flat stones was found, part of a cobbled stone landing area extending down the shoreline. Numerous hazel stakes were recorded in the excavations, vertical in some cases, marking remnants of fishing fences that would originally have been standing in the water to direct fish toward traps. Fishhooks and leister prongs also reflect the importance of fishing here.

Water transport is well documented by three dugout canoes at Tybrind Vig, one complete and two partial examples. The complete canoe was carved from the trunk of a lime tree and is 9.5 m (31′) in length. The cavity of the canoe is 50–65 cm (20–27″) wide and about 30 cm (12″) in depth. The boat has a stern board fitted into place. Also near the stern was a fireplace, marked by a thin layer of clay, 65 × 30 cm (27″ × 12″) in size on the floor of the canoe; perhaps the firelight was used for attracting eels and other fish at night. This boat could have carried six to eight individuals and their equipment. This canoe had been deliberately submerged and weighted down with a large stone, perhaps to keep the wood from drying out and decaying.

Plant materials were carefully selected for specific uses. Straight branches of hazel were used for stakes and wattle. Bows were made of elm, the dugout canoes were lime, wooden paddles were ash. Part of a fish trap woven of alder and willow twigs was also found, as was a wooden net float. Spear fishing is documented by a number of finely worked leister prongs of thorn wood attached to a shaft of hazel with strands of fiber, probably from the stinging nettle plant.

Other plants with other purposes included the tinder fungus, a kind of mushroom that when dried is excellent as a fire starter. Bark was also used, perhaps for flooring or construction. Bast fibers from lime bark and nettles, as well as other plants and trees, were used for string and rope. The line preserved on the fishhook from Tybrind was made of plant fibers. Spun plant fibers were also used to make nets or textiles, with a technique known as needle-netting. Several pieces were found and represent some of the oldest examples of textiles known anywhere.

The animal bones at the site revealed a mixed diet of sea and forest species. The primary game animals were red deer, roe deer, and wild boar. Evidence from tooth eruption and wear from the deer jaws indicates that these animals were hunted year-round. Fur-bearing animals included pine marten, wildcat, otter, fox, and polecat. Other species included a few examples of aurochs (wild cattle) and a wild horse. Twelve species of birds, including ducks and geese, were among the animals represented at the site. Dogs were common, and their bones have been found among the food refuse.

A variety of marine foods were consumed, ranging from oysters to seals, dolphins, and small whales, but it was fish—particularly cod, spurdog, and eel—that were of primary importance in the diet. In total, 16 different species of fish were represented among the bones found at the site. The shells of oysters, mussels, clams, and periwinkles document the use of marine mollusks.

Some animals were apparently hunted for fur rather than food. There were a large number of intact marten skeletons with skinning marks from a stone knife. Fatal fractures on the rear of the skulls represent blows from either the hunter or the trap. Clearly the furs of these animals were desirable, perhaps for exchange as well as domestic use.

Wild plant foods were plentiful. The evidence suggests that there were at least five categories in the local diet, including roots, nuts and grains, wild berries and other fruits, and green vegetables. Direct evidence for starchy tubers comes from the sea beet and the common reed. Hazel nutshells were abundant in the deposits at Tybrind, and charred acorn husks suggest this nut was consumed as well. Nuts could be stored for long periods before consumption. Seeds were found from plants like nettle and goosefoot and from a variety of fruits, including raspberries, strawberries, dewberries, rowan berries, and rosehips. Rosehips are rich in vitamins. Pips from crabapples and seeds from berries of dogwood and hawthorn were also found in the layers at Tybrind Vig.

Animal bones were used to make certain equipment. Small fishhooks were made from the rib bone of red deer (Figure 3.17). Sharp tips of fishing spears were also made of deer bone. Antlers were used for a variety of artifacts, including heavy axes. Two of these antler axes had been polished and decorated with a pattern of fine geometric lines. Tooth pendants were worn as jewelry and ornaments on clothing in the Mesolithic. Canine teeth from a variety of different species were perforated near the end of the root and worn as pendants or sewn onto clothing. More information on decorated antler axes and the use of teeth as jewelry can be found in the Treasures section at the end of this chapter.

Figure 3.17. Bone fishhook from Tybrind Vig with part of the plant fiber fishing line still attached.

Ringkloster, Denmark Ringkloster is an Ertebølle settlement near Skanderborg in central Jylland (Andersen 1995a), located about 20 km from the sea coast. This is one of the very few large Mesolithic sites known from an inland location. The dates for this site cover a range from approximately 5400 to 3500 BC, with the primary concentration of material belonging to the middle and late Ertebølle. Both settlement area and outcast layers were excavated. The site is likely seasonal, primarily fall and winter, with a focus on hunting wild boar and pine marten. There were several bones of marine species at the site, emphasizing a connection with the coast. There is relatively little emphasis on fishing and bone tools are rare. Pottery is abundant, and decorated Ertebølle ceramics were recovered. The lithic assemblage is quite different from the coastal sites; scrapers, burins, denticulate pieces, and points are common, while axes are rare. The scarcity of large inland sites emphasizes the coastal focus of Mesolithic adaptations and the importance of marine resources. Such inland sites may have been intended for the provisioning of meat, skins, and furs for the colder months of the year.

West Sweden/East Norway

There is a long history of research on the Mesolithic cultures of west Sweden (Andersson et al. 1988, Cullberg 1972). These investigations produced a chronology distinct from that of southern Scandinavia. Because of known rates of isostatic uplift in this area, the elevation at which artifacts are found above sea level

provides a good clue to their age. Older materials are found at higher elevations. Radiocarbon dates have been connected with these ancient coastlines as well. This information has been used to construct a chronology for these earlier Stone Age cultures (Cullberg 1996), defined as the Hensbacka (90–55 m [295–180′] asl, 10,200–8000 BC), Sandarna (55–40 m [180–130′] asl, 8000–5500 BC), and Lihult (40–30 m [130–100′] asl, 5500–4000 BC).

The Late Paleolithic Hensbacka culture continued into the Preboreal period and in effect represents the early Mesolithic in these regions. Several sites in western Sweden document the transition from the Late Paleolithic to the Mesolithic. This material, usually assigned to the later Hensbacka tradition, is characterized by flake axes, tanged points, single-edged points, and coarse, thin-backed pieces. The presence of microlithic artifacts in southern Scandinavia, western Sweden, and southern Norway is often used to distinguish the early Mesolithic. The Lihult phase in eastern Norway is similar to West Sweden, but lacks the distinctive Lihult ground stone axe. The Mesolithic cultures of Sandarna and Lihult are discussed in more detail below. Common elements link some areas, such as the round-butted ground stone axes found in both eastern and western Sweden.

The Middle Mesolithic Sandarna culture (Nordqvist 1999) has characteristic tool types such as Sandarna axes and conical microblade cores. Round-butted stone axes (*trindøkse*) and pickaxes of sandstone, quartzite, or slate with biconical shaft holes are also found. Sandarna is the west Swedish equivalent of the Maglemose in southern Scandinavia (Nordqvist 1999). The majority of Sandarna sites from this period document the coastal component of human activities during the later Preboreal and Boreal period, while the Maglemose remains to the south provide evidence of the inland facies. As noted above, coastal Maglemosian sites in southern Scandinavia were submerged by the rise of sea level. The good conditions of preservation at the Sandarna site of Huseby Klev in western Sweden, discussed below, provide remarkable insight into the nature of coastal occupation in the early Mesolithic.

The later Mesolithic of western Sweden and easternmost Norway is known as the Lihult/Nøstvet culture, dating from 5500–4000 BC. The vast majority of the sites are known from coastal and littoral areas. Typical artifacts include pecked and ground stone and flint axes, including the Lihult axe, handle cores for microblades, keeled cores, and scrapers; microliths are absent (Larsson 1990, Olofosson and Olsason 1999). The Lihult axe is flaked to a rough form and ground with one arched side and one rounded side. The most common type of axe is the *trindøkse* made of diabase, greenstone, or other hard metamorphic rocks.

Around 5000 BC, the successful and long-lived Nøstvet Mesolithic disappears in the southernmost part of eastern Norway and western Sweden and is replaced, apparently rapidly, by assemblages dominated by transverse points and blade and flake technology. This transition was time-transgressive; further north in the Oslo Fjord, it is dated to 4700–4200 BC. However, in the interior there was no replacement; Nøstvet elements (like microblades) and transverse points are found together there from about 4400 BC until the beginning of the Neolithic. After 4000–3800 BC, at coastal sites in southern Norway the density of occupation increases significantly and the contents of these sites become more varied. These changes have been interpreted as the beginnings of sedentary occupation during

the Mesolithic (Nygaard 1989), but new discoveries suggest that this shift in fact coincides with the arrival of the Neolithic (Olsen 1995). The issue of the Neolithic and its appearance in this region is covered in the next chapter.

Coast/inland patterns of interaction were established early in the Mesolithic and continued into later periods (Bang-Andersen 1996). Larger settlements are found in the coastal areas, with subsistence based on fish, seals, and whales, supplemented by some terrestrial species. Recent surveys have revealed seasonal settlements in the highland areas of southern Norway dating to the Preboreal, but the majority of known sites in the inland are later and relatively close to the coast. The earliest archaeological sites in the Hardangervidda, the southern highlands of Norway, date to ca. 7250 BC and in the Setesdal Mountains to 5800 BC. More recent surveys in inland areas have also documented the seasonal use of highland valleys at a substantial distance from the coast. The primary subsistence focus of these inland sites appears to have been reindeer hunting and fishing. Several important sites document Mesolithic human activity in western Sweden, including Huseby Klev, Dammen, and Balltorp, described below.

Huseby Klev, Sweden

Located on the island of Orust on the west coast of Sweden, not far from the modern city of Göteborg, Huseby Klev today sits several kilometers inland from the shore of the Kattegat. During the early Holocene, however, the site was on a beach on an island about 10 km from the mainland when the sea level was some 25 m (80′) higher than today in this area, prior to the rebound of the land surface. The location was at the head of a narrow fjord 500 m (1640′) long (Figure 3.18). Deposits of sand, gravel, and clay from several marine transgressions accumulated on top of this former beach to a depth of more than 2 m (6.5′).

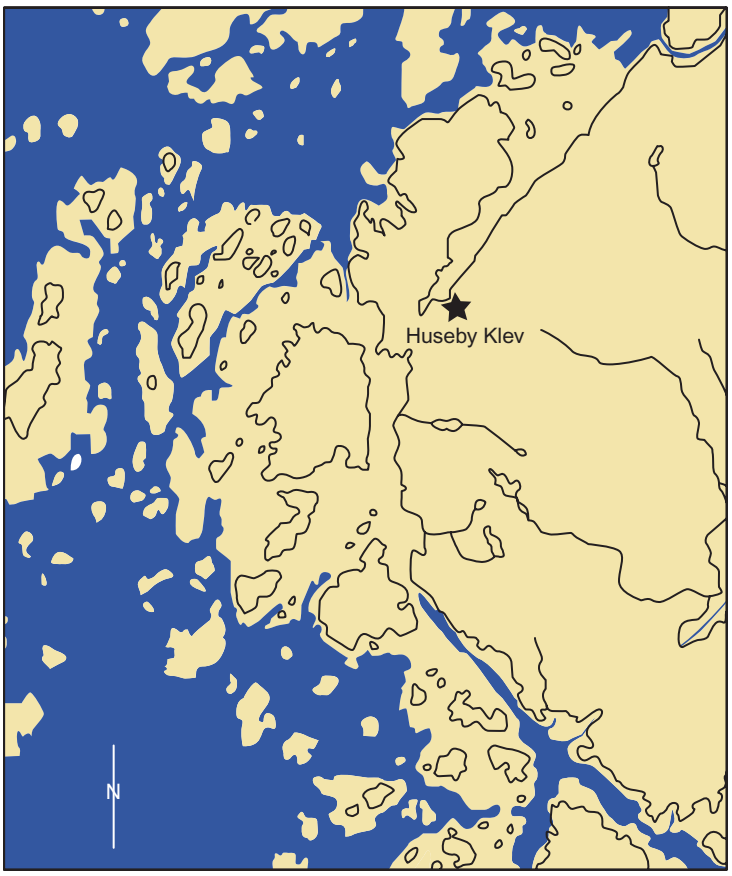


Figure 3.18.
The location of Huseby Klev, north of Göteborg, on the west coast of Sweden. The blue color shows present-day sea level; the black line shows the coastline ca. 7000 BC. The site sits at the head of a long, narrow fjord.

A series of prehistoric occupations from several time periods were revealed in these deposits in the 1980s, beginning with recent and medieval finds (Nordqvist 2005a, 2005b). The earliest cultural level is the most important, from the Preboreal period, radiocarbon-dated to ca. 8200 BC. The assemblage and radiocarbon dates indicate that the site belongs in the early Sandarna phase of the Mesolithic of western Sweden.

Because the cultural layer was deeply buried under marine clay and sand, preservation was excellent. The materials from Huseby Klev are truly remarkable. The excavated finds include a number of animal bones, primarily marine mammals and fish, notably the worked vertebra of a blue whale, an enormous creature perhaps 30 m (100′) long and weighing up to 150 tons. It is not known if these people regularly captured whales or utilized beached animals, but it does seem certain that they hunted dolphin. The very long and narrow fjord here may have been an ideal location in which to drive the animals toward the head of the fjord, where they could be killed and taken ashore (Figure 3.19). Several "packages" of six to eight vertebrae from the white-beaked dolphin, a common resident of the Kattegat during that period, represent large cuts of meat that were removed from dolphins on the beach and brought to the camp for more butchering, cooking, and consumption. The bones of porpoise, grey seal, and fish were also abundant at the site. The fish included cod, ling, haddock, and shark.

Terrestrial mammals were also present among the animal bones, especially red deer, wild boar, and roe deer. The avian fauna included the great auk. The clay deposits also preserved an unusual array of botanical material, including pieces of wood, twigs, bark, and the remains of charred wild apples, hazelnuts, wild briar, blackthorn, and cherry.

In addition to the food remains, a variety of stone, antler, and bone tools were found. Lithic artifacts included distinctive barbed points. Antler from red deer was worked into a variety of implements, including a perforated antler axe, adzes, and a punch. A four-side bone point was found still attached to the end of a wooden arrow shaft. Small bone fishhooks were also recovered in various stages of manufacture. One of the dolphin ribs was worked, perforated through the center and incised with fine lines (Figure 3.19). A tooth from a wild boar had been perforated for a pendant.

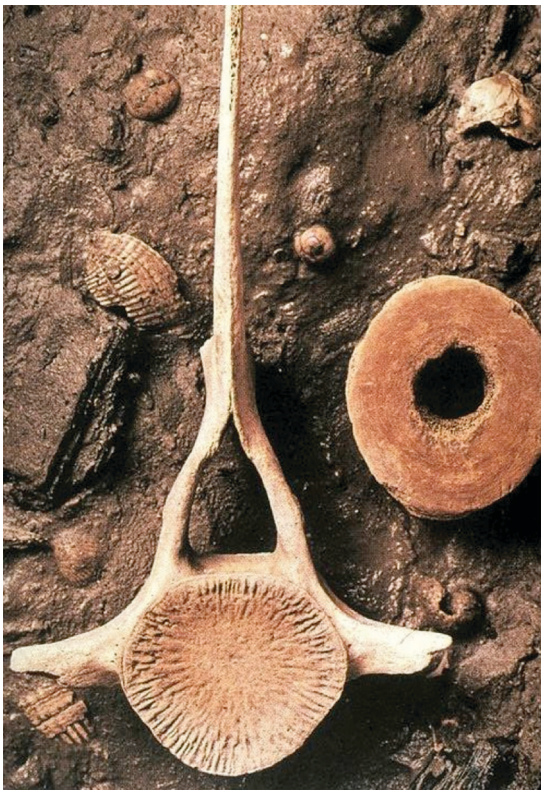


Figure 3.19.
Two vertebrae from the bottle-nosed dolphin. The one on the right has been heavily modified to create a doughnut-shaped artifact of some kind.

One of the more remarkable finds was a series of wads of preserved birch resin with various kinds of impressions. About ten of the pieces had been chewed by the site inhabitants, leaving tooth impressions. The resin was also used for caulking wooden boats; about 50 pieces have impressions of wood patterns on one side with occasional fingerprints on the other (Figure 3.20). There are also pieces of amber and human coprolites from the site. There were human skeletal remains from at least 10 individuals, including teeth, cranial fragments, and long bones. The material included one of the oldest human bones in Scandinavia, the femur of a 12-year-old child.

The focus of this camp of hunters seems to have been marine mammals and fish. A stable carbon

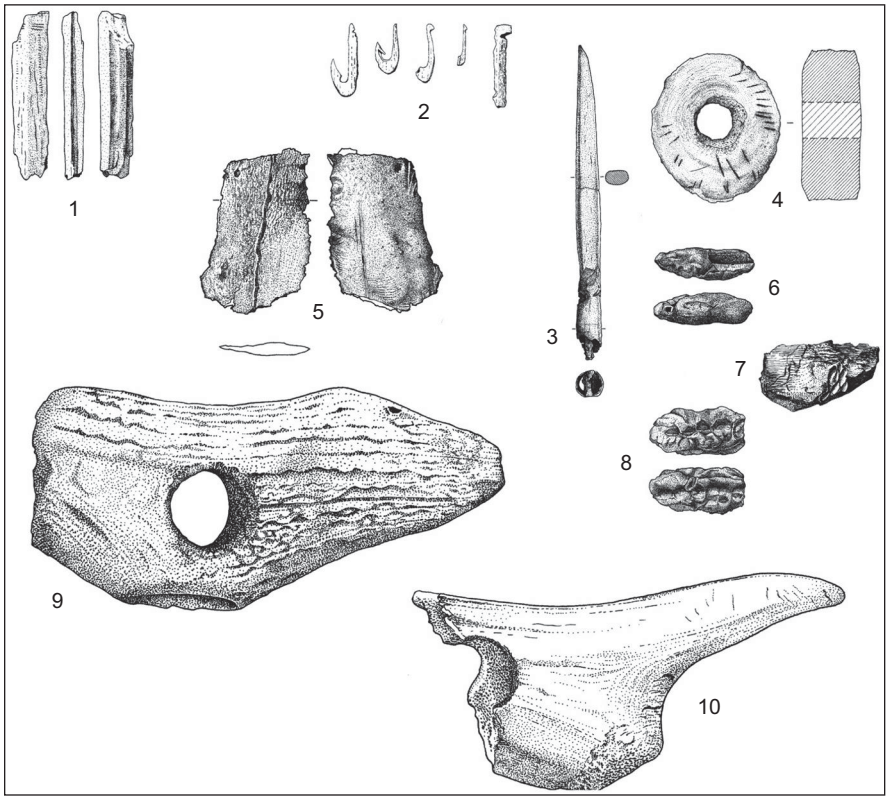


Figure 3.20. Some of the wood, bone, antler, and resin artifacts from Huseby Klev. 1. Fragment of slotted bone point, 2. Fish hooks, 3. Bone point with resin adhesive, 4. Worked dolphin vertebrae, 5. Resin used for boat sealant, 6. Resin with stick impression, 7. Resin from boat sealing with cord impression, 8. Resin clump with tooth impressions, 9. Antler axe, 10 Antler mattock. The mattock fragment is approximately 20 cm (8″) long.

isotope ratio from one of the human bones documents a predominantly marine diet. The plant remains suggest settlement during the late summer and fall, while the whales and birds indicate a late autumn to winter occupation. Contemporary human remains from inland western Sweden exhibit $\delta^{13}C$ ratios reflecting a terrestrial diet, suggesting that perhaps there were distinct coastal and inland adaptations already at this time.

Dammen, Sweden

The site of Dammen, on the Swedish west coast, was excavated in the early 1990s (Schaller Åhrberg et al. 1996). The site today is located at an elevation of 38 m (125′) asl and radiocarbon dates the site to ca. 7500–6000 BC, in the early Atlantic phase. Some inland sites from this period are known in west Sweden, but the majority are coastal. The lithic artifacts included flake and core axes, a ground stone round-butted axe and a possible Lihult axe, microblade cores, conical blade cores, handle cores, keel-shaped cores, blades and microblades, and segmented knives. The artifact assemblage and radiocarbon dates place the site at the transition from Sandarna to Lihult. The site rested on a natural shell deposit and contained shell in the cultural horizon, so that preservation was very good. Faunal remains were abundant. Sixteen different species of fish, four species of birds, and nine species of mammals were identified, including the common porpoise. The emphasis in foraging activities was on the sea. Seasonal indicators suggest a fall/winter occupation at the site.

Balltorp, Sweden

The roughly contemporary site of Balltorp (Nordqvist 2000) provides an interesting contrast with an emphasis on terrestrial animals. Balltorp was located along the west coast near Göteborg, but subsistence was terrestrially focused. Bone and hazelnut shell were preserved in the deep deposits at the site. The faunal remains were primarily from large game animals, including aurochs. Only a few bones of fish and other marine species were recovered. Balltorp was likely occupied in the autumn. There was a substantial assemblage of stone artifacts, dominated by lancette-shaped microlithic and barbed points, with both core and flake axes and one Sandarna axe. Microburins were present at the site in some number. Typologically, the site belongs to the Sandarna phase of the Mesolithic, and this association was confirmed by radiocarbon dates between 8000 and 7500 BC.

South and West Norway

The Mesolithic of Norway differs significantly in the north and the south of the country. Materials south and east of Stavanger are more closely related to southeastern Norway and southern Scandinavia, while the area to the north shares similarities with northern Sweden. West and south Norway were home to the Hensbacka/Fosna culture at the beginning of the Holocene. Mesolithic cultures that succeeded the Fosna in western Norway are termed the Middle Mesolithic and the Late Mesolithic (or Nøstvet culture) (Figure 3.21). Fosna ends around 8000 BC and the Middle Mesolithic around 6000 BC. The Late Mesolithic continues until approximately 4000 BC, when influences from the Neolithic began to

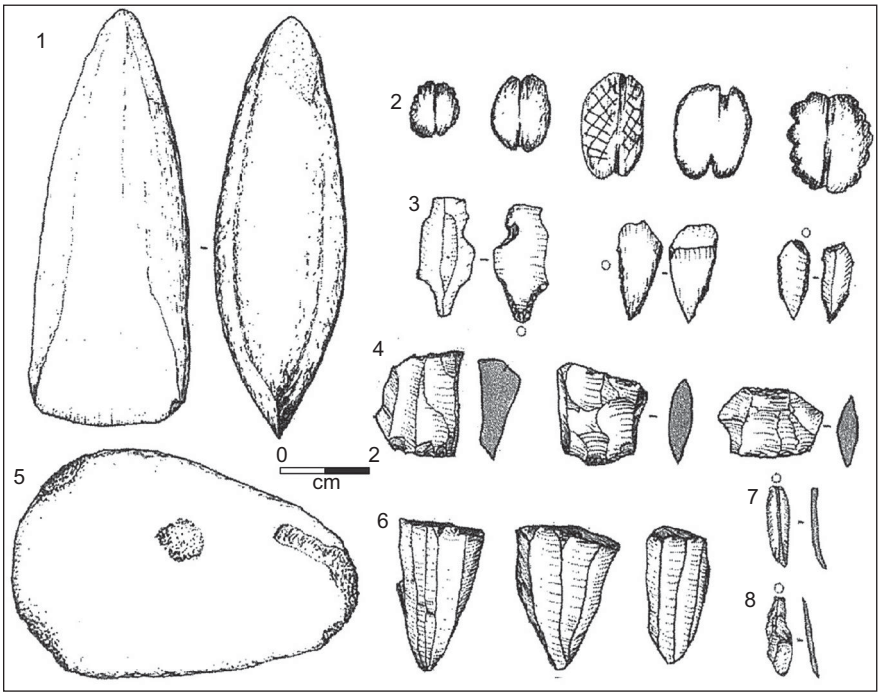


Figure 3.21. Typical artifacts of Norwegian Late Mesolithic/Nøstvet Culture. 1. Chubby adze, 2. Soapstone "coffee bean" sinkers, 3. Borers/engravers, 4. Bipolar cores, 5. Hammerstone/anvil stone, 6. Multifacial microblade cores, 7. Microblade from platform core, 8. Microblade from bipolar core.

reach this area. The impact of the Neolithic in this region is poorly understood in terms of the importance of crops and stock-raising.

Kotedalen, Norway

The landscape—or better, the seascape—of western Norway consists of many large and small low-lying islands and skerries with channels of water and small fjords between them. During the Mesolithic, as well as today, the region was rich in resources during all seasons of the year (Bergsvik 2001). Fish, sea birds, and marine mammals concentrate in the tidal channels along the Norwegian coast. Excavations at a site called Kotedalen in the mid-1980s along one of these tidal channels, known as Fosnstraumen, were undertaken in advance of the construction of a new bridge (Olsen 1992). A total of 10 cultural horizons were exposed in the excavations, five Mesolithic and five Neolithic. The Mesolithic levels are radiocarbon-dated between 6600 and 5600 BC in the Late Mesolithic. The Neolithic levels are discussed in the next chapter.

Faunal remains were preserved at the site. The Mesolithic horizons contained a broad spectrum of resources. Thousands of fish bones were found along with the bones of both land and sea birds and mammals, including red deer, hare, wild boar, otter, fox, and seal. Birds identified among the bone remains were herons, puffins, razorbills, and auks. Fish provided the largest part of the larder, and major species of importance were cod, catfish, plaice, mackerel, herring, salmon, saithe, and pollack. The importance of fishing was also evident in the artifact assemblage, which included a number of net sinkers and fishhooks.

Botanical remains included seeds from wild raspberry and wild peas, as well as thousands of burned hazelnut shells. Seasonality information pointed to summer, fall, and winter occupation at the site. While the seasonal data indicates more permanent settlement, evidence for exchange or travel comes from the sources of the raw material for stone tools, which in some cases lie more than 100 km (62 miles) from the site.

Vingen, Norway

Rock carvings are the oldest surviving material form of human art, probably dating as far back as 40,000 years ago. Rock art is known from every continent except Antarctica. It is almost ubiquitous in human societies where exposed rock is part of the landscape. Rock art falls into two major categories, based on how it is made. Petroglyphs are carved into the surface of the rock; pictographs are painted on the surface. Both types have a long history. There are Mesolithic petroglyphs in various parts of Europe, perhaps best documented in Norway.

Rock art is found in many places along the Norwegian coast. One of the richest and most spectacular sites is at Vingen, north of Bergen, on the west coast (Figure 3.22). The setting for these petroglyphs is a fabulous fjord—cliffs rising from the sea, high peaks everywhere, white water falling down the mountainsides, the deep blue of the sea, and the bright blue of the sky. The rock art is the highlight.

Geometrically carved animals cavort on the large rocks scattered across a level terrace near the waters of the fjord. There are petroglyphs on virtually every flat rock surface at Vingen (Figure 3.23). The number of images on a single surface varies from 1 to 200. The dominant motif is the red deer, with a few moose and

Figure 3.22.
The rock art site of Vingen is located on the low shelf of land at the base of the steep hills around the headwaters of the Frøysjøen Fjord, Norway.

Figure 3.23.
Vingen, Norway, a treasury of Stone Age rock carvings. In this photo there are several petroglyphs on the large rock to the right. The petroglyphs have been filled in with red pigment to make them more visible.

reindeer. There are also wolves or dogs, whales and porpoises, birds, and a few snakes. Human figures comprise about 3% of the depictions. The rock art at Vingen cannot be dated by shoreline displacement, but radiocarbon dates from the remains of small huts around the rocks point to a time between 5000 and 4000 BC for its creation.

Northern Norway

The Mesolithic in northern Norway has been subdivided into several chronological phases (Woodman 1993). The early Komsa phase, described in chapter 2, bears a strong resemblance to the Hensbacka/Fosna materials of southern Norway. This Komsa is often called Early Mesolithic, but because of its connections to Hensbacka and Ahrensburgian, it is more appropriate to think of Komsa as a Late Paleolithic culture in the Holocene. Initial colonization by maritime groups arriving along the coastline occurred by 9300 BC (Hood 2012, Grydeland 2005). Woodman (1993) has proposed using the term Komsa only for this first phase associated with tanged points and ending around 8000 BC. A model for the colonization of the interior of northern Scandinavia is shown in Figure 3.24.

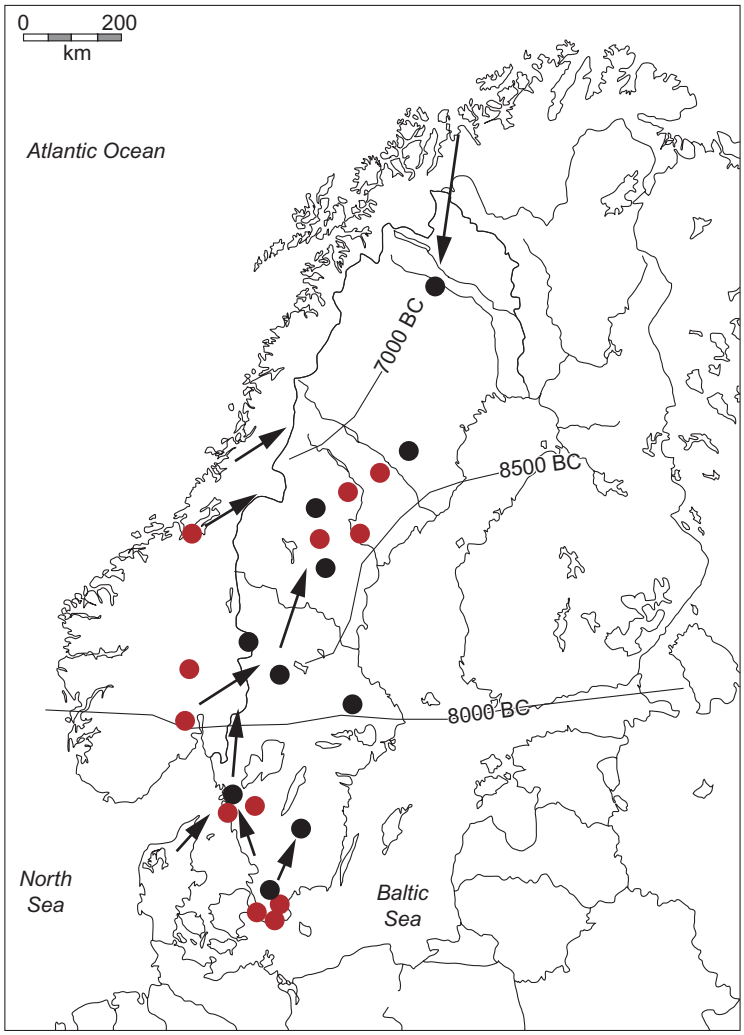


Figure 3.24. The colonization of the interior of the Scandinavian Peninsula. The dated lines mark the regression of the ice front. The red circles are elk antler picks and the black circles are flint handle cores, indicators of early human presence. The arrows mark the presumed directions of movement.

Subsequent phases are more distinctly Mesolithic. The Middle Mesolithic or Salnaeshogda phase, named after another site, begins around 7500 BC and is characterized by small bladelets and microcores along with larger broad blades and small flake scrapers. A single example is provided below from recent excavations near Trømso, Norway. The Salnaeshogda phase continued until perhaps 6000 BC, when it was replaced by the Trapeze phase, characterized by trapezoidal projectile points, scrapers, and bipolar reduction (Woodman 1999). Bipolar reduction is a special technique involving placement of the base of the core on a stone anvil while blades and flakes are removed, resulting in a distinctive shape for the core. A Younger Stone Age period follows the Mesolithic and continues largely the same traditions, with the addition of polished slate tools and the first pottery.

Hundreds of sites are known from the Mesolithic period in Finnmark, Norway, and site preservation is often good. There is little soil formation or surface sediment in this area, so that archaeological remains are often still on the surface of the ground. House foundations are present at some sites in groups of up to 90 structures. Subsistence remains document the importance of marine mammals in

the diet as well as probable year-round occupation at these sites. The multi-house settlements in northern Norway are discussed in more detail in chapter 5.

Tønsnes, Norway

Tromsø, the only city in northern Norway, lies 350 km north of the Arctic Circle. Tromsø is home to the northernmost university, cathedral, and brewery on earth. The city is located on a small island along the west coast, protected from heavy seas by several larger islands in the outer archipelago.

The last 25 years of oil and gas extraction from the North Sea have made Norway a rich country. Some of the wealth has been used to improve and expand infrastructure. The Tromsø region is no exception. Plans for the establishment of a port and industrial area at the small town of Tønsnes in the Tromsø Fjord initiated archaeological investigations to determine if cultural materials would be damaged by the development. Some of this work took place on a steep promontory adjacent to the harbor area. Of course, around 6500 BC, when Mesolithic peoples lived in this area, the land surface was much lower and the coast was 150 m (500′) higher on the slope of this promontory.

Excavations in 2008 revealed three large, rectangular, stone-lined depressions buried under a layer of peat. The largest structure was on the order of 10 m (33′) x 3–4 m (9–12′) in size. These depressions are the remains of residential structures from the Stone Age and the excavators argue they are the oldest permanent houses in northern Europe. The floor of the houses had been dug down slightly into the subsurface. The structures are also marked by a wall foundation of stones and sand. Small pits and depressions were supported pairs of angled, roof-bearing posts. There were two entrances to the houses in the long wall facing the water.

There was some variation among the houses in terms of their size, contents, distribution of raw material, and interior divisions. Organic materials were not preserved. A cooking pit was identified in only one house, and two activity areas were found between the houses. There were two major kinds of local material—flint and quartz—used to make stone tools at Tønsnes.

Early Northern Comb Ware Culture

In recent years, a few sites belonging to the Early Northern Comb Ware Culture have been found in northern Norway. This material is known primarily from Finland and northwestern Russia, but spills over just slightly into extreme northeastern Finnmark in Norway. The term refers to the decoration on the early ceramics associated with these sites. The production of Combed Ware pottery dates between approximately 5500 BC and some time between 4500 and 4100 BC (Skandfer 2005). Pottery technology was reintroduced in this area when asbestos-tempered ceramics later appeared around 2300 BC during the Younger Stone Age (Jørgensen and Olsen 1987, Olsen 1994). Stone artifacts in this culture are largely made from quartz and exhibit diverse manufacturing techniques (Skandfer 2005). At the end of this phase, quartz is replaced by slate as the raw material of choice for stone tools, as seen at the site of Gropbakkeegen, for example.

Middle Sweden

The middle and northern parts of Sweden were occupied relatively late in Scandinavia, as the ice remained in these areas for a longer period. Moreover, throughout most of the Early Holocene, Eastern Middle Sweden was a wide archipelago gradually rising out of the sea. The archipelago was dominated by long and narrow gravel eskers with sandy beaches and rocky islands (Åkerlund 1996, Knutsson and Knutsson 2011). An esker is a linear ridge of sand and coarse gravel originally deposited by a stream flowing in or under a decaying glacial ice sheet.

The Mesolithic of interior middle and eastern Sweden is not well known, and only a small number of sites are reported (Larsson 1990). Sites are generally described as small scatters of either flint or quartzite artifacts with little organic preservation. Both flint and quartz were used for the manufacture of stone tools in this region, and there is substantial debate about the reasons for these differences. The flint group is characterized by Lilhult axes, microblade technology, and use of flint and quartz. The quartz group is characterized by flaked quartz artifacts and an absence of microblade technology. Kindgren (1991) and Åkerlund (1996) have suggested the evidence supports differential use of raw materials by the same cultural group. Lindgren (1997), on the other hand, has proposed that two distinct cultures are represented by the flint and quartz assemblages. The question remains a fundamental issue in the archaeology of the Mesolithic of Eastern Sweden.

The chronology of Middle Sweden has been established in recent years largely on the basis of shoreline displacement curves (Åkerlund 1996, Lindgren 1997). Early Mesolithic sites are found at elevations of ca. 75 m (250′) asl and date to ca. 8000 BC. Only a few such sites have been identified, characterized by quartz artifacts, pecked axes, and bipolar cores. The Middle Mesolithic is found around 50 m (165′) in elevation, dated to ca. 6000–4500 BC, and characterized by pecked, round-butted ground stone axes (*trindøkse*), Lihult axes, conical and handle cores, bipolar cores, and microblades. An intriguing distinction is seen in the distribution of handle cores and microblades, which are mutually exclusive at many sites. This horizon resembles the Lihult phase in western Sweden.

The Late Mesolithic is a brief transitional phase beginning ca. 4500 BC. Sites from this time are found at elevations around 40 m (130′). Quartz artifact production shifted toward the use of prepared platform cores, and transverse points in flint or quartz began to appear. *Trindøkse* and fully polished greenstone axes are typical. Dates from the latest Mesolithic sites are virtually contemporary with the earliest Neolithic. The arrival of the Neolithic in Middle Sweden, up to a line drawn roughly from Stockholm through Uppsala to Oslo, happens around 4000 BC, almost simultaneously with the appearance of the first farmers in southern Scandinavia.

Kanaljorden, Sweden

The modern town of Motala sits on the eastern shore of Lake Vättern, the second largest lake in Sweden. The outlet for the lake flows through the town and runs east to the Baltic Sea. This must have been an important strategic location both for communication in the region and for fishing. Historical documents indicate that the Motala river here was famous for trout and salmon fisheries. During the Mesolithic period, there were at least two large settlements at the outlet. The

location of interest for this discussion is not a settlement, however, but a place called Kanaljorden.

The Swedish railroad decided to rebuild the bridge across the river at Motala, and Swedish archaeologists were called in to investigate the area to be affected by the construction and associated activities on both sides of the stream. Three sites were found with a few hundred meters (ca. 1,000′) of one another. On the southern bank, one large Mesolithic settlement was discovered and excavated. On the northern shore, another settlement was found, and even further to the north, across the large barge canal that had been dug through this area many years ago, test excavations revealed evidence for a former shallow lake. There, excavations on the lake bottom (Figure 3.25) between 2009 and 2013 revealed a large stone pavement and a number of artifacts and human remains.

These excavations at Kanaljorden have exposed one of the more unusual sites known anywhere in Scandinavia, or beyond for that matter. Radiocarbon dates on the human bones and wooden artifacts fall between 6000 and 5600 BC. The stone pavement turned out to form a large platform some 14 × 14 m (45′ × 45′), the equivalent of a large classroom in size. This platform had been constructed on the bottom of the shallow lake. Among the stones of the platform, the archaeologists found artifacts of stone, wood, bone, and antler, as well as both animal and human bones.

The wooden artifacts included a number of pointed stakes. One of the worked wooden objects is thought to be a stylized fish with gaping jaws and rounded tail fin. The fish has a carved hole in its middle and may have been mounted on one of the wooden stakes. The bone and antler artifacts, including barbed points, an ornamented shaft-hole pick, and antler punches, are largely intact, in contrast to their fragmentary remains at the settlement sites. Animal bones at the site are also distinctive and include the mandible of a brown bear, a badger cranium, and large pieces of antler from elk and red deer. There are also more or less complete wild boar carcasses present in the lake.

Figure 3.25.
Test excavations along the canal at Kanaljorden, Motala.

The remains of at least 11 human individuals were found, nine between 15 and 45 years of age and two very young children, including a newborn child. Some 120 of the 130 recovered human bones belonged to skulls (Figure 3.26). Two of the human skulls had pieces of the wooden stakes inside the cranial vault, inserted though the foramen magnum, the hole at the base of our skulls where the spinal cord enters. It seems very likely that these skulls had been on display atop long wooden stakes in the middle of the lake.

Kanaljorden is a remarkable case of what must have been a ritual deposit of skulls and artifacts of special significance to the inhabitants of Mesolithic Motala. Such sites were previously unknown from the Mesolithic. One of the intriguing questions to be answered about the site is whether these individuals on display were relatives or enemies.

Figure 3.26.
One of the human skulls exposed on the stone platform at Kanaljorden.

Northern Sweden

Northern Sweden (Norrland), essentially the region north of Stockholm and Uppsala, generally lies above the limits of cultivation and was primarily home to hunter-gatherers and reindeer herders. Two factors played a major role in the settlement of this area, deglaciation and coastal uplift. The evidence suggests that most of Norrland was free of ice by 7000 BC (Forsberg 1996). Second, the present Baltic coastline of northern Sweden is very recent. This coast has one of the highest land rebound rates in the world today, more than 89 cm (almost 3′) per 100 years. During the Mesolithic, this rate may have been as much as 4–10 m (13′–33′) per century.

Northern Sweden was one of the last regions of Scandinavia to be occupied, due to the slow melting of the last glacial ice. The chronology for this area has been pushed back in time and refined substantially on the basis of recent archaeological investigations. Infrastructure development and dams have required a number of large archaeological projects, and thousands of sites have been recorded. The earliest reliable radiocarbon dates for human occupation are almost concurrent with the disappearance of the ice (Forsberg 1996), beginning shortly after 9000 BC. The earliest Mesolithic in this region is related to the Komsa culture of northern Norway and is found at the site of Aareavaara near the Norwegian border. Further inland a site called Dumpokjauratj has been reliably dated to 6100 BC (Olofsson 2005) and is likely the next oldest evidence of human presence in the interior region.

The Early phase of Mesolithic occupation is characterized by the presence of exotic raw materials and an abundance of stone borers. The appearance of microblades and handle core technology marks the start of the Middle Mesolithic phase around 5500 BC, followed by a quartz- and slate-dominated Late Mesolithic phase from 5000 to perhaps 3000 BC or later.

In the northeastern corner of Sweden, adjacent to Finland, the western limits of the Combed Ware Culture occur, part of a larger archaeological group distributed across northeasternmost Norway and Finland and into western Russia and Estonia. The Combed Ware people were hunter-gatherers with pottery. Early pottery reached this area from the east at least 1,000 years before Early Neolithic ceramics arrived in Middle Sweden. Combed Ware was the earliest pottery in Scandinavia (Hallgren 2008).

After about 4000 BC, clear differences emerged between inland and coastal adaptations. Inland settlements are characterized by small pit-house structures and an abundance of animal bone. Elk, beaver, and bear are the primary terrestrial animals in inland areas, while fish and seals were common on the coast and in the major rivers. Analysis of these remains has indicated a pattern of seasonal mobility for the interior populations. Coastal sites appear to have been more sedentary. This question is discussed in more detail in the chapter on the Middle and Late Neolithic.

Aareavaara, Sweden

Archaeological survey in far northern Sweden, near the Finnish border, revealed several clusters of quartz artifacts and burned bone (Möller et al. 2012). Small-scale excavations exposed buried materials from an early human occupation site. The Aareavaara site is the oldest known archaeological site to date in northern Sweden, ca. 8700 BC. The cultural affiliation of the materials from the site is uncertain. The location was occupied almost as soon as the ice withdrew from this area. At the time of occupation, the site was on a small island near the shore of the enormous freshwater Ancylus Ice Lake that filled most of the Baltic Basin at that time. Pollen data from the area of the site indicate a birch woodland/tundra landscape characterized by open vegetation with an abundance of willow and dwarf birch. Primary game in the region was presumably reindeer and the seal and fish resources of the freshwater lake.

Alträsket, Sweden

The site of Alträsket is a typical Mesolithic coastal site in northernmost Sweden, dating to ca. 5000 BC. Today the site is located today some 25 km (15 miles) from the Gulf of Bothnia and 100 m (330′) above present sea level (Halén 1995). The assemblage includes fire-cracked rock, quartz, flint, and greenstone artifacts, found along with two boiling pits and two dwelling structures. One of the structures was excavated and revealed a semi-subterranean floor with a ca. 1 m (33″) bench or shelf around the outer wall. The lower floor area was approximately 9 m^2 (100 ft^2) and the bench about 15 m^2 (160 ft^2) in area. The interior of the excavated house contained a hearth and a boiling pit at either end. The boiling pit contained burned bone, some of which has been identified as ringed seal. The second structure is estimated to be 12 × 7 m (40′ × 23′) in size. The artifacts of quartz, greenstone, and flint included microblades, keeled cores, and burins, typical of the Mesolithic in northern Sweden (Baudou 1992).

MESOLITHIC PATTERNS

Several important themes emerge from a consideration of the Mesolithic of Scandinavia. Included in the following discussion is further information on subsistence practices and the nature of settlements, including the appearance of

cemeteries, art and style, and territoriality. This discussion concludes with a more general consideration of foraging peoples and the nature of hunter-gatherer adaptations in the Mesolithic of Scandinavia.

Subsistence

Excavations of Mesolithic sites with good preservation in Scandinavia usually reveal a predominance of large animal bones from terrestrial species. The most common species of mammals at most Mesolithic sites were red deer, roe deer, and wild boar (Ritchie et al. 2013, Enghoff 2011). At the same time, the seas provided the bulk of the diet, especially in the later Mesolithic. The majority of sites known from the Mesolithic are coastal.

The late Mesolithic coastal settlement at Skateholm in southern Sweden, for example, contained the remains of some 86 different kinds of animals, including both terrestrial and marine species (Larsson 1984). Red deer, wild pig, and roe deer were the primary terrestrial animals of economic importance. Other animals were also hunted and trapped, including a variety of fowl and small fur-bearing species: marten, otter, wolf, and squirrel. Large quantities of hazelnut shells are known at many Mesolithic sites, along with the remains of acorns, water chestnuts, and nettles; fruits such as wild strawberry, apple, and sloe and rowan berries and raspberries have also been reported (Price 1989, Regnell et al. 1995, Zvelebil 1996).

It is also the case that subsistence varies within and between the larger regions of Scandinavia (Ritchie et al. 2013, Enghoff 2011). There are differences both between east and west and between north and south. It is important to remember that at the start of the Holocene, the Baltic Sea was a huge freshwater lake with relatively little fauna. As the outlets for this lake opened to the North Sea, saltwater entered the area and introduced new species. Seals were particularly important in eastern and northern Sweden during the Mesolithic. The waters of southern Scandinavia were rich in resources, particularly as sea levels rose and shorelines came closer to their modern positions. Many varieties of shellfish, fish, crustaceans, sea mammals, and waterfowl were present and exploited. Fish species came from a wide range of both marine and freshwater habitats (e.g., Enghoff 1995, 2011); eels seem to have been especially important in some areas (Pedersen et al. 1997). The importance of shellfish, particularly oysters, is highly visible in the large shell middens along some coasts. To the north along the west and north coasts of Norway, the warmer waters of the Gulf Stream provided a wealth of resources to the Mesolithic inhabitants. Here reindeer were the primary terrestrial prey, in contrast to red deer, roe deer, and wild boar in southern Scandinavia. There was perhaps more hunting of marine mammals in the deeper, and somewhat colder, waters to the north.

What is perhaps most important to remember is that the combination of marine and terrestrial resources, particularly in the south, provided a rich mix of foods and raw materials for the hunter-gatherer-fisher folk of the area. It is difficult to imagine food shortages or nutritional stress in such a productive environment.

Settlement

As has been noted, the predominant location of human settlement in the Mesolithic of Scandinavia was in coastal, lacustrine, or riverine environments. Larger, richer

archaeological sites are found along the coasts. Inland sites are known primarily from small, ephemeral camps, often on the shore of rivers, streams, and lakes. These groups used boats and paddles, erected large fishing weirs, and successfully exploited the rich resources of both the sea and the land.

The general picture at the coastal sites in southern Scandinavia is often one of large settlements ranging up to several hundred meters along the coastlines (Andersen 1991), sometimes associated with shell middens. The oyster shell midden at Bjørnsholm in northern Jylland is some 325 m (more than 1,000′) long, 10–15 m (33′–50′) wide, and up to ca. 1.2 m (4′) high. These middens were originally much higher; they have collapsed and compressed with time and more recent farming activities. House structures in the Mesolithic are rare, although more have been found in recent years (e.g., Lollikhuse, Sørensen 1995, Bredasten, M. Larsson 1986, or Nivå, Jensen 2009). Evidence is present at many sites for summer, autumn, and winter residence, making year-round occupation likely in several parts of Scandinavia. Cemeteries are another important hallmark of the later Mesolithic (e.g., Albrethsen and Brinch Petersen 1977, Larsson 1984, 1988).

The success of coastal adaptations in the south is documented by the presence of early Mesolithic groups (and Late Paleolithic as well) on the western coast of Norway before the ice sheets left the adjacent highlands. The vast majority of late Mesolithic sites in western Norway are found on the islands and outer coast. Subsistence appears to have been based on fish, seals, and whales, with a supplement of terrestrial species such as red deer, wild boar, elk, and small game. After 6000 BC, the density of occupation at the coastal sites increases dramatically, and sites contain more, and more varied, kinds of artifacts. This change is generally interpreted as due to the appearance of sedentary occupations. Sites are often found close together at this time, which may reflect the presence of large communities. The evidence from the Mesolithic of Norway indicates more complex development in the north than in the south, related to hunting of marine mammals.

Sedentism

In the last 25 years, the antiquity of sedentary settlements in southern Scandinavia has been pushed back substantially into the Middle Mesolithic period; such sites are now known to be several thousand years older than previously considered. It is very probable that the antiquity of settlement permanency will be extended back into the early Mesolithic as soon as more submerged coastal sites from this period are recovered.

In southern Scandinavia and northern Germany, known settlements appear to have been seasonal during the late Paleolithic and early Mesolithic—the vast majority of known sites are short-term camps on inland lakes and river valleys. By the middle Mesolithic, settlements like Nivå become more sedentary, and the majority of sites are found in coastal situations. A number of different types of sites are known from the late Mesolithic, including (1) coastal occupations, containing both marine and terrestrial fauna, with or without associated shell middens (which appear to be largely long-term, episodic accumulations of seasonal activities), (2) smaller, seasonal coastal sites with a more specific procurement focus—deep water fishing, sealing, or fowling for migratory species such as swans, (3) inland

trapping stations with large numbers of intact carcasses from fur-bearing animals such as pine marten, and (4) summer, inland lakeside settlements. Year-round occupation at coastal sites is likely to have been common practice during the Ertebølle.

Bergsvik (2001) makes a compelling argument for longer-term settlements in the Mesolithic of western Norway. The assumption that hunter-gatherers were highly mobile in most times and places until relatively late in the Holocene has, in fact, dominated archaeological perspectives for many years and strongly biased our interpretation of the archaeological record. Part of the reason for this bias lies in a reliance on ethnography; ethnographic records, however, as we know, come largely from marginal groups in difficult environments and may not be the best fit for many parts of the prehistoric world.

New data have forced a substantial reconsideration of Mesolithic settlement and subsistence. Detailed analysis of shell middens has indicated sedentary occupation along the coasts of Denmark. A number of new and very large coastal sites have been discovered, encompassing several thousand square meters in area and emphasizing the importance of the coastal zone. The discovery of several cemeteries, previously unknown from the Mesolithic, in the last 30 years or so has documented both the permanency and complexity of Mesolithic adaptations.

Cemeteries

Cemeteries are an important hallmark of the Mesolithic. Large cemeteries, usually located within settlement areas, reinforce the notion of substantial sedentary communities. The occurrence of graves and cemeteries in Denmark and southern Skåne at this time suggests increased social and ritual complexity. Graves from Bøgebakken, Skateholm, Nederst, Tågerup, Nivå, and elsewhere contain equipment, ritual objects, and ochre dating from late Kongemose and early Ertebølle. The cemeteries provide a wide variety of information on the biology and culture of Mesolithic peoples. These cemeteries likely reflect both a concern for the well-being of the deceased and the more sedentary nature of human settlement. Skeletons are generally robust, with little indication of disease or malnutrition. Violent trauma, however, is not uncommon, and some of the individuals appear to have been victims of murder. Such evidence suggests that inter-group conflict may have been frequent in this area.

Vedbæk, Denmark

At Vedbæk in northeastern Sjælland, a Mesolithic cemetery was uncovered in 1975 during construction activities at a school. The cemetery is dated to approximately 5000 BC and contains the graves of at least 22 individuals of both sexes and various ages, four were newborns, and eight more died before reaching the age of 20. There were nine men, five of whom were over the age of 50; of the eight women, two died before the age of 20, while three lived to be over 40. Two of these women died in childbirth and were buried with their newborns beside them.

Powdered ocher (a mineral pigment deep red in color) was used to adorn individuals in many of the graves. Racks of red deer antler were placed with elderly individuals; males were buried with flint knives, while females often were interred

Figure 3.27.
The grave of a young female with a newborn child at Vedbæk, Denmark.

with jewelry of shell and animal teeth. In one grave, a newborn infant was found buried on the wing of a swan next to his mother (Figure 3.27). The mother's head had been placed on a cushion of animal skins. The infant was buried with a flint blade, as were all males in the cemetery. The cemetery also contained rather dramatic evidence for conflict and warfare. The simultaneous burial of three individuals in a single grave—an adult male with a lethal bone point through his throat, an adult female, and a child—suggests the violent death of all three. The incidence of trauma and injury recorded in human bones from the Mesolithic is remarkably high.

Strøby Egede, Denmark

There is a fascinating Mesolithic mass grave near Køge in eastern Sjælland, Denmark, with the bodies of eight individuals of all ages buried together (Figure 3.28). The buried individuals at Strøby Egede included three newborns, a boy and a girl, an 18-year-old woman, a 30-year-old man, and a woman approximately 50 years of age (Petersen 1988). Each of the individuals was buried with some equipment. The two infants were found with flint knives, the young girl and the young woman wore tooth pendants around their hips, the two adult women had a flint knife, and the adult male was buried with an antler axe, five flint knives, and a bone spatula. The females were placed in the southern part of the grave and the males in the northern part. The cause of death is unknown, as there are no signs of violence.

TREASURES

The concept of art may not have existed in the Mesolithic, but there was certainly an aesthetic and a high level of craftsmanship. The tools and equipment of everyday life were well made, in terms of both function and appearance. All manner of objects were decorated, including flint nodules, wood and bone artifacts, and pottery (e.g., Nash 1998, Plonka 2003). In all likelihood, animal skins, bark, and various construction elements may have been decorated in some fashion as well. Types of decoration included carving, engraving, impressing, and polishing. There are also a few examples of painted wooden objects. Mesolithic art is often described as consisting of fine engraved lines in geometric designs, but some motifs have a more open and flowing decoration. Carved amber figures, sometimes with engraved decorations, represent another form of artistic expression. In northern Scandinavia, stone animal effigies shaped from slate and other types of rock are occasionally found. It is also essential to recall the rock art of the Mesolithic.

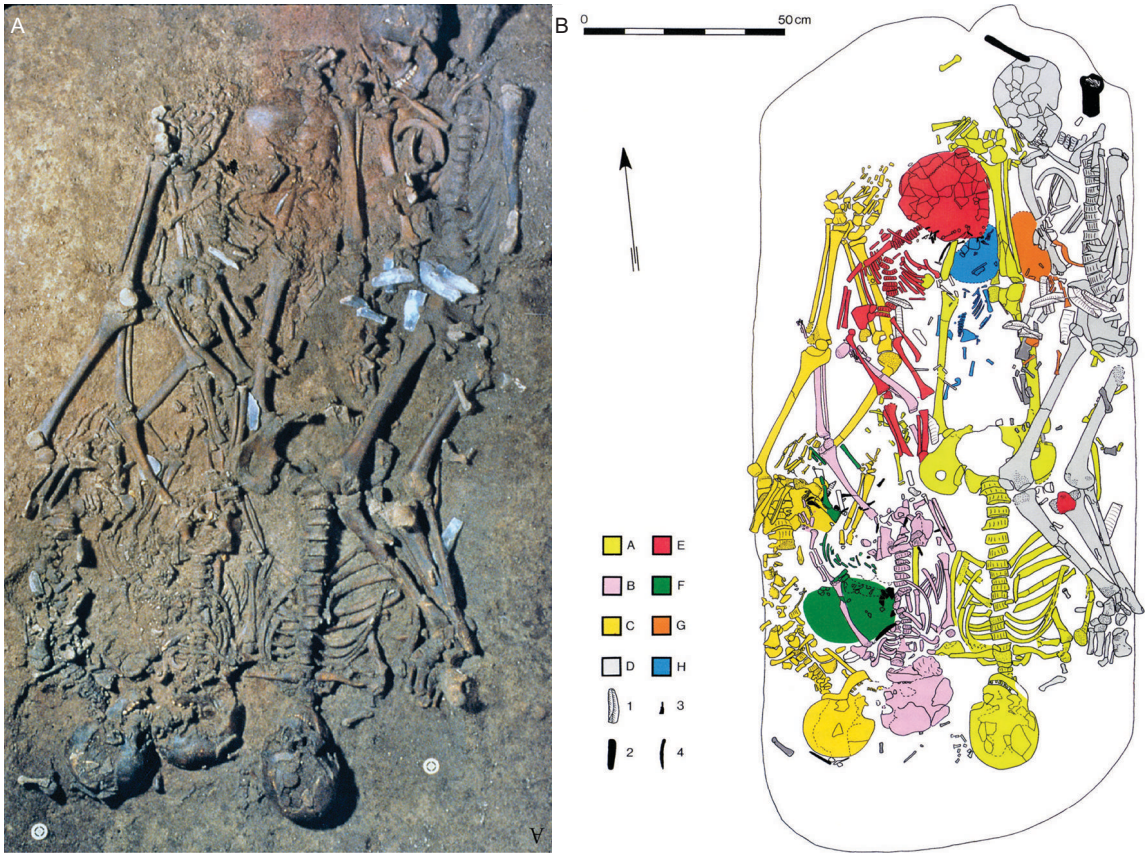


Figure 3.28.
The mass grave with eight individuals found near Køge, Denmark.

Some spectacular objects have already appeared in the pages of this chapter. A few more examples are included below to convey a sense of the extraordinary items that Mesolithic peoples made and used. These include polished and decorated bone pieces and antler axes, which must have contained messages or information of importance for their owners. Three intriguing examples from Ryemarksgård in Denmark, Rosenhof in Germany, and Tågerup in Sweden are discussed. A slotted bone dagger from Denmark documents the care and detail with which some personal equipment was made. Slate points from northern Scandinavia are beautiful examples of the use of alternative materials for stone tools. The paddle from Tybrind Vig exemplifies a new form of decoration in the Mesolithic, unknown before its discovery. The amber effigies are among the more spectacular of the Mesolithic treasures, and new examples continue to be found. Finally, the set of tooth and bone materials from Vedbæk, Denmark, is not art, but the assemblage holds an enigmatic message that makes us think and wonder—perhaps a sufficient definition for art, certainly in the case of this treasure.

Ryemarksgård, Denmark

The decorated bone from Ryemarksgård, Denmark, is probably the best-known example of Mesolithic art. The geometric figures engraved on the polished surface of a large leg bone from an aurochs represent five stylized individuals

Figure 3.29. Decorated aurochs bone from Ryemarksgård, Denmark. The figures are approximately 3 cm (1.2″) high.

moving toward a set of three zigzag lines (Mathiassen 1941). Various interpretations have been proposed for the variation in the figures and the zigzag lines (Figure 3.29). In my mind, the lines are water, perhaps a stream or coast. The five individuals are of two types, perhaps men and women, shown with different bodies, leaf shaped or crosshatched. Human depictions are in fact rare in the Mesolithic; animals and abstract geometric patterns are much more common.

This piece employs the standards of most Mesolithic art in Scandinavia—fine-line engraving on a polished bone, antler, amber, or stone surface, creating geometric figures of various shapes and sizes (S. Andersen 1980). In addition to the fine lines, drilled sets of small holes were sometimes used for decoration.

Tågerup, Sweden

Polished antler axes found in southern Scandinavia and northern Germany are among the more spectacular of the decorated objects. Decorations include fine-line engravings of both animal and geometric figures (Figure 3.30). These objects appear to be personal weapons or tools, carried by an individual. They have a shaft hole at the bigger end. In one or two cases, rather short hazel wood handles have been found in the shaft hole. Perhaps these axes were carried over the shoulder when not in use and served as a personal journal or diary of some sort. The meaning of the engravings is unknown. This is particularly true in the axes that depict what appears to be some kind of notation or counting pattern. One example comes from the site of Tågerup in western Skåne, Sweden (Karsten and Knarrström 2003). On this antler axe shaft, six rows of fine lozenges cover the surface of the artifact, along with a few other small markings. The overall effect is spectacular, but the meaning of these marks to the maker is not possible to discern. They may be simple doodling, counting, recording, or conjuring, among other possibilities.

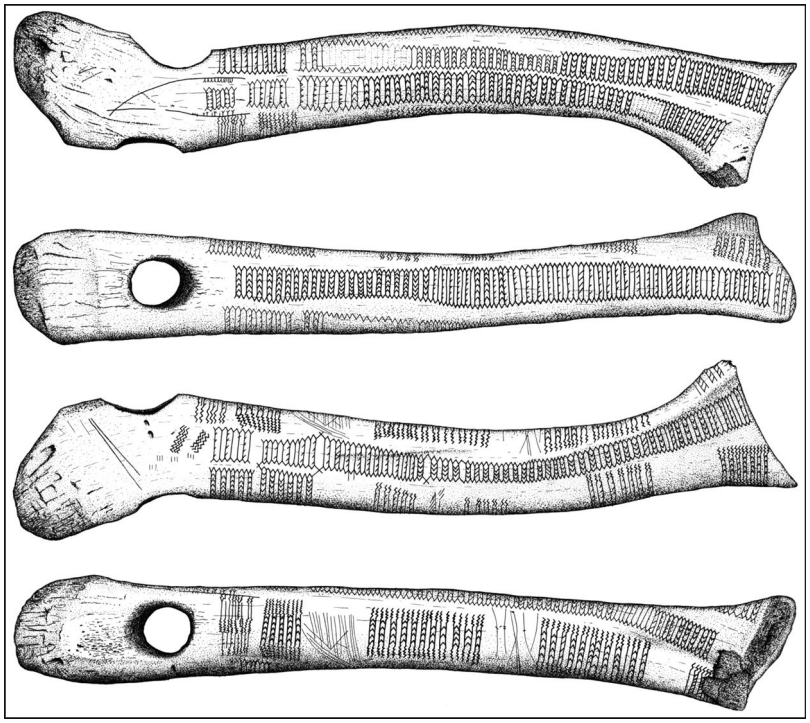


Figure 3.30
Four views of the decorated antler axe from Tågerup, Sweden. Length 39.5 cm (15.5″) (drawing by Annika Jeppesson).

Rosenhof, Germany

Another spectacular example of an antler axe was found at Rosenhof in northern Germany (Feulner and Hartz 2011). Preservation at the site was remarkable. This object is largely complete and was found with a hazel wood shaft still in the shaft hole. When the object was first uncovered, the surface of the antler was very light in color and the black infilling of the engraved lines stood out clearly. The antler shaft or axe was carved, shaped, and polished to have seven sides with a total length of 58 cm (23″). A series of fine tally marks were placed on the edges of these sides in groups of three to seven. It seems clear that the owner was counting something. The fascinating question, of course, is what?

Skellingsted Bro, Denmark

Slotted bone points and daggers were made from the foot and leg bones of European elk, red deer, and roe deer. These bones were thinned, polished, pointed, and grooved along the two sides where inserts of flint blades were attached with birch or pine tar. These points and daggers were sometimes decorated in the fine-line geometric style of the Mesolithic and are extraordinary pieces of craftsmanship. Slotted bone points have a shorter, pointed base to attach to a haft; slotted bone daggers have a longer, heavier, rounded or flat base.

The example shown in Figure 3.31 comes from Skellingsted Bro, Denmark, and is one of the showpieces of the National Museum in Copenhagen (Voss 1960). It is made with a split elk bone, 10 microblades of flint, and resin. It is

Figure 3.31.
A slotted bone dagger with in situ flint edges from Skellingsted Bro, Denmark.

almost 30 cm (12″) long and decorated on both sides with two rows of geometric incisions in an angular S-shape. These incisions would have been filled with a black resin or other material to contrast with the white of the bone so that the decoration could easily be seen.

Slate Tools, Northern Scandinavia

In southern Scandinavia, the abundance of flint meant that virtually all flaked stone tools for cutting purposes were made from that material. Away from the sources of flint, however, a variety of other stone was used as a substitute. During the later Mesolithic and the Younger Stone Age in northern Scandinavia, slate was one of the common materials for making cutting edges for projectile points, knives, and other tools (Figure 3.32). Slate was not flaked but ground to the desired shape. While more fragile, it provided a sufficiently strong edge for its purposes.

Amber Effigies, Denmark

Another medium for art and decoration is seen in the jewelry and figurines of the Scandinavian Mesolithic. Both amber and animal tooth and bone were used to make objects for wear, presumably as some kind of jewelry. A number of pieces of amber have been found perforated one or more times and often decorated with geometric patterns. These items are usually found accidentally by private individuals, and the exact place of discovery is often uncertain. Several of these amber pendants are shown in Figure 3.33. The effigies—from left to right, a seal, a European elk, and a wild boar or bear—are small, only 4–7 cm (1.2″–2.7″) in diameter and often decorated with fine designs of engraved lines or drilled holes. The elk figurine is a head only, with a notch in the top and two holes at the base. The head itself has fine-line chevron decorations. The notch may have been intended to hold a miniature set of antlers, while the base may have been attached to the stuffed or wooden body of the animal. Perhaps this was a child's toy? The large oval of amber in the upper center of the photo is also decorated with pits and fine lines and has a perforation so it could be worn as a pendant or amulet.

Figure 3.32.
Various Stone Age slate artifacts from Västerbottens county in northern Sweden.

Vedbæk, Denmark

Personal ornaments, a kind of jewelry, of animal tooth and bone are also of great interest. Such items are often found at Mesolithic sites in southern Scandinavia and must have been in common use. The majority of these objects are made from the teeth of various species. The root of the tooth is either drilled or ribbed so that the tooth can be attached as a kind of bangle to clothing or hung as a pendant.

One of the most fascinating examples of such bangles and pendants comes from the cemetery at Vedbæk, where a cluster of these items was found together on the chest of an adult female in the grave that also held the bodies of a murdered adult male and a young child (Figure 3.34). The arrangement of the different sets of tooth and bone is hypothetical, based on their location in the excavated cluster and the placement of teeth of the same species or from the same mandible together. Presumably these items were either attached to a garment or a piece of leather worn by the deceased or placed on her body.

Figure 3.33.
Decorated amber pendant and animal figures from Denmark.

Eight species of animals are represented: red deer, roe deer, wild boar, fox, aurochs, European elk, bear, and human. Five large elk teeth are at the top of the arrangement. The two ends of the leg bone of a roe deer make up the second row. There are six sets of upper front teeth from red deer in the center of the arrangement, with two wild boar canines and an aurochs incisor among them. The fifth row contains part of the jaw of a fox, and the bottom four teeth are human. Three of these species—elk, aurochs, and bear—had disappeared from the island of Sjælland centuries before this place was used as a cemetery. These teeth were either heirlooms or had been imported.

What is the meaning of these items and their arrangement? The intent behind this collage will forever remain unknown, but one might posit that these objects are symbolic representations of certain characteristics: the strength of the elk, the agility of the roe deer, the importance of red deer and boar as providers of meat, the mystic might of the aurochs, the cleverness of the fox. The human teeth perhaps belonged

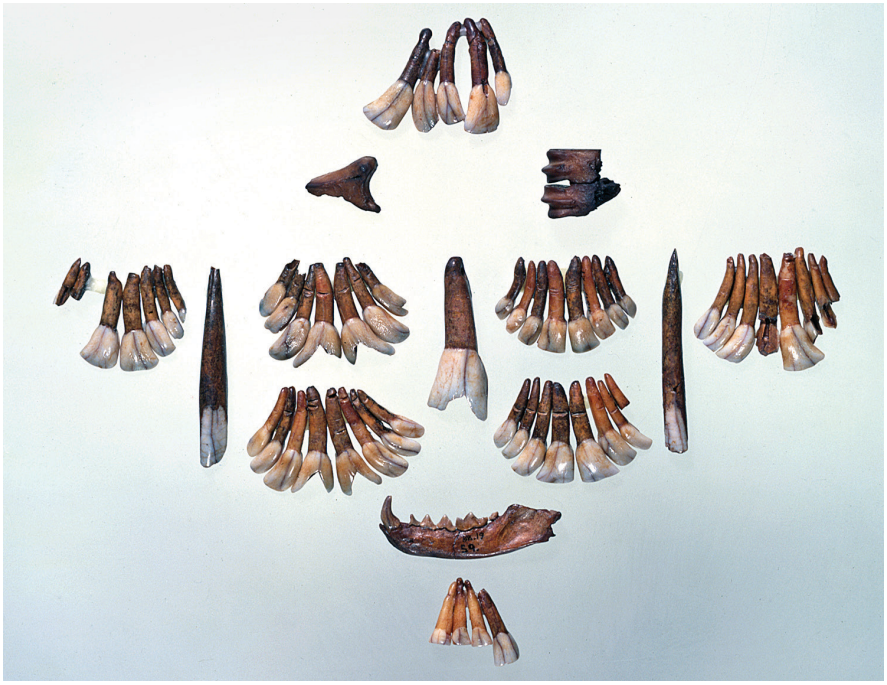


Figure 3.34.
Tooth and bone ornaments from Vedbæk, Denmark.

to ancestors or enemies. Were these symbols and thoughts placed with the murdered family to help on a journey or in an afterlife? It is impossible to know—but the mystery is ever intriguing.

SUMMARY: FORAGING ADAPTATIONS

This transition from the Late Paleolithic to the Mesolithic in Northern Europe witnessed a shift from small, dispersed groups of subarctic big game hunters to larger, more sedentary societies using a variety of resources from both the land and the sea. The general picture of the late Mesolithic in Scandinavia is one of rather substantial, autonomous, and self-sufficient local groups, intensively exploiting the natural environment. These peoples were adept foragers, employing a sustainable technology to extract the resources of the land and the sea. Fish, shellfish, and marine mammals contributed a large part of the diet. Groups lived in often substantial and sedentary communities, at least in the southern part of Scandinavia. The dead were sometimes buried in cemeteries. Social relationships appear to have been primarily egalitarian; there is no evidence for status differentiation or pronounced inequality in the later part of the Mesolithic.

Outside of the coastal areas, the intensity of Mesolithic activity declined. The density of occupation also decreased from Denmark and Skåne into middle Sweden and southern Norway, reflected in fewer sites and smaller amounts of material present. It seems likely that foraging populations in these areas were somewhat less sedentary and lived in smaller groups. It is also the case, however, that archaeological materials are less well preserved, sites less visible, and our impressions more ephemeral.

Most models for prehistoric hunter-gatherer societies are based on recent foragers from the last century or so who inhabited the most marginal environments on the planet. The general consensus for years has been that hunter-gatherers groups were small, mobile, and simple rather than large, sedentary, and complex. The evidence from the Mesolithic of northern Europe demonstrates that at least some of the foraging groups of the early Holocene do not fit the small and mobile mold. The evidence from northern Europe is not atypical of foragers, but rather may be one of our best examples for Late Pleistocene and Holocene adaptations.

One of the reasons that bias in the study of prehistoric hunter-gatherers has been toward small and mobile is because the evidence comes largely from inland regions where population densities would have been lower and mobility more pronounced. There is little evidence in most areas for the coastal aspect of hunter-gatherer adaptations. The rising sea levels of the Holocene submerged the early postglacial coastlines in most places on the planet. The early postglacial coastlines of most of Europe—and the other continents—are underwater today and missing from the archaeological record. Northern Europe is atypical because these old coastlines have been uplifted by the rise of the land and are today accessible to archaeologists.

Thus, the evidence from northern Europe is quite likely typical of foraging adaptations along the coasts of Europe—and elsewhere—during the early Postglacial. Larger, more sedentary communities with significant territoriality, networks of

exchange, and patterns of interaction may well be typical of many foraging adaptations. The sooner archaeologists begin to look for such evidence, the sooner we will begin to better understand the forager societies of the past.

The coastal segment in northern Europe is also missing in the Late Paleolithic and early Mesolithic. There are no coastal sites from the Late Paleolithic in southern Scandinavia, with the exception of the Hensbacka/Fosna/Komsa culture. There the fortuitous combination of more rapid land uplift and slower sea level change has provided good evidence for coastal adaptations. Virtually all known early Mesolithic sites in the south are inland summer settlements. The likely locations for winter settlement at that time—the coasts—are under the sea today. In the later Mesolithic, however, both inland and coastal sites are known, and a more complete perspective on settlement and subsistence is possible.

With this perspective, the complexity of settlement in the later Mesolithic can be seen in the variety of sites and activities represented in the archaeological record. Some years ago, Lewis Binford suggested a useful model for the study of hunter-gatherer settlement. Binford distinguished foraging and collecting patterns based on residential mobility (Binford 1980). Foragers move people to food, while collectors have more permanent residences and bring foods back to their base. Foragers follow what is known as an annual round or cycle, moving regularly from place to place and from year to year across the landscape. In essence, this is a distinction between more and less mobile strategies for survival. Binford intended this distinction to represent two ends of a continuum; prehistoric hunter-gatherers might find a strategy at either end or somewhere in the middle between foraging and collecting.

It seems clear that Late Paleolithic groups, often reindeer hunters, more closely resembled the foraging end of this spectrum, moving seasonally to obtain food. By the later Mesolithic, hunter-gatherer groups were becoming more sedentary and bringing food to larger, more permanent settlements. The question of residential sedentism vs. mobility and relationships between the coast and inland sites is important for understanding hunter-gatherer adaptations. Information from bone chemistry has helped to resolve this question. Noe-Nygaard (1988) used carbon isotope ratios in the bones of dogs from both inland and coastal Mesolithic sites in Denmark as a proxy for humans to identify seafood in the diet. Dogs at coastal sites consumed a diet dominated by marine foods, while dogs at inland sites ate an almost exclusively terrestrial diet. Such evidence indicated that these latter dogs, and most likely their human owners, spent most of the year inland. This study provides strong evidence for a sedentary pattern in both areas and a distinction between coastal and inland settlements in the later Mesolithic.

In the final analysis, it appears that the societies of the last hunter-gatherers of Europe were quite successful and experienced a number of changes in their way of life prior to the spread of agriculture. In most areas, these Mesolithic groups avoided the arduous demands of a farming life for some time in favor of wild foods. In southern Scandinavia, for example, domesticated plants and animals are not adopted for almost 1,500 years after they are in use in parts of nearby northern

Germany. Certain ideas or actual objects such as stone axes and bone combs were obtained in trade from farmers 150 km to the south, but agricultural foodstuffs were among the last items to be brought into the late Mesolithic. In northern Scandinavia, however, beyond the limits of cultivation, agriculture played little role in subsistence, and hunter-gatherer practices continued. At the same time, influences from the farmers to the south are seen across the region as the impact of new social and economic forces was felt. This is the story of the Neolithic that appears in the next chapter.

CHAPTER FOUR

THE FIRST FARMERS, 4000–2800 BC

A MARKET FOR AXES

The landscape of southern Scandinavia was an obstacle for the first Neolithic farmers. It was heavily wooded, and there were few openings for fields or pasture. Forest clearance would have been one of the major activities for the early agriculturalists. A polished flint axe was the solution to this problem (Figure 4.1). These axes were an important commodity in Neolithic Scandinavia. There are tens of thousands of these artifacts scattered across the region today. The simple flaked stone tools of the preceding Mesolithic period were too light and fragile to fell large trees efficiently. Heavy, durable stone axes that could be resharpened were valuable equipment.

The axes were usually made from large nodules of the best flint available. They were beautifully polished, sometimes on all sides. The flint axe blades were hafted in a wooden handle, normally of ash. Size was an important attribute; these axes were occasionally more than 30 cm (1′) in length and could have been resharpened a number of times by grinding and polishing.

Experimental archaeology has been a popular pastime in Scandinavia for many years. There is a dedicated center for experimental archaeology—aimed at recreating prehistoric technologies, artifacts, and constructions—at Lejre in Denmark and several other locations across Scandinavia. One of the more popular subjects of such experiments has been the use and manufacture of Neolithic polished flint axes. Field experiments have shown that these stone axes were fully effective at cutting down large trees. A hardwood tree 30 cm (12″) in diameter can be felled in 10 to 15 minutes with a stone axe (Iversen 1956, Jørgensen 1985).

The amount of time, labor, and experience required to produce a polished flint axe was considerable. Again modern experiments have reproduced these axes and provided information on the process. There were five stages in the production sequence: (1) selection of raw material, (2) shaping of a rough square form by flaking with a hammer stone, (3) finer shaping with antler tools, (4) shaping of the blade and edges with indirect flaking, and (5) polishing, which includes grinding, polishing, and sharpening. Time requirements vary substantially in each stage. Initial shaping of the raw flint nodule into a rough square form takes only five to ten minutes. Three hours are required, however, for flaking the stone into the final rough-out form (stages 2–4) before polishing.

Polishing was done against another stone, using sand and water. Polishing increased the effectiveness and durability of the axe, allowing the bit to penetrate wood more easily. In addition, fractures and wear at the bit end could be removed by additional polishing. Polishing is the most demanding part of axe production. Almost 30 hours are needed to finish and sharpen the axe. The axe is moved a distance of almost 50 km (30 miles) in the process, back and forth against a polishing stone. Total production time for one axe, once the raw material was obtained, was more than 33 hours (Madsen 1984).

The first axes were polished on all four sides, both on the two sides with the blade and on the narrower top and bottom, where it was unnecessary. After some centuries, the polish on the top and bottom was no longer added. In fact, it is not really necessary to polish these axes all the way to the butt, although this was almost always done. The extra polish may have been intended to enhance the appearance and value of the axes. These polished flint axes are a major hallmark of the Neolithic of Scandinavia.

Figure 4.1.
A cache of 10 polished flint axe blades found buried in Denmark. The axes were unused and may represent an offering.

NEOLITHIC SCANDINAVIA

The Neolithic can be best understood by considering the geography of Scandinavia. The limits of cultivation distinguish the north and south geographically. This line has changed with climate over time, but generally runs across the middle of Sweden, north of Stockholm, and parallels the south and west coast of Norway at lower elevations. This limit extends far up the Norwegian coast because of the ameliorating effects of the Gulf Stream. Some cultivation of barley was possible even in northern Norway at various times in the past (e.g., Arntzen and Sommerseth 2010).

The chronology for the Neolithic of Scandinavia is depicted in Figure 4.2. The Neolithic of southern Scandinavia is divided into three major periods: Early (4000–3300 BC), Middle (3300–2350 BC), and Late (2350–1700 BC). The Early Neolithic is associated with the Funnel Beaker Culture (conventionally abbreviated as TRB, from Danish *tragtbægerkultur* and German *Trichterbeckerkultur*) based on the shape of the pottery. The Early Neolithic has two phases, I and II, with a division at 3500 BC. TRB continues through the

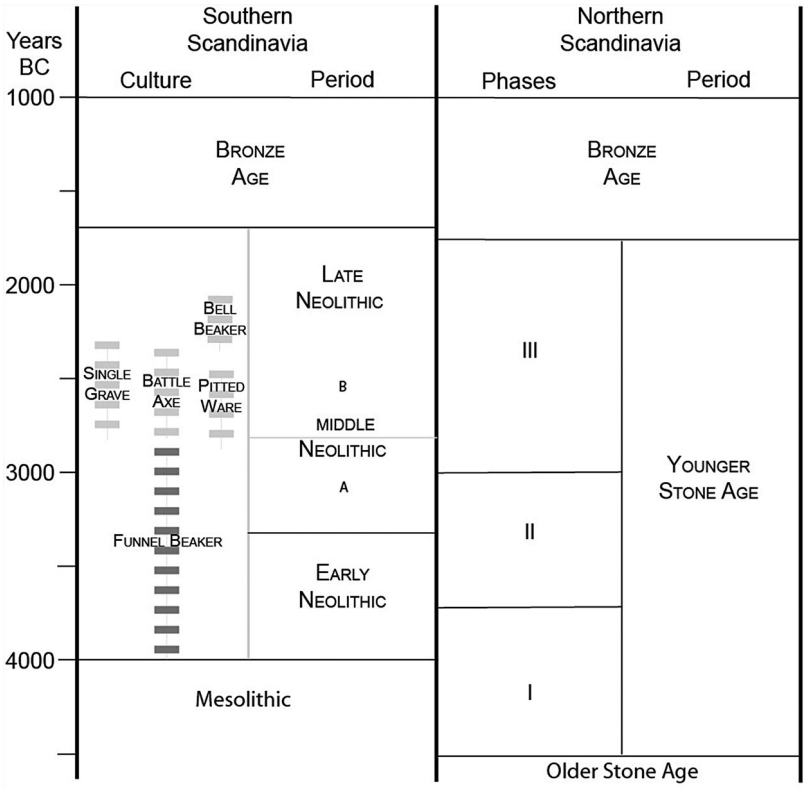


Figure 4.2.
Chronology for the Neolithic of Scandinavia.

first half of the Middle Neolithic, a period designated as MNA, ending around 2800 BC.

This chapter focuses on the Funnel Beaker Culture in southern Scandinavia and covers the Early Neolithic and Middle Neolithic A periods. Chapter 5 discusses the Middle Neolithic B (MNB) and Late Neolithic periods that follow the TRB. The story of the Neolithic in northern Scandinavia is also found in chapter 5.

In the following pages, I will discuss in some detail the Early Neolithic in southern Scandinavia, where the Neolithic is more visible and the changes more pronounced than in the north. The locations of sites mentioned in this chapter are shown in Figure 4.3. I will treat all three phases of TRB (ENI, ENII, and MNA) as one, except where noted. Also of interest is the initial transition from hunting to farming that takes place as the Neolithic replaces the Mesolithic. This transition is considered in the next section.

HUNTERS TO FARMERS

The question of why hunters became farmers in Scandinavia is a fundamental issue in archaeology that remains largely unresolved. The question is equally relevant

Figure 4.3.
Location of some of the sites mentioned in Chapter 4.

to the origins of agriculture in the Near East some 10,000 years ago. Why did these transformative changes take place? The magnitude and abruptness of this transition to the Neolithic—the sudden appearance of domesticates and other hallmarks—can hardly be questioned. Within a few hundred years in southern Scandinavia, almost everything in human society changed. Even so, the long period of contact between hunters and farmers prior to the introduction of farming remains a puzzle.

By 5000 BC Early Neolithic farmers had expanded to an area only one hundred to two hundred kilometers to the south in northern Germany and Poland. Agriculture and the Neolithic, however, did not reach northernmost Germany and Scandinavia until around 4000 BC. Certain ideas, or actual objects—such as "T-shaped" antler axes and "shoe-last" adzes of amphibolite, bone combs and rings, and perhaps copper and jadeite axes—were obtained from these farmers during the late Mesolithic Ertebølle period (e.g., Fischer 1982, Klassen 2004). Yet more than 1,000 years passed before domesticates and other Neolithic traits appeared in Scandinavia. The evidence for farming during the first part of the Neolithic is not abundant. Settlements are rare, and there is little indication of substantial forest clearance or extensive cultivation until 3500 BC.

The dates for the earliest Neolithic are almost indistinguishable throughout Scandinavia, given the resolution of radiocarbon dating. The first appearance of domesticated cattle and wheat, along with polished flint axes and Funnel Beaker

ceramics, is nearly simultaneous across much of the lower third of Scandinavia, from northern Germany and Denmark to Middle Sweden and eastern Norway. The earliest dates for these distinctly Neolithic items are consistently between 4100 and 3800 BC. The distance from the Danish/German border to Stockholm at the northern edge of Early Neolithic distribution is approximately 800 km (500 miles) as the crow flies, and certainly much further along the very irregular coasts of Scandinavia that would have been the principal routes of movement. The sudden appearance of these goods and practices over such a large region, almost 500,000 km^2 (190,000 square miles—an area the size of Spain), suggests that the initial transition to the Neolithic was rapid indeed. The speed of this spread of the Early Neolithic across such a large area is remarkable and comparable to the often discussed explosive expansion of the first farmers in Central Europe (known as the Linear Pottery culture, abbreviated LBK from the German name, *Linearbandkeramik*) in the middle of the sixth millennium BC (e.g., Rowley-Conwy 2011).

The distribution of the earliest Funnel Beaker Culture in southern Scandinavia can be discerned from the finds of pointed-butted axes across the region (Figure 4.4). These artifacts were the earliest type of Neolithic polished flint axes (Figure 4.12) and date from approximately 4000 to 3500 BC (Sørensen and Karg 2013). Obvious concentrations of the axes can be seen, particularly in southwestern Skåne. This is also an area of early flint mines and a major production locale for polished axes. There is

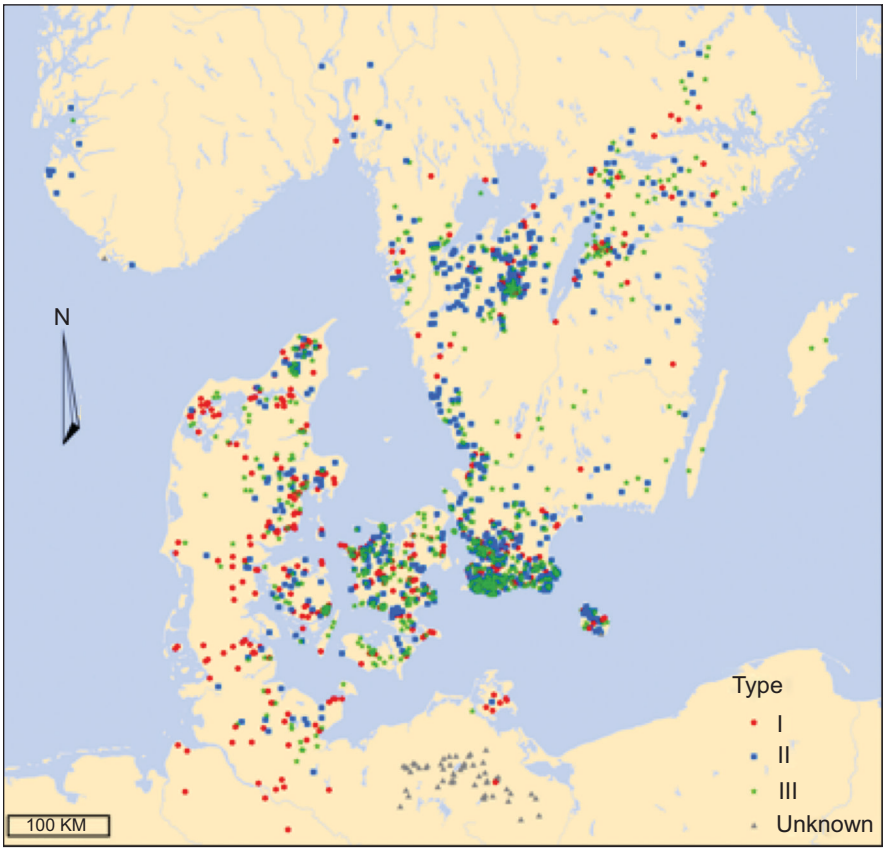


Figure 4.4. Distribution of pointed-butt polished flint axes in southern Scandinavia, Middle Sweden, and southern Norway.

a surprisingly high density of the axes in the Falbygden region, 100 km (60 miles) east of Göteborg, an area with a very high number of megalithic tombs. Megalithic tombs are in-ground constructions of large stone that served as burial chambers. Three types of pointed-butt axes have been defined (Nielsen 1978). Type 1 is the earliest and is never found with type 3. Types 1 and 2 are occasionally found together; types 2 and 3 are sometimes found together, sometimes with thin-butted axes that are slightly later (Sørensen and Karg 2012). High densities of the earliest Type 1 axes are found in Skåne, the Danish islands, and eastern Jylland, which appear to be the core areas of the earliest Neolithic.

Mechanisms and Causes

Information from northern Europe, because of both its abundance and its quality, is particularly well suited to addressing questions regarding the transition to agriculture. There are two major issues: (1) the mechanism for the spread of farming, whether through colonization by foreign peoples or local adoption by indigenous groups, and (2) causality, which involves a number of theories, including resource stress, population growth, and social change.

Colonization versus Adoption

The question of how agriculture was introduced in southern Scandinavia is a difficult one. There are three major hypotheses: (1) the Early Neolithic was intrusive, brought by colonists; (2) the Early Neolithic developed from the local Mesolithic, under the influence of various Danubian cultures to the south; or (3) some combination of the two, e.g., small groups of immigrants brought the basic Neolithic package into Scandinavia, where it was adopted by local inhabitants.

As noted, there was contact between late Danubian farming groups in Central Europe and Mesolithic groups in southern Scandinavia, given the evidence of imports into the Ertebølle culture. The only reasonable explanation for the delay is the presence in northern Europe of these successful fishing-hunting peoples who had little immediate use for other aspects of the Neolithic. The question, then, is not one of interaction, which is evident, but rather of colonization versus indigenous adoption.

The evidence for and against colonization comes largely from material culture. Arguments in favor of colonization cite the simultaneous introduction of a variety of new materials, such as TRB pottery and polished flint axes, and new practices involving domestic plants and animals and monumental tombs (e.g., Solberg 1989). However, a number of similar lines of evidence—similarities between the Mesolithic and Neolithic in stone tool and ceramic technology, settlement location, and burial practice—support an argument for indigenous adoption (Nielsen 1985).

The physical anthropology of Neolithic individuals differs only slightly from that of their Mesolithic predecessors (Bennike 1993). Several minor changes are seen in the Early Neolithic skeleton; bones and skulls are less robust, and teeth are smaller. There are also minor changes in stature; Mesolithic males and females are 1 cm taller than their Early Neolithic counterparts. Interpretation of these differences is ambiguous, however, with regard to the question of colonization versus adoption, as these differences may also be related to diet or activity.

There is also some limited information from ancient DNA in the bones and teeth of Mesolithic and Neolithic individuals. These data are problematic, because there are very few samples from the actual transition period, between 4500 and 3500 BC, due to a paucity of burials during this time, problems of protein preservation and contamination in many samples, and because the study of aDNA is still in an experimental stage. Current studies suggest that there are genetic differences between Mesolithic and Neolithic populations in central and northern Europe, but much more work needs to be done (e.g., Bramanti et al. 2009, Brotherton et al. 2013, Skoglund et al. 2012).

In sum, while there was a rapid influx of new kinds of pottery and decoration, burial rites, house forms, and domesticated plants and animals, several basic aspects of life did not change substantially at first. At the same time, it is important to remember the very explosive initial spread of the TRB into Scandinavia, which does suggest the arrival of new people. Although there is no substantive evidence to indicate the movement of agriculturalists from the south, the possibility that small groups of immigrants came into the region and introduced local inhabitants to the Neolithic seems very likely.

Causes of the Transition

The question of why hunters became farmers is not easily answered. The reasons for the transition are not well understood and are subject to significant debate and interpretation. Three major factors are considered below: population growth, resource stress, and social and economic change. None of these explanations is definitive or particularly satisfying in resolving the question. My own intuition is that the economic, social, and ideological benefits of the Neolithic were of more importance than new sources of food. Clearly, however, it took at least a millennium for the hunter-gatherers of Scandinavia to decide to become farmers.

Population

One of the major hypotheses attempting to explain the transition to agriculture suggests that human population growth resulted in too many people and too little food (e.g., Binford 1968, Cohen 1977). According to this argument, agriculture was a means of increasing food yields per unit of land to feed growing numbers of people. In southern Scandinavia, changes in the environment increased population density even if population numbers were stable. Rising sea levels and a densely forested landscape operated during the Mesolithic to reduce the amount of inhabitable land (Noe-Nygaard 1995).

Archaeologically, however, the question of population pressure is difficult to resolve; population levels in prehistory are a notoriously slippery variable to measure. One approach is to examine the number and size of sites by time period. A systematic survey of the landscape around the Swedish city of Ystad in southern Skåne provides some information (Berglund 1991, Larsson et al. 1992). This huge undertaking involved paleoecologists, geologists, archaeologists, and others in the analysis and reconstruction of the cultural landscape in this area over the last 6,000 years. Settlement patterns in the Ystad area are revealing with regard to changing land use. Mesolithic settlement focused on lagoons and rivers along the

coast. Little evidence of settlement was found inland. Fewer than ten settlements from the Mesolithic were reported from the study area, and late Mesolithic sites were poorly represented. During the first part of the Early Neolithic (EN I), settlements were smaller and widely distributed in sandy soils. These sites are found in two zones, along the coastal strip and in the hummocky inland landscape. The small size of the settlements suggests family units as the primary co-residential unit. There are more EN I settlements in the Ystad region compared to the Mesolithic, but the total is no more than ten. A significant change occurs in EN II, after 3500 BC. Site size increases; settlements are located along the coast and adjacent lands in areas of wetlands, river mouths, lagoons, and archipelagos. Inland sites are few in number. Sites are concentrated around megalithic tombs, constructed in this period. There are more than 30 settlements recorded from EN II.

Several conclusions can be drawn from this study. The number of sites from the Mesolithic was never particularly large. It is difficult to imagine that population size or pressure on resources was a factor at this time. Little or no increase in the total number of settlements is seen in the earliest Neolithic. Sites from that period were smaller in size than in the preceding Mesolithic. In the larger view, the information suggests that population was not a primary cause of the transition to agriculture in northern Europe. More information from the Ystad project is presented in the final chapter of this book.

Resource Availability

Climatic or environmental oscillations are often invoked as a cause for changes in subsistence and settlement. One early model for the introduction of agriculture in Scandinavia was closely tied to the decline of the elm forest at the end of the Atlantic climatic episode (Iversen 1941). A shift toward cooler, moister conditions was argued to have caused the decrease in elm, creating conditions favoring the introduction of agriculture. More recent investigations of the elm decline have convincingly connected this event with the spread of elm disease, however, and not climatic change (e.g., Groenman-Wateringe 1983, Rasmussen 1990). Furthermore, it is not directly related chronologically to the arrival of farming (see Figure 4.8).

Some crisis in resource availability in southern Scandinavia at the time of the transition is implied in a number of papers (Andersen 2008, Larsson 1985, Rowley-Conwy 1984, Zvelebil and Rowley-Conwy 1984, Paludan-Müller 1978). Rowley-Conwy (1984), for example, argued that changes in water levels and salinity reduced the availability of shellfish, causing a food shortage. However, late Mesolithic shell middens are found only in limited areas of northern Denmark; shellfish were not important in the diet in many areas.

Clearly, some changes in the environment did take place at the end of the Atlantic climatic episode. Yet there is no substantial evidence to indicate that these had a profound impact on human population. Other evidence exists to suggest that environmental change and food stress were not significant factors in the transition to agriculture. Several climatic indicators, including species of mistletoe and tortoise now found only in central and southern Europe, were present in Denmark during the Subboreal period, indicating that conditions remained warmer than today (Troels-Smith 1960). Food stress is not seen in skeletal material from the late

Mesolithic; individuals were large and robust, with few indications of nutritional deficiency (Meiklejohn and Zvelebil 1991). Such evidence strongly argues against climatic or environmental factors in the expansion of the Neolithic.

Social and Economic Change

Others have suggested that the transition was caused not by forces external to society, such as population growth or resource stress, but rather by factors involving changes in social structure and the emergence of inequality (e.g., Bender 1978, 1990, Hayden 1990, Price and Bar-Yosef 2011). In southern Scandinavia, Fischer (2002) and Jennbert (1984) have argued that these successful foragers did not require additional sources of food—that the only obvious reason for farming was to generate surplus. They point to the close connections between the farmers of north-central Europe and the foragers of Denmark, and the variety of "borrowed" artifacts and ideas. Jennbert argues that a few leaders were likely responsible for encouraging cultivation and herding for the accumulation of wealth. Kind (2010) has suggested that the transition was the result of intensified social interaction between local hunter-gatherers and pioneering farmers, whom he characterized as "managers of neolithization."

Bogucki (2011) argued that by the fourth millennium BC in central Europe, the necessary conditions of transport, durable goods in the form of metal objects, and capital investment in the form of draft oxen allowed ambitious individuals to accumulate wealth. The possibilities for surplus production and competition between higher-status individuals for prestige then might explain why successful foragers adopted farming. I will come back to the question of causality at the conclusion of this chapter.

FUNNEL BEAKER CULTURE (TRB)

The arrival of the Neolithic in Scandinavia is identified by the presence of domesticated plants and animals, accompanied by a number of innovations, including thin-walled pottery and new pot shapes and large polished flint axes for forest clearing and timber work, along with a related flint-mining industry, weapons like ground stone battle axes, grinding stones for processing cereals, copper axes as well as flint daggers, personal ornaments made of amber and copper, and monumental construction. This complex of things and practices defines the Funnel Beaker Culture (TRB). The first domesticates and TRB pottery appear in northernmost Germany around 4100 BC, in Poland around 4000 BC (Papiernik 2012, Pospieszny 2010), in Skåne in Sweden around 4000 BC, slightly later in Denmark (ca. 3950 BC), and finally in Middle Sweden and southeastern Norway after 3900 BC. Within a period of 200 years or so, the entire area witnessed the arrival of the Neolithic. The exact distribution of early TRB in southern Norway is debated, but there is a clear presence in the southeastern corner of the country that includes domesticated animals and Funnel Beaker pottery (Østmo 2007). There are megalithic tombs as well, probably four at Holtenes on the west side of the Oslo Fjord and one at Skjeltorp to the east (Østmo 2013b).

The TRB culture is divided into three subperiods, Early Neolithic I (ENI), Early Neolithic II (ENII), and Middle Neolithic A (MNA), in the chronology

of southern Scandinavia, from approximately 4000 to 2800 BC. The transition from ENI to ENII in Denmark and Skåne, around 3500 BC, is marked by major changes in settlement, subsistence, and tomb construction. The beginnings of continuous settlement within specific ecological zones, increased cattle herding, the introduction of the ard, and the initial settlement of clay soils were some of the hallmarks of this period. The number of known sites increases, and the evidence of occupation becomes more substantial.

Origins

The beginning of the Funnel Beaker Culture is one of the mysteries of the Neolithic. A number of hypotheses have been proposed over the years, but there is still no obvious point of origin (Müller 2011). One of the early suggestions was with the Sarnowo group in central Poland (e.g., Gabalówna 1968, Midgley 1992). In the region known as Kujavia, both distinctly TRB pottery and earthen long barrows were thought to appear around 4400 BC (Midgley 1992, Sherratt 1990). The early dating of these materials has been questioned, however, and appears dubious (Persson 1999, Pospieszny 2010).

Kruk (1980) has argued for connections between late Linear Pottery Lengyel Culture and the earliest TRB in Poland, but evidence of interaction between late Mesolithic and Danubian farmers there is very limited. Recent excavations at Dąbki on the Baltic coast in northwestern Poland in fact suggest closer connections between early TRB and the Neolithic in Hungary (Czekaj-Zastawny et al. 2011, 2013). Others have suggested a western origin, perhaps in the Netherlands or northwestern Germany.

It is clear that there were contacts between the late Ertebølle groups in southern Scandinavia and the Neolithic farmers to the south in Central Europe (Figure 4.5).

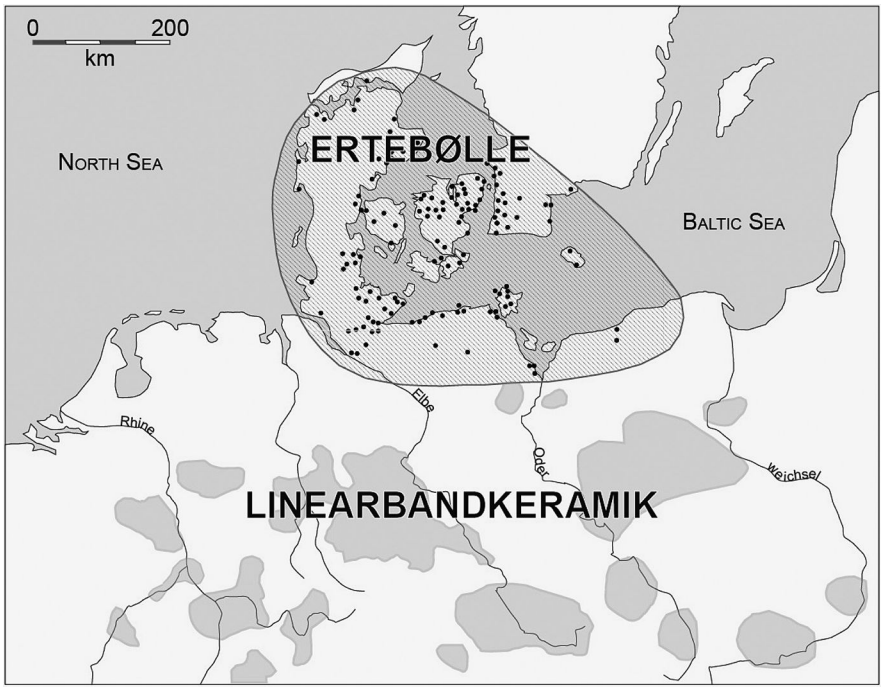


Figure 4.5.
The distribution of Ertebølle sites in southern Scandinavia and northern Germany and LBK-derived Neolithic groups in Central and northern Europe.

One of the more remarkable aspects of the transition to agriculture in northern Europe is the fact that it was delayed for more than 1,000 years. The first farmers arrived in Germany and much of central Europe shortly after 5500 BC, as part of the rapid expansion of the LBK. Descendant groups from the LBK occupied pockets of land in northern Germany less than 100 km (60 miles) from coastal Ertebølle hunter-gatherers in northern Germany by 5000 BC. At the same time, there is no evidence for domesticated plants or animals in northernmost Germany or southern Scandinavia before 4100 BC.

The evidence for contact between the hunters and farmers is substantial. The presence of *Schuhleistenkeil* (perforated shaft-hole axes) in the late Mesolithic of Denmark and southern Sweden is indicative of such contact (Fischer 1982, Verhart 2012). Recent studies of similar materials in Germany have shown that the majority of these adzes are made from a specific type of schist, a coarse-grained metamorphic rock. New sources, mines, and workshops for these adzes have recently been discovered northeast of Prague in Bohemia (Prostředník et al. 2005), marking their likely source.

Jadeite from the Italian Alps, finished as axes in Brittany and northern France, and copper from southeast Europe also found their way into Mesolithic southern Scandinavia (Klassen 2004, Klassen et al. 2011, Pétrequin et al. 2012). A number of other "Neolithic" items also show up in a Mesolithic context, including T-shaped antler axes and bone rings and combs (S. Andersen 1973).

The best candidate for the origins of TRB at present appears to be in the Michelsberg Culture (ca. 4400–3500 BC) in central Germany, northeastern France, eastern Belgium, and the southwestern Netherlands (Biel et al. 1998, Lüning 1968, Müller 2011). Michelsberg is one of several Neolithic groups in Central Europe that descended from the earlier LBK. An expansion of Michelsberg Culture appears to be taking place across the region at the time of the transition to agriculture in southern Scandinavia (Lüning 1998). There are similarities in the ceramics between Michelsberg and TRB, and the slightly later traditions of enclosure and megalith construction in southern Scandinavia likely came from Michelsberg as well. In addition, there is a pit at the TRB site of Flintbek in northern Germany with a number of Michelsberg-related potsherds dating to ca. 4100 BC (Zich 1993), perhaps associated with immigrant settlers coming from the south or west.

Other components of TRB seem to originate in different parts of Western Europe. Long barrows may have their origins in Chasséen/Michelsberg Culture in the Paris Basin, enclosures are known from Michelsberg in Germany, and the megalithic tradition has its roots in Brittany and likely spread toward northern Europe via the Paris Basin and central Germany. The occurrence of TRB pottery in the form of collared flasks (Figure 4.6) in Brittany (Knöll 1981) and jadeite axes from Brittany in Denmark around 3600 BC would seem to confirm this connection (Klassen 2003).

Current evidence suggests that the earliest well-dated TRB in northern Europe is found at several sites in northernmost Germany. The radiocarbon dates for the first domesticates and early TRB pottery come from ca. 4100 BC. One of the most important sites with such evidence is called Wangels.

Wangels, Germany

The sea level of the Baltic today is 2–4 m (6.5′–13′) higher than it was at the beginning of the Neolithic in northern Germany. For this reason, many of the archaeological sites of relevance to the first farmers in this area are underwater. Fortunately, German archaeologists are also frequently underwater, and a number of important sites have been discovered and partially excavated beneath the surface of the Baltic Sea. The details of the late Mesolithic and Early Neolithic in this region are rapidly emerging.

One of the most important sites is called Wangels, located near the town of Oldenburg (Hartz 1999a). The site is on dry land today only because the area was reclaimed from the sea in a nineteenth-century project to create more farmland in the region. The reclaimed land came from the sea floor of a long, narrow fjord adjacent to the site. Wangels was discovered in 1996 when a nearby canal was cleaned and flint artifacts, pottery, and bone materials were brought up by the dredging machinery. Excavations took place between 1996 and 1999 and uncovered an area of some 120 m^2 (1300 ft^2) (Hartz 1999a).

Figure 4.6.
An undecorated Funnel Beaker collared flask from Denmark (drawing by Julie Lolk).

The site is located on the edge of a flat, sandy hill, surrounded by thick organic sediments. There are two major episodes of human occupation at the site, one that extends from the late Ertebølle into the early TRB, approximately 4300–3800 BC, and a second in the later TRB from ca. 3300–2800 BC. The early occupation is of particular interest because it spans the transition to agriculture and includes the earliest TRB remains in the entire region.

The transition from Ertebølle to TRB in northern Germany takes place ca. 4100 BC, 100 to 150 years before agriculture reaches Denmark or Sweden (Hartz 1999b, Hartz et al. 2000, 2007, Sørensen and Krag 2012). The Baltic coast of Germany must have been the region from which agriculture moved into Scandinavia. The earliest dates for farming in southern Scandinavia come from the Malmö area in southernmost Sweden, implying the expansion of farming by sea across the Baltic.

After 4100 BC, subsistence at Wangels shifted from seals and fish, hazelnuts, and terrestrial animals such as aurochs, wild boar, red deer, and roe deer to the herding of domesticated animals (sheep, goat, and cattle) and the cultivation of cereals. About 50% of the animal bones in the early TRB phase come from domesticated species. At the same time, it is clear that the transition was a gradual process. Wild resources from the land and sea continued to provide food, but their contribution to the diet declined. Fragments of grinding stones for processing grain were found in the Early Neolithic levels at Wangels (Hartz 1999a). Cereals such as einkorn wheat, however, appear to be of minor importance in the diet.

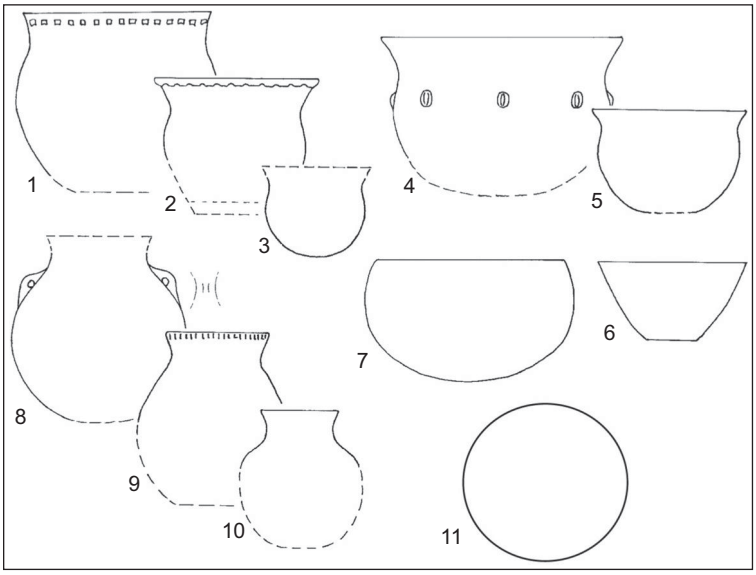


Figure 4.7.
TRB ceramics from the Early Neolithic site of Wangels in northern Germany. Several different forms are present, including 1–3. funnel neck beakers, 4–5. funnel neck bowls, 6. narrow conical bowl, 7. hemispherical bowl, 8. lugged jar, 9–10. jars, 11. clay disk.

Preservation of bone, wood, and antler was excellent at the site because of the waterlogged conditions. Food remains, including mammal and bird bones, fish remains, mollusks, and plant remains, were present in abundance. Wood artifacts were common in the deposits and included leister prongs, paddles, spears, sharpened sticks, shafts for other tools, and carefully carved wood rods and other material perhaps used to construct fish traps. An oak handle for a polished thin-butted flint axe some 67 cm (26″) long was also found in the deposits at the site. Wooden handles for both antler and flaked flint axes were uncovered, usually of hazel, 1.6–2 cm (0.6″–0.8″) in diameter. Polished flint axes appear a century or so later than the first domesticated plants and animals and gradually replace the flake and core axes of the Ertebølle. Some 23 fragments of wooden spears made of ash with a diameter of 1.2 to 2.8 cm (0.5″–1.1″) were found as well. A heart-shaped wooden paddle, also of ash, with a partially preserved handle was found in the Mesolithic layer, along with a long-bladed paddle from the Early Neolithic.

Although pottery was present in the Ertebølle, new forms, more decoration, and better quality mark the introduction of Funnel Beaker ceramics (Grohmann 2010). The TRB pottery includes slender and broad bowls, flasks, lugged amphorae, and flat discs (Figure 4.7).

Subsistence

Agriculture is the hallmark of the Neolithic—animal husbandry and plant cultivation, domesticated species. In Europe, with very few exceptions, these domesticates came originally from the Near East. Domesticated plants in the Early Neolithic included emmer and einkorn, bread wheat, naked barley, and probably spelt. These species are known from grain impressions in pottery and from carbonized remains. The oldest reliably dated cereal grains from these species in Scandinavia proper appear almost simultaneously between 4000 and 3700 BC (Sørensen and Krag 2012). In addition to the wheats and barleys, certain weeds with oil-rich seeds were also collected, along with apples, berries, and nuts (Sjögren 1994). Impressions of grape pips have also been discovered in potsherds from the Early Neolithic, indicating that vines may have been cultivated.

Domesticated cattle, pigs, sheep/goats, and dogs are present at most sites. (Sheep/goats is written with a slash because it is difficult for specialists to distinguish among the bones of these two closely related species.) There are a few early domesticated sheep/goats and cattle in northern Germany before 4000 BC (Hartz et al. 2007,

Heinrich 1999), but domesticated animals (with the exception of the dog) are not found in southern Scandinavia prior to 4000 BC, when they appear rather suddenly (Price and Noe-Nygaard 2009, Sørensen and Krag 2012). Because of the problems of distinguishing domestic pigs from indigenous wild boar, the arrival of this species is less certain but was likely contemporaneous with cattle and sheep/goats.

Cattle were the most important livestock and increased in number through the TRB period, representing 80% or more of domestic animals at some later sites. On Middle Neolithic A TRB sites in western and southern Sweden, over 90% of the animal bones came from domesticated animals, and the majority of these were cattle (Welinder 1998). In addition to meat, cattle were also a source of milk and milk products and of horn and bone for making tools (Isaksson and Hallgren 2012). Pigs were probably the second most common domestic species, clearly more significant at inland sites, where they must have roamed the forest. Sheep and goats were also present. It is unclear whether textiles were produced from wool, flax, or other fibers in the TRB period (Müller 2011). Fur and leather may have been the common material for garments.

Steffens (2007) has documented the low incidence of domestic animals at the earliest Neolithic sites in northern Germany. During the second half of ENI, after 3800 BC, the proportion of domestic to wild animals increases to more than 60%, and during ENII and MNA, over 90% of the animal remains are from cows, pigs, sheep, and goats (Müller 2011). At the same time, there are differences in the proportions of domestic and wild animals between coastal and inland sites (Sørensen and Krag 2012).

The exact nature and extent of Neolithic cultivation and herding have been debated for many years. The question is difficult because of issues of preservation and variation between sites. Preservation of organic remains is better in wetland areas and within coastal shell middens, where some of the earliest Neolithic materials in Denmark have been found (Andersen 1973). Preservation is often not good in inland areas, where extensive plowing and drainage for millennia have destroyed bone, wood, and other organic materials (Malmer 2002).

The general picture for cereal cultivation in the Early Neolithic is of relatively little grain production at the beginning of the period, with 60%–90% of the plant remains coming from wild species. This ratio changes over the 300 years of ENI as domestic cereals become more than 90% of plant remains in ENII (Müller 2011). Grinding stones for grain (querns) become common finds. Excavations in the Malmö area in southwestern Sweden have uncovered a number of cereal finds, and radiocarbon dates have been obtained from the earliest Neolithic.

New pollen studies of samples from beneath Early Neolithic earthen barrows show very local conditions and indicate two primary modes of agriculture in Denmark: (1) clearance of lime forest for pasture, and (2) swidden cultivation of cereals in burned-over birch woodlands (Andersen 1992, Andersen et al. 1991). Cleared areas were small in size; a mosaic of small fields, fallow, and pasture in the larger context of the Subboreal forest seems characteristic. Cultivation was probably done with a digging stick or hoe of some kind. The ard was introduced during ENI and made possible the cultivation of larger areas and poorer soils (Halstead 1995). The first appearance of this kind of plow may have been early in the period, according to a ^{14}C date of almost 3800 BC from Denmark (Beck 2009). Preserved

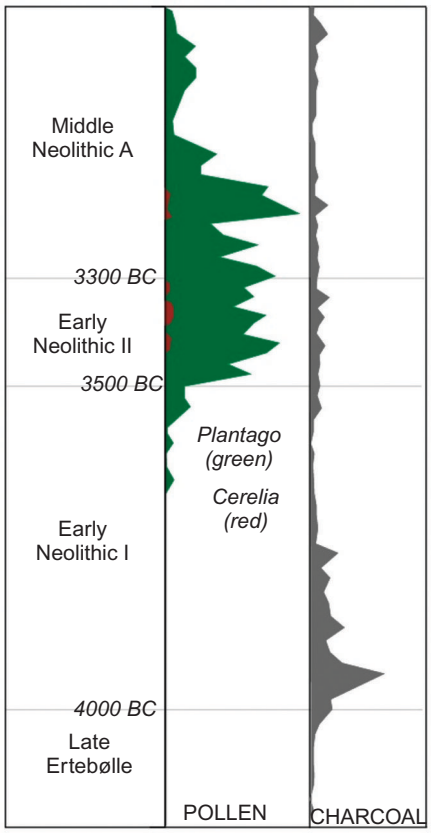


Figure 4.8.
Pollen and charcoal from the Belauer See in northern Germany (Kirleis et al. 2011).

plow marks provide another indication of cereal cultivation at this time (Sørensen and Krag 2012).

Evidence of the impact of the first farmers can be seen in the pollen record. Kirleis et al. (2011b) report on a pollen core from Belauer See, ca. 20 km south of Kiel, Germany, dated from the late Mesolithic through the Neolithic (Figure 4.8). Of particular interest is the evidence of plants associated with pasture (*Plantago* pollen) and cereal cultivation (*Cerelia* pollen) and for burning (charcoal), which may reflect slash-and-burn practices of field clearance. The charcoal evidence increases dramatically with the onset of the Neolithic, likely as initial field clearance in the Belauer See area takes place. The amount of charcoal declines significantly through the Early Neolithic I and remains at a relatively low level through the Middle Neolithic A. *Plantago*, a weed that flourishes in pasture, appears late in Early Neolithic I and increases dramatically during Early Neolithic II, falling off somewhat in the later MNA. *Cerelia* pollen is never abundant and is only really visible during ENII and the first part of MNA and again in the Late Neolithic. A similar picture can be seen in Denmark. Pollen analysis and charcoal counts reveal a human impact on the landscape starting around 3900 BC with intensive burning. By ENII, pollen of *Plantago lanceolata* makes an appearance, indicating freely grazing livestock, and there is the first pollen evidence of cereal cultivation (Rasmussen 2005). There are significant differences in the plant remains found at different types of TRB sites at this time. Wild plants, especially hazelnuts, are found more commonly at enclosures and tombs, while domesticated barley and wheat occur at the settlements (Müller 2011).

A variety of subsistence activities characterize the Early Neolithic in southern Scandinavia. The primary food quests involved terrestrial hunting, seal hunting, fishing, cereal cultivation, cattle breeding, and pig herding. Domesticated plants and animals were important in Denmark and southern and middle Sweden. In the rest of Sweden and Norway, seal hunting and fishing seem to have been primary pursuits. Cereals, and perhaps domesticated animals, arrived slightly later in southern and western Norway than in the rest of southern Scandinavia. The Early and Middle Neolithic groups in western Norway have been described as sedentary hunter-fishers practicing agriculture on a small scale (Bergsvik and Østmo 2011, Bergsvik 2012). There is little evidence for a Neolithic presence in the interior areas of central and middle Sweden and Norway. The focus of human settlement and activity in northern Scandinavia was on the coasts.

The acquisition of wild resources is reflected in the appearance of a variety of extraction sites in the Early Neolithic. These extraction sites were small, specialized localities with a limited range of artifacts and domestic debris. One or a few species tend to dominate the faunal assemblage. Activities included hunting for red deer, wild boar, baby seals, ducks, swans, collecting of shellfish, berries and nuts, and fishing. At the site of Siretorp in southern Sweden, only 7% of the bones are of

domestic species; the remainder are seals (86%) and deer (7%). Muldbjerg, a summer lakeside camp in Denmark, contained evidence of domestic cattle and sheep, red deer, wild boar, and beaver, as well as strawberries, raspberries, and hazelnuts (Troels-Smith 1957). Early Neolithic extraction sites along the coasts of southern Scandinavia are likely associated with very large fishing facilities (Pedersen et al. 1997). Fishing was very important in the Early Neolithic in Sweden and Norway as well, and sites were often situated in prime fishing locations.

In eastern Middle Sweden, there is settlement continuity from the Mesolithic into the Neolithic. Two zones of Early Neolithic TRB sites are known (Knutsson and Knutsson 2003), either on the coast, with an emphasis on fishing and seal hunting, or inland, where domestic plants (wheat, barley, peas, beans, and grapes) and animals (cattle, sheep, and goats) are the focus of subsistence. The settlement pattern appears to be seasonal, with spring to autumn in the inland and winter to spring seal hunting by the coast (Apel et al. 1995). The artifact assemblages are similar at both types of sites, with TRB pottery, battle axes, sandstone querns, and flint tools. The artifact inventories at these sites also include exotic artifacts in the form of pointed- and thin-butted flint axes from southern Scandinavia and slate knives and points from the Early Neolithic Slate Culture of Northern Scandinavia (Hallgren 2008). Small huts and burials are known from the coastal sites, while larger houses near small sacrificial bogs seem to be more typical for the inland settlements. Megalithic tombs are almost nonexistent in this area.

The site of Anneberg, located on the former Baltic coast near Uppsala, is one of the earliest in Middle Sweden, dated to 3950–3700 BC (Segerberg 1999). The excavations revealed sealed deposits with rich organic remains. The organic material contained almost no evidence for domesticated plants; about 10% of the faunal remains were pigs and cattle. Fågelbacken (Apel et al. 1995, Lekberg 1997) is another large coastal site with pottery and other artifacts from the TRB but no evidence for domesticates, typical of the coastal Neolithic in Middle Sweden. The site has been dated from food residues on pottery to approximately 3900 to 3600 BC. Fågelbacken is interpreted by the excavators as an aggregation camp used by inland farming groups on a seasonal basis and focused on marine resources.

There are also a number of inland TRB sites in central and eastern Middle Sweden. New excavations at Östra Vrå have uncovered the remains of both domesticated plants (wheat and barley) and animals (sheep/goats, pigs, and cattle). More than 80 saddle-shaped grinding stones were found at this site as the stone packing in the graves of two children (Kifilstedt 1996). The site of Frotorp near the city of Örebro contained finds of carbonized domesticated cereals (Eriksson et al. 1994). Radiocarbon dates ranged from 3900 to 3550 BC. The early TRB site of Skogsmossen is discussed in more detail below.

Hallmarks

In the following pages, I discuss some of the major characteristics of the TRB, including the ceramic material, stone axes, and exchange and trade. In the next segment, the focus is on the variety of sites found in TRB in addition to settlement sites and extraction camps. In this section, flint mines, bog offerings, megaliths, and enclosures are described. Several examples from specific sites are included.

Figure 4.9.
Reconstruction of a finely decorated lugged Funnel Beaker from Denmark (drawing by Julie Lolk).

Ceramics

TRB ceramics are among the highest-quality pottery ever made in prehistoric Scandinavia. TRB pottery is also the primary diagnostic artifact for the presence of the Early Neolithic in Scandinavia (Gebauer 1988, Nielsen 1987, Koch 1998), although there is very little pottery present on the Early Neolithic sites in Norway. Pottery is found in several contexts in the Early Neolithic: at settlements and ceremonial sites, in votive offerings in bogs, and at places of burial.

TRB pottery occurs in a variety of shapes used for a wide range of domestic and ritual purposes. The early TRB inventory contained seven types of pots, compared to the two types in the preceding Mesolithic. The major forms of TRB pottery are bowls, beakers/jars, and flasks (Koch 1987, 1998). Funnel-neck beakers are the most common form in the TRB, although the name is somewhat misleading. The S-shaped profile and splayed rim are the most common characteristics of these vessels (Malmer 2002). Small lugs were sometimes added to the shoulder of the pot between the body and the neck, probably to hang the vessel from a cord (Figure 4.9).

Funnel-necked beakers are often 10–20 cm high, but examples 30–40 cm high are also known. The beakers can be divided into three sizes: small, medium, and large. Although some of these vessels are thought to have been containers for liquid, others were clearly used as cooking vessels and have charred food residues present on the interior (Hulthén 1977). Medium and large vessels appear to have been used for cooking and storage; the smaller vessels were likely drinking cups. Medium and large vessels are common at settlement sites, while medium beakers are dominant in ritual deposits in bogs. Small drinking cups, flasks, and bowls are found primarily in burial contexts. In addition to ceramic containers, there are also a number of flat clay disks.

Decoration is rare in the earliest phases, limited largely to the area below the rim. The rims of larger vessels and clay disks were sometimes decorated with finger impressions. Decoration of the vessel body became more common and elaborate between 3500 and 3000 BC, often with numerous vertical incisions. The Neolithic ceramic vessels from Denmark provide a useful chronology based on the changes in shape and decoration that characterize TRB pottery over time (Figure 4.10).

Axes

Several new kinds of axes appear in the Neolithic. Two major categories will be discussed here: polished flint axes and battle axes. The former is a common tool, and the latter likely a weapon. Both may also have signaled a certain status for the owner or bearer. Other types of axes were also in use, including examples of early copper axes from southeastern Europe as well as various kinds of ground stone axes made from raw material quarried in Sweden and Norway (e.g., Bergsvik and Østmo 2011). Flake axes of flint continued in use from the Mesolithic period and are virtually indistinguishable between the two periods.

Polished flint axes are important diagnostic artifacts for the Neolithic (e.g., Nielsen 1985, Nordqvist 1991). In Norway, where Early Neolithic pottery is very rare, such axes are used as the primary evidence for the arrival of the Neolithic (Østmo 1986, 1990). Polished flint axes are usually made from large tabular cores, available largely from deposits of fresh flint in layers of chalk. Mines and quarries dating to the earliest Neolithic are known from the chalk belts that cross northern Denmark and southwestern Sweden. A number of mines and manufacturing sites have been identified (Becker 1980, 1993, Madsen 1993, Rudebeck 1987). The flint mines are described in a subsequent section in this chapter. Outside of the chalk zone, large flint nodules are known primarily from beach deposits.

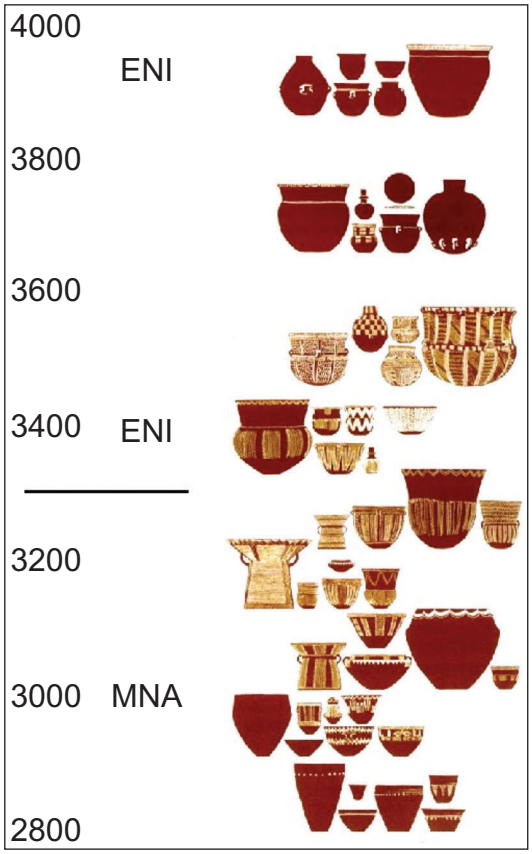


Figure 4.10.
Changes in TRB ceramics over time during the Early Neolithic and MNA.

There are three major types of polished flint axes (Figure 4.11), distinguished primarily by the shape of the butt-end—pointed-butt, thin-butted, or thick-butted. The predominant type of axe changes over time. The earliest type is the pointed-butt, mentioned earlier in this chapter, probably modeled on the polished jadeite axes circulating in western Europe in the late fifth millennium

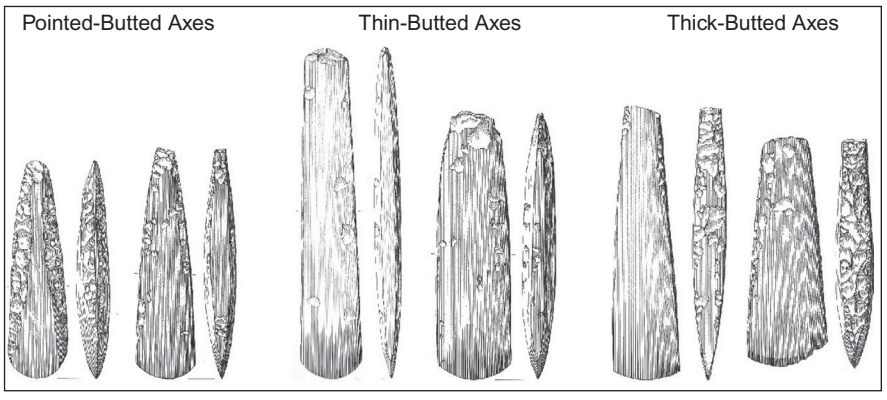


Figure 4.11.
The three major types of Neolithic polished flint axes in Scandinavia. The longest axe in the drawing is 36.5 cm (14″).

Figure 4.12.
A jadeite polished axe and a pointed-butt polished flint axe, both from Denmark.

BC (Klassen 2004, Klassen et al. 2011) (Figure 4.12). Pointed-butt axes appear around 4000 BC at the start of the TRB and fall out of use by the end of ENI, ca. 3500 BC.

Thin-butted axes are the most common type in the Early Neolithic and first appear ca. 3700 BC. These axes were initially polished on all four sides and made in a range of sizes, up to 50 cm (16.5″) in length. The extent of the polish and the remarkable size, along with their discovery in hordes and offerings, suggests that at least some of the axes were important in terms of ritual, status, and display. The thin-butted axes were eventually replaced by thick-butted. Thick-butted polished flint axes appeared toward the end of MNA, approximately 3000 BC, and continued to be used into the Early Bronze Age.

Battle axes come in a variety of shapes, sizes, and forms. These axes are weapons, not woodworking tools. They are usually perforated, with a hole perpendicular to the long axis of the axe and ca. 2 cm (almost 1 inch) in diameter. The axes are usually made from diabase, which occurs widely in the moraines of southern Scandinavia, with occasional examples made from porphyry. Battle axes are known from the beginning of the Neolithic until the end of the Bronze Age. Based on the large number of finds, many males must have carried one of these artifacts. Based on the preponderance of left-side head wounds among Neolithic skeletons, it seems that conflict was not uncommon. Violent death is also highlighted by the skull found at Porsmose (Sjælland, Denmark), pierced through the nose by a nasty bone point (Figure 4.38).

Neolithic battle axes appear early in the period (Figure 4.13), probably personal weapons carried by many males. There is a well-known example found in the flat grave at Dragsholm, Denmark, described below. Battle axes in the Early Neolithic are described as polygonal, in reference to their cross section. Battle axes in the Middle Neolithic A are called symmetrical or double-edged when both ends are sharp. In contrast, battle axes from the Battle Axe culture in MN B have a distinctly different cutting edge and butt end. Daggers largely replace battle axes as symbols of male status in the Late Neolithic. Battle axes are found across southern Scandinavia, but appear to be most densely concentrated in eastern Middle Sweden, the Oslo Fjord area, and southwestern Skåne (Hallgren 2008). There are many more polygonal battle axes in Sweden than in Denmark or Norway.

Ground stone battle axes were often replicas of copper weapons known from southeastern and central Europe (Randsborg 1975, 1979). The stone battle axes lack a sharp cutting edge, a feature that may be related to their largely symbolic role (Andersen and Johansen 1992). There are also simple flint daggers from the Early Neolithic that are copies of a similar copper artifact from the south of

Europe (Ebbesen 1992, Klassen 2000). The widespread production of stone battle axes and flint daggers in Scandinavia emphasizes the impact and value of this new metal in the Stone Age.

Dragsholm, Denmark A simple flat grave near the castle of Dragsholm on the west coast of the Danish island of Sjælland was excavated in the early 1970s. The place was of particular interest because two graves were found only 1.5 m (5′) apart, one containing two females from the Mesolithic period and the other a single 30-year-old Neolithic male (Petersen 1974). The Neolithic grave was of particular note for several reasons. Flat graves from the Early Neolithic are rare, and Dragsholm is one of the earliest, dating to 3650 BC (Price et al. 2007). Carbon isotope ratios measured in the bones of the skeletons indicate that the male individual had a largely terrestrial diet compared to the two females, whose diet was dominated by marine foods.

The abundant contents of the male grave were also of interest, and quite different from the females' grave. The grave goods included at least 60 amber beads, several flint blades, projectile points of bone and flint, an antler pick or shaft, a bone archer's wrist guard, a polygonal battle axe, and a small Funnel Beaker of an early type (Figure 4.14). This is one of the very few examples of a battle axe placed with a burial in Scandinavia and, along with the bow and wrist guard, may have identified this individual as a warrior. Most of the burials from the Early Neolithic have been found in communal megalithic tombs with other individuals. In many cases, the skeletons of these individuals are incomplete and an association of grave goods, if any, with a particular skeleton is usually not possible. The flat graves, while rare, provide a much sharper picture of the individual in the Early Neolithic. The battle axe and amber beads must have been important possessions of the Dragsholm man and symbols of his place in society.

Figure 4.13. Early Neolithic polygonal and double-edged battle axes and mace head.

Exchange and Trade

Community specialization in the production of specific goods and materials and long-distance exchange in prestige items were important aspects of the introduction of agriculture in Scandinavia (e.g., Simonsen 1975). The simultaneous appearance of status differentiation, community specialization in production, and trade and exchange of both local and exotic materials reflects a largely new pattern of social and economic organization that may be a more important hallmark of the "Neolithic Revolution" than the domestication of plants and animals and new subsistence strategies. The abundance of amber that appears

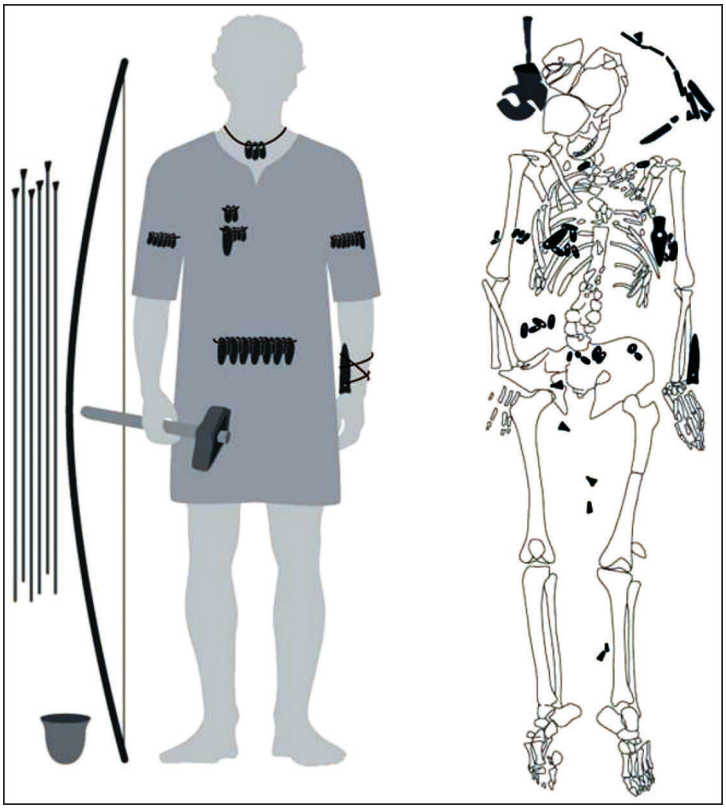


Fig 4.14.
The Neolithic male grave from Dragsholm, Denmark. The battle axe was found under his left arm and other artifacts around his head. Amber beads were scattered around the body.

in the Early Neolithic reflects the importance of rare and valued materials. Certainly, the extensive production of pointed-butted axes (copies of polished jadeite axes from the Italian Alps and Brittany) and battle axes (copies of copper axes from southeastern or central Europe) documents the importance of exotic status items.

The flint mines in the chalk areas of southwest Skåne and northern Jylland, discussed in more detail in subsequent pages, were an invaluable source for raw materials for the manufacture of axes both for local exchange and use and for long-distance trade. Polished flint axes were in huge demand, and the sources of large flint nodules for their manufacture were limited. The utility and perhaps status of these tools gave them great value. For example, there are very few large nodules of high-quality flint in Norway, yet polished flint axes from Denmark or southern Sweden are found in substantial numbers around the Oslo Fjord in an area with a radius of more than 200 km (125 miles). Neolithic farmers on the island of Bornholm in the middle of the Baltic, 40 km (25 miles) from the nearest mainland, imported tens of thousands of polished flint axes from southern Sweden and/or Denmark (Nielsen 2009). Similar patterns of long-distance trade are seen in other areas. Large depots of flint from southern Scandinavia have been found on the Baltic coast of northern Sweden at what appears to be an important trading center and transport point for moving resources from south to north and vice versa (Becker 1953).

Flint axes of Danish or southern Swedish origin are also known from the Neolithic in the Netherlands and Germany, according to Rech (1979), and also from Middle and northern Sweden and Norway (Clark 1948, Simonsen 1988, 1996, Welinder 1988). Several other networks for the exchange of axes were operating in the Early Neolithic (Bostwick Bjerck 1988); greenstone and diabase axe distributions mark two zones of exchange in western Norway (Olsen and Alsaker 1984).

Long-distance exchange networks characterize the Early Neolithic, and these networks expanded dramatically over time in their extent and in the amounts and types of materials involved. Amber, copper axes and jewelry, jadeite axe blades, and a variety of other materials were part of an extensive network of long-distance trade and exchange (Hallgren 2008, Zvelebil 2006). The close relationship between amber and copper is highlighted in a cache in a

TRB pot containing amber necklaces and copper axes and jewelry found near Bygholm, Denmark (Figure 4.15). Another example of this close relationship can be seen in an amber pendant from northern Jylland, Denmark, made in the shape of a copper axe (Figure 4.16).

Figure 4.15. Cache of amber bead necklaces and copper artifacts buried in a TRB pot in Denmark.

Amber is an almost magical substance, practically a gemstone. It is a beautiful, nearly gold, yellow color, translucent, lightweight, and often encloses insects or other objects. Amber is the fossilized resin of coniferous trees and is found in Scandinavia in abundance. The material erodes from deposits on the sea floor of the Baltic and North Sea and is eventually carried by currents and storm waves to the beaches of Denmark and elsewhere northern Europe. Amber was the "gold" currency of the Bronze Age, traded across the European continent to Greece, Crete, Egypt, and the Near East. Amber was also of great value in the Neolithic of Scandinavia, and much of this special material stayed at home during this period. There are numerous caches, hordes, and burials containing hundreds of pieces of this valued material (Ebbesen 1995).

Copper is relatively common in the Early Neolithic of southern Scandinavia. There is more copper in Denmark in this period than anywhere in Europe outside of the Balkan Peninsula. This copper takes the form of axes, beads, spiral bands, and even a halberd blade. While some of these objects may have been made or reworked locally, the source of the metal itself was far away. The materials traded from Scandinavia in return are unknown, but must have included amber. Organic products such as fur, feathers, lamp oil from seals, and honey may also have been included among the exports.

Beginning in the fifth millennium BC, the initial sources of copper in Europe were the copper mines in Serbia (e.g., Jovanović 1976, Pernicka et al. 1993). Klassen and Pernicka (1988) analyzed a copper axe from southern Scandinavia and documented the origins of the metal in southeastern Europe. These sources are more than 1,500 km (more than 900 miles) from the Danish border. More recently, it has been learned that copper was also being produced from local ores in the Tyrolean Alps of Austria by 4500 BC (Höppner et al. 2005). It now appears that most of the Early Neolithic copper objects found in southern Scandinavia came from this source area (Klassen 1999, Klassen and Nielsen 2010). Connections to Scandinavia must have been important; the largest copper axe in Europe north of the Alps comes from Jylland.

Figure 4.16.
Amber pendant in the shape of a copper axe.

TYPES OF SITES

A wide variety of archaeological sites have been found in the Neolithic, with more diversity than in the preceding Mesolithic. In addition to the settlements and specialized extraction sites in the TRB, there were many other kinds of places in use in this period, reflecting new activities. Flint was mined to obtain high-quality raw material for axes and other equipment. Ceremonial activities at lakes and swamps left bog offerings. Monumental tombs of various forms were constructed across the landscape. Palisades and enclosures were another kind of ceremonial center for larger groups. Some of these new uses of the landscape are described in more detail below. These new sites reflect increased importance of ideology and exchange in the Early Neolithic.

Settlements and Structures

Early Neolithic settlements were poorly known in Scandinavia until the last 30 years or so, when large, open excavations became a common strategy in rescue archaeology projects. Small excavation units could not expose a sufficient area to make such structures and the related posts and pits visible and coherent. In addition, such houses must have been largely on the surface of the ground without much depth, so that repeated plowing for millennia erased many of the traces of these structures.

The earliest Neolithic settlements in southern Scandinavia are found in two zones, either coastal in the upper levels of late Mesolithic settlements or inland in new locations. The majority of settlements were inland, at some distance from coastal areas, placed at lakes or streams where fresh water was easily obtainable and conditions for grazing animals were favorable. Most of the sites were small, containing individual farms (Larsson and Brink 2013). Inland settlements are sometimes found beneath burial monuments that protected the locations from later plowing. The association of settlement and subsequent burial at the same spot may reflect attempts to legitimize claims to place through ancestry and inheritance.

Two examples document this practice, Damsbo in central Denmark and Rastorf in northern Germany. The house at Damsbo was found beneath a later passage grave (Figure 4.17) and defined by the postholes that remained from the earlier structure. The postholes revealed a two-aisled house with four central posts. This large house, 12 m (40′) long and 4.6 m (15′) wide—the equivalent of a long, narrow classroom—was the first construction on this site, built sometime before the passage grave. Little was left of the house contents because of the later construction.

Excavations at Rastorf, Germany, revealed a similar structure with pits, a burial, and plow marks to the east in front of the house (Figure 4.18). It is unlikely that the plowed area and the house are contemporary, since the plow marks were also observed inside the house, but their location here may reflect the close proximity of

the farmers to their fields. The house is a large rectangular structure with a central row of roof support posts, approximately 17 m (55′) × 7 m (23′) in size, almost 120 m² (1300 ft²) in area. For comparison, that is the equivalent of two 18-wheel truck trailers side by side. The combination of cultivation and residence appears to be typical for an Early Neolithic single farmstead with associated fields (Steffens 2009). The normal arrangement for early TRB settlement during the fourth millennium BC appears to be single, isolated farmsteads.

The typical Early Neolithic house was either rectangular with oval corners or a more fully oval structure with a central row of roof support posts. This latter type of house has been designated as the Mossby two-aisled house, after the original place of discovery (Larsson 1992). The size of these elongated oval structures varies from 5 m (16′) to 17 m (56′) in length and 4.5 m (15′) to 7 m (23′) in width, ca. 35 (377 ft²)–130 m² (1,400 ft²) in area (Artursson et al. 2003, Eriksen 1992, Larsson and Brink 2013). The houses were usually oriented east-west. Cultural layers of midden and waste were found in front of the houses, outlining the former farmyard. The entrances to the houses were probably on one or both long sides. In most cases, no internal rooms were seen in the structures, although there are a few examples with an internal walled division. Often the house floor was sunken or semi-subterranean and contained an area likely used for the hearth and as a workplace and primary activity area (Larsson and Brink 2013).

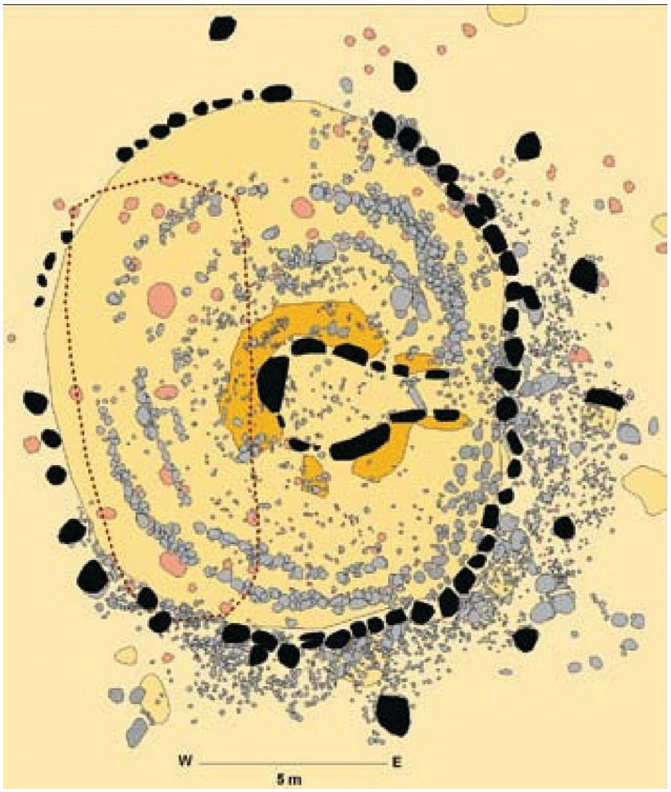


Figure 4.17.
Plan of a passage grave at Damsbo, Denmark. A two-aisled house, 12 m long and 4.6 m wide, was the first structure on this spot (dotted red line). A burial chamber with a passage to the east was found in the middle of this feature, surrounded by a spiral of smaller boulders where deposits of broken pottery vessels were found. A curb of smaller stones surrounded these features, and an outer row of larger granite boulders enclosed the whole.

Residential sites in the earliest Neolithic were small in size with a thin cultural layer compared to late Mesolithic settlements, suggesting that co-resident groups in the Neolithic were small (e.g., Andersen 1993). Madsen (1982) and Larsson (1992) argue that Early Neolithic settlements were regularly relocated within a short distance and rebuilt. This pattern has been observed repeatedly, for example, at the site of Dagstorp in Skåne, where a number of houses and huts were uncovered (Andersson 2004). Detailed analysis of the ceramics indicated that only two houses were in use at any one time, and they were apparently rebuilt at a nearby location several times. The significance of this relocation is not clear, but may relate to patterns of land use and soil exhaustion caused by slash-and-burn agricultural practices.

Houses of the Mossby type were present during the entire Early Neolithic. Structures from the later Early Neolithic were somewhat larger than the older constructions (Larsson and Brink 2013). Slightly different house types appear

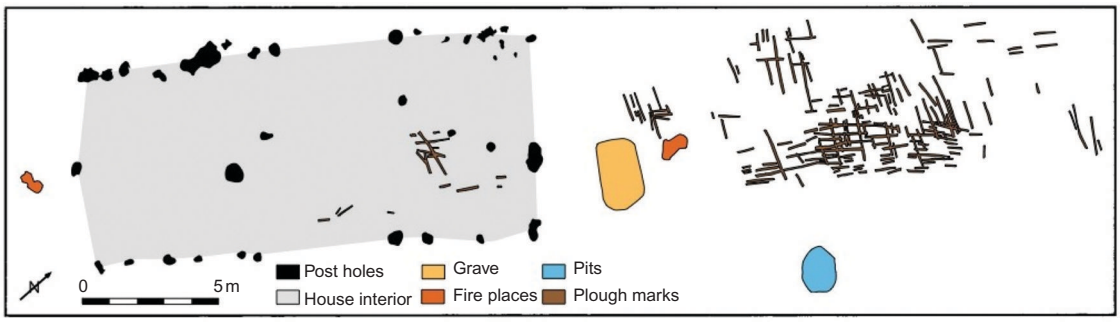


Figure 4.18.
The ENII house at Rastorf with burial, fireplaces, and plow marks.

at the end of the Early Neolithic and in the early part of the Middle Neolithic. The greater size might correspond to larger family groups or more than one family living at the same farm. Smaller houses or huts may be linked to farmsteads. However, no obvious clustering of farms into small villages is observed (Müller 2011).

The Neolithic settlement area expands over much of southern Scandinavia in ENII. Regional forest clearance is seen in pollen diagrams. Domesticates were more common. However, cereal growing continues to be limited; specialized hunting and fishing sites are still in use. Exchange of local and exotic materials appears to have intensified. An enormous amount of energy was invested in ancestor cults and other rituals, reflected in the construction of thousands of megalithic monuments and tens or hundreds of causewayed enclosures within a very short period. Elaborate offerings, including human sacrifices (Bennike and Ebbesen 1987), were placed in bogs and lakes. Within this context of larger population and large-scale construction between 3600 and 3200 BC—toward the end of ENI and into MN—the Early Neolithic settlement pattern in southern Scandinavia can be described as two levels with regional centers at the causewayed enclosures, surrounded by small settlements, each with a cluster of megalithic tombs and bog deposits. These types of sites are described in more detail later in this chapter.

The final stage of the TRB, MNA, 3300–2800 BC, is characterized by population growth and aggregation. One estimate of site size from eastern Jylland suggests that the early settlements covered ca. 500 (5,400 ft^2)–700 m^2 (7,500 ft^2), increasing to 4,000 m^2 (43,000 ft^2) in ENII and 20,000 (215,000 ft^2)–30,000 m^2 (323,000 ft^2) in MNA (Madsen 1982). It is not until the beginning of the Middle Neolithic around 3300 BC—700 years after the first appearance of the TRB—that substantial agricultural activity is seen. Vast areas of forest were cleared, and there is abundant evidence for cattle herding and the use of pasture as well as cereal cultivation, predominantly of wheat. Settlements increased dramatically in size and number, and more substantial houses were constructed.

Territorial divisions appeared to have been fixed; each territory may have been marked by a cluster of megalithic tombs. A group of hamlets appear to have shared a common regional ceremonial center at the causewayed enclosures (Madsen 1982, Madsen and Jensen 1982). Trade and exchange of flint axes, copper, and amber items intensified at this time. After 3300 BC, there is an influx of amber from

western to eastern Denmark, suggesting an intensification of inter-regional trade relations (Ebbesen 1995). The heavier reliance on food production was apparently associated with more people more ritual activities and a need for prestige status symbols (amber/copper jewelry) to signify leaders and authority (Kristiansen 1987, Skaarup 1985).

Several Neolithic settlements are described in the following pages in order to convey some sense of the scale, contents, and organization of these small farms. The focus is on early TRB settlements. The discussion includes early inland sites such as Mossby in southern Sweden and Lisbjerg Skole from eastern Jylland in Denmark, early coastal sites such as Bjørnsholm in northern Denmark, Almhov and Skjutbanorna in southwesternmost Sweden, Skogsmossen in eastern Sweden, and Kotedalen in southern Norway.

Mossby, Sweden

The site of Mossby is one of the earliest Neolithic settlements located on the south coast of the province of Skåne (Larsson 1992); it is dated between 4000 and 3900 BC. Features at the site included postholes, pits, and hearths, along with a brown-black sandy midden layer 15 cm (6″)–30 cm (12″) thick. The site contains a large house construction about 12 m (40′) × 6 m (20′) in size, marked by burned daub with wattle impressions, and three central posts 40–50 cm (16″–20″) in diameter. The pottery from Mossby is cord-marked in a fashion similar to the eastern Danish Early Neolithic, but only about 5% of the ceramics are decorated. Other materials at the site included flaked flint artifacts, polished pointed-butt axes, grinding stones, and carbonized grains and seeds. The total site area was 300–400 m^2 (3230–4300 ft^2), similar in size to other small Early Neolithic settlements across Denmark and southwestern Sweden, and in contrast to the larger inland Early Neolithic settlements in Middle Sweden (Larsson and Brink 2013).

Lisbjerg Skole, Denmark

New connections and interchanges for the express roadway north of Aarhus were planned. Archaeologists were sent out in advance to record and recover threatened historical and prehistoric remains in the right of way. One of the sites from this project, Lisbjerg Skole, lies approximately 2 km (1.2 miles) from the coast in a small stream valley. Early TRB remains along with a number of postholes and pits were encountered beneath a later cultural layer (Skousen 2008).

One of the earliest features found at the site was a row of overlapping pits with an abundance of potsherds, flint, and stone. The broken pottery comes from many different vessels and could not be reassembled into individual pots, suggesting that only some fragments were placed in the pits. Ornamentation is rare, but the pot forms are clearly from the early part of the TRB, belonging to a ceramic tradition termed Oxie that is better known in eastern Denmark and southwesternmost Sweden. In addition to the containers, there were fragments of ceramic spoons and flat clay disks in these pits. This ceramic material at Lisbjerg Skole also resembles the pottery known from the contemporary Michelsberg Culture, a few hundred kilometers to the south in central Germany. The flint artifacts in these pits were

typically TRB, with numerous scrapers and borers and some very fine long blades. There were no core axes, but polished flint axes were present, including one of the earliest known pointed-butt types.

The pits contained an abundance of charred plant remains, especially hazelnut shells and a few cereal grains from barley. Radiocarbon dates from hazelnut shells in these pits fall between 4000 and 3800 BC, making the cereal grains the oldest known from Denmark. There were also impressions of cereal grain inclusions in the fired clay of pottery vessels and impressions of chaff in the clay disks. The chaff and stems used for temper in the clay disks document the threshing, and probable cultivation, of these domesticated plants on site. It is interesting that all but one of the charred grains at the site are barley, while all of the impressions in clay are of wheat. This differential treatment of wheat and barley may reflect different uses of these cereals at the site. Wheat was probably used for making bread, while barley may have been primarily for brewing beer. Many years ago, an archaeologist named Robert Braidwood organized a symposium entitled *Did Man Once Live by Beer Alone?* (Braidwood et al. 1953) to consider the possibility that the Neolithic revolution was really about making beer. There is little direct evidence of brewing in the Early Neolithic, but the fact that funnel beakers are designed to hold liquids may be another hint that beer was important for the first farmers.

As is the case at most early TRB inland sites, bone preservation was not very good at Lisbjerg Skole. Some 330 fragments were found in the excavations, and only 11% could be identified as to species. There was a single wild animal bone from red deer; the remainder were cattle, with a few sheep/goats. A better picture of inland fauna was present at nearby Lindegård Mose, a small contemporary wetland site where 60% of a total of 400 bones could be identified (Skousen 2008). Domestic animals were predominant, especially cattle, with fewer pigs and even a few sheep/goats. Five species of wild animals were recognized—roe deer, red deer, aurochs, brown bear, and horse—about 10% of the identified animals. The wild horse was particularly surprising, given the general absence of these animals during the middle Holocene.

The very early TRB occupation at Lisbjerg Skole was followed by a second phase of TRB settlement, dating from approximately 3800–3400 BC. Pottery from this period was more heavily decorated and in a new style known as Volling, a more typical local Jylland tradition. Interestingly, several of the pits from the earlier Oxie occupation appear to have been reopened and reused in this second phase.

About 60 m (200′) southwest of the pits from the Oxie phase lay another cultural layer and a number of postholes and pits. One set of postholes outlined a typical early TRB house with a central row of roof support posts. The cultural layer in this area is found directly to the east of the house and behind it to the south, probably the farmyard and trash dump for the house. The house is approximately 13.5 × 4.5 m (44′ × 15′) in size, approximately 60 m^2 (650 ft^2) in area. Other postholes from three other structures suggest that the house may have been rebuilt several times. Pottery in the cultural layer and nearby pits indicates that the house belonged to the Volling phase occupation.

Bjørnsholm, Denmark

Bjørnsholm is a well-known shell midden in the central Limfjord area of northern Jylland, dating from the late Mesolithic and Early Neolithic (Andersen 1991, Andersen and Johansen 1992). The site is of particular importance because of the presence of shell midden and settlement deposits from both periods, along with an Early Neolithic burial monument. The Ertebølle layers at Bjørnsholm date from 5050 to 4050 BC and the Early Neolithic deposits from 3960–3530 BC. The location of residence did not change from the Mesolithic to the Neolithic. In fact, settlement continued in virtually the same spot following a 90-year hiatus in the use of the shell midden. The latest Mesolithic occupations are enormous, extending more than 300 m (1000′) in length and 10–50 m (33′–165′) in width along the coastline. The earliest Neolithic midden is smaller and a meter (3.3′) or so lower along the coastline, a response to slightly lower sea levels. There was a shift from oysters to cockles in the shell midden around the time of the transition, suggesting that changes in the marine environment may have been taking place. However, the earliest Neolithic pottery was present in the sequence before this shift in the shells in the midden occurred (Andersen and Johansen 1992).

The evidence for Early Neolithic settlement at Bjørnsholm comes from two scatters of artifacts that include early TRB pottery, in close association with the burial mound. Neolithic food remains were very similar to those from the Mesolithic, with the addition of small amounts of wheat, barley, sheep, cattle, and pig (Bratlund 1993). Fishing was a very important component of the subsistence base, and a variety of both freshwater and saltwater species appear in the middens (Enghoff 1995). Eels were particularly abundant among the remains. The Early Neolithic long barrow was built with a massive timber facade and held a single burial furnished with a large thin-butted polished flint axe and a stone axe with a splayed edge, which was a copy in stone of a central European copper axe.

Almhov, Sweden

The joint agreement between Sweden and Denmark in the early 1990s to build a bridge across the waters of the Øresund between Copenhagen and Malmö, Sweden, had enormous consequences on both sides. Apart from the bridge itself, road and rail connections had to be upgraded throughout southwestern Sweden. The project included the construction of a 25-km (15.5-mile) ring road around the city of Malmö, with new approach roads, roundabouts, and connecting rail links.

Swedish authorities decided to dig a City Tunnel 6 km (4 miles) long through the middle of Malmö as part of a rail link to improve connections to the bridge and the rest of Sweden. The enormous $1.25 billion project also required a substantial investment to insure that any archaeological remains in the path of the rail link were not destroyed. Many important finds resulted from the archaeological investigations, and several are discussed in this volume: the Almhov Neolithic settlement and burial area and the Skjutbanorna site discussed here, and the Hyllie palisaded enclosure (Brink 2009) in the next chapter.

The archaeological zone at Almhov covered a huge area. Almost 10 ha (25 acres; an acre is slightly smaller than an American football field) were opened in the excavations, exposing many houses, graves, pits, and other features (Nilsson and Rudebeck 2010). There were almost 1,350 excavated postholes and 382 pits and other features from the entire Neolithic period. Early Neolithic layers were concentrated in a 6–7 ha (15 acre) zone, and most of the remains were actually found in an area roughly 200 m in diameter. There were 192 pits dating to the Early Neolithic, with many finds of pottery, antler, flint, stone, and animal bones that appear to have been waste from various activities (Figure 4.19). In addition, there are relatively abundant remains of preserved cereal grains from some of the pits at Almhov, dominated by emmer and bread wheat (Sørensen and Karg 2012).

Other features and pits appear to have had a more ritual function, usually occurring in pairs or clusters, with distinctive contents, including feasting remains. These pits were arranged in a circle some 200 m (650′) across, and a pair of large posts stood behind each pair of pits. There were at least four structures with massive facades and associated graves to the west that must have been Early Neolithic earthen long barrows. In front of these four structures were "empty" zones ca. 6–8 m (20′–26′) in diameter without pits or other features. These may have been special ceremonial places in front of the tombs. Two dolmens and at least two houses from the Early Neolithic were also uncovered by the project.

What is also remarkable at Almhov, in addition to the large number of structures, the circle of pits, and other features, is the very early date. Almhov and the Malmö area have the earliest Early Neolithic remains in Scandinavia, with a few dates just prior to 4000 BC, almost as old as the earliest dates in northern Germany. These dates suggest that the initial introduction of farming into Scandinavia may

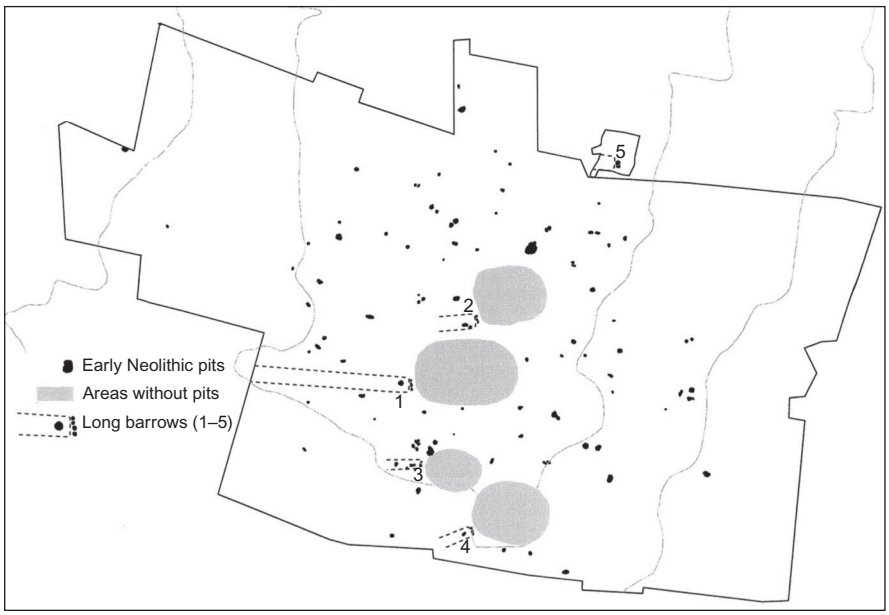


Figure 4.19.
The major excavation area at Almov with TRB features, including the long barrows indicated by the truncated ovals in the south-central part of the excavation unit. The large gray ovals indicate empty areas in front of the long barrows.

have taken place in the Malmö region, perhaps in relation to the abundant sources of high-quality flint present there.

Skjutbanorna 1A, Sweden

One of the most important Early Neolithic sites found during the initial surveys for the Øresund bridge and infrastructure investigations was a place called Skjutbanorna 1A for the modern shooting range where it was located (Jonsson 2005). The site today lies immediately south of the entrance to the Öresund Bridge and about 600 m (2,000′) from the coast. Excavations began here in 1996 and continued for two years, involving more than 100 archaeologists. The dominant feature of the terrain is an ancient beach ridge that formed about 4000 BC. The ridge was originally about 60 m (ca. 200′) wide and contained two archaeological layers from the very late Mesolithic and earliest Neolithic respectively, the earlier one in and beneath, and the later on top of, the beach ridge. These deposits have been radiocarbon-dated to between 4200 and 3700 BC, right at the time of the Mesolithic-Neolithic transition.

More than 7,500 m^2 (almost 2 acres) were excavated during the course of the project, exposing many layers and features. These included pits, hearths, and one flint-working area in the lower level. The upper level had even more pits and hearths, along with a number of cooking pits and post holes. The late Ertebølle materials extended for approximately 300 m (almost 1,000′) along the beach ridge, suggesting repeated visits to the location. Early TRB pottery was found along with Late Mesolithic ceramics in the lower part of the ridge. The earliest Funnel Beaker pottery found at Skjutbanorna 1A resembles decorated Ertebølle pottery. Certain types of decoration, e.g., nail impressions, are present in both the Ertebølle and the TRB traditions (Jonsson 2005). The stone artifacts were generally similar in both layers, with the exception of a number of Neolithic polished flint axes in the upper layer. Several of these could be identified as pointed-butt forms and early thin-butted axes. One of these polished axes was made from a distinctive type of flint known only from a source on the southern Danish island of Falster, where it must have originated.

Plant remains were preserved in limited amounts at the site, primarily as carbonized hazelnut shells and the seeds of various wild species. A large set of 5,500 animal bones survived. Among the 34 identified species were 17 different kinds of mammals, 11 kinds of fish, and 5 types of birds. Most of the bones recovered were from fish, primarily cod; wild mammals included seal, roe deer, wild boar, and red deer, in order of abundance. Most of the bones were found in the older, lower layer at the site. The three domestic species identified at the site—cattle, sheep/goats, and pigs—were found in pits just behind the beach ridge to the east.

The beach ridge at Skjutbanorna 1A is composed of sand, gravel, and rock, and includes an abundance of large flint nodules. The location must have been a good area for stone tool production, for fishing and sealing, and, after the arrival of the Neolithic, small-scale cattle herding. The evidence from the stone tools and pottery vessels indicates that substantial similarities continued through the transition from the Mesolithic to the Neolithic. At the same time, the introduction of domestic animals must have forced dramatic changes in the way of life of these last hunter-gatherers in southern Scandinavia.

It is also interesting to compare Skjutbanorna 1A with the contemporary site at Almhov (described above) just a few km (2 miles) to the north, where the evidence for cultivation and herding is pronounced and Neolithic burial monuments and ritual areas abound. Sites like Skjutbanorna 1A may be more typical of everyday domestic activities in the earliest part of the TRB culture, where the evidence for, and the impact of, the Neolithic was less visible.

Skogsmossen, Sweden

The Mälardal in eastern Central Sweden is one of the northernmost regions with remains from the Early Neolithic TRB. This area around the lake district west of Stockholm today is a low rolling landscape of rich farmland, small cities, and wealthy suburbs. This area has seen significant human population since the Stone Age. The rich soils and more moderate climate fostered by the waters of the lakes and sea attracted farming groups at a very early date. The region held major concentrations of Iron Age and Viking populations and continued to be of significant importance throughout prehistory. Today of course Stockholm is the capital of Sweden, and the area remains a major center of population and human activity in Scandinavia.

In the Neolithic, the region looked quite different, as much of the land area of today was submerged beneath the waters of a bay of the Baltic. The modern coastline had not yet rebounded to its present position. Sites from the Early Neolithic were located close to the coast at that time. One of the more interesting of these sites is known as Skogsmossen (Hallgren et al. 1997, Hallgren 2008). Skogsmossen lies slightly inland, about 0.5 km from the former coastline. The archaeological remains cover a large area some 400 × 200 m. Several different kinds of activity were observed within this area, including a house, a separate cooking place, locations for axe manufacture, and a small sacrificial bog.

The small bog had two distinct pools of water. At the bottom of each pool were found a series of post holes and large amounts of fire-cracked rock and burned clay, which the excavators interpreted as the remains of platforms for clay-lined fireplaces that would have stood over the water. In addition to the evidence for the platforms, there were substantial amounts of broken pottery, stone tools, and plant and animal remains. There were some 100 kg of pottery in the bog, including a large number of funnel beakers, along with some collared flasks and clay disks. Radiocarbon dates on food crusts from the pottery in the bog date the site to approximately 3720 BC in the Early Neolithic. Analysis of the fats retained in the clay of one of the pots from the bog documented the use of milk at the site (Isaksson and Hallgren 2012).

The stone tools included axes, querns, and many smaller artifacts, a number of which had been burned and broken before being deposited in the bog. The plant and animal remains were burned and include cereal grains and bone. The bog appears to have been a sacred place for the household where various sacrifices were made, perhaps required by the beliefs of these people.

Kotedalen, Norway

Most of the information regarding TRB in Norway comes from the southeastern corner of the country, around the Oslo Fjord. This area has some of the most

productive agricultural land in Norway. Early Neolithic pointed-butt axes have been found almost exclusively in the Oslo area and their distribution corresponds closely with the location of arable land (Østmo 1986). Ritual wetland offerings, megaliths, and burial ceramics of typical TRB types have also been found here (Østmo 1986, 2007). Radiocarbon dates around 3725 BC are among the earliest for the Neolithic in Norway (Østmo et al. 1996).

There is also a recently discovered site at Hamremoen on the south coast outside the modern city of Kristiansand (Glørstad and Sundstrom 2014). The site had been buried under 1.5 m (5′) of blown sand, perhaps the result of a single major sandstorm, terminating the occupation. A number of almost complete TRB pots have been recovered, along with stone artifacts; even a few bone and wood objects have survived. Radiocarbon dates places the site between ca. 3900 and 3600 BC. The most intriguing find at the site was not an artifact, but a 70 m (230′)–long dike and ditch, with an associated wooden wall or fence, along the southern border of the occupation area. The function of this feature is unclear, but Glørstad and Sundstrom suggest that is similar to the causewayed enclosures known in the TRB to the south.

Elsewhere in Norway, the onset of the Neolithic has been defined by the appearance of polished flint axes and cereal pollen. The earliest Neolithic generally lacks both TRB pottery and domesticated plants and animals, and it is not clear how far from the Oslo Fjord region a true farming Neolithic culture actually spread (e.g., Hjelle et al. 2006, Bergsvik 2012). Polished flint axes begin to appear in southern Norway after 3800 BC (Boaz 1994, Mikkelsen 1984). Locally produced stone adzes were the primary heavy working tools in western Norway, but TRB polished flint axes were present as well, imported from southern Scandinavia toward the end of the Early Neolithic and the beginning of MNA (Bergsvik and Østmo 2011). The site of Kotedalen in western Norway provides further information on the transition to the Neolithic in this area.

Kotedalen sits on the southern shore of Fosnstraumen, some 60 km (37 miles) north of Bergen. Fosnstraumen is a strait between two large islands, characterized by strong tidal currents that provide very rich fisheries (Bergsvik 2012). The cultural layer at the site contains sixteen phases of occupation from the Late Mesolithic to the Early and Middle Neolithic, documenting the importance of the location (Olsen 1992, 1995). Radiocarbon dates place the occupation of the site between 6000 and 2500 BC. The Mesolithic layers at Kotedalen were discussed in the previous chapter.

A number of important changes take place at the site after 4000 BC, including an increase in site size, an increased thickness of the cultural horizon suggestive of longer occupations, and new technologies (cylindrical cores) and materials (flint, slate) for stone artifacts. A major change in the availability of stone for tool manufacture occurred in Norway at the onset of the Neolithic. Large, chalky white nodules of flint became available, suggesting the transport of pieces of flint from mines in northern Denmark or southwestern Sweden. Flint nodules found in Norway were normally weathered with no chalky outside shell, common for flint that has moved naturally with the ice or been deposited on beaches.

Evidence for more sedentary occupation comes from the animal bones at the site (Figure 4.20), along with increases in both the number of species and the

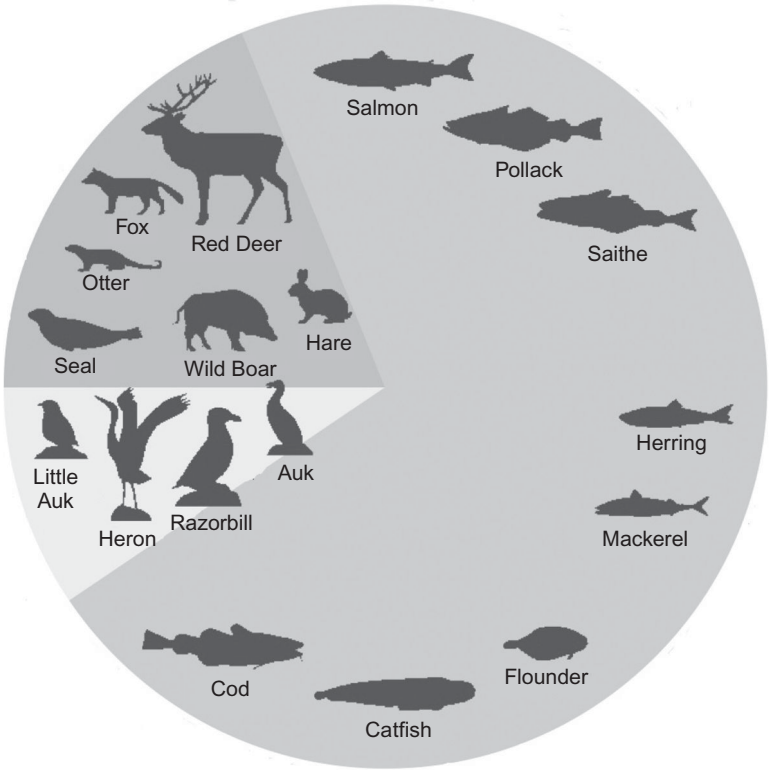


Figure 4.20.
Relative contribution of fish, fowl, and mammals to the animal bones found at Kotedalen, Norway.

number of bones present. At the same time, the remains of domestic animals are not found at Kotedalen. Imported vessels of Funnel Beaker ceramics document the Early Neolithic levels, dating to ca. 3650 BC. These early dates for the Norwegian Neolithic are surprising in that they are only slightly younger than the earliest TRB in Denmark and Sweden. However, the pollen of weed species associated with cultivation, pasture plants, and cultigens such as barley were not found until 3400 BC, suggesting that domesticates may have come even later. At the same time, the forested landscape became more open.

Thus it appears that agriculture itself did not arrive for some several hundred years after the evidence for TRB pottery at Kotedalen. The most characteristic finds from Neolithic levels at the site are artifacts associated with hunting and fishing (Figure 4.21). The absence of domestic animal bones in the faunal remains and of cereal impressions in the pottery led Prescott (1996) to question the role of agriculture at this site and elsewhere in Norway outside of the Oslo Fjord region. He argues that food production does not arrive until the Late Neolithic in the rest of Norway, around 2200 BC. Others argue that some form of animal husbandry was practiced in western Norway in the Early Neolithic (Bakka and Kaland 1971, Bostwick Bjerck 1988, Næroy 1993). In this sense, the Early Neolithic of Norway may resemble the late Mesolithic in Denmark and Skåne, reflecting sedentary hunter-gatherers in contact with farming groups, exchanging a subset of materials and ideas (Prescott 1996).

Olsen (1995), the excavator of Kotedalen, suggests that successful hunter-fisher societies in this region were only minimally influenced by eastern Norwegian TRB groups in the Oslo area. Olsen argues that the first farmers of Norway occupied the coastal landscape, one of the richest biotopes for marine exploitation anywhere. In this context, farming and herding were likely minor concerns in a bigger picture of hunting, gathering, and fishing employed by sedentary groups.

The Early Neolithic in Norway is distinct from that of southern Scandinavia, and in this sense just barely Neolithic. A number of innovations in the Early Neolithic likely reflect both the dynamics of such complex hunter-gatherers and long-distance exchange among many different groups. Mesolithic and Early Neolithic artifacts are found in the same favorable locations for hunting and fishing activities at the shore along the outer coast and in the fjords. It is not until the

Figure 4.21. Fishing equipment from Kotedalen. Stone net sinkers and bone fishhooks.

beginning of the Late Neolithic in Norway, ca. 2200 BC, that this pattern changes in the wake of major farming expansion and the large scale import of flint daggers from Jylland, Denmark (e.g., Bakka and Kaland 1971).

Flint Mines

Some of the most archaeologically visible remains of the Neolithic are the tens of thousands of polished flint axes scattered across the landscape of southern Scandinavia. Because the normal flint found on the surface of the ground has been redeposited and subject to natural forces that reduce the original pieces in size and leave fracture lines, the best flint for making axes was obtained from *in situ* geological deposits. Flint mining became an important activity in areas where there was high-quality flint close to the surface of the ground. In Scandinavia, sources of flint in chalk deposits are limited to the northern parts of Jylland, easternmost Denmark, southwest Skåne, and northeastern Skåne. These areas were also the focus of substantial flint mining to obtain large nodules for the production of polished flint axes (Becker 1980, 1993, Rudebeck 1987).

The earliest flint mines in Skåne at Södra Sallerup date from 4000 cal BC (Olausson et al. 1980), at the very beginning of the Early Neolithic. Mining for flint was also an important part of Early Neolithic cultures across western Europe (Grooth et al. 2011). A variety of methods were used to extract the flint, depending on the conditions and depth of deposit. Surface exposures of flint nodules

Fig 4.22.
Mine shafts (white circles) dug into chalk bedrock to obtain large flint nodules in southwest Skåne, Sweden, exposed by large surface excavations. The large digging machine provides some sense of scale.

were exploited with small open pits. Actual mining techniques were used where the flint was deeper in the ground. In the upper levels, where the risk of collapse was higher, the miners dug wide pits with sloping walls. At deeper levels, the chalk bedrock became more stable, and proper shafts could be dug (Figure 4.22). The shafts were continued until veins of quality flint were encountered, often at a depth of 5 or 6 m (16′–20′) or more. From there, horizontal passages were carved out to the sides to collect as much flint as possible. Flint mining was risky business.

Bog Offerings

Bog offerings—another category of Early Neolithic site—are generally small votive sacrifices of various material deposited in what were likely sacred lakes, springs, and bogs across the landscape. The bogs were used for sacred offerings through much of the prehistory of Scandinavia, and in some cases these offerings have endured to the present. The preservative powers of the Danish bogs can amaze. The bog people from the Iron Age are of course one astounding example of the past that was preserved in the bogs.

Hundreds of Neolithic deposits have been reported, usually pottery vessels with food. One example of an Early Neolithic pot with a wooden spoon was uncovered in the Åmose bog in central Sjælland and is shown in Figure 4.23. These ceremonial sites may also contain deposits of flint axes, amber beads, or copper ornaments and axes—evidence of wealth accumulation and exchange at this time. The flint axes are

often very fine examples, unused, and quite large (Figure 4.1). The longest known example was 45 cm (18″), and the largest number in an offering was 15. Amber was also buried in large quantities. The largest known cache was found in northern Jylland and weighted 8.5 kg (19 lbs.).

Animal and human sacrifices were also occasionally placed in the bogs (e.g., Bennike and Ebbesen 1987, Koch 1987, 1998). There are, for example, a number of sacrificial bulls with a lethal blow to the forehead found in Denmark. At Sigersdal in eastern Denmark, two young women, 16 and 18 years of age, probably sisters, were found with a large pottery vessel. One of the women had been strangled with a cord. The skeletons date to ca. 3500 BC and may be the oldest human sacrifices in Europe. On the island of Langeland, a sacrificial deposit from the early Middle Neolithic included five oxen, four pigs, one goat, one dog, and three humans. These offerings in the Neolithic represent a considerable value in terms of labor, materials, and surplus production—as well as human life—invested in ritual activities. These deposits of items of wealth and value reflect the removal of valuable materials or individuals from circulation and may have served to stimulate even more production. Such ritual activities probably also reflect the uncertainty of life and survival in the past. Sacrifice may have been a means to appease the forces of nature and the supernatural.

Figure 4.23.
Wooden spoon and bowl, part of a food offering placed in the large bog at Åmose, Denmark.

Monumental Tombs

Megalithic ("large stone") monuments provide dramatic and enduring evidence of the Neolithic in western Europe. The first farmers of Atlantic Europe built tens of thousands of massive stone structures, often still visible today, along the western fringe of the continent in Portugal, Spain, France, Belgium, Ireland, Britain, the Netherlands, Germany, Denmark, Sweden, and Norway (Midgley 1992). These include world-renowned sites such as Stonehenge in southern England and the long lines of standing stones at Carnac in Brittany. The megaliths are distributed geographically in a curious patchy pattern that defies explanation. Different traditions of pottery and house construction were associated with these monuments; different groups of people—different archeological cultures—built the same kinds of tombs.

In northern Europe alone, the number of monumental tombs is estimated to have been more than 40,000 (Furholt and Müller 2011). The distribution of these megaliths is largely in the lowland areas of the North European Plain and southern Scandinavia (Figure 4.24). The stones and mounds of these structures serve today as a powerful reminder of ancestors and what was. It is difficult to grow up in areas

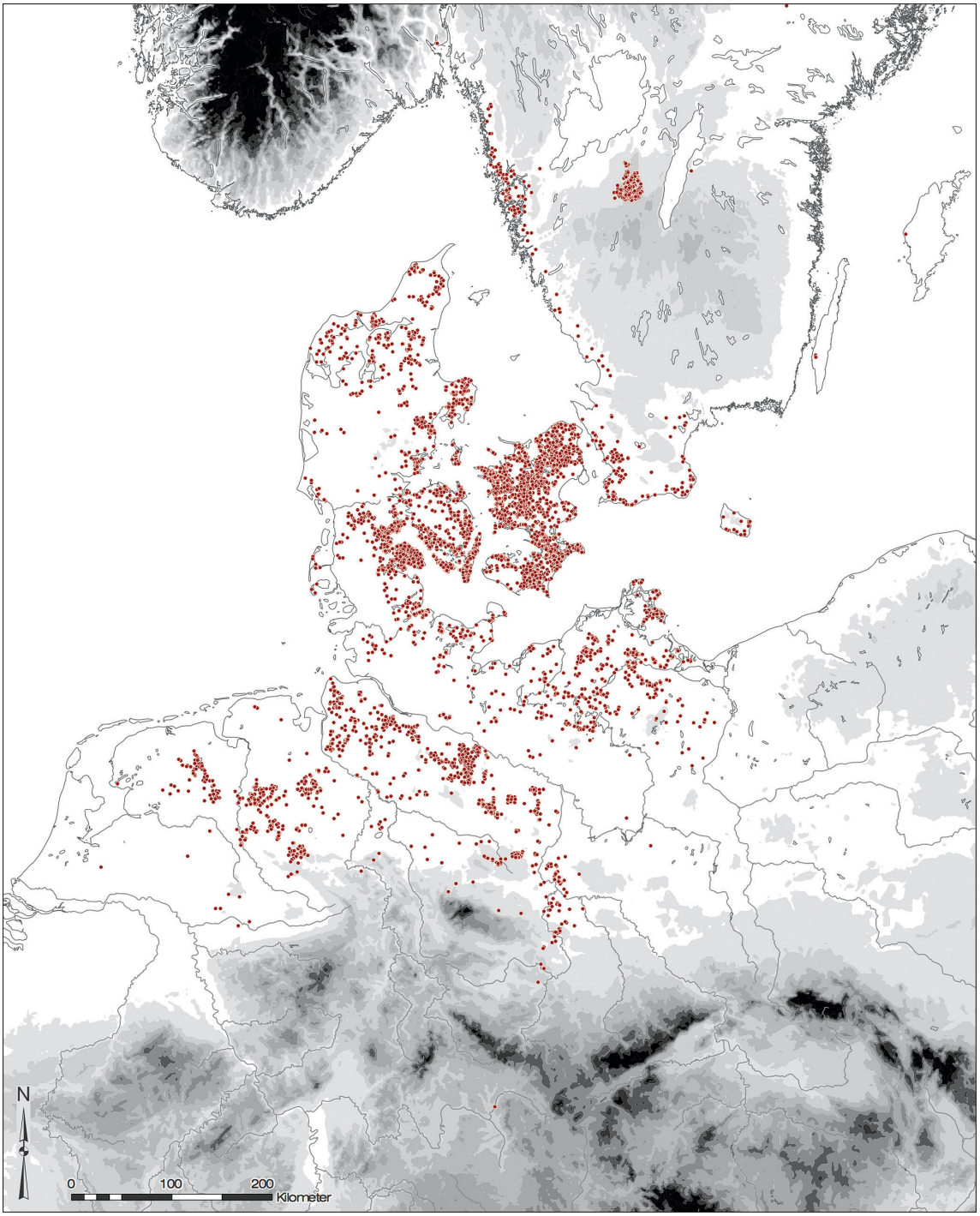


Figure 4.24. The distribution of megalithic tombs in northern Europe (Fritsch et al. 2010).

of visible prehistoric monuments without an appreciation for, or at least a curiosity about, the past.

There are three major types of monumental tombs associated with the TRB culture, non-megalithic earthen long barrows and the megalithic tombs—dolmens and passage graves. The long barrows appear early in the TRB and the first megalithic tombs come later, just before the beginning of ENII, ca. 3500 BC, slightly earlier in northern Germany (Müller 2011). A study by Persson and Sjögren (2001) summarized the radiocarbon dates from these tombs and argued that dolmens and passage graves in Sweden were roughly contemporary, showing no chronological sequence in construction.

In Denmark, on the other hand, there does appear to be some sequence in the construction. Dolmens appear earlier, beginning around ca. 3600 BC, and continue to be built in MNA, ca. 3100 BC. The later dolmens are usually somewhat larger than the earlier. Many of the estimated 40,000 or more megalithic tombs from Scandinavia and northern Germany were constructed during a brief span of perhaps 200 years during the Early Neolithic II phase. Passage graves in Denmark were erected in a very short period in MNA from ca. 3250 to 3100 BC. Megalith construction is largely contemporary with the construction of the causewayed enclosures described below. Gallery graves are a later type, constructed primarily during the Late Neolithic, with a few examples from MNB (Sjögren and Persson 1996). These various types of graves are discussed in more detail below, following a short introduction.

Very few simple graves are known from the Early Neolithic. Poor conditions of preservation have left only a handful of flat graves from this period. The example from Dragsholm, Denmark, is one the best. Burials in the earthen long barrows are also seldom preserved. Although the grave chamber is usually visible in excavations, there is little left of human remains. The few primary burials indicate that early wooden burial structures and the first dolmens were intended for one or a few individuals (at most five persons have been found). The dead were buried in an extended position accompanied by grave goods of pottery, flint and bone artifacts, and amber beads. There is no obvious correlation between type and size of the grave, type and amount of grave goods, or the age and sex of the deceased. There are no more than 50 earthen long barrows known in southern Scandinavia so clearly only a small part of the population was buried in such a fashion (Laux 1996).

Burial in the wooden chambers of the earthen long barrows and in the dolmens indicates that the primary funerary tradition of the TRB period initially was to bury certain individuals as intact and complete bodies in an extended position (Skaarup 1985). In several cases, modifications of human skeletons appear to have taken place, including the removal of bones (especially skulls), deposits of selected bones, cleaning of the burial chamber, and secondary burials of disarticulated skeletons.

Passage graves and some of the later dolmens, on the other hand, are often described as communal tombs containing tens or even hundreds of burials (Figure 4.25). During MNA, it seems that everyone was entitled to burial within a large collective tomb. The communal tombs were not places for elaborate grave goods or

Figure 4.25.
Scattered human remains from the interior of an undisturbed passage grave in northern Sjælland, Denmark.

furnishings for the dead. On the other hand, pottery vessels with food and drink were placed at the entrances to these tombs for years and perhaps generations after burial.

An interesting debate has arisen regarding the nature and meaning of the burials in the passage graves. Some years ago, Shanks and Tilley (1982) argued that the human remains in the MNA tombs were secondary burials of defleshed bones that resulted in an anonymous collection of ancestors—rather than individuals—that concealed specific familial relationships, thereby masking inequality in society. Sjögren (2010), however, has suggested that recent evidence from west-central Sweden indicates that the skeletal remains represent primary burials, that intact bodies were placed inside the chambers which served to preserve the cadavers in the cool, constant environment of the tomb. From this perspective, the visibility of individuals as ancestors was maintained for some time after death, and social and familial relationships over generations were more strongly defined. The issue of primary versus secondary burial remains unresolved at present, and, of course, both forms of burial may have been practiced.

Another unusual type of burial has been found in western Jylland during MNA. These so-called stone packing graves (or stone heap graves) were built between 3100 and 2800 BC. These tombs are found as pairs or lines of grave-size pits packed with stones, usually accompanied by a small mortuary house (Figure 4.26).

Long parallel rows of these graves have been uncovered. The longest row is almost 1,700 m (a bit more than a mile) and probably ran beside a path or road (Johannsen and Laursen 2010). Poor conditions for preservation in the sandy soils of western Jylland mean that bone and wood are generally absent. There are occasional indications of ox skulls at one end of the grave. Grave goods were usually flint axes and chisels, and occasionally a battle axe. These objects were placed in the small mortuary houses rather than in the graves themselves.

Figure 4.26.
Stone packing graves and mortuary house in western Jylland before and after the stone packing was removed.

Earthen Long Barrows

Early Neolithic earthen long barrows with large wooden structures were first recognized in Denmark in the early 1970s (Madsen 1979). The earthen long barrows are described as non-megalithic; huge boulders were not used in their construction. Timber and earth were used to make these long earthen mounds monumental. More than 40 non-megalithic long barrows are known today, predominantly in western Denmark. These long barrows are often found in association with settlement remains from the earliest Neolithic (Liversage 1992, Madsen 1979); for example, at Bjørnsholm, discussed above. In eastern Denmark, simple inhumations without mounds were more common. Only eight or ten earthen long barrows are known from southern Sweden.

The barrows show variation in both construction and size. Normally, the barrows are low, 1–2 m (3.3′–6.5′) high, and vary in length from 20 m to more than 100 m (65′–330′). Certain distinctive features were normally incorporated in their construction: a rectangular or trapezoidal palisade enclosed the mound, the interior of the barrow was sometimes transversely partitioned by rows of stakes, and a massive timber facade was usually erected at the east (often wider) end of the mound. Facade construction at the eastern end of the barrow usually involved a line of several large posts, occasionally with a small stone pavement in front of the facade. This area in front of the facade is often associated with deposits of pottery. The facade was usually demolished sometime after construction, either by burning or removal of the posts. The graves in these long barrows were placed near the facade in the eastern end or elsewhere along the longitudinal axis of the mound. Only one, or a very few, graves have been found in each of these mounds (Figure 4.27), providing substantial evidence for emerging social differentiation in Early Neolithic society.

Nothing like these new, mounded, elite internments are known from the Mesolithic. The appearance of barrows at the onset of the Neolithic indicates that substantial changes in social organization took place at the time of the transition. Perhaps concepts of property related to the creation of fields and

Figure 4.27.
Soil silhouettes of four burials in an earthen long barrow from the site of Bygholm Nørremark in Denmark.

pastures are reflected in new social norms and rules. Communal involvement and participation in the construction and maintenance of these monuments emphasizes the fact that the barrows were more than just places for the dead. The earthen long barrows likely were a focus for local ceremonial activities for several centuries.

Jättegraven, Sweden The earthen long barrow at Jättegraven in Sweden provides an example. Until 1990, these tombs were unknown in Sweden. Although 20 or so had been discovered in Denmark from the 1970s, the monuments were strangely missing in the Early Neolithic of Skåne. Excavations at Jättegraven—a rather nondescript low mound about 1 m (3.3′) high and 60 m (almost 200′) long with a few exposed large perimeter stones on the south coast about 20 km (12.5 miles) east of Malmö—corrected that situation. The absence of a visible cist or stone chamber in the mound initially suggested it might be an earthen long barrow.

The mound was the focus of investigations in the early 1990s (Larsson 2002a, 2002b) that eventually documented the first earthen long barrow in Sweden. Jättegraven turned out to be rather typical for such tombs and was extremely early. Radiocarbon dates for the site provided a date of ca. 4000 BC, at the beginning of the Early Neolithic. Excavations focused on the east end of the mound, where major structures were normally found (Figure 4.28). Here a trench had been dug in the Early Neolithic to support several standing wooden timbers that may have been several meters high marking the east end of the tomb.

On the original ground surface under the mound and largely to the east in front of the timber facade was a stone pavement with a scatter of potsherds, perhaps evidence of the placement of ceramic vessels at the tomb. The timber facade was

aligned with the large curbstones that surrounded the entire mound. Evidence of a burial was found 28 m (90′) west of the eastern facade, where a single standing stone and a few pieces of amber probably marked the original grave in the monument. Directly beneath the long barrow were found the remains of an Early Neolithic settlement, suggesting that the monument was built on top of an abandoned farm.

Figure 4.28.
The excavated eastern end of the earthen long barrow at Jättegraven, Sweden. A. Neolithic trench for supporting large wooden posts, B. pavement stones, C. stones in trench, D. ceramics. The large, black numbered objects are the remains of large curbstones encircling the monuments.

Dolmens and Passage Graves

Dolmens usually contain a small stone-lined chamber for burial covered by three or more standing boulders supporting a massive capstone (Figure 4.29). These huge

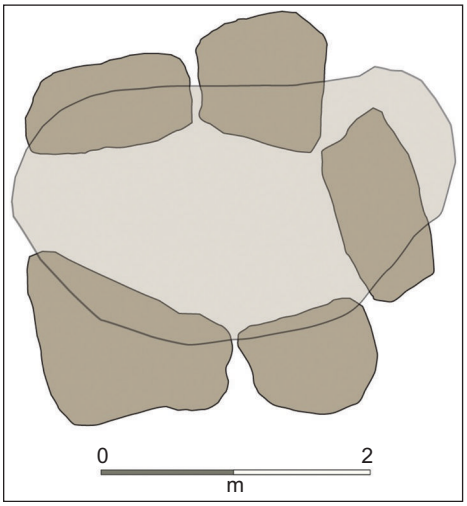
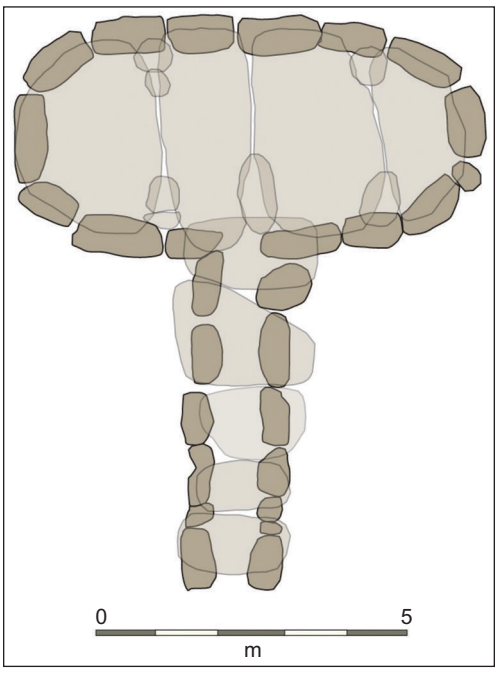


Figure 4.29.
Schematic plan of a dolmen from southern Scandinavia with capstone in lighter color.

granite boulders weighed many tons and require an enormous amount of labor for construction. The stone structure was often covered by a round or rectangular mound, circumscribed by a row of large stones. Like the simple inhumation graves, the early dolmens were apparently originally intended for a single funeral (Skaarup 1985). The dead were placed in a similar position and given the same equipment as in the inhumation graves. Only later in the Neolithic were larger dolmens and then passage graves built as collective tombs for tens or hundreds of individuals. More elaborate offerings, involving many pottery vessels, were made at the entrances of the tombs. Similar offerings of a few pots were made at the east end of the long barrows at the beginning of the Neolithic.

Passage graves are another form of megalithic tomb from the Neolithic. A passage grave is a larger megalithic tomb, entered via a long, low, narrow passage that opens into a larger chamber, generally near the center of the covering mound (Figure 4.30). The walls and roof of the construction were made with huge stones (megaliths). These larger megalithic tombs contain many burials, sometimes hundreds. The burial place may have been intended for most or all the members of a related group of farmsteads or hamlets or as a communal tomb for many generations of the same family or community. These tombs must have symbolized the collective and cooperative nature of the group, both in life in the construction effort and in death in the shared space. The erection of these monuments ended everywhere around 3000 BC.

Figure 4.30.
Schematic plan of a passage grave from southern Scandinavia with capstones in lighter color.



There are thousands of these megalithic tombs still standing today across southern Scandinavia, western Sweden, and northern Germany. The megalithic tombs are sometimes found in lines or rows across the landscape and were probably built along Neolithic trails or roadways. Wheel tracks have been found beneath at least one of these monuments. The tracks found at the TRB monument of Flintbek LA3 in Schleswig-Holstein have been dated to 3400 BC (Mischka 2010), perhaps the oldest evidence of the wagons anywhere in the world (Bakker et al. 1999). However, the tracks might also have come from a sledge used in the construction of the tomb.

As part of the communal burial phenomenon that appeared ca. 3250 BC, burial in the megalithic tombs apparently became the second step in the funerary process. The skeletons found in the megaliths are usually incomplete, missing smaller bones or skulls or other parts, and disarticulated, i.e., not in correct anatomical order. Part of the burial ritual may have involved lengthy ceremonies and treatment of the bodies of the deceased prior to final disposition in the tombs (this issue is discussed above). Some of this treatment of the

deceased may have taken place at the causewayed enclosures described in the next segment.

Parker Pearson (2012) has characterized Durrington Walls and Stonehenge in the Salisbury Plain in Wessex, England, as way stations for the passage of the dead. Durrington Walls involved the passage from life to death, involving celebration and perhaps preparation of the dead for their journey. Nearby Stonehenge, a short journey down the Avon River, was the home of the ancestors, a final resting place and cemetery. Perhaps a similar situation on a smaller scale is reflected in the relationship between the causewayed camps and megalithic tombs.

Kong Svends Høj, Denmark Kong Svends mound, on the island of Lolland in southern Denmark (Figure 4.31), is one of the most famous passage graves in Denmark, both because of its size and its history of investigation. The first recorded diggings at the mound were done in 1780 by a Danish prime minister and a pastor's son who later became bishop of Copenhagen and one of the founders of the National Museum. The monument has since undergone two episodes of restoration in order to remove vegetation and reset the position of the standing stones.

Kong Svends Høj is a remarkable example of a very large megalithic tomb from the Middle Neolithic (Dehn et al. 1995). The 11 m (36′)–long passage grave is enclosed in a large, rectangular, house-shaped mound surrounded by high curbstones. The tallest of these is 4 m (13′). The passage grave was constructed ca. 3200 BC by craftsmen capable of splitting the large standing stones inside the chamber. These massive split boulders are referred to as "twin stones." Kong Svends Høj contains at least 10 twins supporting the massive capstones of the tomb. The passage entrance to the tomb was not found until the first restoration in 1942, located on the side rather than in the normal eastern location. The artist's reconstruction

Figure 4.31. Kong Svends Høj on the island of Lolland in southern Denmark (photo by Lars Bjarke Christensen).

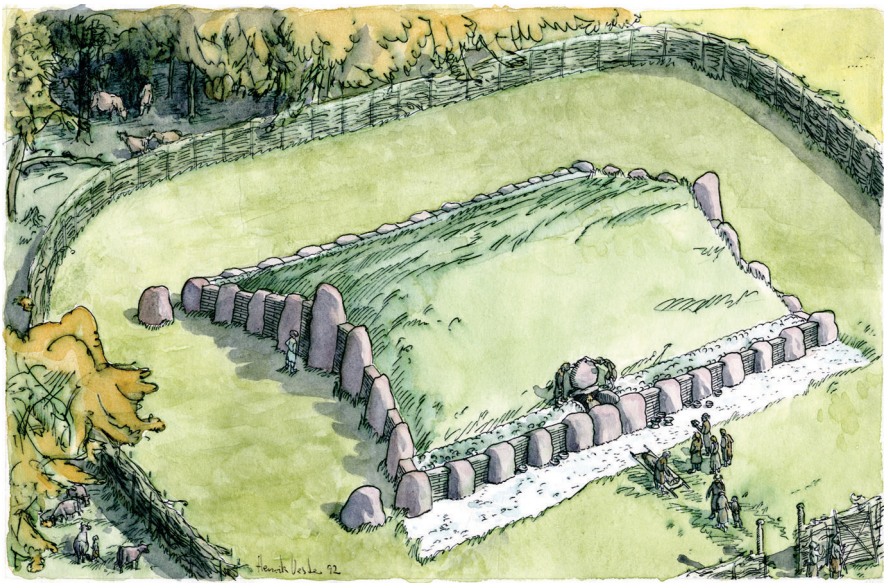


Figure 4.32.
An artist's reconstruction of Kong Svends Høj (drawing by Henrik Vester Jørgensen).

below shows this entrance and a wicker fence enclosing the entire structure and its immediate surroundings (Figure 4.32).

Enclosures

Two types of enclosures were erected during the Neolithic in southern Scandinavia (Larsson 2012). These monuments are among the largest constructions ever made in Scandinavian prehistory.

The first and older of the two were the causewayed enclosures, defined by a line or circle of interrupted ditches or trenches usually associated with a palisade (Andersen 1990, 1993, Madsen 1988). The term *causewayed* is taken from English examples, where the gaps between the ditches were assumed to be entrances into the center of the circular feature. There are at least 40 such causewayed enclosures in northern Germany and southern Scandinavia (Klatt 2009).

These features are made up of a series of unconnected oblong pits, which together form the longer ditches of the enclosure. The artist's reconstruction of the ditches and palisade at Sarup, Denmark, conveys the arrangement of these features (Figure 4.33). Andersen (2002), Müller (2011), and others have hypothesized that these features represent a succession of pits that were dug collectively by small groups like families. Ritual deposits at the bottom of the ditches include whole pots, heaps of tools and bones, skulls and bones of humans and cattle, and dark greasy layers of organic material. The palisade and/or line of ditches usually enclosed a natural promontory, peninsula, or small hill—some sort of isolated area.

These enclosures date from the later part of ENII into early MNA, between 3500 and 3100 BC. During this same period, thousands of megalithic tombs were erected across the landscape by these industrious farmers. It has been assumed that there is a strong relationship between the causewayed enclosures

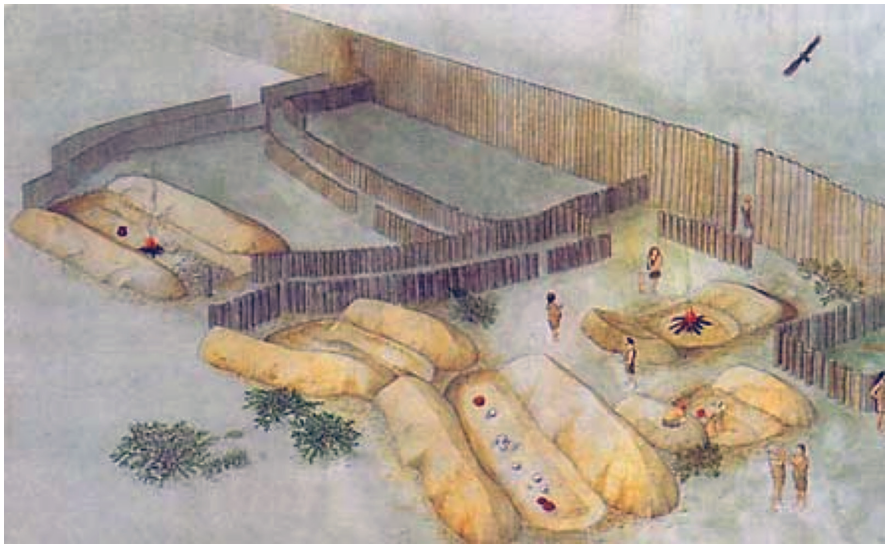


Figure 4.33.
An artist's reconstruction of the palisade, fences, and ditches at Sarup, Denmark (drawing by Louise Hilmar).

and the megalithic tombs in terms of death and burial. The interrupted ditches at the causewayed camps are hypothesized to be places for the ceremonies of death, accompanied by feasting and the initial burial of the dead. These ditches were later reopened, often repeatedly, presumably to remove the skeletonized remains of the deceased for placement in a megalithic tomb. The enclosures vary from 1.6 to 20 hectares (4 to 50 acres). Based on the size of these structures and the area enclosed, communal activities at the causewayed enclosures may have involved several hundred people (Andersen 1993). The site of Sarup in Denmark is a well-known example of such a structure. Another distinctive Early Neolithic site, Döserygg in southwestern Sweden, has a linear double palisade demarcating a ridge with more than 20 megalithic tombs. Both of these sites are described in more detail below.

Later in the Middle Neolithic, between 2900 and 2600 BC, another type of feature called a palisaded enclosure appeared (Brink 2009). Artifacts from both the TRB Culture (Middle Neolithic A) and Corded Ware Culture (Middle Neolithic B) have been found associated with these enclosures. The palisade enclosures are only found in the southernmost part of Sweden and east of the Storebælt in Denmark (Larsson 2012). The idea for these enclosures likely originated in the Chasséen culture in northern France and Belgium, where the earliest examples are known (Müller 2011).

These structures were built as a large palisaded oval with one or more rows of heavy posts. The palisaded enclosures are assumed to be places of assembly, similar to the earlier causewayed enclosures, although the association with death and burial is less obvious. They may also be defensive structures or large animal pens. Their function is unclear. Large quantities of flint, especially burned flint, are often found associated with the palisades. The palisades appear to be involved in both the manufacture of flint axes and the destruction of large quantities of flint in ritual ceremonies. The enclosures may well have been important in terms of regional and superregional interaction and trade (Brink 2009).

Sarup, Denmark

A long-term archaeological project on the south coast of the Danish island of Fyn, begun in 1970, has uncovered a series of sites that reveal a fascinating aspect of the ancient human landscape (Figure 4.34). Within a small area of 20 km^2 (7.7 square miles), numerous Neolithic structures such as houses, megalithic monuments, and causewayed enclosures have been found and excavated (N. Andersen 1997, 1999, 2011). The focal point is a place called Sarup, a causewayed enclosure dating from the Early Neolithic.

The enclosures at Sarup (there are two—one earlier, one later) sit near the end of sandy promontory between two streams. The palisades of the enclosures close off the end of the peninsula. The earlier and larger enclosure was built around 3400 BC and demarcated an area of 8.5 ha (21 acres). A second enclosure was built 150 years later, incorporating a much smaller area but along the same lines as the first, with palisade, fenced yards, and segmented ditches.

The first palisade was a substantial structure, almost 600 m (2,000′) long, curving in a hook shape to isolate the end of the promontory (Figure 4.35). First, a trench 1 m (3.3′) deep was dug, and then huge planks of split oak were erected in the trench. These planks probably stood 3 m (10′) above ground and came from oak trees with a diameter of up to 40 cm (16″). This palisade would have been a massive wall enclosing the end of the peninsula, blocking it from sight and controlling movement into the area. There was one entrance to the enclosure, 1.6 m (5.2′) wide, shielded by a short fence in front of it. The archaeologist at Sarup, Niels Andersen, estimates it would have taken 100,000 hours to cut the trees, dig the trenches and post holes, and build—something on the order of 200 people for three months.

So far, it sounds like a defensive construction. But there was very little inside the enclosure at the time it was erected—nothing to protect. Most of the archaeological remains are outside the palisade, along the wooden structure. Large amounts of pottery, burned bones (including human remains), burned rocks, and charcoal from hearths were found close to the outside of the palisade. Adjacent to the palisade were a series of 19 fenced-in lots, generally rectangular in shape. The purpose of these lots is unclear. In front of the palisade and the fenced lots were two parallel rows of long and short segments of ditches, originally up to 15 m (50′) long, 4 m (13′) wide, and shallow (0.2 m) to deep (2 m) (6.5″–75″). At the bottom of the ditches were a number of unusual finds, in no way typical of residential settlement. These included whole pots or large fragments of pots, skulls of cattle, sheep, and pigs, and whole or broken human skulls and other human bones. The unusual items deposited at the site were often deliberately broken, burned, or destroyed. What is most remarkable is that the enclosure at Sarup appears to have been built for one event, perhaps a single great celebration of society and death. The rapid collapse of the palisade, the almost immediate intentional refilling of the ditches, and the absence of any significant domestic debris point to short-term use of the area. Many of the ditches were reopened sometime later, perhaps to remove human remains for reburial.

These enclosures do not sit in isolation, but rather form part of a larger Early Neolithic II landscape. It is essential to consider the local area in order to make

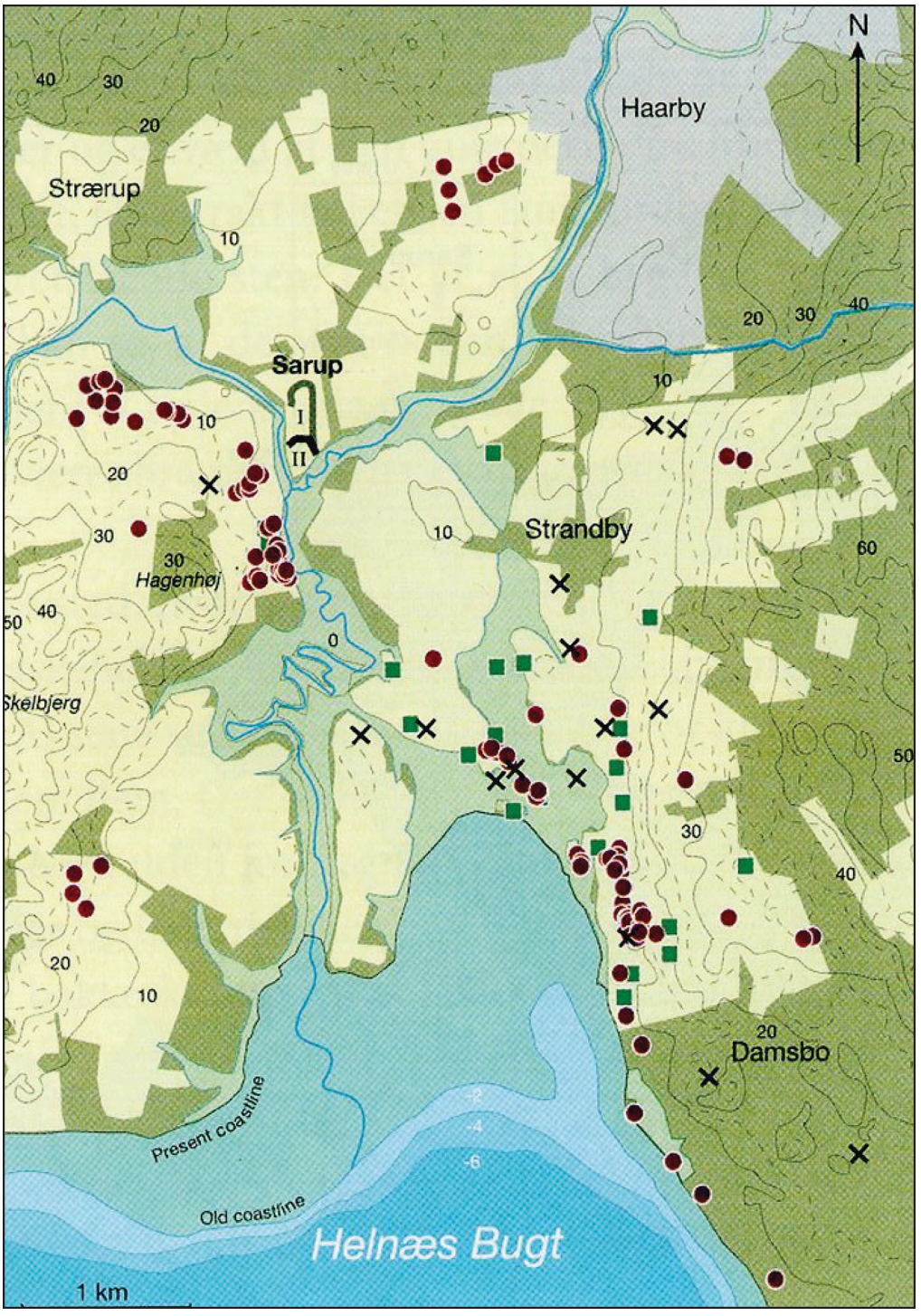


Figure 4.34.
The Sarup area with the enclosure, megalithic tombs, and settlements. The Sarup enclosures are in the upper center of the map. Red dots are megalithic tombs, black spots are settlements, light green marks wetland areas.

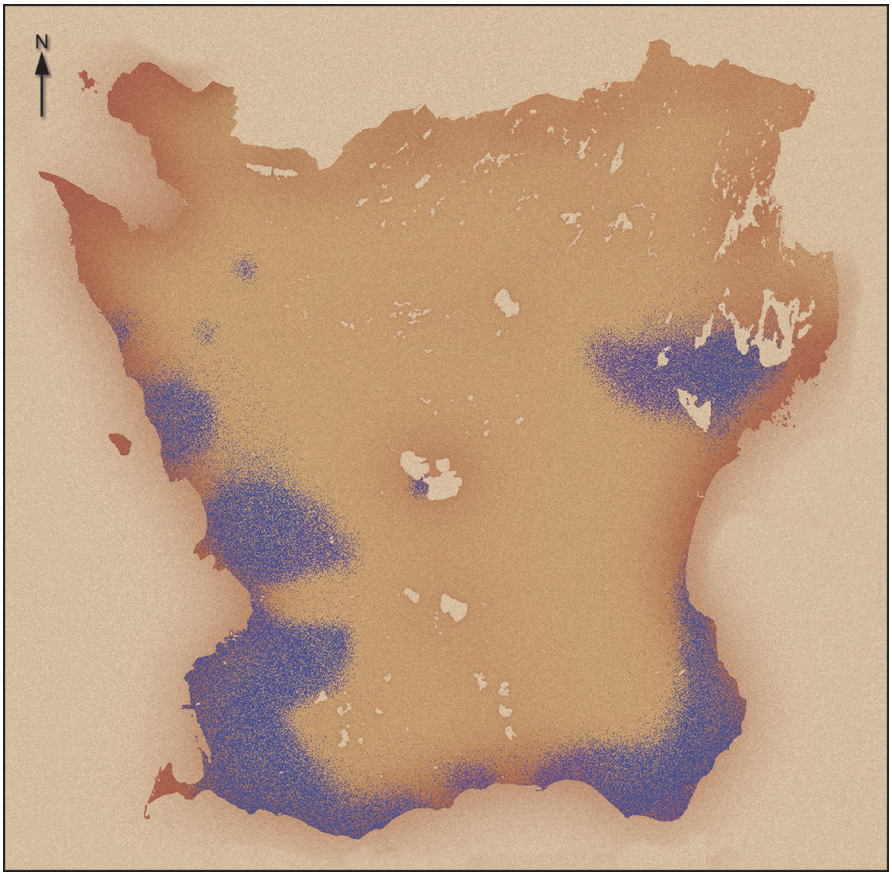


Figure 4.35.
The distribution of megalithic tombs in southernmost Sweden. The largest concentration occurs in the southwest around the modern city of Malmö.

sense of the enclosures themselves. Megalithic graves and farming settlements dot the area around Sarup. Field walking and survey since 1988 have recorded 152 sites in an area of 20 km^2 (7.7 square miles) (Figure 4.34). There were 22 small settlement sites, probably residences for one or two families, usually with somewhat specialized activities. Some sites were used for hunting and fishing, while others were for cattle and pig herding and for cereal cultivation.

At Sarup, the field walking and survey recorded 121 megalithic tombs in an area of 3 × 4 km (1.9 × 2.5 miles). Only four such tombs were known before the survey. Most of the megaliths had been dismantled over the centuries by stone robbing and plowing and were largely invisible. A range of tombs, from dolmens to passage graves, were reported. The tombs were frequently found in groups, dividing the larger region around Sarup into areas of approximately equal size. This pattern suggests some kind of territorial arrangement.

The contents of the tombs are also of interest. These were communal tombs during the time of the Sarup enclosure, with a number of individuals buried in each structure. The tombs were designed to be reopened and reused. In some cases, the earlier inhabitants were pushed to the side as new skeletal remains were placed in the tombs. Few complete primary burials are known from the tombs, only parts of individual skeletons. The same is true at the enclosures, suggesting that both of these monuments were used for related funerary practices and ritual, perhaps involving a process of moving the deceased from the land of the living to the land of the dead.

The central location of the enclosure at Sarup among the surrounding settlements and megalithic tombs suggests that it may have been a shared facility for the entire area. The scale of construction at Sarup, involving the felling, splitting, and erecting of massive timbers for the long palisade, indicates that a number of households must have been involved. Niels Andersen, the excavator, believes that the segmented parts of the features in front of the enclosure—the fenced yards and separated ditches—may belong to individual families, farms, or perhaps lineages within the wider community.

Causewayed enclosures were central sites that played a key role in the social integration and cohesion of dispersed groups of early farmers, incorporating activities related to death, burial, and feasting. Participation in the building of the enclosure and in the activities that took place there must have strengthened social, economic, and religious institutions of the larger group. Andersen (2011) describes the period as one of profound change in Neolithic society. All of this monument building and destruction of objects stopped by 3000 BC as a more stable economy developed in the context of larger human populations.

Döserygg, Sweden

Remarkable discoveries have continued to result from archaeological investigations of new roads and rail associated with the new bridge across the Øresund and subsequent development. This area of southwestern Sweden is extremely rich in Early Neolithic tombs and artifacts (Figure 4.35), so perhaps it is not surprising that many new finds would come with large new excavations. Expansion of a road to the south of Malmö in 2007 exposed a completely new Early Neolithic complex on the landscape. At least 20 megalithic tombs along with a double walled palisade, standing stones, and other features were revealed that had not been visible at the start of the excavations. The site also yielded rich grave goods and pottery and flint tools in ritual deposits and votive offerings. Prior to these finds, such elaborate complexes of Early Neolithic tombs and other larger structures were mostly unknown in Sweden. The entire complex dates to a few centuries around 3500 BC.

The site is known as Döserygg (dolmen ridge). There were several important features (Figure 4.36). The double palisade ran more than 700 m along the edge of this ridge next to a wetland area to the west. The palisade consisted of large posts 15–25 cm (6″–10″) in diameter placed close together in a shallow trench, supported by many stones. More than 5,000 trees would have been used to build the palisade. Large standing stones were also erected along the palisade. There were at least three elaborate openings in the wall in the area of the megalithic tombs. The ends of this long structure have not yet been located. In 2012, ground-penetrating radar was used to follow the palisade another 65 m to the east, where it turned north for another 20 m. This bend in the wall suggests that it may be some kind of unusual enclosure similar to Sarup and other such features found in southern Scandinavia and northern Germany.

It is clear that Döserygg was a very special place in the rich Neolithic landscape of southwestern Sweden. There is a good possibility that this ritual center was located at a crossroads, demarcated even further by the wooden wall and standing stones. The monuments themselves, especially the megalithic tombs, stood for millennia, marking the home of the ancestors of the early farmers and documenting their place in the region.

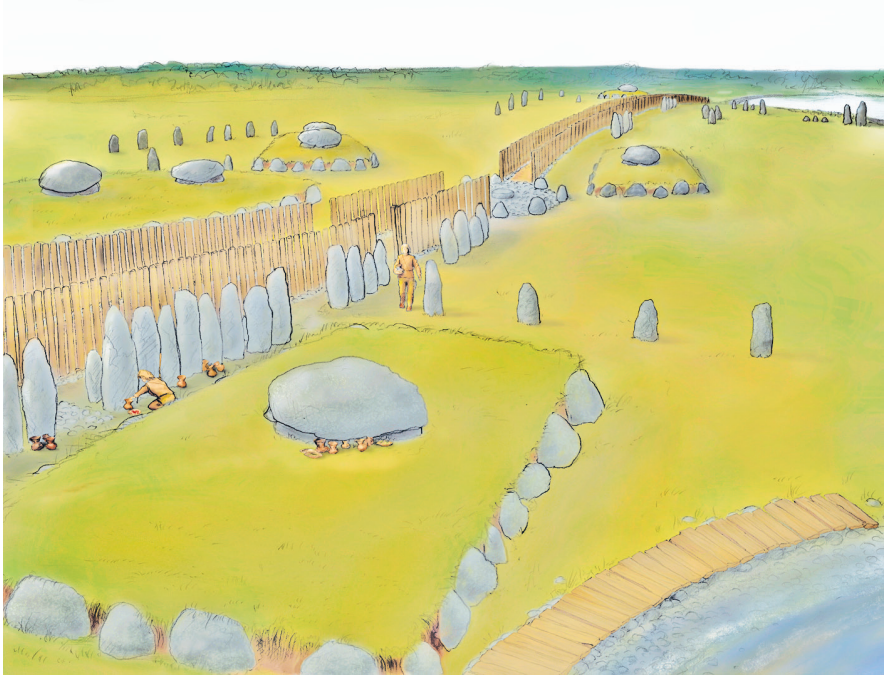


Figure 4.36.
Artist's reconstruction of the site of Döserygg, a long, narrow ridge with some 20 megalithic tombs and a long double palisade (drawing by Staffan Hyll).

TREASURES

There are a number of spectacular finds from the TRB period in Scandinavia. Some of these treasures are the archaeological sites themselves, particularly the megalithic tombs that dot the landscape today. Some of these have already been mentioned in this chapter—the amber pendant in the form of a copper axe, stone battle axes, polished flint axes. A few other examples encourage a sense of the aesthetic and craftsmanship involved in the creation of various items in different materials—wood, clay, bone.

Skarpsalling, Denmark

This spectacular pottery vessel is a Funnel Beaker bowl with an elaborately decorated body, the so-called fine-ware ceramic that is found primarily in ceremonial contests (Figure 4.37). The vessel is approximately 30 cm (12″) high. The incised lines were added before the vessel was fired and then these lines were filled with white chalk or bone ash to highlight the decoration against the darker clay background. This example was found in a burial mound at Skarpsalling in Himmerland in northeast Jylland and is dated to around 3200 BC.

Bygholm, Denmark

Near the village of Bygholm, not far from the modern town of Horsens in eastern Jylland, a hoard was found with some of the earliest copper objects in Scandinavia, dated to approximately 3500 BC (Glob 1980). This hoard comes from the Neolithic—the New Stone Age—yet copper tools and jewelry were not

Figure 4.37.
The Skarpsalling vessel, an elaborately decorated Funnel Beaker pot from northern Jylland, Denmark.

Figure 4.38.
The copper hoard from Bygholm, Denmark.

uncommon in the southern Scandinavia during this period. The eight copper artifacts include a dagger blade, four axe blades, and three spiral armbands (Figure 4.38). Copper jewelry is sometimes found in tombs, but axes are known almost exclusively from hoards. The copper contains a small amount of arsenic, which points to a Central European source for these objects.

Figure 4.39.
The skull from Porsmose, Denmark, with the bone point in place.

Porsmose, Denmark

The skeleton of Porsmose Man was found in a bog by peat workers in 1946. The man was 35–40 years old when he died around 3500 BC. A bone arrow point lodged in his skull had been shot through his nose from above and projected downward obliquely through the nasal cavity and into the right half of his upper jaw (Figure 4.39). A second projectile point penetrated his breastbone, and that was probably the shot that killed him. His body went into the bog, where the bones and projectile points were preserved. The skull is a reminder that violence and trauma were part of the Neolithic. A study by Fibiger et al. (2013) reported the evidence for trauma in human skulls from Neolithic Denmark and Sweden and found endemic levels of non-lethal violence among both men and women. Interestingly, the incidence of skull trauma was almost 17% in Denmark, compared to less than 10% in Sweden.

SUMMARY: THE TRANSITION TO AGRICULTURE

The transition from hunting and gathering to agriculture is arguably the most important event in human prehistory, representing a shift from foraging to farming, from food collection to food production, from wild to domestic, that sets the stage for most of the subsequent developments in human society. For this reason, the beginnings of agriculture have been the subject of scholarly interest since at least the middle of the nineteenth century, as evidenced by Charles Darwin's 1868 treatise *The Variation of Plants and Animals under Domestication* and subsequent works by many other scholars.

In Scandinavia the transition to agriculture began with the appearance of the TRB around 4000 BC. This change started with an extended, 500-year-long period of the adoption of farming in southern Scandinavia and Middle Sweden that culminated in the opening of the landscape with the introduction of the ard and the construction of tens of thousands of monumental tombs and dozens of large wood and earth constructions. An enormous amount of energy was spent on a variety of ritual activities in the Early Neolithic (Andersen 2000). In the wetlands, a number of people, often young, were sacrificed along with domestic animals, food, and valuable equipment (Koch 1998). There was a production of exquisite and richly ornamented ceramics, the most elaborate in Scandinavian prehistory, and

the manufacture of very large, fine flint axes. Many of these items were sacrificed, by breakage, fire, or burial in ritual consecration.

This introduction was also accompanied by a number of innovations and changes in economic and social organization. Trade in flint, polished axes, amber, and other materials was part of an extensive network of exchange. The beginnings of social inequality likely accompanied the increases in food surplus and growing population that were part of the agricultural revolution. These changes in the social, economic, and religious spheres in the earliest Neolithic are at least as significant as the changes in the food quest.

There are several conclusions to be drawn from the evidence for the transition to agriculture in southern Scandinavia, specifically concerning questions involving rates of change, colonization versus local adoption, and causality. There are two answers to questions about the rate of change—it was both fast and slow. On the one hand, the period from first contact with farmers in central Germany until the full adoption of agriculture lasts almost 1,500 years, from approximately 5000 BC until 3500 BC. Sedentary foragers in the late Mesolithic began to import certain items of Neolithic origin from the south after 4500 BC, but domesticated plants and animals, TRB pottery, domesticates, and long barrows do not arrive until after 4000 BC. As noted earlier, a fully Neolithic economy is not in place until after 3500 BC.

Not all the components of this TRB package arrived at the same time or in the same form. A graph of the appearance and decline of certain features of TRB (Figure 4.40) illustrates this phenomenon (Klatt 2009). Pottery decoration varies

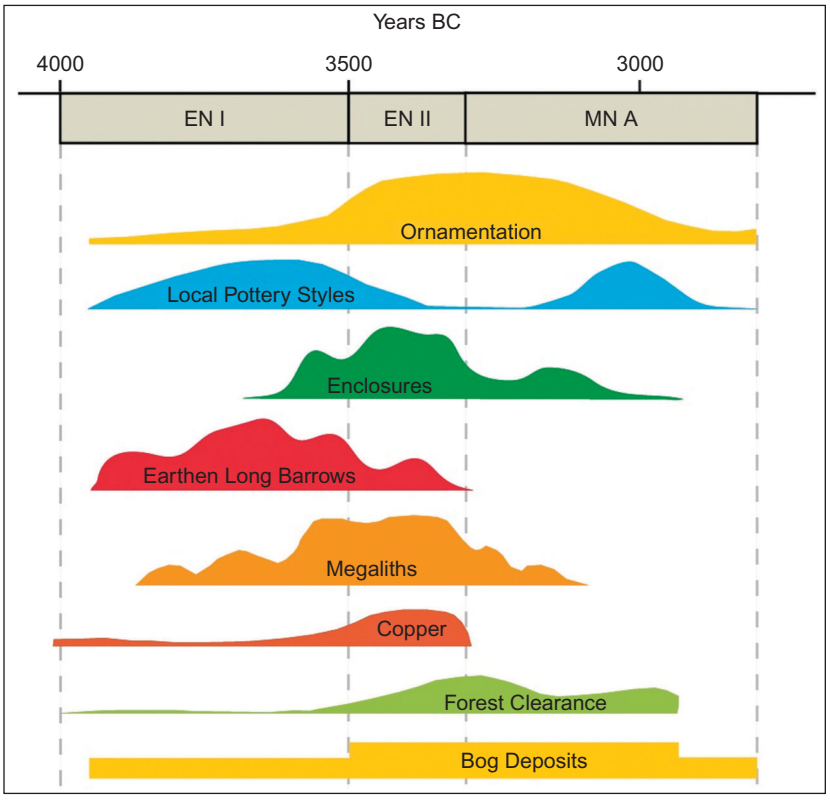


Figure 4.40. The appearance and intensity of major activities during TRB (after Klatt 2009). Ornamentation refers to the decoration of ceramics.

significantly, with local styles more common in ENI and MNA, while regional styles dominate in later ENII and the early part of MNA. Elaborate ornamentation, on the other hand, is more pronounced a bit later during the time of regional styles, when pottery is more important in ritual contexts. Various monuments were constructed at different times. Earthen long barrows appear early as monumental tombs, to be replaced by megaliths in ENII. Causewayed enclosures are a feature of ENII and MNA as well, and both the enclosures and megaliths appear to have been built within a narrow window of only 200 to 300 years. Bog sacrifice increases in ENII and MNA compared with ENI. Copper imports peak in ENII and virtually disappear during MNA, probably as a consequence of economic disruptions in Central Europe. Finally, significant evidence of forest clearance and the expansion of agricultural fields does not appear until ENII, emphasizing the slow pace of the transition to an agricultural way of life during ENI.

On the other hand, the almost simultaneous appearance of domesticated plants and animals and TRB pottery across Denmark, Southern and Middle Sweden, and southeastern Norway within a period of a few hundred years after 4000 BC is remarkable. This "instantaneous" introduction reflects a very different phenomenon, the very quick expansion of new technologies, subsistence practices, economic and social organization, and ideology. It is difficult to imagine that such a rapid spread of new species, new practices, new ideas, and new materials was not accompanied by knowledgeable individuals, familiar with the intricacies, details, and requirements of an agricultural lifestyle. Some level of human colonization must have accompanied the spread of TRB across southern Scandinavia.

Current evidence suggests that the search for causality in terms of the adoption of agriculture should focus on the realm of human choices, rather than forcing models requiring changes in climate, environment, or population. Human groups at the onset of the Neolithic participated in a larger sphere of trade and formalized the higher status of certain individuals through burial and other practices. It seems most reasonable to suggest a scenario in which interaction through exchange networks among foragers and farmers involving both ideas and materials fostered the adoption of agriculture, participation in new forms of social and economic organization, and the rise of hierarchical leadership in society (Price and Bar-Yosef 2011). The Neolithic meant the production of surpluses based on domesticated plants and animals and involvement in both local and long-distance exchange that intensified economic production. The reasons that hunters became farmers in southern Scandinavia likely have more to do with access to new goods and ideas than new ways of obtaining food.

CHAPTER FIVE

NEOLITHIC SOCIETIES, 2800–1700 BC

EXPENSIVE TRINKETS

The lovely boat axe in Figure 5.1 was auctioned by Christie's several years ago. It was one of many thousands of prehistoric artifacts that have been sold to the highest bidder. Collectors, dilettantes, and home decorators are paying large sums of money for souvenirs from the past. Unfortunately, that means that the rest of us cannot enjoy them. Moreover, the objects have been removed from their place of discovery, and any semblance of provenience or contextual information is usually lost. Without provenience, these objects are essentially worthless to archaeologists. For future generations, a part of their heritage is lost. Some estimates suggest that the trade in antiquities worldwide is a billion-dollar enterprise. Dealers in antiquities and the market they supply are ultimately responsible for the looting of hundreds of archaeological sites each year (e.g., Renfrew 2000). The business of the past means looting and theft, illegal sales and crime, and the destruction of our common cultural heritage.

One of the issues facing archaeology today involves the ownership of the past. This question involves both nations and individuals. Humans have tremendous destructive power as well as creative abilities. Through looting, careless development, and the wanton destruction of archaeological resources, we have the potential to eliminate our own past. Such destruction is catastrophic, since so much of human history occurred before the advent of written records and is largely retrievable through archaeological investigations alone.

It is essential to recognize that no one owns the past—it belongs to all of us. Important archaeological sites and artifacts should not be the property of individuals. Archaeological materials are valuable cultural resources and part of our inheritance. It is essential that everyone understand their significance and support their care and protection. Trading in antiquities and disturbing archaeological sites without permission are illegal in most countries and punishable by fines and/or imprisonment. Enforcing existing legislation against the import and sale of antiquities is a large part of the battle to save the past, and the Scandinavian countries are in the forefront of efforts to protect cultural resources.

THE MIDDLE AND LATE NEOLITHIC

As a reminder, the Neolithic of southern Scandinavia has three major subdivisions: Early (4000–3300 BC), Middle (3300–2350 BC), and Late (2350–1700

Figure 5.1.
A boat axe from the Middle Neolithic, sold by Christie's auction house in 2001.

BC). The Early Neolithic is also known as the Funnel Beaker Culture (TRB); it continues through the first half of the Middle Neolithic, a period designated as MNA, ending around 2800 BC. The TRB was discussed in chapter 4. This chapter focuses on the post-TRB Neolithic—the Middle Neolithic B and Late Neolithic periods that follow the TRB.

Major changes take place at the end of MNA. Of particular importance is the appearance of several new cultures in southern Scandinavia. Similar changes occurred across much of eastern and central Europe. The second half of the Middle Neolithic (MNB) is known as Battle Axe Culture in Sweden and southern Norway; it is closely related to the Corded Ware Culture found across east-central Europe at that time. Single Grave Culture found primarily in Jylland is another variety of the Corded Ware/Battle Axe Culture. The Pitted Ware Culture was also present during the MNB period, between 2800 and 2400 BC, expanding from a slightly earlier origin in Middle Sweden. Eastern Denmark has a complex mix of cultures in this period, including late Funnel Beaker and elements of both Pitted Ware and Single Grave Culture.

During the Middle Neolithic B phase, after 2800 BC, a new relationship with the land emerged. A more stable settlement pattern was established, and the landscape was regularly divided among single farms in more densely occupied areas. More continuity in place is seen. Overall, settlement was more varied, with farms, hamlets, and even the beginnings of small villages. Communal megalithic tombs were no longer being built, although some continued in use. The house and farm became the center of social and economic life.

The Late Neolithic begins around 2350 BC and ends by 1700 BC with the start of the early Bronze Age. A new group, the Bell Beaker Culture, appears in northwestern Denmark around 2350 BC, at the beginning of the Late Neolithic.

This Bell Beaker presence likely has a western origin, perhaps in Britain or the Netherlands.

After 2000 BC, during the Late Neolithic, very large houses were built at some farms, often with smaller separate structures for storage. Differences in house sizes and the contents of graves provide evidence of increasing social inequality in Late Neolithic societies.

The northern and southern regions of Scandinavia are distinct in terms of the chronology of the Neolithic. The arrival of agriculture in southern Scandinavia changed everything, and many new innovations appeared during the Neolithic. In northern Scandinavia, on the other hand, changes were not so pronounced or rapid. Hunting and gathering continued as the primary means of subsistence in the north. These developments in northern Scandinavia are discussed toward the end of this chapter. The locations of some of the sites mentioned in the chapter are shown in Figure 5.2.

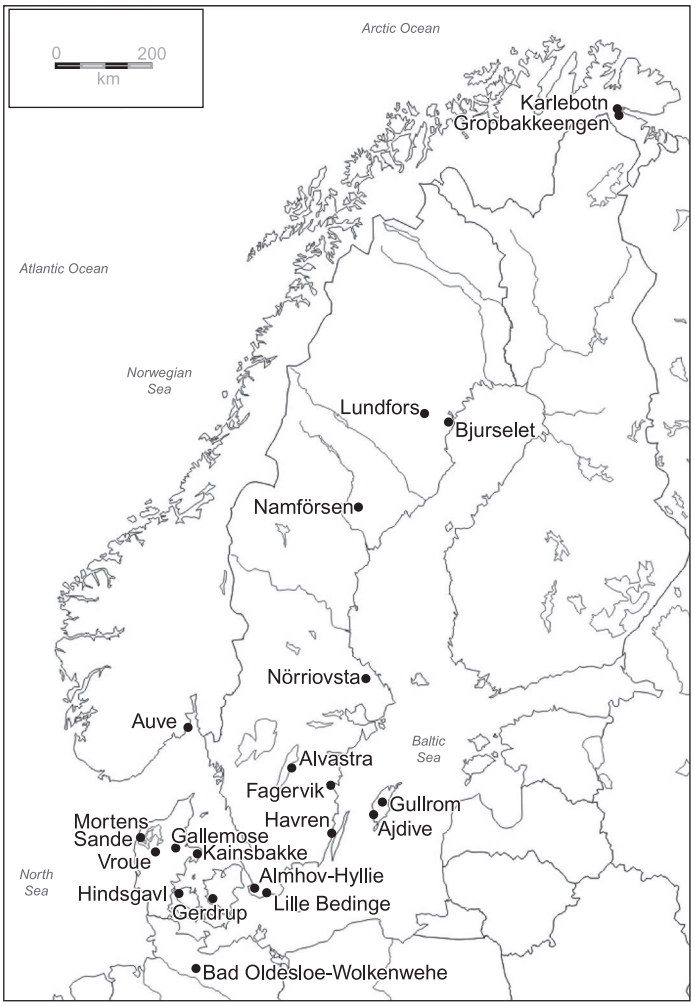


Figure 5.2.
Locations of some of the sites mentioned in chapter 5.

MIDDLE NEOLITHIC B

The Middle Neolithic (MNB) dates from approximately 2800–2350 BC and represents one of the more complex periods in Scandinavian prehistory. This was a time of substantial change in society. Several different cultures are recognized within this relatively brief period—Corded Ware/Single Grave/Battle Axe, Pitted Ware, and Bell Beaker. MNB people in southern Scandinavia were strongly influenced by foreign traditions associated with the Corded Ware and Bell Beaker cultures. Interaction with people from the continent brought new ideas, new material culture, and new ways of doing things to local societies in the region. Each of these cultures is described in more detail in the following pages.

Corded Ware/Single Grave/Battle Axe Culture

Of particular significance for this discussion is the spread of the Corded Ware culture in eastern and central Europe. In Scandinavia, Corded Ware is known from northern Germany, Denmark, southern and Middle Sweden, and the south

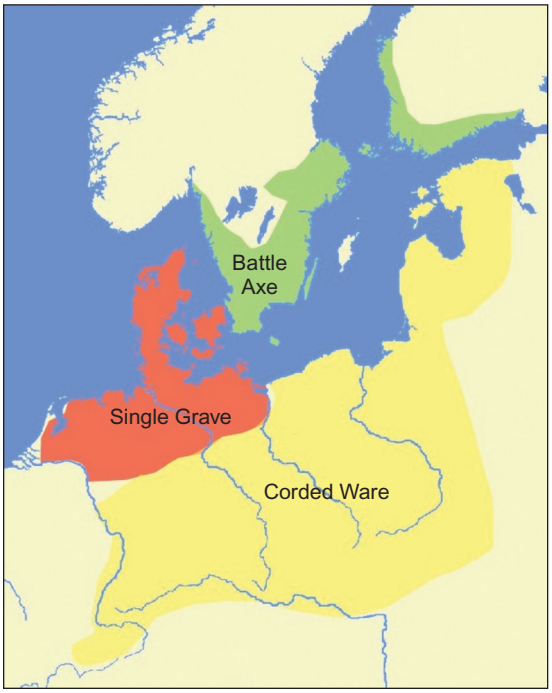


Figure 5.3.
The distribution of Corded Ware, Single Grave, and Battle Axe Culture in the Middle Neolithic B period.

coast of Norway. In the rest of Europe, it is found from the Netherlands across Germany, Poland, the Baltic countries, Finland, the Czech Republic, Slovakia, northwestern Romania, northern Ukraine, and European Russia—from the Rhine to the Volga (Figure 5.3).

There is continuing debate regarding the origins of the Corded Ware Culture (e.g., Anthony 2009, Mallory 1997). Some argue for the expansion of pastoral societies from the Ukrainian steppe, while others believe that Corded Ware arose in central Europe. This was a period of substantial mobility in Europe, and outside influences had a significant impact on local societies. Corded Ware, however, is not a coherent tradition of material culture, architecture, and practices across east-central and northern Europe. This culture must reflect different groups of people sharing certain norms and objects across a broader zone, in addition to the likely arrival of new people.

The term Corded Ware refers to the decoration of pottery in this period, Battle Axe to the characteristic artifact found in male graves (Figure 5.4), and Single Grave to the type of burial. The techniques and decoration of pottery are new in terms of temper, manufacture, decoration, firing, and shapes (Hulthén 1977). In Sweden and Norway, Corded Ware pottery is typically a rather standardized large bowl with cord-marked decoration. Elsewhere, cord-ornamented beakers and amphorae are the most widespread types of vessels in central Europe and Denmark.

Most of what is known about the Corded Ware/Single Grave/Battle Axe Culture comes from graves rather than residential contexts, and for this reason there is a bias in the archaeological knowledge of the period. Settlements from this

Figure 5.4.
Corded ware ceramic bowls from the Lille Bedinge cemetery in Sweden.

period are rare, and that absence may reflect lifestyle. These groups are sometimes described as pastoral warriors.

The Corded Ware period is referred to as the Single Grave Culture in Denmark, especially in Jylland, and as Battle Axe culture in Sweden and Norway. The terms are largely interchangeable, and hence the compound term Corded Ware/Single Grave/Battle Axe is sometimes applied. Here I will use the local terms in Scandinavia, with the reminder that all of this refers to Corded Ware.

The Single Grave Culture follows the TRB in Jylland and is known largely from the numerous low, circular earthen mounds that mark burials from this period. A circle of split timbers originally surrounded some of the mounds. Graves in low mounds contained one, or sometimes two, plank coffins, each with a single individual. New graves and mounds were occasionally added on top of a previous mound (Figure 5.5). Grave goods for males included battle axes, flint tools, and large amber discs. The women were buried with amber necklaces made of small beads. Both sexes were provided with a ceramic beaker that probably contained a fermented beverage, perhaps beer. These rather standardized burial practices have been interpreted as evidence of the equality of men and women in Single Grave society.

The chronology of the Single Grave Culture is based on burial stratigraphy and grave goods in the barrows where two or more mounds were built sequentially over time at the same spot (Figure 5.5). Three phases have been recognized based on the stratigraphy, changes in pottery, and other grave contents. Amber and battle axes were the most common grave goods in Jylland. In northern and western Jylland, the appearance of Single Grave Culture was accompanied by a period of forest clearance and an expansion of animal husbandry, focused on cattle. Houses are rare. Elsewhere in Denmark, megalithic tombs from the TRB were used for burial by Battle Axe groups, who buried their dead with polished flint axes for grave goods.

In Sweden, the Battle Axe Culture (aka Boat Axe Culture) is concentrated in Skåne but is known at varying levels of intensity across the southern half of the Scandinavian Peninsula (Malmer 1975, 2002). Animal bones are poorly

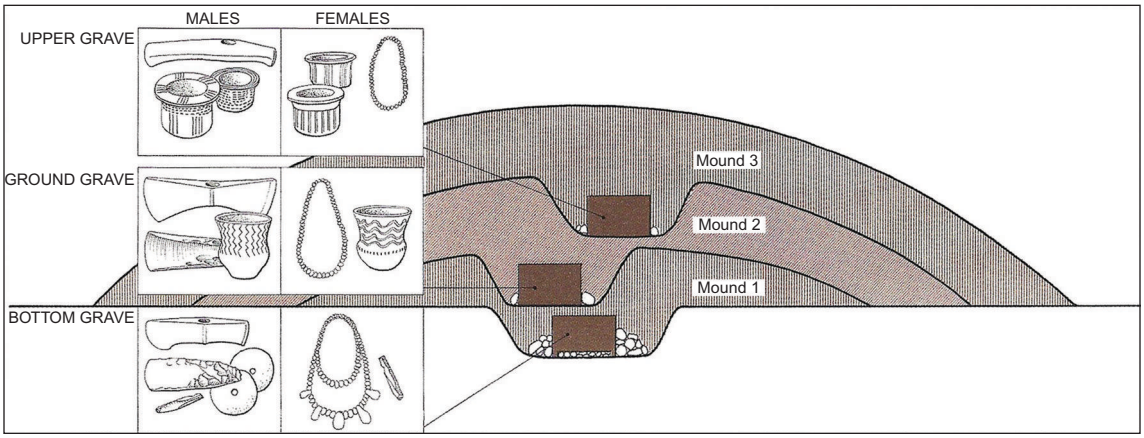


Figure 5.5.
The sequence of Single Grave burial mounds and grave goods that provides the chronology for the period.

preserved in most Battle Axe Culture settlements. Faunal remains from burials are commonly red deer and sheep. Cattle bones are rare (Larsson 2009b). There are also a few examples of grain impressions in ceramics in Sweden, the majority of which come from barley (Malmer 1975). The economy of the Battle Axe Culture in Sweden has been described by some as characterized by small-scale horticulture, sheep pastoralism, and hunting (e.g. Knutsson 1995, Malmer 2002, Larsson 2009).

More than 250 Battle Axe Culture burials have been found in Sweden, and they are quite distinct from those in Denmark. The deceased was usually placed in a single flat grave without a barrow (Malmer 2002, A. Larsson 2009b). The graves were commonly oriented north-south, with the body in a flexed position facing east. Men were placed on their left side and women on their right. Grave goods were rather standardized in terms of both objects and placement. Axes of flint were found in both male and female graves. Battle axes were placed with males near the head (Figure 5.6). Corded Ware ceramics were also a common grave good and usually placed at the head or feet. Other grave goods include polished flint axes and chisels, amber beads, amber disks, arrowheads, and weapons of antler.

In southernmost Sweden, the archaeological remains reveal a close spatial relationship between houses and graves, marking the significance of the farm as the center of social and economic activity (Malmer 2002). The Swedish Battle Axe Culture cemetery at Lille Bedinge in Skåne is described in more detail below. Battle Axe Culture in eastern Middle Sweden is recognized by the presence of battle axes, distinctive pottery, and a few bones from sheep/goats. There are relatively few settlements (e.g., Edenmo et al. 1997, Hallgren 1997a). Battle Axe Culture sites are usually located inland but also occur in coastal areas, although not directly on the coastline.

Pitted Ware Culture is quite common in those same coastal contexts. The relationship between the Pitted Ware Culture and Battle Axe Culture in Sweden is not well understood and controversial. There are frequent finds of Battle Axe Culture pottery on Pitted Ware Culture settlements. The two traditions of pottery have been found together in secure contexts at the site of Havren in Kalmar, for example, along with a third set of ceramics that represents a fusion of the two

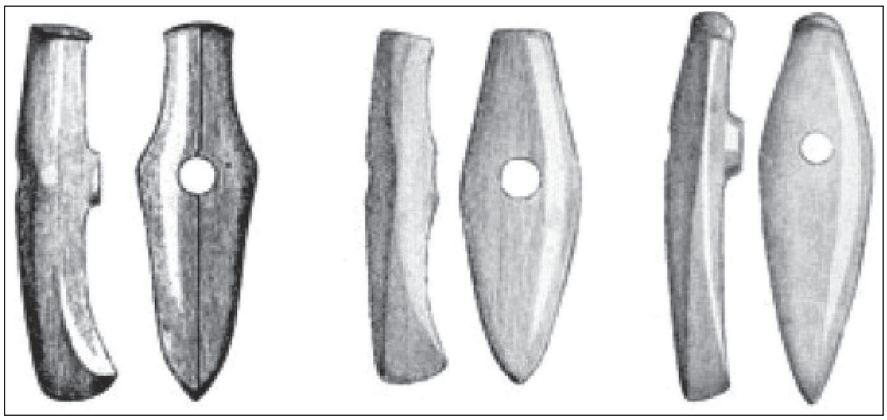


Figure 5.6.
Swedish boat-shaped battle axes.

pottery styles (Larsson 2009). More on this issue in a subsequent section on Pitted Ware Culture.

Rapid and significant changes began in western Norway during MNB (Bergsvik 2012). External contacts increased dramatically, as evidenced by new tools, weapons, and raw materials. Some have argued for influence and immigration from Battle Axe Culture to the east and south (e.g. Prescott and Walderhaug 1995). Bergsvik (2012) suggests that these groups were the last hunter-gatherers in western Norway living in large settlements on the coast, utilizing a rich marine resource base along with some terrestrial resources. These groups were largely sedentary and cultivated domestic plants on a small scale (Hjelle et al. 2006, Bergsvik 2004). They were also territorial and involved in extensive trade networks in stone and finished stone tools. It is not until the Late Neolithic ca. 2500–2350 BC that the pollen record shows a dramatic deforestation of the landscape and an expansion in both pasture and permanent fields (Høgestøl and Prøsch-Danielsen 2006).

Neolithic Settlement in Western Skåne

Artursson (2004) examined Early and Middle Neolithic sites, along with their numbers, location, and distribution, in two small valleys in western Skåne, north of the city of Malmö, called the Saxån and the Lödde å (Figure 5.7). A great deal of archaeological investigation has been done in this area in response to the enhancement of infrastructure for the Øresund Bridge to Denmark, which opened in AD 2000. For that reason, there was a substantial body of information for Artursson's study. The two Neolithic cultures of interest were Funnel Beaker and Battle Axe, covering a period of 1,500 years. The types of sites present included residential areas, cemeteries, megalithic tombs, wetland deposits, and central places.

The earliest Neolithic people in these valleys settled in places previously used during the late Mesolithic. Coastal sites from the Mesolithic continued in use, and there were four or five large settlements near the mouths of the two valleys. Some of these settlements may have held more than a few families. Sites are found inland, but these were small and ephemeral, suggesting seasonal utilization.

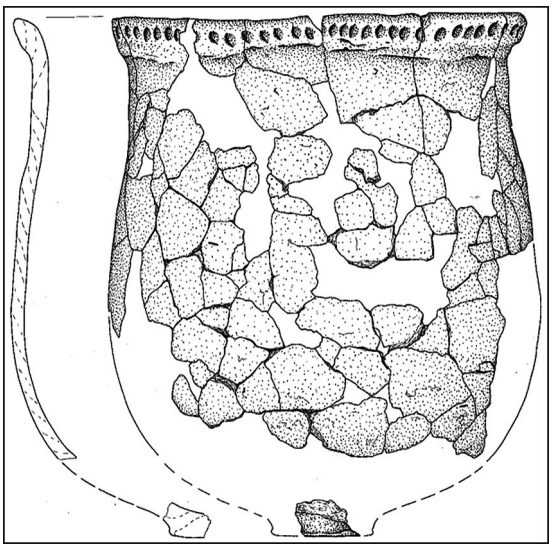


Figure 5.7. Reconstructed Single Grave Culture pottery vessel from Mortens Sande, approximately 33 cm (13″) high.

These early farmers invested in the landscape, clearing forest to create pasture and fields. Such investment must have created a sense of belonging and ownership. After 3600 BC, in the Early Neolithic II phase, megalithic tombs were built as monuments to ancestors and must have been landmarks for the local inhabitants. The bones of these ancestors have been found both in the megalithic tombs and at dwelling sites, suggesting that these human remains were an important reminder to their descendants of both the past and the present in terms of permanence of place. This second phase of the Neolithic was marked by increased cattle herding, the introduction of the ard, and more permanent inland settlement. The number

of known sites increased, and the deposits from human activities became more substantial.

In the TRB half of the Middle Neolithic, ritual activity increased in conjunction with the passage graves. Sacrificial deposits in wetlands grew in number and contents. Residential sites declined in number and clustered around growing primary settlements as population aggregation took place. Toward the end of this period, however, there appears to have been conflict and tension as larger inland settlements were abandoned and population grew along the coast, ritual declined, and evidence of Pitted Ware influences is seen in the flint and pottery artifacts. Funnel Beaker culture as a cohesive tradition was coming to an end.

The Battle Axe Culture emerged during the second half of the Middle Neolithic and was distinct from the preceding TRB. Artursson argues that new ideologies, including greater emphasis on the individual rather than the group, came from Corded Ware peoples to the south and were responsible for these differences. In western Skåne, the Battle Axe Culture left relatively few, mostly ephemeral, traces on the landscape. This absence of evidence is likely due to a mobile way of life associated with cattle herding and the short-term aggregations of human groups at a few large places like the palisaded enclosures found around Malmö, such as the site of Hyllie described below. The long rows of graves—probably along former paths and trackways—associated with the Battle Axe Culture may reflect this mobile perspective. An example of such linear cemeteries can be seen at Lille Bedinge, also described below.

Mortens Sande, Denmark

The west coast of Jylland is a wild place, torn by the wind and the sea that breaks constantly against the peninsula. The wind has thrown up large sand dunes in many areas of the coast, and the sea tries to remove them. This was the situation at a place called Mortens Sande just north of the Limfjord in northern Jylland. Here dunes have been accumulating since the Neolithic, and the sea has been cutting cliffs into these deposits, trying to take back the sand. In 1984, a local farmer noticed a layer of charcoal with some pottery and stone artifacts eroding out of the face of a small sand cliff along the beach. The National Museum of Denmark began excavations at the site and uncovered a settlement from the Single Grave Culture (Liversage 1988).

The excavations uncovered some 63 m^2 (675 ft^2) of the settlement, focused on a charcoal-rich occupation layer. A radiocarbon date from the charcoal produced an age of ca. 2500 BC. In addition to the charcoal, a number of artifacts and features were uncovered. Features are permanent facilities for housing, fire, storage, or other purposes. Examples include houses, graves, post holes, hearths, and storage pits. There were 65 small post holes and three large ones, along with a small cooking pit at the site. A number of charred cereal grains were found in the cooking pit and scattered around the area, almost all from barley. The small post holes were 5–10 cm (2″–4″) in diameter and 20–40 cm (8″–16″) in depth, with a pointed bottom. The small post holes were aligned in two double, parallel rows, and the larger posts were found in these parallel rows. The three large posts were substantial, 40–50 cm (14″–18″) wide and 50–60 cm (18″–22″) in depth.

The exact nature of the structure that utilized these posts was not clear, but the distribution of artifacts indicated that the parallel rows of stakes were probably walls that enclosed the majority of the pottery and flint artifacts. The excavator, David Liversage, suggested that there were three houses represented by the three sets of parallel rows of small posts, each with one large post.

The pottery and flint was typical for the Single Grave Culture in northern Jylland. Approximately 4.5 kg (10 lbs.) of pottery from perhaps 14 vessels were recovered from the settlement layer (Figure 5.7). The flint artifacts from the site included a large number of cores and flakes along with scrapers, drills, and burins. Only a single arrowhead was found, which suggests that hunting was not a major activity.

In addition to the pottery and flint, a number of pieces of amber, several with a drilled hole, a small concentration of amber waste from manufacturing, and fragments of a stone bowl were found at the site. Amber was apparently being worked into finished artifacts, perhaps for trade, in a workshop with raw materials and perforated unfinished beads.

Bad Oldesloe-Wolkenwehe, Germany

The site of Bad Oldesloe-Wolkenwehe, in the state of Schleswig-Holstein in northern Germany, was originally located on an island in a wetlands (Mischka et al. 2007). Radiocarbon dates around 2800–2500 BC place the site in the Corded Ware Culture, MNB. More than 500 post holes, along with several stone settings, pits, and a large quantity of stone tools, potsherds, and animal bones were recovered in the excavations.

The settlement was probably used seasonally in the summer and fall and abandoned during winter and spring flooding of the lowlands. The more permanent winter settlements for this group were likely on a higher terrace of the local river. There was no evidence for cultivated plants at the site, but the bones of both domestic and wild animals were present. The manufacture of flint tools was evidenced by an abundance of waste flint. A strange system of ditches and large quantities of charcoal were uncovered. The excavator of the site suggested that they might have been used for salt production, using brine from a nearby salt spring. The preserved posts and numerous post holes at the site permitted the reconstruction of a number of houses (Figure 5.8). The archaeologists, however, believe that only two or three of these houses were used at any one time.

Lille Bedinge, Sweden

The prehistoric graves at Lille Bedinge were found along the south coast of Skåne, Sweden, about 1 km from the shore. A total of 13 flat graves were found in a linear arrangement at the site, suggesting their alignment with a road or trackway (Malmer 1962). These graves come from both the Middle and Late Neolithic—at least eight are from the Battle Axe Culture. Cemetery may be a misnomer, since the graves were found over a linear distance of several hundred meters (ca. 1,000′). Most of the graves probably contained a wooden coffin, often covered with large stones. These heavy stone structures recall the megalithic tradition of the earlier TRB.

The graves at Lille Bedinge are of substantial interest because of their contents and the variation among burials. Three examples are described here. Grave 49

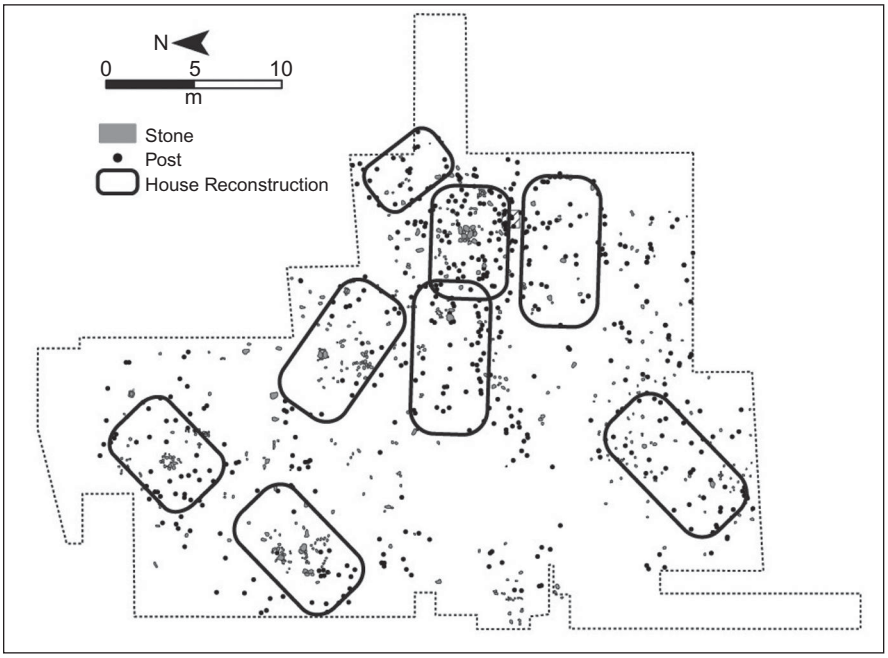


Figure 5.8.
Excavation plan at Bad Oldesloe-Wolkenwehe with reconstructed house outlines based on post hole distributions and fireplace locations. There were probably only two or three houses in use at any one time.

held a massive wooden coffin covered with heavy stone boulders. At the bottom of the grave were five individuals, three adults and two infants (Malmer 1962, 2002). The two children were placed between two of the adults. The causes of death are unknown, but the simultaneous burial of a group of individuals suggests a catastrophe—disease, murder, or perhaps sacrifice (Malmer 2002).

Grave 47 contained a young female with several skeletal deformities in her arms and legs. A structure of stone, in the shape of an inverted boat hull, had been built over her body. At the stern of the boat-shaped structure were the remains of five individuals with the skulls together and the long bones in a separate pile. Other contents of her grave included a pottery vessel, a stone axe, two long flint blades, a bone awl, and two pendants of boar tusk (Figure 5.9).

The double burial in grave 52 was the richest at Lille Bedinge. The coffin was almost 3 m long. The two individuals were placed with their heads at the opposite ends of the coffin. One of the individuals was male and the sex of the other could not be determined. The contents of the grave included several Corded Ware pottery vessels, flint axes and blades, two bone awls, a fragment of a copper basket-shaped earring, and 52 amber beads and pendants. These objects were rather evenly distributed between the two deceased individuals.

Vroue, Denmark

The mound of Vroue is not far from the town of Skive in northern Jylland, more or less in the center of the peninsula. The mound had not been previously excavated, probably because of a looter's pit on one side that made it look like that the tomb had been robbed. Eventually, excavations were begun in the 1980s. Fortunately the looters had not reached the center of the mound. There, beneath the large earthen barrow, was an unusual MNB tomb. Normally, Late Neolithic burials in this region took the form of stone cists, but in the case

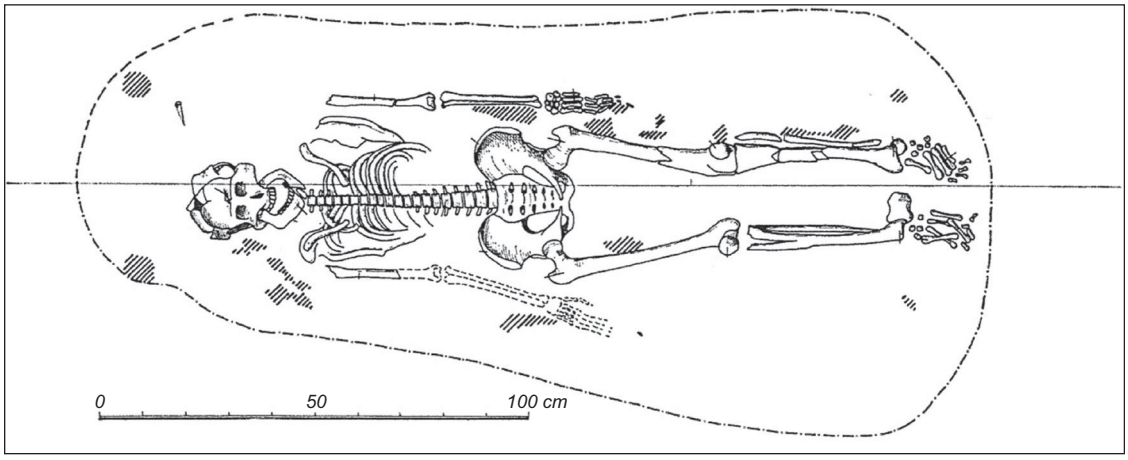


Figure 5.9.
Battle Axe Culture, grave 47, at Lille Bedinge, Sweden, after removal of the stone covering.

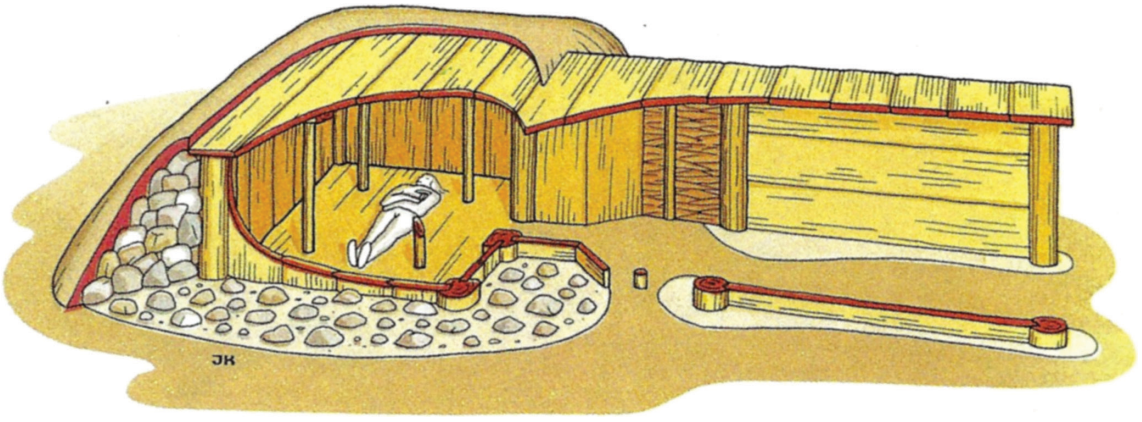
of Vroue a timber chamber had been constructed, very much like contemporary tombs from Central Europe, known as princely graves.

The excavations revealed a central chamber, 2.3 × 1.5 m (7.5′ × 5′), built of vertical wooden planks with four huge corner posts (Jørgensen 1985). The chamber was roofed with six massive planks supported by another four posts inside the tomb (Figure 5.10). The wood of the tomb had been intentionally charred, perhaps to resist rot. There was a narrow wooden tunnel or passage leading into the tomb from the east. The plank walls of the chamber were supported by large rocks placed against the outside of the timbers. The entire structure had been enclosed with a 10–20 cm (4″–8″) layer of clay and then covered with a huge mound of grass or heather sods. The excavator estimates that 56,000 sod squares had been used for the construction. The tomb had been built for a single inhabitant, a male. The perishable contents of the tomb were long gone, but a single battle axe and part of its wooden shaft were found near the right hand of this once powerful person.

Figure 5.10.
Artist's reconstruction of a Single Grave burial chamber and mound from Vroue, Jylland, Denmark.

Hyllie, Sweden

One archaeological advantage of the City Tunnel and other infrastructure projects in the Malmö region was that large areas could be opened for excavations



and lots of prehistoric sites discovered. There were 55 MNB sites recorded with evidence of settlement, 18 sites with one or more graves, and three sites with palisades (Brink 2009).

The southern mouth of the City Tunnel in Malmö today opens at the place where the Hyllie palisaded enclosure once stood. The enclosure was dated to the Battle Axe Culture, from the late MNB period. This was the first such construction from the Neolithic in Sweden and particularly important, as most of what was known about this culture had come from graves. The palisaded area is oval in shape, approximately 220 by 140 m (720 × 460′), enclosing some 30,000 m^2 (7.5 acres), the equivalent of five soccer fields. Two extensions were added, one to the north and a smaller one to the southeast. The palisade was built using round posts of oak and ash 10–40 cm (4″–16″) in diameter, placed 20–40 cm (16″–32″) apart. There were at least two rows of posts—in some places three, or even four—surrounding the enclosure. Four major entrances have been found.

Palisaded enclosures probably served as central places for communal activities shared by a number of farms. Large quantities of flint waste from the production of polished flint axes point to one of these shared activities. The enclosures may also have been used as corrals for cattle or other livestock, where individual herds may have been combined for purposes of breeding, exchange, or sale. The shared views and values of the builders and users of the enclosures must have played an important role in constructing and maintaining local social relationships.

Clearly, southwestern Skåne was an important center in the late Middle Neolithic. At several MNB sites in the City Tunnel project the farm and graves continued in use into the Late Neolithic. Based on the results of his study, Brink (2009) argues that a major change took place during the late Middle Neolithic, when the role of large places of assembly such as palisaded enclosures disappeared, and the farm became the primary social unit of identity for the inhabitants of southern Scandinavia.

Pitted Ware Culture

Agriculture and the TRB Culture were established in southern Sweden by 4000 BC. But 600 years later, eastern Sweden witnessed the disappearance or decline of agrarian societies and a renewed focus on hunting and gathering, with seals as a major prey. The coastal settlements of these groups are remarkable for large quantities of pottery with deep, pitted impressions. This so-called Pitted Ware Culture (PWC) is found in northeastern Denmark, western and eastern Middle Sweden, and the Baltic islands (Figure 5.11). PWC (ca. 3200–2300 BC) appears in Middle Sweden slightly earlier than in southern Scandinavia, suggesting its origins in the former. It spread quickly along the east coast to the south and to Gotland and Öland. By 3100 BC, there were PWC sites found in northeast Skåne. The Pitted Ware complex in Denmark began ca. 3000 BC and continued until 2450 BC during late MNA (TRB) and MNB (Single Grave Culture). There are very few pure PWC settlements in Denmark; most of the material culture is found as a minor component at Funnel Beaker or Single Grave sites (Iversen 2010).

In southern Norway, a relative of the Pitted Ware Culture, sometimes referred to as the Cord Stamp Culture (Olsen 1992, Østmo 2010), has been identified based on distinctive pottery decoration, tanged points flaked from local stone materials, and the widespread use of ground slate points. The primary difference is the use of cord stamping to decorate ceramics in contrast to comb stamping in the PWC.

The development of PWC from TRB during the Middle Neolithic A period can be seen in the gradual changes in ceramic styles at sites like Fagervik in eastern Middle Sweden (Malmer 2002). Ritual sites like Alvastra, also in Middle Sweden and described below, were used in both periods (Browall 1986). The roots of PWC appear to have been in TRB, but subsistence practices represent a step away from agriculture—a reversion to primarily hunting, gathering, and fishing during the Neolithic. Pitted Ware sites in Middle Sweden are found along the coast with substantial amounts of pottery and seal bones (Knutsson and Knutsson 2003). Most subsistence appears to be based on wild plants and animals. Faunal remains at Pitted Ware settlements include wild boar, elk, beaver, red deer, porpoise, and fish in addition to seal (Eriksson 2004). Some inland sites appear to emphasize pig herding. Some domesticated plants and/or animals are also known from other PWC contexts (Edenmo & Heimdahl 2012, Eriksson 2204).

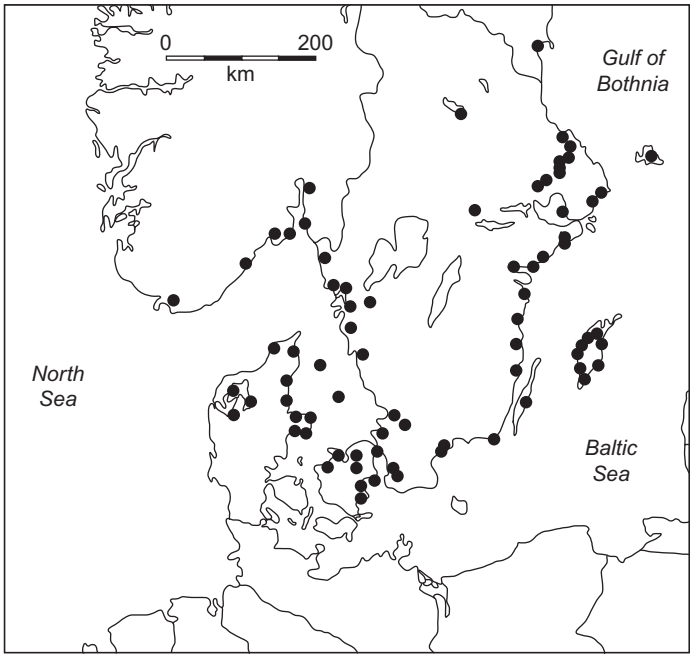


Figure 5.11. The distribution of selected Pitted Ware Culture sites in Scandinavia.

Ceramics and stone tools are the hallmarks for PWC. This pottery generally has a small base, high body, and short neck. Decoration is found around the neck and shoulder of the vessel. Long, cylindrical flint cores provided the large blades commonly found in this period (Figure 5.12). Projectile points are long, tanged types. Quartz and slate were used for other kinds of tools. The quartz artifacts are similar to what was used during the Mesolithic in northern Scandinavia, while the slate objects, which increased in quantity during the PWC, came from the north. The oldest slate tools in northern Sweden date to almost 7000 BC (Matiskainen 1989). Fishing equipment in the form of large, barbed hooks, net sinkers, and harpoons is common. Small bone and stone animal figurines are another characteristic artifact type from this period.

Burials are usually simple inhumations and occur in cemeteries. Grave contents often include pottery, stone axes, bone spears, harpoons and fish hooks, worked boar tusks, animal tooth pendants from seals, dog, and fox, and beads of shell and bone. These distinctive artifacts are sometimes found in megalithic tombs as well, indicating that these earlier structures were also used by Pitted Ware people. Stone

Figure 5.12.
A cylinder core, large blade, and three tanged points from the Pitted Ware Culture.

artifacts were made primarily with quartz in this area, some with imported flint. Pecked stone axes are made from local materials.

In Sweden, there are more settlements from the PWC than from TRB or Battle Axe Culture (Malmer 2002). Most of these sites are found on the east coast of Sweden and on the Baltic islands of Gotland and Öland. There are also more non-megalithic burials from the PWC in Sweden. The cemetery of Ajvide on Gotland is discussed below as an example.

One of the more controversial questions in Swedish archaeology concerns the relationship between Pitted Ware Culture and Battle Axe Culture and whether PWC was really a distinct cultural entity (e.g., von Hackwitz 2009, Hallgren 1997a, Knutsson 1995). The PWC appears slightly earlier, toward the end of the Early Neolithic, originating in the TRB, while Battle Axe Culture is found only in Middle Neolithic B, after 2800 BC. During this latter period, the two cultures are contemporary and found throughout much of Middle and Southern Sweden. Both groups utilized polished flint axes coming from southwest Skåne or Denmark.

Pitted Ware Culture is considered to be a more egalitarian society of marine hunter-gatherers utilizing the coastal environment, while Battle Axe Culture is thought to have been associated primarily with inland farming societies. Settlement sites from Battle Axe Culture are few and generally ephemeral in appearance. Pitted Ware sites are often located on earlier TRB or even Mesolithic settlements. Von Hackwitz (2009) concludes that Pitted Ware settlements were unusual because of the presence of exotic materials, fragmented human bones and graves, and deposits of heavily fragmented pottery. Von Hackwitz suggests that Pitted Ware and Battle Axe Culture are two aspects of the same dynamic society using the landscape in different ways, rather than two ethnic entities. No doubt the controversy will continue.

Alvastra, Sweden

The Alvastra Pile construction is an unusual wooden structure in a bog near the western shore of Lake Vättern in eastern Middle Sweden. Most of this Middle Neolithic structure has been uncovered by excavations at various times during the twentieth century (e.g., Browall 1986, Malmer 1978) (Figure 5.13). The artifacts at the site are a confusing combination of Pitted Ware Culture ceramics and Funnel Beaker Culture stone tools and weapons. A distinctive double-edged battle axe was very common in the deposits.

The wood of the pilings and construction at Alvastra is generally well preserved. The structure is a large wooden platform on pilings with a number of internal rooms and fireplaces. There were more than 100 stone hearths found. The two original smaller platforms with several rooms each at the site were later replaced by a larger construction some 1,000 m^2 (10,750 ft^2) in area. The rooms had wooden floors, and the entire structure was connected to the shore by a boardwalk. At the entrance of the boardwalk, a single human skull was found. The entire platform

was encircled by a palisade or wooden fence. Radiocarbon dating of the timber points to construction around 3000 BC. Dendrochronology revealed that the logs for the structure were cut during the winter months over a 16-year period (Bartolin 1978).

The function of the construction is not clear—dwelling, feasting house, ritual building, burial place, or perhaps all of the above. The construction was used only in the summer months. The site has some of the most numerous and best-preserved organic remains in Swedish prehistory. Food remains were found around the fireplaces; they included charred wheat and barley, split and charred crab apples, hazelnut shells, and bones of cattle, sheep and pigs, red deer, roe deer, European elk, wolves, and bears, birds such as mallard and black grouse, and fish, including pike and perch. After approximately 40 years of use, the place became a cemetery, with the dead placed atop wooden scaffolds on the platform (Malmer 1984).

Figure 5.13. The 1908–1919 excavations of the Alvastra pile construction in Sweden.

Kainsbakke, Denmark

This site from eastern coastal Jylland is one of the few pure PWC settlements in Denmark. Radiocarbon dates indicate an occupation between 2900 and 2550 BC. The archaeology consists of a layer of cultural materials along with a number of pits and hearths covering an area of almost 5,000 m^2 (1.2 acres) (Rasmussen 1993). Kainsbakke contains at least 16 deep pits, only one of which has been partially excavated. This one example was a large oval, roughly 6 × 4.5 m (20′ × 15′) and more than 1 m deep, filled with the remains of broken artifacts, waste materials, and meals. The pottery and other artifacts showed close similarities with Pitted Ware groups in southwestern Sweden. PWC is known to be associated with causewayed enclosures in other parts of Denmark, and these pits may be the trenches of just such a monument (Iversen 2010).

The animal bones included domestic cows and pigs, sheep, dogs, horses, roe deer, red deer, aurochs, brown bears, wild pigs, gray seals, Greenland seals, beavers, badgers, water rats, mice, birds, herring, eel, garfish, cod, mullet, mackerel, flatfish, snails, oysters, cockles, and mussels. These remains indicate a broad-spectrum economy involving herding, hunting, fishing, and gathering, with an important marine component (including shellfish) in the diet. There is no direct evidence for cultivation, but the use of grain is suggested by the presence of grindstones and sickles (Jensen 1994, Rasmussen 1991). Human remains were encountered in the excavated pit as well, likely the remnants of a grave. Isotopic analysis of the human bones indicated a mixed diet of marine and terrestrial species.

Ajvide, Sweden

Gotland is a large island in the center of the Baltic Sea, about 100 km from the Swedish mainland. It is a popular summer resort area for Swedes. The resident

population of almost 60,000 is augmented by nearly 2 million visitors each year, arriving by sea and air. The site of Ajvide on the western shore of the island contains the remnants of a large PWC settlement and cemetery, dated to ca. 2900–2300 BC (Burenhult 1997b). The area of archaeological remains at Ajvide is huge, covering some 200,000 m^2 (almost 50 acres), and the location was in use from the Late Mesolithic until the middle Bronze Age. The primary period of activity, however, was during the PWC between 3100 and 2700 BC. The settlement area at the site is marked by a thick cultural layer with waste material and animal bones, along with some posts and hearths. The bones were predominantly from seal and fish, along with a number from wild or feral pigs (Rowley-Conwy and Storå 1997). Other species included fox, dog, hare, hedgehog, and porpoise. About 90% of the bones came from marine species. Almost 400 complete and broken bone fishhooks were found in the cultural layer, probably used for cod fishing in deep water (Olson et al. 2008). Isotopic analysis of the human remains confirmed that marine foods from the Baltic provided the major portion of the diet (Lidén 1996, Lindqvist and Possnert 1997).

The cemetery contained almost 90 inhumation graves with at least 95 individuals, along with some 8 empty graves. Several of the burials remained only as scattered sets of bones. There were three bundle burials, which are rare in the Neolithic of northern Europe (Norderäng 2007). Such disarticulated clusters of bones were bundled or bagged before burial and often are missing some of the smaller bones of the skeleton. The general interpretation is either as the bones of an individual who died elsewhere and whose remains were transported to the place of burial, or special treatment of the body after death, such as a scaffold burial, defleshing, or other ritual preparation.

Figure 5.14.
A museum reconstruction of Grave 29 with a woman and two young children (photo by Raymond Hejdström).

The age and sex ratios of the buried individuals are evenly distributed and appropriate for a normal population (Fahlander 2003). The presence of slate points with later burials at the site indicates contacts with either mainland Sweden or perhaps Finland to the north, where the sources of this slate are found. Grave 29 is particularly striking, containing the remains of an adult female and two young children aged 2.5 and 4–5 years (Figure 5.14). Cause of death is unknown.

Grave furnishings were common and included Pitted Ware pottery, worked boar tusks, tooth pendants from seal, dog, and fox, awls, spears, harpoons, and fishhooks of bone, stone axes, tubular beads of dentalium, and cylindrical bone beads (Burenhult 1997a). Among the other grave goods, there were several interesting clusters of objects. Near the right arm of Burial 7 at Ajvide was a group of greenstone axes along with the wing bones of a red-throated diver, long bones

from hare, six bone points, tooth pendants from boar and seal, and 20 retouched flint artifacts (Mannermaa 2008). Near the head of this individual lay a thick-butted flint axe and a bone fishhook. Burial 60 was provided with a cache of 46 pig jaws (Figure 5.15). Aging the animals based on the tooth wear on the jaws revealed a time of death between October and December (Rowley-Conwy and Storå 1997), probably reflecting the season of burial.

Figure 5.15.
Ajvide Burial 60. A young child buried with the jaws of at least 23 pigs.

Auve, Norway

The site of Auve, on a former coastal sand dune along the southwestern shore of the Oslo Fjord, was excavated from 1979 to 1984 (Østmo 2010). The stone artifacts were typical of the Cord Stamp Culture. All 250 flint points and fragments had tanged bases (Figure 5.12). In addition, there were 91 points made of schist. There were 786 fragments of polished flint axes. Seventy pieces of amber were found, some used as beads or buttons. The flint axes and amber must have been imported from southern Scandinavia. There were more than 120 pieces of pumice used for shaft straighteners or net sinkers. A few objects of worked bone or antler were also found, including harpoons, fishhooks, and several pointed tools.

The pottery finds at Auve were particularly abundant, more than 40,000 sherds. These Cord Stamp Culture ceramics had been decorated with lines of cord or string stamping, with knotted strings, or with pits of different sizes and shapes. Only burned animal bones survived in the sandy soils of the settlement. More than 33,500 bones were collected, but only 1,121 could be identified as to species. Some 84.5% of the identifiable animal bones belonged to marine species, including fish, birds, and sea mammals (Hufthammer 1997). The rest of the bones came from fur-bearing animals such as otter, beaver, and hare. There was no evidence for animal husbandry or cultivation.

Bell Beaker Culture

Bell Beaker Culture appeared in isolated pockets of settlements and graves scattered across Western and Central Europe, dating from approximately 2800 to 1800 BC (Figure 5.16). The origin of Bell Beaker appears to have been in Portugal (Müller and van Willigen 2001). The initial spread may have been along the Atlantic Coast and into the Mediterranean in search of copper and other valuable raw materials (Cunliffe 2012). Bell Beaker is present in Scandinavia, largely in northern Jylland, Denmark (Vandkilde 2007). There is also an outpost in southwestern Norway, at the site of Slettabø (Skjølsvold 1977), along with a

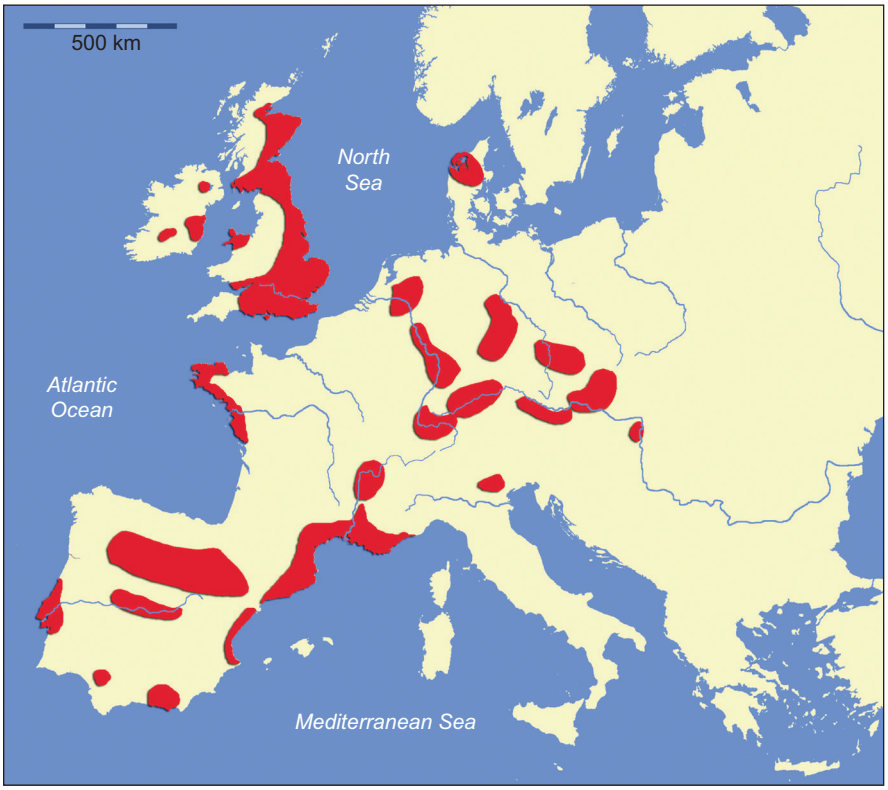


Figure 5.16.
The distribution of Bell Beaker Culture in Europe.

range of Bell Beaker material including flint daggers, tanged and barbed bifacial points, wrist guards, and amber buttons (e.g., Holberg 2000, Prescott and Walderhaug 1995).

The first appearance of these Beakers in northern Jylland dates to 2350 BC and coincides with the beginning of the Late Neolithic (Figure 5.17). This is several hundred years after the initial appearance of Bell Beaker in continental Europe. This fine Beaker pottery in Denmark is locally produced. The closest ties, in terms of the decoration of the pottery and styles of daggers, are with a Bell Beaker group in the central Netherlands. The smaller Bell Beaker ceramics appear to be drinking vessels. In addition to the Beaker pottery, other distinctive artifacts include V-perforated amber buttons and flint daggers.

At the beginning of the Late Neolithic, metalwork is concentrated in the Beaker region of northern Jylland and includes gold sheet ornaments and copper flat axes. Bell Beaker folk appear to be best understood as explorers and traders, importing metalwork and perhaps introducing beer or other new beverages to Scandinavia while exporting flint daggers and other items. The Bell Beaker presence in northern Jylland was likely related to the abundant local sources of high-quality flint for the production of daggers. These flint daggers were traded throughout northern Europe and also document connections between Denmark and Norway in this period (e.g., Solberg 1994). An argument can be made that the Bell Beaker presence in northern Jylland initiated the onset of the

Late Neolithic in southern Scandinavia, particularly in terms of trade and commerce in metals and other prestige objects (Vandkilde 2007).

THE LATE NEOLITHIC

The Late Neolithic in southern Scandinavia dates from 2350 to 1700 BC and is also known as the Dagger Period because of the abundance of flint daggers in circulation. The material remains of this period extend south into northern Germany and north to southern Norway and Middle Sweden. Shared artifacts and architecture across this region include finely made flint daggers (Figure 5.18) and spearheads, pottery, early metallurgy, wetland sacrifices, costume, similar burial practices, and house types (Vandkilde 2007). The primary symbolic objects continued to be weapons, as finely made flint daggers and spearheads largely replaced the battle axes of the previous period.

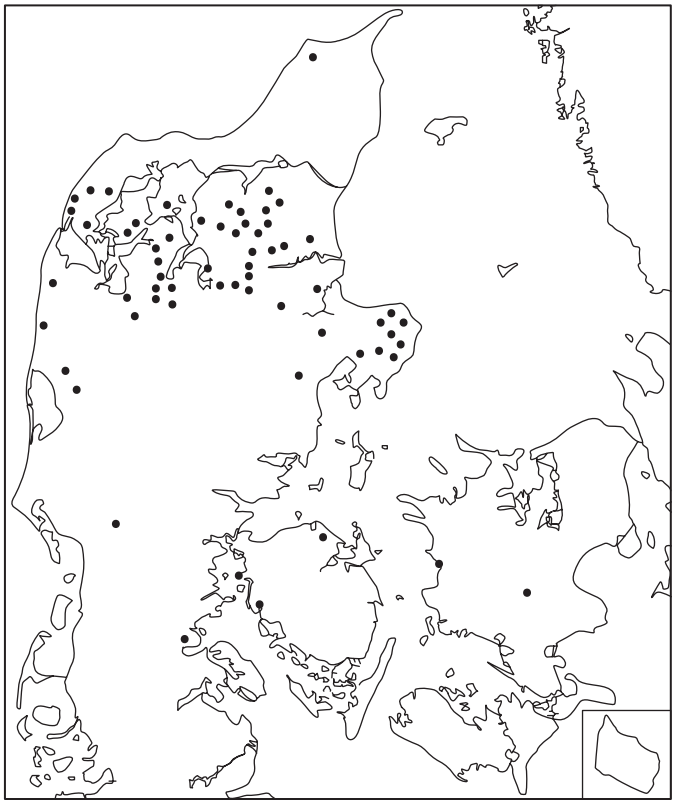


Figure 5.17.
Finds of Bell Beaker pottery in Denmark.

The Late Neolithic in northern Europe was distinguished by a greatly increased use of metals and the use of metal models from Central Europe for the production of flint daggers. This period also witnessed a major intensification of long-distance exchange, bringing a series of innovations ranging from dress styles to burial ritual (e.g. Prieto-Martinez 2008, Vandkilde 1996, 2005). Local metallurgy in southern Scandinavia likely involved copper casting (Vandkilde 1996). Copper and gold artifacts include axes, jewelry, and a few other objects. These early metal objects were usually deposited in wetland sacrifices or hordes rather than graves, a common fate of flint daggers as well. The hoard from Gallemose described below is an example of such an offering. Slate pendants, amber beads and buttons, and bone pins were items of dress, attached to woven woolen clothing (Bender Jørgensen 1992). These items often found their way into graves, along with a few flint artifacts and pottery vessels.

From its earliest appearance in northern Jylland, Late Neolithic appears to spread to the rest of southern Scandinavia, northern Germany, southern Norway, and Middle Sweden (Figure 5.19). The Late Neolithic is divided into an early and a late phase based on the typology of the flint daggers. Late Neolithic I is more closely connected to the preceding Neolithic, while Late Neolithic II resembles the early Bronze Age (Vandkilde 2007). The break between the two phases occurs around 1950 BC. The seminal synthesis of the late Neolithic by Ebbe Lomborg (1973), *Die Flintdolche Dänemarks*, is still an essential source regarding this period in Denmark.

Figure 5.18.
Late Neolithic daggers from Denmark.

While Bell Beaker traditions dominate northern Jylland at the beginning of the Late Neolithic (described below), central and eastern Denmark and southern Sweden appear to be more closely connected with the early Bronze Age Únětice Culture (2300–1600 BC) found in the Czech Republic, southern and central Germany, and western Poland. Amber from the Baltic and North Sea region was common in graves of the Únětice Culture (Gimbutas 1965). This Únětice connection intensifies through the Late Neolithic and must be considered responsible for the beginning of the Nordic Bronze Age (Vandkilde 1996).

Some 13,000 flint daggers have been recorded archaeologically from northern Europe. The total number must have been several hundred thousand during the Late Neolithic. The hallmark flint dagger is "a fragile status object virtually useless for practical purposes, which imitates the copper or bronze dagger in form but not function" (Malmer 2002: 11). These daggers were largely for show, probably as status symbols, and are usually found in male graves. Nevertheless, demand must have been enormous given the numbers of these daggers produced during the Late Neolithic.

The daggers represent a highpoint of Stone Age flint knapping. Their manufacture requires large pieces of flint and a good bit of time. The initial production of flint daggers took place primarily in the Limfjord region of northwest Jylland, utilizing the rich flint resources in the chalk at places like Skovbakken in the modern city of Aalborg (Becker 1993). Later, sources in eastern Sjælland and southwestern Skåne were employed for production (Apel 2008). Stafford (1998) has experimentally replicated these daggers and reports an average production time of 12 hours. Between 3,000 and 4,000 pieces of flint waste were produced in the process.

Apel (2008) argued that skilled craftsmen were likely responsible for production. He suggested that an apprentice system of some sort must have been in place in order to maintain these highly technical manufacturing skills for 25 generations. He also observed that different stages in the production of daggers took place at different locales. The initial stages of nodule acquisition and blank production were near the flint sources themselves. The later stages of production—the fine flaking and finishing of the dagger—were completed in settlements. Apel suggested that some flint dagger manufacturing techniques may have been kept as an industrial secret in order to monopolize production. Such sophisticated organization of craft production was likely controlled by elite leaders.

Copper and gold are present early in the Late Neolithic in southern Scandinavia (Figure 5.20). True bronze begins to appear in LNII, after 2000 BC. Bronze is a mixture of copper and arsenic or tin. The earliest bronze probably resulted from

the accidental result of smelting a high-arsenic ore for copper production. Tin is an intentional additive to copper to make true bronze. The metals in use in LN II Scandinavia vary from pure copper to full tin bronze. About one-third of the metalwork in LNII is true bronze, containing 5% to 16% tin (Vandkilde 1996). By the beginning of the Nordic Bronze Age around 1700 BC, however, copper items are rare, and most metal objects are made of true bronze as this new metal became more available.

Population and settlement were expanding with forest clearance and extensive trade and exchange in the Late Neolithic. Farming increased in both scale and intensity. New land was opened, and farms expanded into new areas in southern and central Scandinavia. The primary focus was on cattle herding in this period, with only a secondary investment in cultivation. Artursson (2009) has calculated the number of recorded houses from the Neolithic in Scandinavia. It is clear from a graph of these numbers (Figure 5.21) that there was an enormous increase in houses in the Late Neolithic, and it should be remembered that these houses were generally larger than in the preceding Early and Middle Neolithic. The relatively low numbers of houses from the Middle Neolithic are also clear in this graph. Two-aisled timber houses with or without sunken floors were typical dwellings of the Late Neolithic (Nielsen 1999). Toward the end of LNI, some of these farmhouses were very large and likely reflect a more powerful elite group.

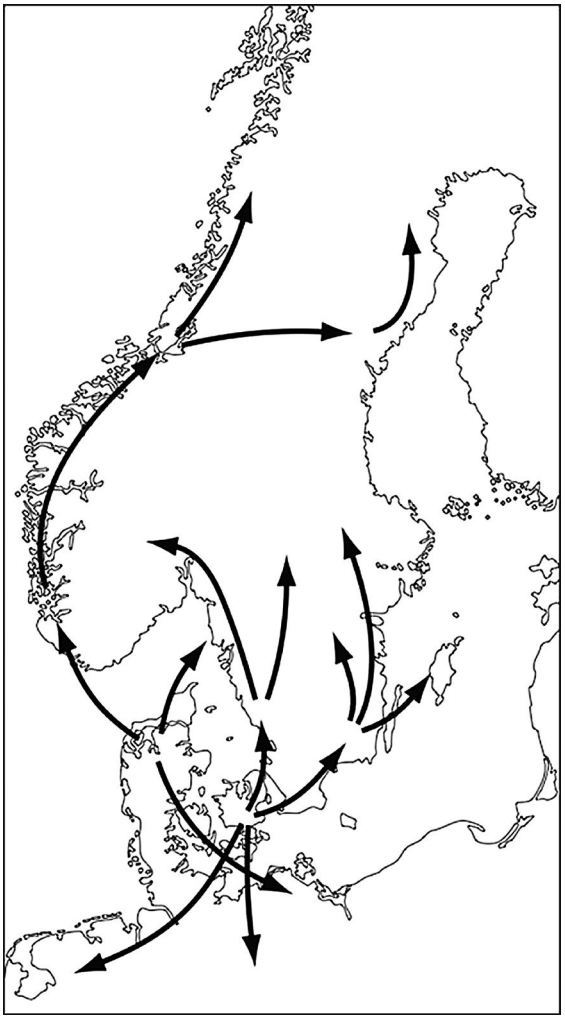


Figure 5.19.
The trade in flint daggers from two production areas in Denmark (northern Jylland and eastern Sjælland) to the rest of northern Europe.

Artursson (2010) argued that political power became more visible and concentrated during the Late Neolithic in southern Scandinavia as a consequence of contacts with Central Europe, the increasing amount of metal being imported, and the introduction of metal craft production. Metal production was focused primarily on weapons—axes, spearheads, and swords. In all likelihood, the beginnings of inherited rank and the warrior ideology can be traced to this period. This long-distance network of exchange supported the rise of chiefly power and aristocratic centers over much of southern Scandinavia. Trade in other items of wealth and prestige provided the displays of wealth and status that helped legitimize the power of these individuals.

These changes in power and accumulating wealth can be seen in the houses and graves from the Late Neolithic (Artursson 2011, Nielsen 1999). Houses have a single, central row of roof-bearing posts (Figure 5.22). Some of the houses have sunken floors in one end in an area that may have been the animal stable.

Figure 5.20.
Gold and copper artifacts from the Late Neolithic in Denmark: four gold arm rings, four copper axes, two gold earrings, a gold crescent necklace, and fragments of gold wire.

Some of these structures are very large, especially in the second half of the Late Neolithic.

Kristiansen (2006) has graphed changes in house size and the proportion of very large houses present in the context of land and metal use in Denmark (Figure 5.23). There seems to be a very clear correlation among the expansion of agriculture, the beginning of metal production, and very large houses. These larger houses likely represent the estates or magnate farms of the higher-ranking members of Late Neolithic society. Artursson (2011) has characterized these large farms as chiefly hamlets. There is also a strong association between the location of the larger houses, access to natural resources, and strategic location along the major networks of transport and movement (Artursson 2011). A similar style of

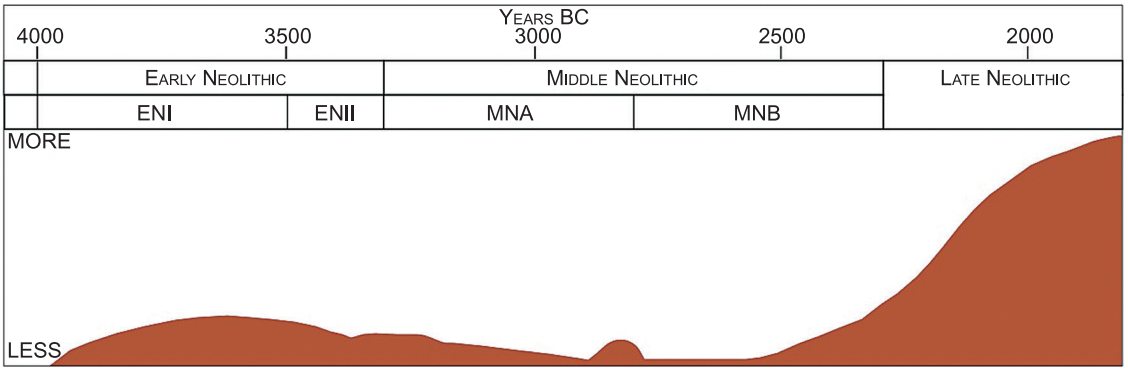


Figure 5.21.
The relative number of excavated houses by period from the Neolithic in Scandinavia.

Figure 5.22.
An enormous Late Neolithic house at Limensgård, Bornholm, Denmark.

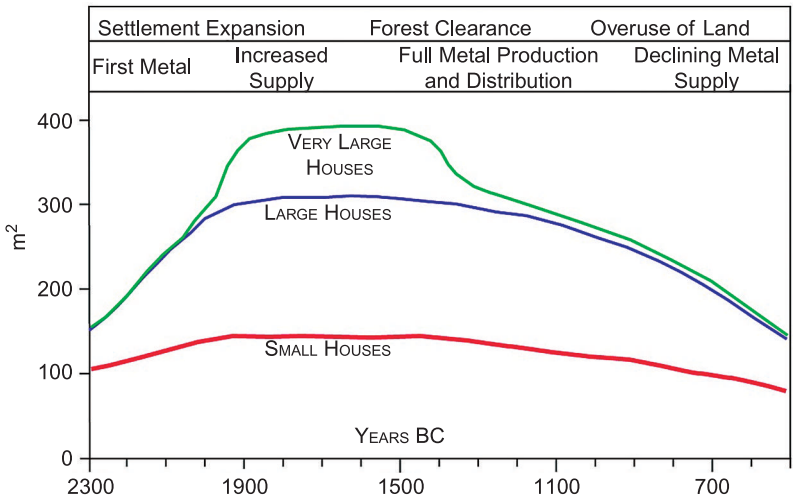


Figure 5.23.
A graph of changes in house size in the context of land and metal use.

large house is found across large parts of northern and central Europe at this time (Nielsen 1999).

The Late Neolithic dead were buried in various ways, both in tombs and in flat graves, normally in a plank coffin or stone cist. Earlier Neolithic dolmens and passage graves were commonly employed for burials (Lomborg 1973). Reusable stone cists or, in a few cases, timber chambers with an opening similar to passage graves

were another form of burial monument in the period. Burial types show regional variation, with the stone cists of the Single Grave Culture in western Denmark and the reuse of megaliths in eastern Denmark. The significance of the long house in society can also be seen on occasion when symbolic ceramic miniature models of these structures were placed in tombs.

The quantity and wealth of grave goods increased during the Late Neolithic and included high-status metal weapons and jewelry (Vandkilde 2007). In some areas—the Limfjord region of northern Jylland, Sjælland, Skåne, and on the Baltic island of Bornholm—there is a clear increase in the size and complexity of the graves as well. Moreover, rich and poor graves are found in proximity to one another in burial areas, documenting growing inequality in society (Vandkilde 2007). The example from Gerdrup, Denmark, below is of a so-called *stenkist* or stone cist grave that is typical for the region.

Gerdrup, Denmark

Late Neolithic burials in southern Scandinavia were often placed in the megalithic tombs from the earlier Neolithic, but in some cases new stone chambers were constructed to hold one and often more individuals. An earthen burial mound was then erected over the grave to commemorate the deceased. These structures are known as *hellekister*. The graves consist of a rectangular stone frame with large capstones, constructed in a dugout pit. The length of these structures varies from 1.5 to almost 4 m (5′–13′), but the average is about 2.5 m (8.2′) (Liversage 1964). They were intended for the burial of a number of individuals over some period of time (Figure 5.24). For this reason, one end of the tomb was constructed with an entrance intended to be reopened. Intriguingly, these stone-lined tombs and earthen mounds from the Late Neolithic were often buried beneath a later earthen barrow containing a grave from the Bronze Age.

The *hellekiste* from Gerdrup is located in central Sjælland, overlooking the Roskilde Fjord (Liversage 1964). A total of ten individuals—five males, two females, and three children—had been interred in the tomb, but only the last burial, a male, was represented by an intact skeleton. The other human remains had been moved for the new occupant, replaced in piles or pushed to the sides of the grave. The grave goods included a fine dagger buried with the last occupant as well as a bone pin, a bone awl or pointed piece, three copper or bronze rings, a bone bead, and an arrowhead. There was another burial of a young female just outside the *hellekiste* in a flat grave with a wooden coffin, contemporary with the stone structure.

Gallemose, Denmark

In AD 1887, a group of boys found a massive hoard weighing almost 12 kg in a small bog called Gallemose near Randers, Denmark. The hoard had been deposited ca. 1800 BC, just before the end of the Late Neolithic. The metal is a mix of copper with very little tin, not true bronze. The offering contained nine axe blades, including one from Britain, another from southern Europe, and the remainder of local origin. The largest of the axes is 34 cm (13″) in length. Nine

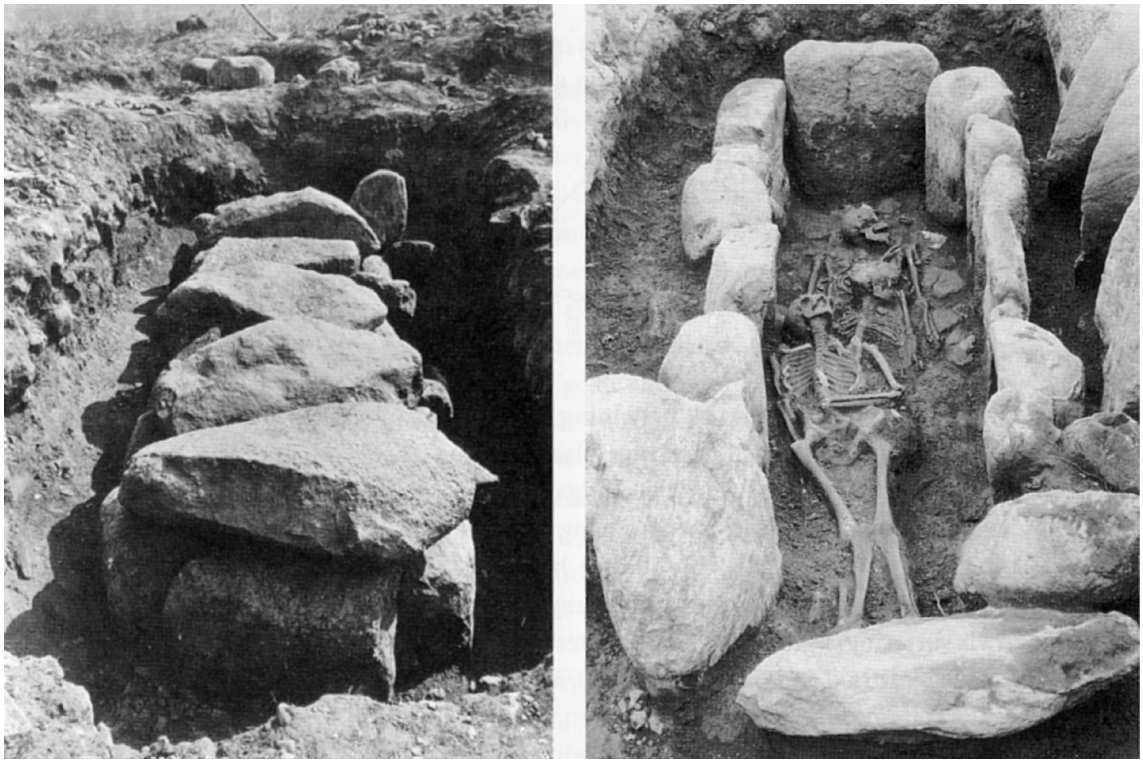


Figure 5.24. The Late Neolithic *hellekiste* from Ølsted, Denmark.

ingots in the form of heavy rings were also included in the hoard. Parallels to these rings are known from central Europe. Finally, there were three long, cast objects with a hook on one end (Figure 5.25). The hooked pieces are made of heavy copper (almost bronze) cast around a fired clay core. These three pieces from Gallemose may have been attached to the front of the chariot's shaft to hold the reins and probably document the use of the two-wheeled chariot and horses in Late Neolithic Scandinavia.

The horse was originally domesticated in the Eurasian steppes around 4000 BC (Wermuth et al. 2012) and arrived in Scandinavia after 2000 BC. The horse was probably used for riding, chariots, and religious rituals and may initially have been considered a sacred animal. A light two-wheeled chariot appears several times in the rock art of Bronze Age Sweden and Norway—perhaps used in processions, among other activities.

Almhov, Sweden

The site of Almhov, part of the City Tunnel Project in Malmö, Sweden, has previously been discussed. The location was also an important place in the Late Neolithic and has the largest number of excavated houses from this period in Scandinavia (Artursson 2009, Brink 2009, Larsson and Brink 2013). There are almost 40 houses known from the Late Neolithic and Early Bronze Age (Figure 5.26). Comparison of the houses through time documents an initial increase in the number and size of the structures, followed by a decrease at the end of the Late Neolithic and into the early Bronze Age (Larson and Brink 2013). In the

Figure 5.25.
The Gallemose Hoard, Denmark, 1800 BC. The largest axe is 34 cm long.

twentieth century BC (2000–1900 BC), there were six contemporaneous working farms within the excavated area at Almhov. Some of the farms had a very large house and some more than one house. These farms at Almhov appear to be located around a large oval of open space, suggesting an area for common activities shared among the entire community (Artursson 2011).

Moreover, some of these farms have a long history of occupation, being repaired and rebuilt for several hundred years, suggesting a previously unseen permanence in place. One farm had a sequence of large longhouses through the whole period of the settlement. In the context of more permanent residence, routes of movement and communication appear more strongly etched on the landscape. In one sense, these permanent, long-term large houses were the monuments of the Late Neolithic. Then, shortly before the end of the period, the number and size of the houses declined, and finally the farms at Almhov disappeared by the beginning of the Bronze Age.

NORTHERN SCANDINAVIA

In northern Scandinavia, the Neolithic is usually termed the Younger Stone Age, and sometimes referred to as the Subneolithic. The Younger Stone Age in northern Sweden has also been called the Early Neolithic, or the Slate Culture (Brøgger 1906, Hallgren 2010), or the Quartz/Slate Complex because of the presence of ground slate and flaked quartz tools used by these hunter-gatherers (Baudou 1977, Hallgren 2008, Nygaard 1989). Quartz as a raw material for stone tools is commonly found on the west coast of Norway as well at this time. Slate is used for making knives, spear and arrowheads, adzes, pendants, and various ritual objects (Nygaard 1989) and was found initially across northern Sweden and north central Norway and eventually throughout western Norway, as well as in the south. In Sweden, slate artifacts have been found over most of the country except the extreme southwest.

Because agriculture was not possible in much of the northern half of Sweden and Norway, a true Neolithic with domesticated plants and animals was not seen in these areas. Dependence was based on the resources of the wild, and subsistence continued to focus largely on hunting, gathering, and fishing. The terminology and chronology of the Younger Stone Age varies by region in the north. In the following pages, I will discuss this period first in Norway and then in Sweden.

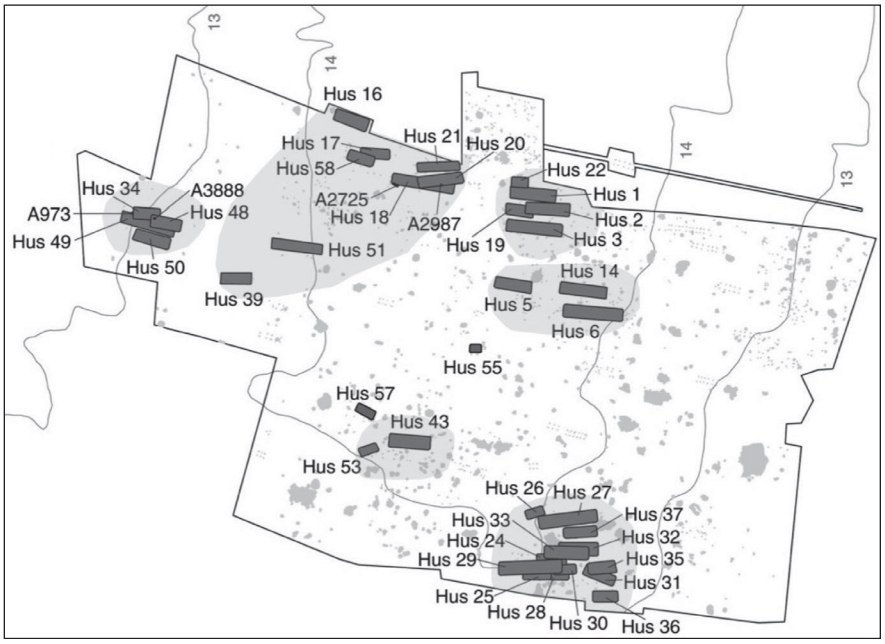


Figure 5.26.
The excavations of the City Tunnel Project at Almhov, Sweden, and the distribution of Late Neolithic/Early Bronze Age houses. The six individual farms are shaded. Not all houses were occupied simultaneously.

Norway

The Younger Stone Age of northern Norway lasts from approximately 5000 BC until 1700 BC and the start of the Early Metal Period. This Younger Stone Age is distinguished by the presence of ceramics and ground slate technology, which gradually exceeds flaking as the most common technique for stone tool manufacture. House remains become more common, with larger dwellings, and artifact assemblages are generally more varied over time (Olsen 1994). Permanent or semipermanent settlement is a possibility at some of the larger sites (Renouf 1981). Two sites with extremely large concentrations of houses have been found at Gropbakkeengen and Slettnes. The site of Gropbakkeengen is described in more detail below. Simonsen (1961) and others interpreted these bigger groups of houses as large winter villages, with spring-fall camps elsewhere in the landscape used for seasonal hunting and fishing. Helskog (1984), on the other hand, argued that the large number of house depressions at such sites represent reuse and reconstruction of these structures, so that only a small number of houses would have been in use at any one time. He suggested that prior to 1000 BC, community size in the Younger Stone Age was small—perhaps one to six contemporary houses—rather than the larger villages suggested by other researchers.

With the beginning of the Younger Stone Age, a number of new materials and objects began to appear in the far north. Pieces of amber from the southern Baltic region, flint arrowheads of a type known from Denmark, and slate ornaments from Sweden offer testimony to the expansion of exchange networks. There have also been stray finds of polished flint axes, flint daggers, spearheads, battle axes, and more, originating in the southeast Baltic and southern Scandinavia (Simonsen 1975, Zvelebil 2004). Rose-colored flint from western Russia was used commonly

in northeastern Norway. Finally, asbestos as a raw material has been found throughout northern Scandinavia, used as a temper in pottery production. The major source of asbestos in northern Europe is in eastern Finland, although there are a few minor sources in northern Norway (Simonsen 1975). These exotic materials in the north point to trade connections to the south and to the east. Materials in exchange may have included walrus ivory, seal oil, and skins and furs.

Around 2500 BC, there was a shift from smaller to larger houses that must reflect a change in family structure, perhaps from nuclear to extended or multifamily dwellings. At the same time, the resident population at settlements appears to have doubled from ca. 25 to 50 individuals (Helskog 1984). After 2000 BC, interaction with middle and southern Scandinavia increased with the spread of new materials during the Late Neolithic and Bronze Age (Baudou 1977). Scattered evidence of limited agriculture also appears in the north during this period. The pit houses, which were the most distinctive feature of the Younger Stone Age settlements, disappeared. Little is known about the populations of the following millennium in this northernmost coastal area. It is assumed that the people were fisher-hunters, some of whom could have tended small herds of reindeer (Simonsen 1961, Helskog 1980). This is about the time that the Saami may have appeared in this area, a topic discussed in more detail in chapter 7 on the Iron Age.

Gropbakkeengen, Norway

The site of Gropbakkeengen on the Varangerfjord in far eastern Finnmark near the Russian border contains at least 89 house depressions arranged in rows along the former coastline (Figure 5.27). The ground plans for these houses were round, oval, or rectangular with rounded corners, outlined by low mounds covering the former walls, probably built of sod. Most of the houses that have been excavated have a single central hearth and a floor area between 8 and 23 m^2 (25′–75′) (Helskog 1984, Simonsen 1961). The number of contemporary houses at any one time is unknown.

The site dates belongs to the Younger Stone Age, dated to ca. 3500–2500 BC, and is sometimes described as Early Neolithic (Hodgetts 2010). Flaked stone tools are replaced by well-made slate artifacts, such as knives and projectile points, and

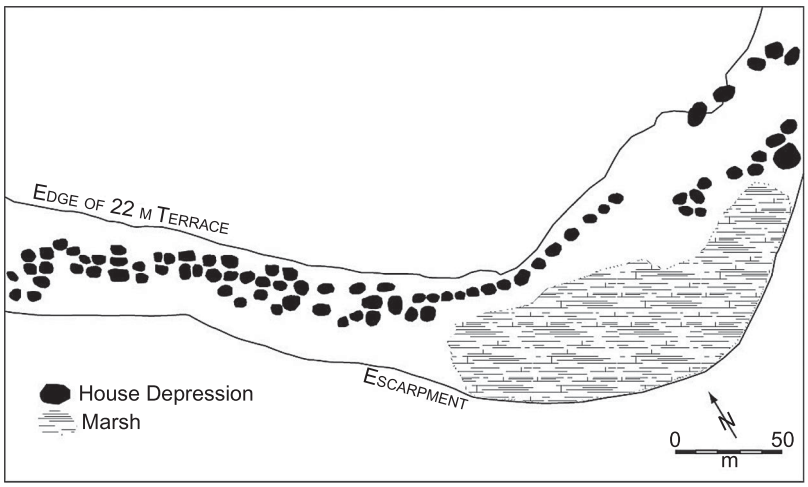


Figure 5.27. Plan of the house depressions at Gropbakkeengen.

ground stone technology. The limited range of artifacts has led to the suggestion that these were specialized sea mammal hunting camps, and represent seasonal aggregations of settlement (Olsen 1994).

In addition to the archaeological settlements, there are also petroglyphs and pictographs from the Younger Stone Age in the Varanger Fjord, depicting different animal prey, boats, and hunting and fishing activities. One scene shows a man in a skin boat with a line and sinker pulling in a halibut. Another shows a man in a skin boat hunting a seal. A third panel reveals two men on skis wearing hunting gear. A few portable art objects have also been found in the far north, including the carved bone figures shown in Figure 5.41.

Animal bones were relatively few in number and included fish, harp seal, and whale, perhaps indicating a late winter/early spring occupation when these species were most readily available. Renouf (1981, 1989), on the other hand, argues that these sites may be sedentary given the rich variety of marine resources present in the fjord and the relative absence of evidence for inland settlement. Seals and whales are large, rich sources of calories and protein available year-round (Hodgetts 1999, 2010). Reindeer bones are less than 10% of the total, but antler and bone from these animals were used for a variety of tools, including fishhooks, harpoons, and many other implements and utensils.

Sweden

Northern Sweden has two major zones of significance for the hunter-gatherers who occupied this region, the Baltic coast and the interior. The interior environment, although coniferous forest, is relatively productive. These boreal forests were fertile with grasses and herbs and supported large populations of elk and bear. The rivers and streams held beaver and fish, especially salmon on a seasonal basis. The coast was rich in the marine resources of the Baltic, especially fish and several species of seals that appear to have been a mainstay in the diet of coastal populations.

Quartz and slate stone artifacts are common at the sites from this period. At approximately the same time, there are other significant changes and more evidence of contact with Battle Axe Culture groups to the south. Numerous caches of south Scandinavian flint axes and adzes appear toward the end of the Middle Neolithic. At the site of Bjurselet, discussed below, a number of these caches were found along with Battle Axe pottery (Baudou 1977, Christiansson 1986, Knutsson 1986). New tools and equipment appear, such as bifacially worked projectile points of quartz or quartzite, Russian flint, bronze artifacts, and casting molds (Baudou 1977, Huggert 1984). Cereal cultivation (barley) and animal husbandry (sheep and cattle) are documented on the coast of Västerbotten at this time (Königsson 1970, Lepiksaar 1975, Engelmark 1982). Asbestos-tempered pottery is introduced in this region after 2000 BC, probably originating in Finland.

There is a distinctive kind of site found in the center of northern Sweden within an area some 200 km (125 miles) in diameter. These sites appear as large heaps of fire-cracked rock with a central depression along the rivers of the interior. These rock mounds encircled pit house structures that varied in size from 2 × 3

(6.5′–10′) to 8 × 12 m (26′–40′) (Spång 1986, Lundberg 1985). The walls were probably made of sod and sand dug from the pit. The stones may have been used originally in the house fireplace and then discarded outside after fracturing. The stone heap likely accumulated over time and may have helped to support and insulate the house. Elk bone is common in the stone piles along with beaver. The faunal evidence points to winter residence in these pit houses. The structures are found in groups of one to ten, usually two to five. These clusters occur roughly 35 km (22 miles) apart in central-northern Sweden. The fire-cracked rock structures were used between 4700 and 2000 BC (Knutsson and Knutsson 2003). A number of other sites without rock mounds are present from this period and are assumed to represent settlements and activities from other times of the year.

The site of Lundfors is described below as an example of hunter-gatherer settlement along the coast of northern Sweden. Namsförsen is an inland site in northern Sweden, located along a major river, and both a large settlement and extensive area of rock art have been recorded there. Although hunting and gathering continued to be the predominant mode of subsistence, Neolithic groups from southern Scandinavia made an appearance along the Baltic Coast involved in trade and some form of colonization. Polygonal battle axes began to appear, and eventually other imported items such as flint axes and daggers also made their way into northern Sweden. An example from the site of Bjurselet is described below.

Lundfors, Sweden

The site of Lundfors lies on the coast of the Gulf of Bothnia in the northern Swedish province of Västerbotten. The site was excavated in the early 1970s, along with several others, and described as a large, year-round settlement of seal hunters (Broadbent 1978, 1979). The site dates to ca. 3800 BC. The settlement lies on a former shoreline on the eastern side of a sheltered inlet with access to the open sea. Because of the acidic conditions of the soil, only materials like stone artifacts, charcoal, and burned bone have survived.

The stone artifacts fall into three categories: (1) slate tools, which included single-edged knives, small, barbed projectile points, and axes, (2) non-cutting tools of various kinds of stone, including net sinkers and whetstones, and (3) artifacts of quartz. The axes were made from blocks of amphibolite, flaked to shape and roughly ground and polished, often with a pointed butt. Quartz was the primary raw material and was used to make large numbers of scrapers, borers, and engraving tools. Several quartz quarries have been found within 10 km of the site (Broadbent 1973).

Analysis of the limited faunal remains indicated that ringed seal were the primary prey of these hunters. This species calves on the ice during late winter, when it is most vulnerable to the hunters. Its preferred habitat is in small bays. An enormous number of heavy, notched stone net sinkers were found at the site, suggesting that heavy nets may have been used to catch the seals. Fishing was also important, and pike appears to have been an important part of the diet. Mussel and barnacle shells were found in the deposits and would also have been a source of food. Information on season of death for the seals and other species indicates that

the site could have been used year-round. The size of the settlement was substantial, ca. 12,000 m^2 (3 acres), which suggests a rather large population.

The sites at Lundfors are contemporary with the rock mound sites in the interior of Västerbotten mentioned earlier. Several authors have suggested that there were distinct inland and coastal settlement systems operating in northern Sweden, with essentially sedentary residence in both areas. The coastal region in this part of Sweden had a series of narrow environmental zones, including pine and deciduous forest, which contained a variety of seasonal resources. Together with the seals, these resources may have permitted year-round settlement. This hypothesis remains untested, and more study is needed to determine the exact pattern of residence during this period in northern Sweden.

Nämforsen, Sweden

Gustaf Hallström (1880–1962), a Swedish professor of archaeology, dedicated much of his life to discovering and documenting the Stone Age rock art of northern Scandinavia. Spending almost 40 years clambering around the isolated lakes and rivers of northern Sweden and once nearly drowning, Hallström published two major volumes on what he called the monumental art of northern Europe (1938, 1960). This phrase was intended to convey the magnificence of the carvings, both in quality and quantity.

A major focus of his research was at the site of Nämforsen, one of the largest collections of rock art in Europe (Figure 5.28). The art dates largely to the late Mesolithic and Neolithic periods and covers both sides of the Ångermanälven River and several islands over a distance of 500 m (1,640′). This area is one of turbulent whitewater rapids. The rock walls and banks of the river expose large, polished stone surfaces that were used as a canvas by Stone Age artists.

These figures are pecked or "carved" on the smooth stone surfaces along the river, usually very close to the water. Most of the carvings were made between 3500 and 2000 BC (Baudou 1992). There are almost 3,000 depictions, including at least 720 animal figures (especially European elk—the close cousin of the North American moose), 366 boats, 87 people, 34 cup-shaped hollows, 25 foot soles, 19 fishes, 9 birds, and 11 elk-head staffs, among others (Figure 5.29). Most of the carvings are between 20 and 60 cm (8″–24″) in height.

Animals dominate the motifs. The distribution of designs is variable. Elk and boats are the most common and occur everywhere. Most of the figures were carved on the three large islands that command the rapids. Most of the various motifs appear on the islands as well. Only a small number of motifs appear on the southern shore, where boats are predominant. Boats are also most common on the eastern island. Humans are also more frequent on this island and are the third most common motif. Fish, birds, and feet are generally rare.

There is also a substantial settlement area across the river from the islands, with remains dating from ca. 4000 BC to AD 500. One of the largest collections of artifacts from northern Sweden was excavated there; more than 700 arrowheads were found, 750 scrapers, and 6 kg of potsherds with asbestos temper. There were 120,000 flakes and cores from the excavations. Burned bone fragments were found from species such as beaver, salmon, pike, and trout. A single bone from a seal was also reported.

Figure 5.28.
The rock carvings at Nämforsen. These examples and most of the depictions have been filled in with red color to make them more visible.

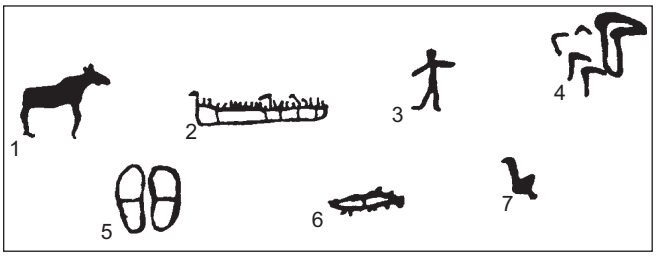


Figure 5.29.
The motifs seen at Nämforsen: 1. elk, 2. boat, 3. human, 4. tool, 5. shoe sole, 6. fish, 7. bird.

Bjurselet, Sweden

The settlement of Bjurselet was located along the Stone Age coastline of northeastern Sweden, approximately 130 km (80 miles) north of the modern city of Umeå. The site was excavated in the 1960s and has produced intriguing results in the form of flint axes that must have come from an enormous distance (Christiansson and Knutsson 1989). Pottery, the flint axes, and a battle axe at the site appear to belong to Middle Neolithic B Battle Axe Culture. The site is best dated to this period, approximately 2800–2350 BC.

The settlement remains at the site contained a large sample of animal bones. Fish (pike, Atlantic salmon, and whitefish) and seal (ringed seal) appear to have been the primary sources of food, but a variety of other animals, including elk, beaver, fox, marten, hare, and several species of fowl, were the game for these hunter-gatherers. The discovery of the bones of sheep/goats, pigs, and cattle led the excavators to suggest that herding may also have been practiced at the site. In all likelihood, these animals were brought to the site by the same people who transported the flint. Cereal was also reported in pollen samples from the area. In spite of these and similar claims for domesticated plants and/or animals

in the northern part of Sweden (e.g., Baudou 1992), there is no convincing evidence that any significant agricultural activity extended north of Middle Sweden (Malmer 2002).

The site is remarkable for a series of flake scatters and at least 13 flint hoards found around the settlement area. It is important to remember that there are no native sources of flint in northern Sweden and that the nearest significant sources of high-quality flint are in southern Scandinavia at a distance of approximately 1,500 km (930 miles). There are also a few pieces of Russian flint from the east found at the site. The objects in the hoards include finished tools as well as whole flint nodules. Most of the flint artifacts are axes, adzes, and chisels—around 300 items in total. As Siemen (1982) and others have pointed out, the axes in each cache are so similar that they were likely to have been made at the same place, perhaps even by the same individuals. These axes were buried in distinctive ways—vertically for example, or flat in a circle around slate objects—which suggests that these deposits were ritual in nature. A large proportion of the imported flint at the site had been burned. The arrangement of the flint axes in the caches and the roasting of the flint are similar to ritual practices known from southern Scandinavia.

Questions about this site have abounded for decades. Where exactly did the flint come from? Who transported it? Local people or foreigners? The original excavator thought that the artifacts at the site indicated the presence of three different groups of people (Christiansson 1989): the people who brought the flint, the local inhabitants, and groups from the east.

Recently, new scientific techniques have been applied to the identification of flint sources in Scandinavia, with some success (Olausson et al. 2012). Olausson and her colleagues have used X-ray fluorescence analysis (XRF) to distinguish a number of different flint sources in southern Scandinavia. Chemically, the candidates for the source of the Bjurselet flint were eastern Denmark or southwestern Sweden in southern Scandinavia. The Bjurselet axes were analyzed using the XRF technique (Figure 5.30), and the instrumental analysis confirmed eastern Denmark/Skåne as the source of the flint. Visually, the flint from these sources cannot be distinguished. Archaeologically, the manufacturing techniques and the arrangements of the caches point to eastern Denmark as the source for the axes in northern Sweden (Becker 1952, Knutsson 1986).

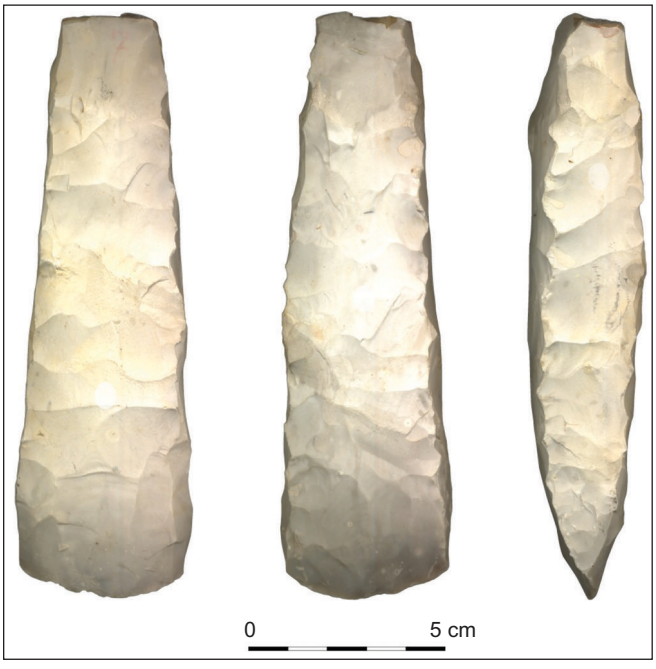


Figure 5.30. Three views of one of the flint axes from the Bjurselet caches.

The consensus, then, is that members of the Battle Axe Culture transported the axes to the coast of northern Sweden as part of an attempt to colonize the area (Olausson et al. 2012). Bjurselet and several other sites in the Bothnia Gulf of the northern Baltic Sea appear to be outposts of Battle

Axe Culture, perhaps trading stations for furs and other materials exchanged for flint. Such an interpretation is of course speculative, but fits much of the evidence.

TREASURES

Gullrum, Sweden

This well-preserved bone hair comb from the site of Gullrum on the Swedish island of Gotland has been dated to ca. 3000 BC (Figure 5.31). The comb has a human face and an elk head carved on either end of the handle. The handle itself has a series of fine zigzag lines on its surface. The comb is 9.5 cm (3.75″) in width.

Norrlövsta, Sweden

The battle axe shown in Figure 5.32 comes from a place called Norrlövsta in northern Sweden and is dated to approximately 4200–3200 BC. The axe was shaped from greenstone, and some have argued that it may have been imported from Finland. This particular treasure is also clearly a piece of art. The axe is

Figure 5.31.
Pitted Ware Culture. Bone comb from Gullrum, Gotland. Moose and man (photo by Gunnel Jansson).

Figure 5.32.
A battle axe in the form of an elk from Norrlövsta, Uppland, Sweden (photo by Soren Hallgren).

approximately 14 cm (5.5″) long, with a heavy butt end, a large, incomplete perforation near the middle of the object, and a marvelous moose head at the opposite end. The moose appears to be smiling. The axe does not seem to have been used much if at all; it may have been unfinished or largely symbolic in function.

Figure 5.33.
The Hindsgavl dagger. Length = 30 cm (12″).

Hindsgavl, Denmark

The Hindsgavl dagger, found in a plowed field in 1876, is one of the treasures of the National Museum in Copenhagen and one of the finest examples of these Late Neolithic objects in existence. The parallel-flaked flint daggers of Late Neolithic Denmark are among the most technically complex stone tools in the world (Stafford 2003). A technique known as pressure flaking involves using a pointed piece of bone, antler, or perhaps copper to press or push long thin flakes off of the flint artifact, resulting in thin parallel flake scars with a very distinctive appearance.

The striking reddish-brown color of the Hindsgavl dagger is a result of its intentional deposition in a bog, probably as a sacrifice, and the action of tannic acid discoloring the flint (Figure 5.33). Even more impressive is the extraordinary craftsmanship. The blade of the dagger is less than 1 cm thick and carefully thinned by long series of careful removals of material by pressure flaking. These elaborate daggers are intended to be replicas in stone of rare bronze daggers from Central Europe. The hilt is described as a fishtail form, and what is perhaps the most remarkable feat of crafting this dagger is seen in the very fine line of chevrons running up the middle of the hilt. This line is intended to replicate the sewn seam of the leather grip attached to the bronze daggers.

Figure 5.34.
A carved bone figure from Advik, Varanger, Finnmark, Norway (photo by Adnan Icagic).

Varangar, Norway

This figure was carved from bone and is approximately 7 cm (3″) in length (Figure 5.34). It comes from a site called Advik inside the Arctic Circle in far northeastern Norway (Olsen 1994). The date is uncertain but, based on the style of the carving, probably around 2000 BC.

SUMMARY: STONE TO METAL

In general terms, the introduction of the Neolithic was a rather gradual process as the first farmers utilized Mesolithic locations for settlement. Over time, as population grew and familiarity with interior areas increased, more people moved inland and modified the environment for agricultural needs, at the same time creating a shared history with the landscape. As Artursson (2004) has noted, the human landscape has both ecological and historical components that influence human settlement and use. The landscape accumulates social memories and meaning created by the preceding generations of inhabitants. Ritual activities increased, and the burial of ancestors became a focal point of Funnel Beaker society, culminating in elaborate ceremonies involving megalithic tombs and causewayed camps.

Major changes were seen during the Middle Neolithic, particularly at the onset of MNB when several new cultures and new peoples appeared. The changes taking place in central and northern Europe in terms of the expansion of Corded Ware groups were probably related to events on the steppes of southern Russia and the Ukraine. The arrival of the Battle Axe Culture in Scandinavia after 2800 BC brought a very different pattern of settlement and land use. These groups were primarily mobile cattle herders and less invested in the rituals and monuments of the dead, leaving fewer traces in the earth.

Single Grave Culture, Battle Axe Culture, and Pitted Ware Culture share the region of southern Scandinavia in MNA. Pitted Ware Culture appears to reflect some backtracking or reversion from an agricultural way of life as "Neolithic" groups returned to hunting and gathering along the coasts of middle and southern Sweden and the northern parts of Denmark. PWC has its roots in Sweden, in contrast to the Corded Ware/Single Grave/Battle Axe culture, which originated to the south in Central Europe. Single Grave Culture is predominant in Jylland, while the Battle Axe Culture is known from eastern Denmark, Sweden, and southern Norway. Many things changed. The evidence for this period comes largely from graves and tombs rather than settlements and cultural layers. Rather few actual settlements are known, and a new form of residence, perhaps more mobile and/or temporary, seems to have been the norm. A decline in monument construction and long-distance trade accompanied this change in archaeological cultures.

The Late Neolithic begins with the Bell Beaker Culture, a widely dispersed phenomenon in western and central Europe usually associated with the spread of metals, weapons, and horses. Bell Beaker is known almost exclusively from northern Jylland, specifically the areas of rich flint deposits. Logic suggests that Bell Beaker people were traders and merchants involved in the production and

trade of flint daggers and spearheads across northern and north-central Europe. At the same time, large amounts of copper, gold, and eventually bronze make their way to Scandinavia as part of the economic network of the Late Neolithic.

The Neolithic itself, then, was a 2,300-year period of transition—from foragers to farmers, from hunters to warriors, from small camps to the beginning of village life, from small egalitarian groups to chiefly power, from equality to wealth and status differentiation, from local interaction to long-distance trade—that totally and forever changed human society. In Scandinavia, these changes are focused on the southern half of the region, within the limits of cultivation. Northern Sweden and Norway remained marginal to agricultural societies throughout prehistory, although the area was strongly influenced by developments to the south.

As the Neolithic became the Bronze Age after 1700 BC, changes were less dramatic than at its beginnings. The dynamic new aspects of Neolithic life that appeared after 4000 BC gave rise to new social systems that would result in the emergence of more powerful regional centers in the second millennium BC. The transition from small societies of hunters to villages of farmers was very successful in Scandinavia and set the stage for the spectacular developments of the metal ages. The subsequent Nordic Bronze Age was a remarkable period in Scandinavian prehistory and is the subject of the next chapter.

CHAPTER SIX

BRONZE WARRIORS, 1700–800 BC

THEY DREW ON ROCKS

The west coast of Sweden is one of the lovely places in the world. Archipelagos of rocky islands reach far out into the Kattegat like lines of humpback whales. Bare rock, scoured and polished by the passage of many glaciers, gleams along the coast and hillsides. The Swedish forest covers the places where there is soil, and the rocks shine through where the forest cannot grow. Those bare rocks were a blank canvas for Bronze Age artists, who carved their thoughts and beliefs, leaving enigmatic messages that survive today.

Scandinavia has the most Bronze Age rock art in Europe. The coastal region of Bohuslän north of Göteborg has Scandinavia's largest concentration (Figure 6.1), dating primarily from the Bronze Age, ca. 1700 to 500 BC. In this particular part of Sweden, petroglyphs—rock engravings—are found almost everywhere. Some 1,500 sites have been recorded, and more are discovered almost every year (Ling 2008). The World Heritage Area at Tanum, Sweden, encloses a zone of approximately 45 km^2 (17 square miles) with more than 430 localities with Bronze Age petroglyphs. The majority of the rock-art localities in Bohuslän were very close to the ancient Bronze Age coastline. At the time the rocks were engraved, this area was the coastline; today it is 25 m (80′) above sea level.

This area is a gallery. The motifs include human figures, ships, weapons, fishing nets, the sun, bulls, horses, deer, birds, and scenes of daily life (Figure 6.2). Certain themes are repeated everywhere, especially ships and human figures. It is ship images that dominate the panels; about 10,000 have been recorded (Ling 2008). The usual ship is depicted with a crew of six to thirteen. Human figures are also grouped into what appear to be processions, perhaps reflecting the origins of this art as a ceremonial or religious activity. The carvings from the later Bronze Age and early Iron Age convey frequent images of conflict, power, and mobility (Ling 2012). One image of a human figure carrying a spear is over 2 m (6.5′) tall, the largest petroglyph of an individual in Europe. The figure is sometimes interpreted as Odin, the Norse god of war. The rock art as visual mythology is another possible interpretation of their meaning (Fredell 2003). (More information on Norse mythology appears in chapter 8).

The so-called Vitlycke panel at Tanum is one of Sweden's most remarkable pieces of rock art. The stone surface is smooth and sloping; the rock is light in color. The panel of carvings is 22 m (70′) long and 6 m (20′) wide. Water flows over parts

of the carved surface. This very famous place contains nearly 300 carvings, including 170 cup marks—small, circular depressions carved into the stone. There are a variety of scenes and motifs. One of the more famous is the so-called "bridal couple." The male has a huge phallus and is shown raising an axe. Other special and interesting images are the worshiper in front of a huge snake, a "devil-like" human figure in a chariot, and a kneeling female figure beside a tall man lying down. Many of the cup marks are arranged in a line, and men are depicted fighting on both sides of that line. There are numerous ships of different sizes, some double-lined, with or without crew. There are a series of warriors equipped with axe and sword, some with a circle-shaped body which may represent a shield. These characteristics help to define the Bronze Age.

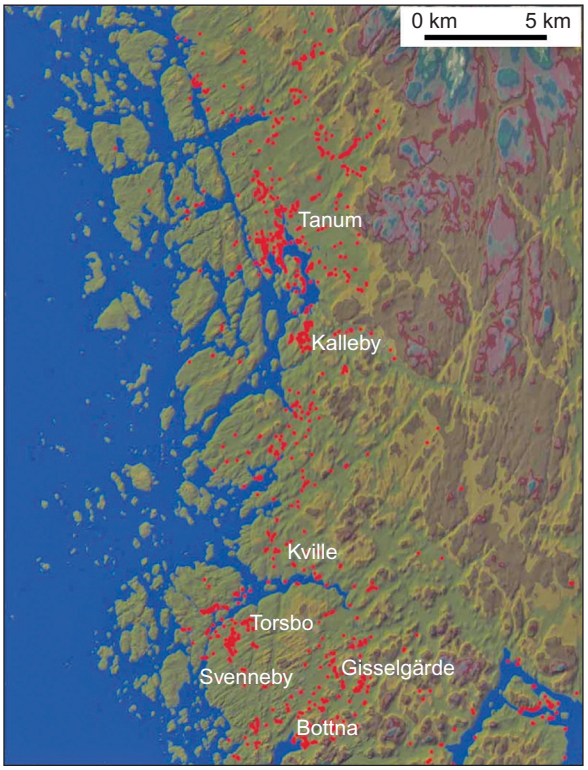


Figure 6.1.
The distribution of Bronze Age rock art in northern Bohuslän, Sweden.

THE BRONZE AGE IN EUROPE

I begin this discussion with the larger context of the Bronze Age in Europe, where major changes were taking place, particularly in the Aegean, with consequences for the entire continent. In fact, it is the emergence of pan-European trade networks and interaction that really defined the Bronze Age. I will then turn to Scandinavia and the developments that characterize this period in northern Europe. Surprisingly, southern Scandinavia, lacking usable metal ores to make bronze, became one of the major centers of the European Bronze Age. There are more bronze swords found in early Bronze Age Denmark than anywhere else in Europe (Harding 2007, Kristiansen and Larsson 2005).

It is important to keep in mind that much of what is known from this period comes from tombs and hoards, traces of the elite and well-to-do. There is less known about common people and everyday life in Bronze Age Scandinavia. Because of the limits of cultivation, northern Scandinavia remained largely unchanged. Most of the spectacular archaeology of this period is found in the south.

The European Bronze Age of the third and second millennia BC took place in the context of the rise of early civilizations and empires in Mesopotamia and the Nile Valley. The first cities, the first states, the first writing systems, and many other developments began in this region around 3000 BC. Europe was unquestionably impacted. Partially in response—and 1,500 years before the classical civilization of Greece, 2,000 years before Rome—the Aegean area witnessed the first emergence of complex state societies in Europe. North of the Alps, there was less political integration; societies operated on a smaller scale at tribal or chiefdom

Figure 6.2.
Bronze Age rock art at Tanum, Sweden. The petroglyphs have been filled with red color to increase their visibility for visitors.

levels. This pattern continued essentially until the Roman conquest of Western Europe, shortly before the end of the first century BC and beyond in some areas.

There were two major centers of development and power in the Aegean: one on the island of Crete and one on mainland Greece. The palaces on Crete and the citadels in Greece were the centers of these civilizations and the focal points of industry, commerce, religion, military power, and central accumulation. The civilization that emerged on the island of Crete was known as Minoan and reached its peak between 2000 and 1450 BC (Figure 6.3). During this period, the Minoans dominated the Aegean through sea power and the control of trade in the eastern Mediterranean. The seats of power on Crete were the palaces and villas, residences of the local rulers who directed this early state. Defensive fortifications were apparently not needed by the islanders; they were protected by their ships.

The Mycenaeans on mainland Greece controlled most of the Aegean between 1600 and 1100 BC and took over Crete after 1450 BC. The Mycenaean civilization was dominated by a series of hilltop fortresses, or citadels, interconnected by roads. These citadels were ruled by powerful warrior-kings, whose graves are among the richest ever discovered in Europe. Episodic alliances among these citadels led to greater political, economic, and military power, and the Mycenaeans became the major force in the Aegean around 1500 BC. The collapse of Mycenaean power and the abandonment of the heavily fortified citadels after 1100 BC is one of the more intriguing mysteries of Aegean archaeology.

Copper and tin are needed to make bronze. Because the sources for these metals were unevenly distributed, the demand for raw materials bound European society together in a metals trade. Long-distance networks emerged, crossing most of the continent. The growing powers in the Aegean acted as a powerful magnet for raw materials from the north and west, converting them into a variety of finished products. Copper and tin came from the British Isles, the Ore Mountains, the Austrian Alps, and Serbia. Wool and textiles may have been another valuable trade commodity. Northern Europe, and southern Scandinavia specifically, sent huge quantities of amber and perhaps furs to the Mediterranean in exchange for metal products. Amber was the gold of the north and probably worth its weight or more in the precious metal. These materials formed the basis of wealth in Denmark and southern Sweden and funded the Nordic Bronze Age. Bronze weapons and jewelry were the main exports from the Aegean.

There is compelling evidence that the site of Bernsdorf, north of Munich, was once an important intermediary in the trade and movement of commodities between the Aegean and northern Europe (Rieder and Gephard 2002). Bernsdorf is a large, fortified settlement along an important prehistoric trade route through this region. The settlement was surrounded by timber palisades and ditches and dates to the fourteenth century BC. In addition to an enormous gold hoard, finds from the site include two engraved amber artifacts, one a stamp seal. The amber is of course from Scandinavia. The stamp seal (Figure 6.4) has a human face on one side and three Linear B characters on the other. Linear B was the written language of the Aegean.

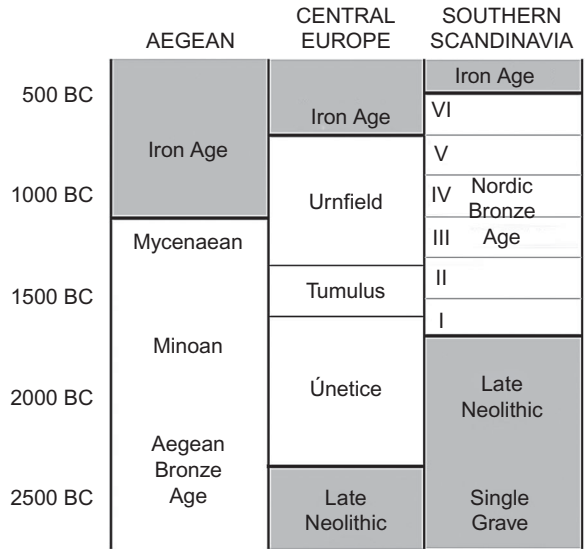


Figure 6.3.
Bronze Age chronology for the Aegean, Central Europe, and southern Scandinavia.

Bronze production on a significant scale first appeared in central Europe about 2400 BC during the Early Bronze Age Únětice Culture, centered around the Erzgebirge, or Ore Mountains, in the German-Czech border area. Metal was a rare and valuable material. Sources and quantities were limited, so that status and wealth were often attached to products of bronze and gold. Metal is also a spectacular substance, shining and flashy, an ideal material for displaying one's importance. Metal smiths were probably another highly valued resource.

THE NORDIC BRONZE AGE

The Bronze Age came late to Scandinavia. After an early European beginning in the Aegean around 3000 BC, the Bronze Age makes its start in the north more than a millennium later, ca. 1700 BC, and continues until 500 BC and the beginning of the Iron Age. Two phases, early and late, divide the Nordic Bronze Age around 1100 BC. In 1885, the renowned Swedish professor of archaeology, Oscar Montelius, subdivided the Bronze Age into six periods of approximately 200 years each, three each for the Early and Late phases (Figure 6.3). Montelius's formulation, with some modification, remains today as the primary chronology for the period (e.g., Hornstrup et al. 2012, Vandkilde et al. 1996). At the same time, it seems that the impact of the earlier start of the Iron Age in Central Europe was also felt in Scandinavia after 800 BC with the arrival of new crops, the composite ard, and major changes in the location of settlements and the use of the landscape (Skoglund 2013).

Figure 6.4.
Linear B inscriptions on an amber stamp seal from Bernsdorf, Germany (photo by M. Eberlein).

Bronze defines the period, but its acquisition began much earlier. Recall that copper axes and jewelry were already present in the Early Neolithic in southern Scandinavia. Metallurgy essentially disappeared in Scandinavia during the Middle Neolithic, but was reintroduced by the end of the third millennium BC with the Bell Beaker culture and the onset of the Late Neolithic. There is a surprising amount of metal present in northern Europe in the Late Neolithic, largely in the form of copper objects from central Europe and the British Isles. The amount of tin mixed with the copper increases through the Late Neolithic. True bronze began filtering into Northern Europe after 2350 BC during the Late Neolithic (Vandkilde 1996), but the regular appearance of the metal and a number of accompanying social and political changes are seen only after 1600 BC.

Despite its late start, the Nordic Bronze Age was a spectacular time (Thrane 2013). As noted, there are more bronze artifacts in Scandinavia from this period than anywhere else in Europe, and pottery takes a back seat to bronze objects from an archaeological perspective. Ceramics are largely undecorated and rarely appear outside of household or grave contexts. Flint continued to be used for most cutting and scraping tools. Metal production and crafts blossomed with the onset of the Bronze Age and spread these new metals to a large hinterland (e.g., Hjärthner-Holdar 1993, Oldeberg 1942–1943, Vandkilde 1996). There are large numbers of fragments of crucibles and casting molds for the production of metal tools, weapons, and jewelry in Bronze Age workshops, primarily on settlement sites across the southern half of Scandinavia. Imported ingots of tin and copper have also been found. The products of the casting process—the artifacts themselves—come primarily from graves and hoards. While there are some areas with copper ores in Middle Sweden and southern Norway, these do not appear to have been exploited during the Bronze Age (Ling et al. 2013). Many locally manufactured bronze objects, such as lurs (large, curved bronze trumpets) and shields, are extraordinary in appearance and craftsmanship and have been found largely intact in hoards and graves. The ore for these items was imported; the items themselves were often locally manufactured.

The amounts of ingots and scrap that entered the region must have been enormous to permit the production of so many finished products. Recent evidence indicates that much of the later Bronze Age raw material came from the western Mediterranean (Figure 6.5), probably along the Atlantic trade route (Ling et al. 2012b). The styles of the artifacts produced in Scandinavia, however, were borrowed largely from Central Europe (Ling et al. 2012a). Bronze production on a large scale in Central Europe first appeared in the Únětice culture, about 2400 BC in the Ore Mountains where there are significant tin deposits.

But the Bronze Age is about much more than metal. New objects and ideas came into Northern Europe along those corridors of trade. By the middle of the second millennium BC, northern and western Europe had witnessed a number of major innovations, including bronze, new weapons, and the horse and chariot, along with new or remodeled social institutions. Secondary animal products such as milk and wool likely became more important and fostered new industries. Horses became common in this period, probably with the introduction of chariots or as draft animals in military contexts. These

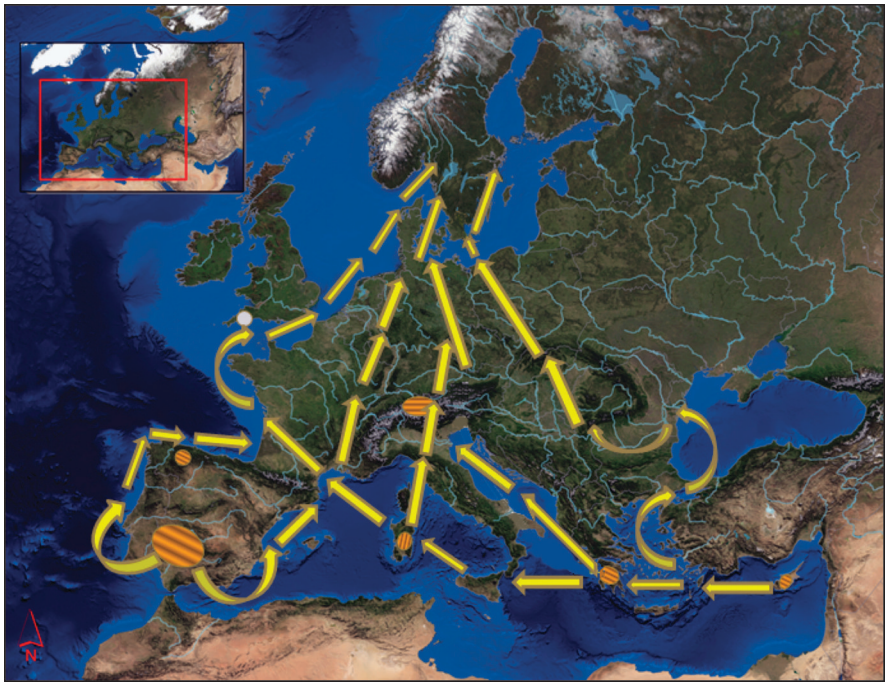


Figure 6.5.
Sources of copper and tin and trade routes in Bronze Age Europe.

changes accumulated in larger and more powerful societies, where trade, craft production, and growing competition were added to the existing foundation of agricultural production.

At the same time, there was competition for resources, wealth, and power that led to increased conflict and warfare, cross-cutting the integrating ties of trade and exchange. The metals that defined this period provided the weapons that characterized the class of warrior elite that sought power and control. The martial tones that highlight the Bronze Age have their sources in that competition for power and wealth.

The Bronze Age witnessed the first pronounced differences in social status and position in North European society. Wealth differences, probably associated with ownership of land and herds, were a significant aspect of life. Slaves and captives were probably involved in the economic activities of wealthier families. The control of the amber sources around southern Scandinavia provided the exportable wealth of the region, perhaps in conjunction with furs and other commodities.

One aspect of the Nordic Bronze Age that has contributed to its remarkable archaeology are the large earthen barrows that dot the landscape of southern Scandinavia and parts of Middle Sweden and southern Norway. The ubiquity of these burial monuments in the region gave rise to the notion of the Mound People, coined by P. V. Glob in his well-known synthesis of the Bronze Age (Glob 1970). Some of these barrows have extraordinary conditions of preservation for clothing, furniture, and even the hairstyles of the Bronze Age, discussed in more detail later in this chapter.

Differences in social status are displayed in the riches buried in stone cists and oak coffins during the early Bronze Age. In the Late Bronze Age, cremation and the placement of the ashes in urns became the predominant form of burial practice. These two major funerary customs broadly reflect the situation in Central Europe, first in the Tumulus Culture and then in the Urnfield Culture from around 1300 BC. Although cremation is often seen as a practice in which everyone is treated equally in death, this custom may have concealed a reality of considerable social inequality. This view is supported by the existence of chieftains' burials below giant tumuli, as seen, for example, at Lusehøj in the central part of southwest Fyn in Denmark and in the mound of Hågahögen near present-day Uppsala in central Sweden, discussed later in this chapter. The locations of Bronze Age sites mentioned in the text are shown in Figure 6.6.

A Warrior Society

Warrior graves—male burials with grave goods, including weapons, drinking equipment, clothing, toiletries, and horse-related objects—began to appear across central and northern Europe after 1500 BC (Treherne 1995). Weaponry took the form of swords, spearheads, axes, and some forms of defensive armor. Personal equipment often included combs, razors, mirrors, and tweezers. Apparently the fashionable warrior of the day was well-groomed. This identity and style was likely limited to the upper crust of Bronze Age society (Treherne 1995).

The sword was the primary weapon of the warrior, and the first equipment designed specifically for combat (Figure 6.7). Earlier weapons—arrows, spears, axes—had been adapted from hunting gear. These were primarily slashing swords designed for hand-to-hand combat (Osgood 1998), and they were deadly weapons. Of course, these weapons also functioned as important status symbols and must have been of great value. In fact, there are several examples of copies made in flint from southern Scandinavia, emphasizing the rare and valuable nature of these objects.

Studies of swords from the Nordic Bronze Age have documented extensive damage, suggesting that these weapons were often used (Kristiansen 1987). Swords were frequently resharpened and had nicks removed before being placed with a burial. Swords in votive weapons offerings were usually not repaired, and the scars of battle remained. Two categories of swords are known, those with a solid metal hilt riveted to the blade and those with a flanged hilt, where sword hilt and blade were cast together in a single piece. The solid metal hilt swords exhibit less wear and use than the flanged hilt swords. Kristiansen and Larsson (2005) suggest that they were used by the leaders and therefore saw less action.

Surprisingly, there is little evidence of violent death in the human skeletal remains from the Nordic Bronze Age. This is in part due to the poor preservation of skeletal material in general from this period and the practice of cremation in the later Bronze Age (Bergerbrant 2007), but at the same time there appears to be little indication of traumatic injury. Life expectancy in the Bronze Age was limited, around 40 years. A catalog of the human remains from 4,400 Bronze Age individuals (primarily from central and southern Europe) lists only 21 indications of

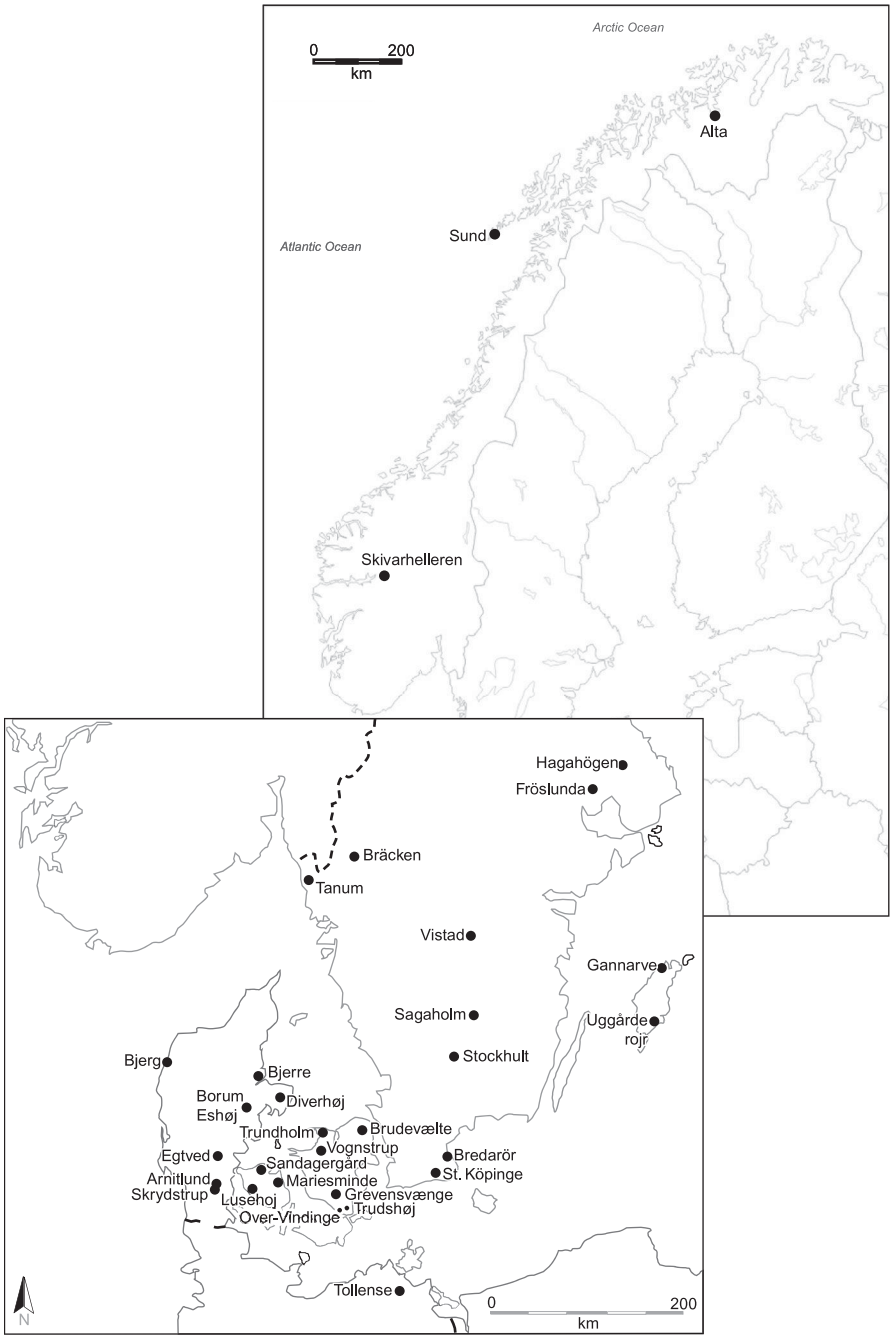


Figure 6.6.
Locations of the sites mentioned in chapter 6.

violence (Peter-Röcher 2007). In Scandinavia, there is an example of a spearhead in the lower back of a Bronze Age skeleton found at Over-Vindinge, Denmark (Vandkilde 1996), but such cases are rare. There are the highly atypical burials from Sund in Norway, discussed later in this chapter. But until recently there was little other evidence of warfare and violence in the Bronze Age of northern Europe. Discoveries in the Tollense Valley, Germany, however, are changing that view.

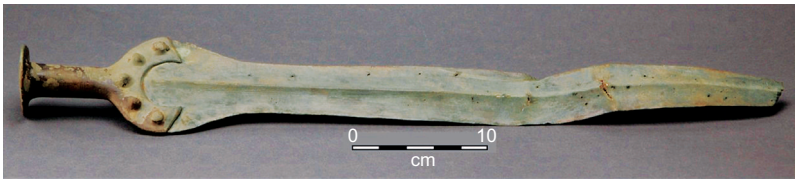


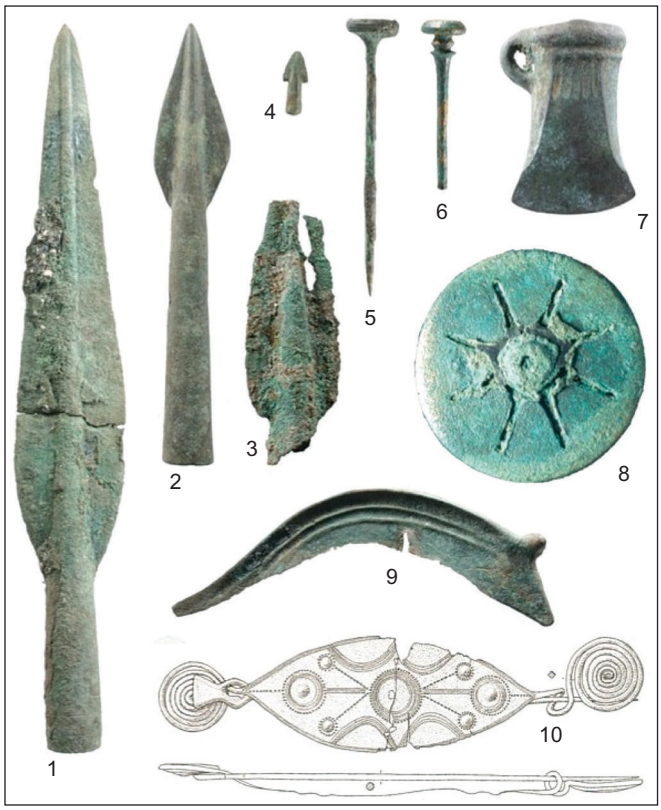
Figure 6.7.
A Bronze Age sword with riveted hilt from Sweden (photo by Christer Åhlin).

Tollense, Germany

The Tollense River flows peacefully through a small corner of northeastern Germany, an area of farmland and small woods. The region is rich in archaeology, full of Neolithic tombs and Bronze Age barrows. Beginning in the 1980s, a series of finds were made along the banks and in the river itself, including bronze weapons and jewelry (Figure 6.8), as well as a number of human bones. These materials come from a stretch of the river 3 km (2.2 miles) long, as some of the materials had washed downstream. Animal bones were also present, often from horses. For the first time, here was extensive and dramatic evidence of violence in the Nordic Bronze Age and perhaps a forerunner of the numerous sacrificial sites associated with victory celebrations from the Iron Age (Jantzen et al. 2011).

The remains of more than 100 individuals have been found to date, and the search continues. Most of the individuals are male, between the ages of 20 and 40. Only a few women and children are known from the bones that have been collected. Among the male remains, there were at least eight lethal blows seen in the crania, along with a flint arrowhead in a shoulder joint (Figure 6.9). Radiocarbon dates from the human bones fall very closely together at 1200 BC, suggesting that the bodies in the Tollense stream may have resulted from a single event. The evidence implies that these materials were from a battle that took place in the early Bronze Age. Tollense provides documentation of what were violent times.

Figure 6.8.
Artifacts from the Tollense Valley, Germany. 1–3. spearhead, 4. arrowhead, 5–6. pins, 7. adze, 8. round box, 9. sickle, 10. fibula (brooch).



METAL WORKING

Metal is a medium for producing efficient tools and weapons that can be repaired without loss of material, but it also is well suited to be a symbol of status. Metals would have reflected light in a way that no other substance at the time did. The use and possession of metal was a measure of wealth—particularly in areas such as Scandinavia, largely dependent on outside sources for its copper, tin, and gold. Bronze was scarce in the earlier phases of its use. This scarcity was compounded by the need for tin, which

was even rarer than copper. The earliest objects made of bronze were weapons, axes, and ornaments. Bronze axes were lighter, cut deeper, and lasted longer than stone (Figure 6.10).

Bronze is an alloy, a mixture of copper and tin, with an ideal ratio of 9:1. The presence of tin improves the fluidity of the molten metal, making it easier to cast, and allows the use of complex mold shapes. Bronze can be cast or hammered into elaborate shapes as well as sheets. Cold hammering has an additional effect—it elongates the mineral crystals and causes hardening. Cold hammering produces effective, sharp edges on blades. Heating, or annealing, causes recrystallization and eliminates the distortion of the crystals, canceling the hardening effect and enabling an artifact to be hammered into a desired shape.

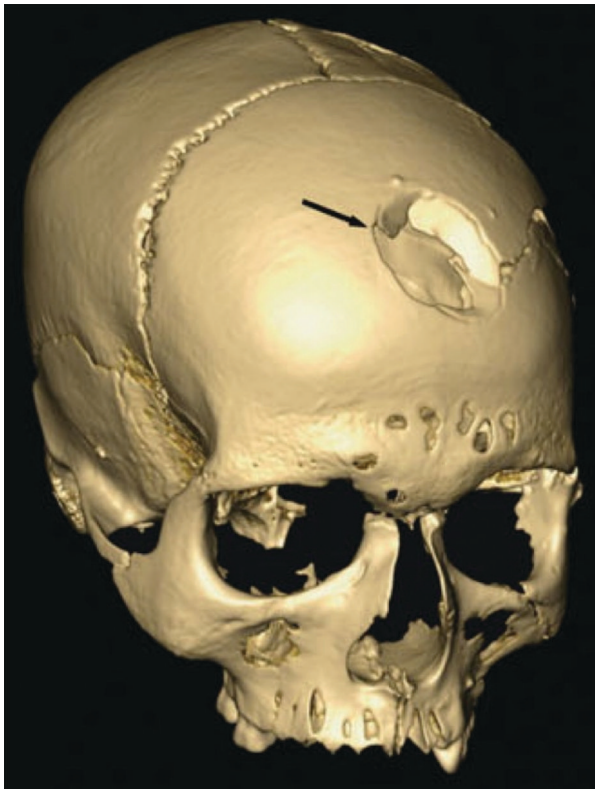


Figure 6.9.
Computer reconstruction of a human skull from the Tollense Valley, Germany, with a lethal head wound (arrow).

A key in the growth of social complexity is craft specialization, where some individuals are employed in the production of specific items and materials rather than in domestic food production. Examples might include pottery making, stone axe production, or weaving. As copper and bronze metallurgy developed, many crafts emerged, including prospecting, mining and ore preparation, smelting, refining, casting, and finishing. It is likely that at least some of these craft skills involved protected, secret knowledge. Metalworkers with the requisite skills to perform the "magical" transformation of blue-green copper ore into bright, shiny metal may have been equally scarce. Bronze could be given form by casting it into shapes or hammering it into sheet metal. The sheet metal could be used in the production of armor—helmets and shields—and vessels. The basic technique employed by the Scandinavian metalworker was casting. Hammering was rarely used as a primary method of working bronze. This is unlike the situation in central Europe, where vessels and shields were beaten into shape rather than cast.

SETTLEMENT

Bronze Age settlements were almost unknown in Scandinavia until the 1970s. Houses had been hard to find because most of the remains of structures, features, and artifacts from this period were in the topsoil and had been plowed away by millennia of cultivation. In a few cases, sealed settlement layers were found beneath Bronze Age mounds during excavation. This was the situation at the sites of Skrydstrup and Diverhøj in Jylland, Denmark, both described in a subsequent

Figure 6.10.
Two bronze axes from Lilla Beddinge in Skåne, Sweden.

section dealing with these barrows. The general lack of settlement information led to misconceptions. When larger-scale archaeological projects finally uncovered a number of large farmhouses, fences, pits, and even agricultural fields, traditional notions of mobile pastoralists or low population numbers in the Bronze Age fell by the wayside.

The primary unit of settlement in the Bronze Age appears to have been the individual farm with a farmhouse and one or more outbuildings for storage and other activities. The three-aisled house replaced the earlier two-aisled version from the Late Neolithic by the beginning of the Bronze Age. In general, Bronze Age farmhouses were smaller and lighter in construction. Two rows of wooden posts meant that less massive timbers could support the roof. Wall construction was commonly wattle and daub instead of wood. These changes may also reflect a decline in the numbers of large trees available for construction. The landscape was more open in the Bronze Age, as the forest had largely been removed in many areas during the Late Neolithic. Pollen analysis from southwestern Skåne indicates that 60%–80% of the landscape was open in the Bronze Age. The absence of forest was even more pronounced in coastal areas and places where barrows (a proxy for human population) were concentrated (Hannon et al. 2008).

The longhouses of the farms have been found in a range of sizes, from ca. 50 m^2 (540 ft^2) up to almost 500 m^2 (5,380 ft^2) in area. The longhouses were usually oriented east-west, and doors were placed on both long sides. Traces of paint have been found on the interior of the daub walls in at least two instances (Jensen 1993). Some of the houses have survived with their floors preserved, so various activities can be discerned. The artifacts found at the farmhouses are usually flint and pottery; metal is rare. Bone is not often preserved, and what is reported comes largely from cattle (Rasmussen 1993a). Internal divisions are present in the houses. In Jylland, houses sometimes have a living area and large hearth separated from a barn area with stalls for domestic animals. This arrangement with housed animals did not spread to the rest of southern Scandinavia until later in the Iron Age.

Some of the structures have large pits or cellars in the floor of the house, presumably for storage or manure collection. A modern reconstruction of a Bronze Age house from the Ystad area in southernmost Sweden is shown in Figure 6.11

Figure 6.11.
Modern reconstruction of a Bronze Age house from Ystad, Sweden.

(Tesch 1993). The largest structures served as the chiefly halls for the leaders of Bronze Age society (Rasmussen and Adamsen 1993). One example of such a hall—Bjerre 6—is described below. Another appears in the section on barrows, an enormous farmhouse found near the Bronze Age mound at Skrydstrup, Denmark.

In terms of more common Bronze Age farms, excavations often reveal the traces of several houses at or near the same location. In most cases, these houses were occupied sequentially rather than simultaneously. A new house was built as an older one deteriorated. Individual farms were the norm in the Bronze Age. Fences are rare. Settlements appear stable and well organized, and occupation continuous over long periods of time.

The pattern of settlement was rather open, with some distance between farmsteads. Each farmstead appears to have controlled an area of several square kilometers. Sometimes the family cemetery or barrows were located on the property (Jensen 1983). There was a trend toward more households in clustered settlements through the Bronze Age, but true villages like those from the Early Iron Age with clusters of fenced-in buildings are largely unknown. These changes over time are the focus of a study of land use in the Late Neolithic and Bronze Age at St. Köpinge, near Ystad in southernmost Skåne, Sweden, described later in this chapter.

A settlement hierarchy, with a large central farmstead surrounded by smaller farmsteads, is apparent in the later Bronze Age in one carefully studied region in southwest Fyn (Rasmussen and Adamsen 1993). This pattern may also have existed in the earlier Bronze Age, particularly in areas with dense concentrations of burial mounds. Fortified settlements, common in Central Europe during this period, are largely unknown from Scandinavia, but one intriguing

example of a palisaded farm from Vistad in Middle Sweden is discussed in the following pages.

In the later Bronze Age, there was a decline in the size of the longhouses that could be interpreted as a reduction in activity and wealth, but the development of more complex settlements and the continued investment in metal and large burial monuments instead indicates a concentration of wealth and a centralization of power in fewer, more central places in southern and middle Scandinavia. Artursson (2011) argues that increasing differences in the size of the farmhouses and changes in settlement structure during the Bronze Age reflect a gradual transformation in social and political relationships. He suggests that the more complex farmsteads and hamlets document true chiefdoms with inherited leadership and a decentralized political structure based on chiefly networks.

In the segment below, more detailed information on settlements in Bronze Age Scandinavia is discussed as a big-picture view of changing settlement patterns from the Neolithic to the Iron Age. Excavations at Bjerre in northern Denmark revealed a buried Bronze Age landscape complete with agricultural fields and the houses of local chiefs (Bech 1993). A very different perspective comes from the highlands of Bronze Age Norway, where a project of field surveys and excavations at the rock shelter of Skrivarhelleren informs us about the use of the landscape in a region where agriculture was limited.

Bjerre, Denmark

The province of Thy lies in the northwestern corner of the state of Denmark; it is bounded to the north and west by the North Sea and to the south by the Limfjord. During the early Bronze Age (1700 to 1000 BC), this rather isolated region was one of the richest in Europe. Thousands of earthen burial mounds housing wealthy tombs were erected on the high spots of the landscape. Almost any broad view incorporates several of these barrows.

A stroke of fortune preserved pieces of a Bronze Age landscape in Thy. A low-lying area with a high water table known as Bjerre Enge was covered with a layer of blown sand following Bronze Age settlement in the area. Because of the moisture, bone and sometimes wood has survived in the deeper holes left by human activity. The bases of some wooden posts and building timbers have even been preserved at some sites (Bech 1993).

Pollen analysis indicated that there had been extensive grazing areas on the higher land in the region. Bones from the sites at Bjerre showed that cattle had been the primary domestic animals and had been herded in large numbers. Fields were found in places where it was not too wet. Excavations exposed agricultural fields in the form of small, irregular plots in the slightly elevated parts of this lowland at Bjerre Enge. There were small bogs and hollows between the largely oval-shaped fields. The fields varied in size but averaged about 40 × 25 m (130′ × 80′).

Settlements were in the same low area as the fields but on higher, drier locations. Settlements were generally small, with just one or a few buildings. In addition to long three-aisled farmhouses, some with interior animal stalls, there were

also circular structures with ditches or walls of two or three rows of wooden posts that may have been used as silos or corrals.

One of the excavated houses, known as Bjerre 6 was particularly well preserved beneath the sands and appears to have been the residence of a local leader or petty chief. The structure has been radiocarbon-dated to the Early Bronze Age. The house was 25 × 8 m (80′ × 25′) in size, built as a three-aisled structure covering about 200 m^2 (2,150 ft^2). This was one of the larger houses in the entire region (Figure 6.12). There was an entrance area with a cobbled pavement on either side of the house. A large number of posts supported the roof of the house and there were many additional posts inside, often without a clear pattern or indication of function. These posts were recognized by the holes that had been dug to hold them and in some cases the remains of the actual wooden base of the post. At least 11 cooking pits were found in the house, filled with sand, containing charcoal and fire-cracked stones.

Bone, wood, and plant remains were found on the floor of this house along with flint tools, pieces of amber, and a number of pits and other features. The animal bones reflect the meat sources for the inhabitants and were largely from cattle. Sheep and goat are rare, and there is one red deer and a fox bone present. The plant remains from the floor of the house included a number of domesticated cereals, including barley, emmer, bread or club wheat, einkorn, and spelt. Artifacts were found largely inside the house and more commonly at the two ends. Flint tools included scrapers and knives, and there were quern stones for grinding grain. Scrapers for hide working were made from large flakes of flint found in the house. Analysis of use wear on the flint scrapers, sickles, and knives indicated a high

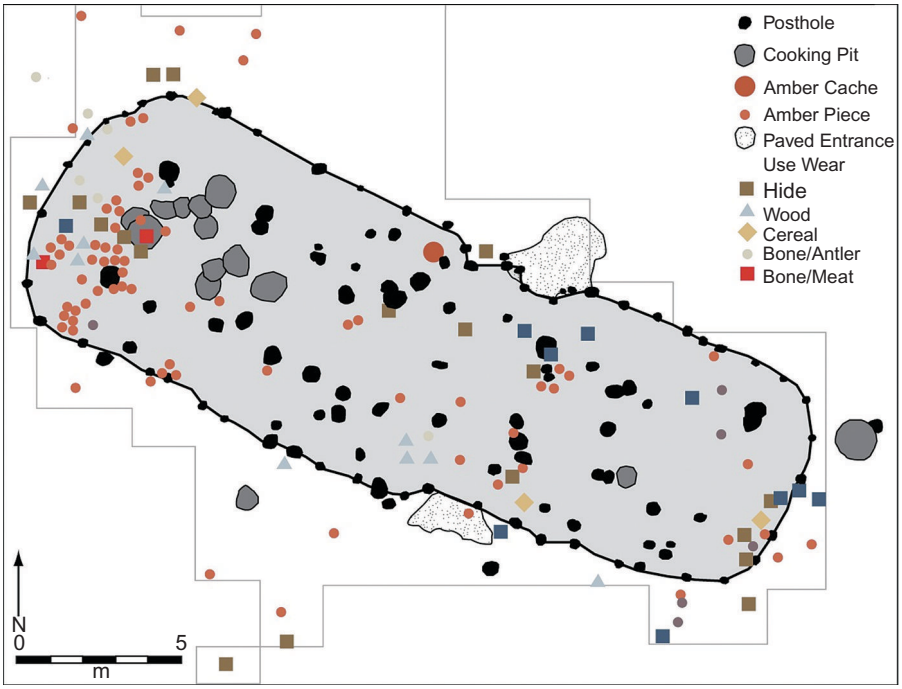


Figure 6.12. Early Bronze Age house at Bjerre 6, Denmark. Smaller post holes are not shown. "Usewear" refers to different functions of stone tools as determined by polish on the edge. The gray rectilinear line marks the borders of the excavation.

incidence of hide working, along with wood working and cutting bone, meat, and antler, all probably typical domestic activities in the Bronze Age. Sources for the flint for the stone tools were nearby in areas of earlier Neolithic flint mines.

In addition to food and tools, a number of unusual items were found, specifically of bronze and amber. There were three bronze objects—a double button, a fibula (a kind of fancy, large safety pin), and a 3 cm (1.2″)–long hook, perhaps for a belt. The raw amber found in the house is unworked, probably collected from nearby beaches and intended for export. There were 85 amber pieces found scattered on the house floor and a cache of 69 pieces buried in a bundle near the north house wall. These items reflect the connections of the people of Thy with the outside world, as well as their status and wealth in Bronze Age society.

It seems that the forest was largely gone in this area by the Bronze Age. The wood and timbers for the house construction were often small and included driftwood. Crooked branches were used for the wattle and daub walls (Christensen 1999). The fuel used for fires reflects the absence of forest, with a wide variety of species used for burning. By the early Iron Age, some houses in this area were being built with sod walls due to the continuing lack of timber.

Skrivarhelleren, Norway

One of the more interesting archaeologial projects in western Norway involved the survey and excavation of Bronze Age sites in the interior between the headwaters of one branch of the Sognfjord and the high mountains (Prescott 1991). The archaeological survey and testing covered an area that stretched from sea level to more than 1,000 m—above the timberline in this region. A dozen or so Bronze Age sites were discovered, ranging from a handful of artifacts to one large site of 2,000 m^2 (0.5 acre) with more than 200,000 stone artifacts. In addition to the stone artifacts, small amounts of asbestos-tempered pottery were found, along with a few pieces of bronze, a fragment of a soapstone container, and a crucible for melting copper. These sites are almost certainly seasonal, with occupation restricted to the warmer months of the year by the harsh winters and deep snows in the Norwegian mountains. The abundance of projectile points emphasizes the importance of hunting. Reindeer was the only sizable prey in the highland region. Sheep/goat bone was also found, suggesting a possible pattern of summer transhumance and mountain herding during the Bronze Age.

Excavations at the site of Skrivarhelleren, a rock shelter at 800 m in elevation, just below the timberline, uncovered cultural layers from the Late Neolithic through the early Iron Age. Bronze Age artifacts point to connections with southern Scandinavia in the form of a soapstone mold for casting bronze, slag from casting, and flint dagger fragments. The animal remains at the site include reindeer, hare, fowl, and most notably seal. Other marine resources from the fjord itself were found in the form of herring, salmon, cod, and saltwater snails and shellfish. Thus, in spite of the high elevation of this site, visits to the fjord about 12 km (7.5 miles) to the west must have been made quite frequently.

The general picture is one of coastal farmers using the interior during the summer months, when rich pasture areas would have been available in the uplands. Hunting and fishing were also common activities during this period as well. This

pattern of winter-summer transhumance is one that persisted in Norway into the twentieth century as the inhabitants took advantage of the seasonally productive environments within their reach.

Vistad, Sweden

The site of Vistad is located in eastern middle Sweden, east of Lake Vättern, and was excavated in the late 1980s (Larsson 1993a, Larsson and Hulthén 2004). The site dates from the late Bronze Age, ca. 900–500 BC. Vistad is highly unusual, both as a fortified farmstead and because of the archaeological materials that were found. The site is located on a small hillock, and at least five houses have been identified. These houses, and perhaps others as yet unexcavated, appear to have been surrounded by a circular timber palisade on the order of 140 m (460′) in diameter. The ditch supporting the palisade timbers was almost 1 m deep, and the excavator estimates that the palisade itself stood 4–5 m high. The timber posts were buttressed by large stones placed in the ditch. There appears to have also been a smaller palisade dividing the interior settlement area into two or more sections, as shown in the reconstruction in Figure 6.13. Only about 20% of the site was excavated and the palisade was seen in only three narrow trenches, so the reconstruction is speculative. Nevertheless, Vistad appears to be one of a very few fortified Bronze Age settlements in Scandinavia.

The contents of the site were highly unusual in many ways. The houses were distinctive in design and construction. They were square or rectangular in shape, with 6–8 m for a maximum dimension. The wall posts of these structures carried the weight of the roof, in contrast to the rows of central posts in a normal three-aisled Bronze Age house in Scandinavia. The walls themselves were probably made of horizontal timbers—a kind of log house. Hearths, cooking pits, storage pits, and trash pits were common at the site. The domestic animal bones found in these features included sheep, goats, and pigs, along with a few horses and dogs. Wild species included ducks, geese, beavers, and a variety of fish. Four ovens or kilns were

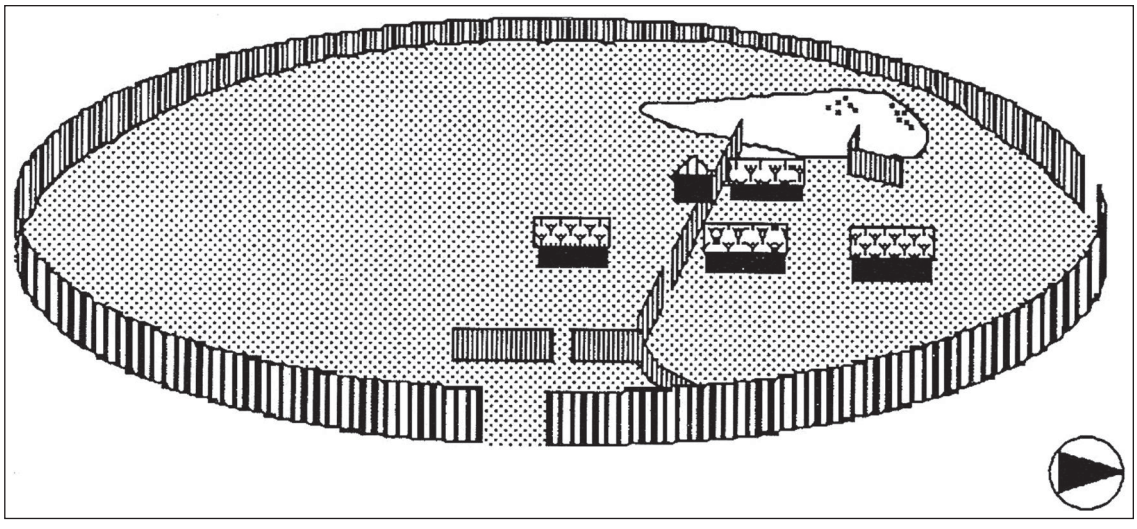


Figure 6.13. Schematic reconstruction of the Vistad settlement and palisade (drawing by Thomas B. Larsson).

also found in the excavations of the houses. These ovens had domed roofs of a type unknown elsewhere in Sweden. Small amounts of iron slag were found in some of the kilns. Most of the pottery was found in the palisade ditch, and it is quite unusual. Careful analysis of the ceramic material by Birgitta Hulthén (Larsson and Hulthén 2004) revealed that much of the pottery was made elsewhere, probably in the Lusatian region of central Europe.

The Lusatian culture dates to the later Bronze Age and early Iron Age (1300 BC–500 BC) in Central Europe and has been found across most of Poland, parts of the Czech Republic and Slovakia, eastern Germany, and northern Ukraine. The remains from Vistad—with its distinctive houses, palisaded settlement, kilns, pottery, and other objects—closely resemble the material culture of the Lusatian culture. Larsson, the excavator, believes that Vistad was an outpost of the Lusatian culture, the location of seasonal or occasional visits by Lusatian prospectors and metal smiths in search of iron. This is a controversial interpretation, but a variety of finds from Central Europe document a strong connection of some kind between eastern Scandinavia and the southern Baltic coast between 1000 BC and 500 AD (e.g., Kaliff 2001).

HOARDS AND SACRIFICES

The perplexing practice of burying rare and valuable items of bronze and sometimes even gold in the less accessible parts of the landscape is one of the more confounding aspects of the Nordic Bronze Age. Wetlands, streams, and low areas were the preferred locations for such hoards. Bogs and former lakes where hoards were placed had often been used as sacrificial locations in earlier periods as well, emphasizing the special nature of these spots.

The use of metal detectors in the last 25 years has resulted in a huge increase in the amount of prehistoric metal found in Scandinavia, especially in hoards. There are around 1,000 of these Bronze Age hoards known from the southern half of Scandinavia and northern Germany. The contents are highly varied; they include the famous sun chariot from Trundholm bog in Denmark, large cult axes, lurs, bronze shields, drinking vessels, and personal equipment. Other hoards contain helmets, weapons inlaid with gold, bronze and gold vessels (cauldrons, ladles, cups), ornamental horse trappings, and various other items. The contents of a hoard can sometimes be understood as the possessions of a single individual. A man's set of gear may include sword and spear; a woman's may be a neck ring, arm ring, and belt ornaments. Some items, such as shields, lurs, and horse equipment, are found almost exclusively in hoards, not on settlements or in graves. On the other hand, daggers appear often in graves but almost never in hoards.

The concept of votive offering is usually associated with such hoards. The objects in the hoards appear to be either items of value and important symbols of social rank or ritual equipment used in special ceremonies. One or more metal objects were usually found in the ground stacked together, inside a container or piled in a heap. Ritual equipment was often not really functional. For example, battle axes in ritual hoards are sometimes unusable as weapons, composed of a thin sheet of metal covering a fired clay core (Stenberger 1962). The shields found in hoards were often made of very thin bronze sheet. Their functional

use as weapons has been debated. Coles (2003) has suggested they could not possibly have been used in combat and were made for ritual or status display. Uckelmann (2011), however, has demonstrated that the shields have damage marks consistent with battle and argues they worked well as defensive weapons. A hoard of such shields from Fröslunda in Sweden is described below. Hoards of such special items rarely have more common weapons, such as swords. Although most of the hoards appear to be from a ritual context, there are exceptions, such as a hoard of scrap bronze pieces from Bräckan in western Sweden with materials for making bronze (Figure 6.14). These objects were probably buried by a metal smith for later use.

The frequency of hoards changed through the Bronze Age, varying with the supply of metal from Central Europe. There were two major peaks of hoarding, Period II and Period IV–V. Period II was a time of intensive barrow construction with rich grave goods for both males and females. By Period IV–V, on the other hand, barrows had become a rare form of burial, yet huge amounts of metal were placed in ritual deposits. Female possessions, especially jewelry and costume, were more common in the hoards of the later period.

All of these objects were rare and very valuable. Many were imports, manufactured in central Europe (the shields, vessels, some of the horse gear, and probably the helmets). There is a clear relationship between the amount of metal in the hoards and agricultural potential across southern Scandinavia (Randsborg 1974), reiterating the connection between wealth and productive fields. Kristiansen (1981) has also shown that bronze objects had been in use for shorter periods before burial in the more productive regions. It seems that in the Bronze Age the intensity of deposition was controlled by two factors, the ability to produce a surplus from the land and the ability to obtain metal.

Interpretation of these hoards is an ongoing debate. Worsaæ (1843) and many of the archaeologists who followed him agreed that the hoards were largely the

Figure 6.14.
One of the largest hoards of metal scrap and bronze-making materials from Bräckan, Sweden. Dated to the younger Bronze Age, it contains melts and rods from the manufacturing process as well as broken and whole weapons, socketed axes, jewelry, and tools.

result of ritual activities, motivated by religious beliefs. Certainly the deposits of nonfunctional axes, shields, and other items suggests that these objects were made for ceremony and perhaps specifically for deposition. Hoards of complete objects tend to be viewed as personal equipment, either concealed with the intention of recovery or gifted to the supernatural. In such cases, lavish offerings may be a means of enhancing one's social status and personal prestige. Rowlands (1980) argued that relations of dominance and hierarchy in societies such as those in Bronze Age northern Europe were directly related to the control of circulation and exchange rather than the control of production, especially since the necessary raw materials for bronze making had to be imported. The removal of wealth from circulation in such hoards was also a means of increasing demand and value.

Calendrically scheduled feasts with drinking ceremonies, ritual activities, games, and processions seem to have taken place regularly in Bronze Age societies. Similar activities probably occurred as well when important people died or in celebration of victories in war. Alcohol appears to have played an important role in the Bronze Age, at least among the elite. Beer, wine, and perhaps mead would have been beverages of choice at that time. Drinking equipment—bowls, cups, ladles—are an important part of the goods buried in hoards or as grave goods with elite burials. The extraordinary gold cups and bronze vessel from Mariesminde, Denmark, described later in this chapter, are an example. The close of a ceremonial event may have been marked by the burial of valuables of bronze and gold as gifts to the gods. Some sacrifice of animals and even humans also seems to have taken place on certain occasions, in association with military victories and perhaps other important moments in the life of society. There were also special houses built for the dead and for funeral ceremonies. These cult houses are described in more detail in the following pages.

The Bronze Age hoards from the southern half of Scandinavia provide evidence regarding social organization and the nature of social relations. The geographic distribution of these metal finds also offers information on land use and the location of population. The hoards represent economic wealth and include objects of ritual importance. The metal sumptuary goods can be ranked in value (Levy 1979). Thus, the evidence from these hoards and the earthen barrows characterizes an intersection of political, religious, and economic activities that are under the control of an elite group with a ranked social organization that represents the presence of prehistoric chiefdoms in the Bronze Age (Levy 1979, Vandkilde 1996).

Chiefdoms are a form of sociopolitical organization in which relationships are defined by inequality and the presence of a powerful leader. Status is hereditary, assigned by birth order (rank). Agriculture is usually intensive, and relations with other societies are often conflictual. There is some debate about the timing of the emergence of sociopolitical complexity in southern Scandinavia. Some scholars argue that the Bronze Age brings major changes and the rise of chiefdoms. A pattern of ranked, family-dominated hierarchies and chiefly level society is said to contrast sharply with the Late Neolithic, when group-oriented organization was the norm and inequality was not pronounced. Other, however, believe these changes had begun earlier in the Late Neolithic with the first large farmhouses and accumulations of wealth (Artursson 2009: 205). New evidence in the last two

decades has documented more complexity in the Late Neolithic than was previously recognized.

A number of the Bronze Age hoards are discussed in the following pages in order to provide some sense of the nature and content of these deposits. The hoards constitute one of the more spectacular aspects of the European Bronze Age and offer remarkable insight into these societies, at least at the upper levels. One of the sites, Vognserup Enge in Denmark, came to the attention of archaeologists through an unusual set of circumstances.

Vognserup Enge, Denmark

In the summer of 1968, at the end of a day of plowing, a farm employee found a strange bronze disk stuck on the muddy wheel of his tractor. He and a friend located the place in the field where the disk had turned up and dug a hole, uncovering 156 pieces of ancient bronze jewelry and dress ornaments. The place is called Vognserup Enge, located a few kilometers west of the town of Holbæk on the island of Sjælland.

The world is small. Two and one-half years later an archaeology student named Flemming Rieck visited his girlfriend in the town of Ribe on the west coast of Denmark. By sheer coincidence, the sister of the tractor driver from Vognserup Enge lived in the same building. She showed Flemming some of the bronze jewelry and asked how old the pieces were. Rieck immediately recognized the objects as rare and important. Eventually, excavations were undertaken and more pieces were found. The hoard was proclaimed a national treasure and all the objects were purchased by the National Museum (Figure 6.15).

A total of 243 pieces of bronze were recovered, weighing 2¼ kg (5 lbs.), one of the largest prehistoric hoards in Scandinavia. It dates from the early Bronze Age

Figure 6.15. The bronze hoard from Vognserup Enge, Denmark.

Figure 6.16.
Detail of spiral and linear decoration made by the lost wax technique.

and had been deposited about 100 m (330′) from the shore in what was once an alder bog. The objects in the hoard are various pieces of female costume and jewelry, likely the possessions of two women. There are two large belt disks with spiral decorations, two neck collars, four spiral rings, 42 pointed conical ornaments, and 193 small bronze tubes. The bronze tubes are probably ornaments from a corded skirt, known from oak coffin graves where such clothing has been preserved. All of the objects had been used, and some had even been mended.

The lost wax (*cire perdue*) technique was used to make many of the ornamented bronze objects (Rønne and Bredsdorff 2011). The belt disks from Vognserup Enge are decorated with chased circles, spirals, and punch-impressions (Figure 6.16). The lost wax casting method permits the rendition of such fine details, including the remarkable spiral designs. An exact copy of each design is carefully formed on a wax model of the object to be cast. The wax model is then carefully covered in clay and heated to harden the clay and melt the wax. The wax runs out the base of the mold, leaving a hollow reproduction of the object to be cast. Molten bronze is then poured in through the top of the mold, filling all the empty spaces, including the fine decorations originally formed in the soft wax.

Fröslunda, Sweden

The Fröslunda hoard is a Late Bronze Age ritual cache of shields. The hoard was discovered in the mid-1980s in the Fröslunda region just south of Lake Vänern in Middle Sweden (Hagberg 1988). It was found by a farmer cultivating his fields, and was badly damaged by the plow (Figure 6.17). At least 16 shields had been placed in a bog with woven reed mats between them. The shields were also arranged in pairs, leading some scholars to suggest they served as cymbals in ritual ceremonies (Goodway and Yuyan 1996). Stylistically, the shields date between 900 and 700 BC. Förslunda is the largest hoard of shields of this type in Europe. There are 19 other examples known from Sweden, five from Denmark, four from Germany, and one from Italy.

The shields are of made thin, hammered bronze and probably could not have functioned as defensive weapons. The metal is only 0.5 mm (0.02″) thick. The shields are approximately 70 cm in diameter and slightly oval and weigh about 1.5 kg (3.3 lbs.). They have a distinctive decoration in the center, with three wide ribs running concentrically around the oval shield boss. Further from the boss, the decoration consists of alternating ribs and rows of decoration. There seems little question that such thin, nonfunctional shields were intended for ceremony and

Figure 6.17.
The museum display of some of the Fröslunda shields from Bronze Age Sweden.

display rather than battle. The use of rare and valuable metals in the manufacture of ceremonial objects highlights the importance of ritual and religious activities in the Bronze Age.

Stockhult, Sweden

Discovered in AD 1900 next to a large cup-marked stone in south-eastern Skåne, the Stockhult hoard provided new insight into the early Bronze Age, in terms of both long-distance interaction and religious beliefs. The hoard is dated between 1500 and 1300 BC. The buried items included six axes, a spearhead, two large round belt plates and other belt ornaments, three necklaces, bracelets, spiral finger rings, and two small human figurines, all made of bronze.

The two figurines are of men in loincloths, with moveable arms (missing) and brimmed hats with holes for feathers or perhaps horns (Kristiansen and Larsson 2005). The design and costume are reminiscent of similar figures from the ancient Near East or Mediterranean region (Figure 6.18). These figurines may be effigies of sun gods or other deities; if so, they represent some of the earliest images of gods in northern Europe. Kristiansen and Larsson (2009), and others, argue that these figures represent the "divine twins," an element of early Indo-European religious belief that expanded across Europe from an Anatolian homeland.

Figure 6.18.
The two bronze male figurines from the Stockhult hoard, Sweden.

Grevensvænge, Denmark

Another fascinating hoard with human figures was found near Grevensvænge, Denmark, again many years ago, late in the eighteenth century. There were originally seven of these figures found in the hoard from the Late Bronze Age, but five have been lost. A drawing of four of the figures was made in 1779 (Figure 6.19). The drawing depicted two kneeling figures of warriors with horned helmets and axes, a leaping acrobat, and a standing woman (Djupedal and Broholm 1952). These figures were probably attached to a small model wooden boat and put on display during certain rites and ceremonies. Similar objects are known from other sites in the Scandinavia Bronze Age. Interestingly, the short skirt worn by the female acrobat is identical to a string skirt found in the oak coffin graves, described later in this chapter.

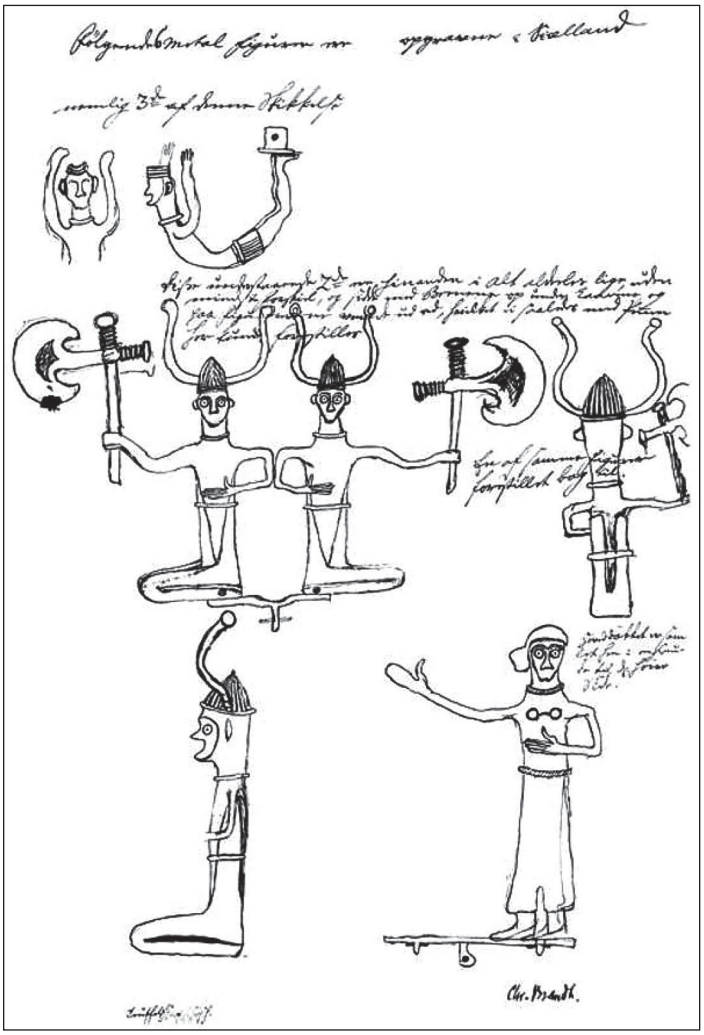


Figure 6.19.
A 1779 drawing of four of the small bronze figures from the Grevensvænge hoard in Denmark. Note the female acrobat with the short string skirt in the upper row.

BARROWS AND BURIALS

Information from old maps and other sources indicates there may originally have been as many as 85,000 barrows, round earthen burial mounds, in Denmark, most of them dating to the Early Bronze Age (1600–1150 B.C). Of these, only 18,000 remain. An estimated 35,000 mounds still stand in northern Germany, across Denmark, and into southernmost Sweden. This represents an extraordinary amount of construction in a brief period, and a very destructive process. Each mound was built of thousands of turfs of cultivable earth, removed from adjacent fields and pasture. Each barrow built required stripping the soil from 0.5–10 hectares of land (Holst et al. 2013b).

During the first half of the Bronze Age, the wealthier, more powerful members of society were buried in stone cists or hollowed-oak-tree-trunk coffins under large earthen mounds (Glob 1970). These barrows dot the landscape of southern Scandinavia

(Figure 6.20). The tall, circular mounds were often built in dramatic locations on the horizon or along roads and trails to commemorate the importance of the buried individuals. More common folk were buried in simple flat graves, or perhaps not at all. During the Late Bronze Age (Periods IV–VI), rather simple, standardized cremation graves replace the elaborate inhumations of the earlier Bronze Age in many areas.

There are almost 30 examples of the oak coffins surviving, largely from the southern half of Jylland and northern Germany. Several are described below. Most of the trees for these coffins were at least 200 years old when they were cut, suggesting that substantial forests still grew in the region. Most of these barrows with preserved coffins and contents were excavated 100 or more years ago.

The barrows with oak coffins appear to have been intentionally engineered to preserve the contents of the grave. The contents were buried under very specific conditions (Breuning-Madsen and Holst 1995, Holst et al. 2001). All mounds with preserved coffins have the same bipartite construction, with a waterlogged bluish clay core containing the coffin and a dry outer mantle of sods. The two parts are always separated by a thin layer of iron hardpan, which formed in the soil, sealed the coffin on all sides, and hindered decay.

The clay core was a smaller mound built directly over the coffin. This flat-topped structure may have been built initially for ceremony or rituals associated with the funeral. This core structure was flooded with water prior to burial under the second, exterior mound. There are some reports of water flowing like a spring when the tombs were first re-opened. This process of waterlogged burial was known later, in the medieval period, as a technique for preserving meat and was probably done intentionally by people in the Bronze Age to preserve the contents of the grave. The water in the tomb created the conditions for a rapid reduction-oxidation reaction that created the iron-rich hardpan around the smaller core mound. The hardpan and water sealed the contents from the air. These conditions preserved both

Figure 6.20.
Bronze Age barrows in the Danish landscape, marked by the red arrows.

the coffins and the contents to a remarkable extent. Later disturbances by tomb robbers and farmers unfortunately destroyed many of them.

Most of this extraordinary phenomenon of oak coffin burial took place during a short period of time after 1400 BC. Because the surviving coffins can be dated precisely by dendrochronology (tree-ring dating), it has been determined that the tree trunks for the surviving coffins were cut over a 164-year period between 1396 and 1260 BC (Randsborg and Christensen 2006). Most of these mounds in fact date between 1391 and 1344 BC, a period of just over 50 years. Because of the limited time period and the small geographic area in eastern Jylland and northern Germany where these barrows occur, some of the people buried in the mounds must have known each other.

Bronze Age barrows were built for the wealthier members of society and placed near where the living had died. The elite segment of the population must have controlled trade as well as most of the resources of the local area. The density of barrows in Denmark is higher in areas of productive farmland, evidence of the important relationship between wealth and the control of agricultural resources. Barrows and hoards from the Bronze Age are probably best understood as competitive displays of status and wealth among the social elite (Olausson 1993). Some individuals were buried with a great deal of bronze and gold and some without any, suggesting that social differentiation was pronounced. Gold was probably much more valuable than bronze; only 1 g (0.035 lbs.) of gold has been found for every 1,000 g (2.2 lbs.) of bronze.

The amount of metal in these burials provides some indication of the wealth of the deceased individuals. Figure 6.21 is a histogram of the amount of metal in the barrows. Gold is given a value of 100 grams of bronze in the diagram. There is a clear indication of graves with more and less metal, but the overall impression from this plot is a gradual decrease in the number of graves with substantial amounts

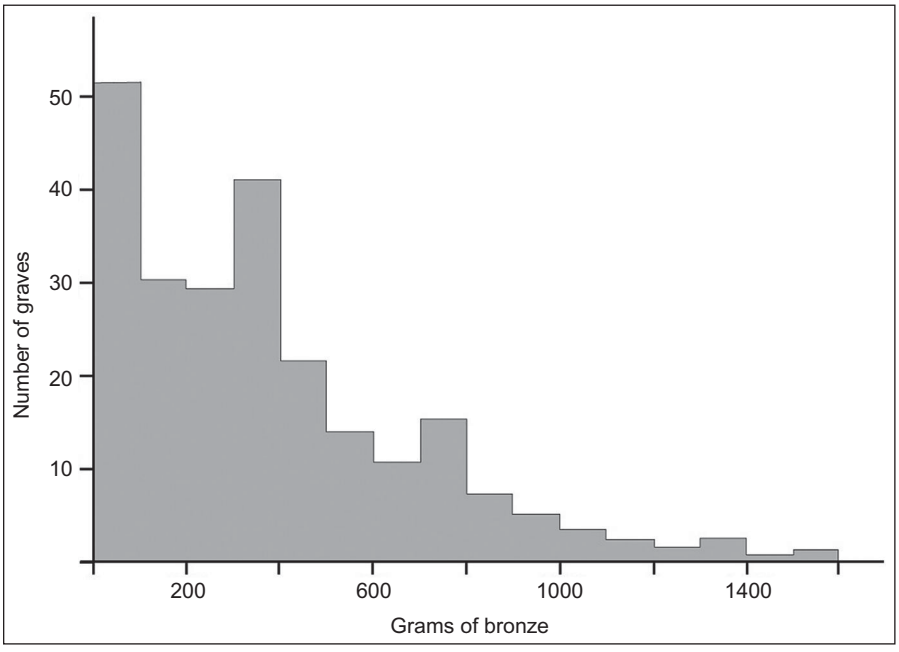


Figure 6.21.
Histogram of grams of bronze and gold in early Bronze Age barrows. 1 g of gold is counted as 100 g of bronze.

of bronze and gold. These differences in wealth among the graves appear to be ramped rather than stepped, as might be expected in the case of a ranked system of social inequality. There are pronounced differences in buried wealth between the sexes. Male graves are more common than female graves, and they contain more bronze and gold. Some of these burials were looted later in the Bronze Age, suggesting that less fortunate people sought the buried riches or that enemies wished to destroy the social identity and status of the deceased.

The distribution of thousands of such barrows provides some information on the use of the landscape and the organization of early Bronze Age society. Figure 6.22 shows the location of Bronze Age barrows in the southern part of Jylland, Denmark. Clear concentrations can be seen in various areas. In addition, distinct linear arrangements of barrows can be observed. The lines of barrows almost certainly mark routes of movement and communication in the area. The major intersections were where the wealthy had residences (Johansen et al. 2004). The earliest known roads in northern Europe appear in the early Bronze Age as wooden track ways across low, wet areas. Stone-paved roadways have been found from the later Bronze Age.

The distribution of Bronze Age barrows and cairns in Sweden documents the location of the primary areas of settlement and land use. These burial mounds are concentrated along the south and west coast of Sweden, with pockets in the interior of southern Sweden and a swath across Middle Sweden. Some areas have extremely high numbers of mounds. The Bjäre peninsula in northwesternmost Skåne has the

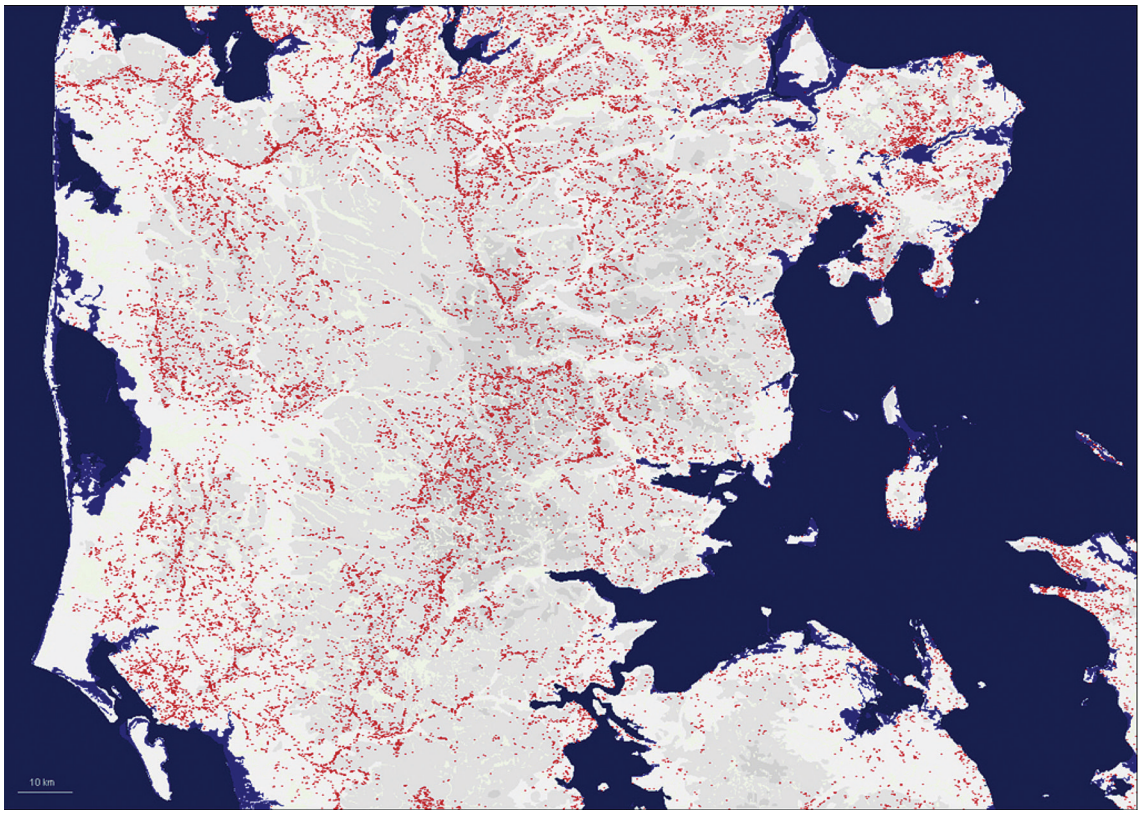


Figure 6.22.
The distribution of Bronze Age barrows in southern Jylland, Denmark. Clear concentrations can be seen, and the linear arrangements of the barrows probably reflect placement along routes of movement.

highest density of mounds (Hannon et al. 2008, Nord 2009). There are also huge Bronze Age rock cairns (a barrow equivalent) on the island of Gotland.

In addition to the large barrows, small mounds were another type of grave in the Bronze Age, ranging in size from 1.5 m (5′) to less than 1 m (3.3′) high and 10 (33′) to less than 5 m (16′) in diameter. Mounds like these were found in an early stage of the construction sequence at Lusehøj, described below. Because these mounds are small, they are particularly susceptible to the millennia of plowing that has leveled much of the landscape of southern Scandinavia. Modern farmers rarely appreciate burial mounds on their land and often try to transform them into flat fields. Thus, the number and distribution of such small mound burials is not well understood.

Cremation was the standard burial practice in the later Bronze Age. A large proportion of the burials from the Late Bronze Age are quite simple and lack a mound, found instead as cremation urns, sometimes placed in earlier grave mounds. A few large cemeteries of flat graves are also known from Late Bronze Age Sweden and northern Germany.

Stone ship settings are another form of burial that appears in the later Bronze Age. The ship was an important part of life in Bronze Age Scandinavia and heavily involved in trade and travel. The ship was also an important religious symbol, related to the passage of the sun across the sky each day (e.g., Kaul 1998, 2004), and was depicted in a variety of media from rock carvings to bronze razors to small wooden models. The image of a ship appears on rock carvings in graves after 1500 BC (Goldhahn 2005, Kaul 1998). However, it was not until around 1300 BC that graves were first built as stone outlines in the shape of a ship (Artelius 1996).

The size of these stone ship settings varies considerably. The average is ca. 10 m (33′), but they range from 2 to 45 m (6.5′–150′) in the Bronze Age (Capelle 1995). Almost all of these stone ship settings would have been buried under an earthen mound or rock cairn. Men, women, and children were buried in the graves found inside the ship settings, usually as cremations (Artelius 1996). This practice of stone ship settings for burials came late to the Swedish island of Gotland, around 1100 BC, but it arrived in full force (Wehlin 2013). There are some 350 stone ship settings on the island. As an example, the Gannarve grave (Figure 6.23) is 29 m (95′) long and 5 m (16′) wide.

After the cremation of the body, the bone fragments and ash were collected, cleaned, and placed in an urn. A few small gifts were included, such as a knife, razor, or tweezers. The urn and gifts were then placed in a stone cist, either in or adjacent to the boat-shaped grave. Such graves are often found in groups and sometimes one ship outline was joined at the prow or stern with another similar setting.

A number of different types of burials and barrows are described in the following pages. A mass grave at Sund in western Norway provides one view of the violent nature of Bronze Age society. The Danish barrow at Diverhøj illuminates the construction process of these barrows and the rather distinctive locations on which they were often built. Hågahögen is a massive mound on the edge of the city of Uppsala and one of the richest Bronze Age graves in Sweden. Borum Eshøj in east-central Jylland is one of the more famous oak-coffin barrows and reveals a remarkable set of individuals and their grave goods. The Egtved barrow contained

Figure 6.23.
A restored Bronze Age ship burial at Gannarve on Gotland.

a young woman with well-preserved costume and grave goods. The barrow at Skrydstrup in southern Jylland is notable for the young woman buried inside and the evidence of nearby settlement that reaffirms the elite status of the barrow inhabitants. Bredarör in southernmost Sweden is a different kind of mound, a stone cairn, with a fascinating and wholly atypical stone burial cist. Sagaholm is a barrow in Middle Sweden with a very distinctive stone setting encircling the mound.

Sund, Norway

Two archaeological sites near the city of Trondheim in western Norway provide a dramatic contrast of life and death in the Bronze Age. These sites are geographically and chronologically related and may represent two segments of the same society. Twenty-one rock cairns were excavated at Toldnes in the late nineteenth century (Rygh 1906). These graves contained 15 skeletons, a number of cremations, and grave goods from the early Bronze Age. Twenty-one bronze offerings were found in about half the graves, including three bronze celts, two swords, a dagger, a pair of tweezers, a bone needle, a bone comb, and a piece of flint. Individuals buried under rock cairns are generally assumed to have been members of the upper level of Norwegian Bronze Age society.

A few kilometers to the east, at a gravel quarry near Sund, a mass of human and animal bone was found directly beneath the topsoil in 1967 (Farbregd et al. 1974). The bones have been dated to ca. 1100 BC. There were six concentrations of bones containing at least 22 male and female individuals, adults and children (Figure 6.24). Several skulls were set in a row on top of the bone piles. There are no artifacts to suggest that this was a grave. The age distribution of the burials includes a high proportion of children. Almost half of the identified individuals are 15 or younger; most of the adults, on the other hand, were over 40. The animal bones included rodents, small ruminants, horses, and a few other mammals.

Figure 6.24.
One of the skeletal concentrations at Sund, Norway.

The health status of these individuals was not good, as evidenced by degenerative features in the skeletons, including spondylosis and osteoarthritis, common among young people who do hard labor such as farming (Fyllingen 2003). The teeth were severely worn, perhaps a consequence of an abrasive diet of stone-ground cereals. There were also cases of rickets in the Toldnes material, caused by vitamin D deficiency. Carbon isotope analysis of the bone collagen indicated a largely terrestrial diet that might help explain the lack of vitamin D, which is present, for example, in fish oils. Other indicators of malnutrition were seen in 20% of the children (Fyllingen 2003). A picture emerges of a society under severe physical and nutritional stress.

Not only were food shortages a problem, the Sund individuals appear to have experienced a violent life and death. At least seven of the adult skeletons show deep cuts to the bone, probably from a sword. Some of these were healed, while others appeared fresh. Evidence of both old and new trauma at Sund was found in 54% of the adult individuals (Fyllingen 2003). None of the children bore signs of violent injury. Obviously, the fact that all these individuals are buried together at the same time suggests some catastrophic event such as violent murder or disease.

The skeletal evidence reveals a community in distress, riddled by malnutrition and parasites as well as repeated violent encounters. Intriguingly, comparison of the skeletal remains indicates that while indicators of malnutrition were present at both Toldnes and Sund, only the Sund individuals exhibited violent trauma and sword cuts in the bone. Discussions of warfare in the Bronze Age have often concluded that conflict and violence were a regular part of life, at least for some segments of the population (Harding 2007). The concept of the warrior society, however, rarely involves starvation.

Diverhøj, Denmark

Until 1985, a very large earthen barrow had stood atop a hill in eastern Jylland for more than 3,000 years. In that year, the farmer removed the remaining parts of the mound to expand his fields. Fortunately before the mound's complete destruction, archaeological investigations were undertaken to learn as much as possible (Figure 6.25). That was a good thing, because this mound, known as Diverhøj, was a very important one. Diverhøj had been partially dug away at the end of the nineteenth century The mound had originally been one of the largest in the area, 5 m (16′) high and approximately 25 m (82′) in diameter (Asingh 1987).

The excavations revealed the construction stages of the mound along with its contents. There were at least four episodes of substantial human activity at the site. The latest was the massive round earthen barrow constructed of sods. This construction covered an earlier disk-shaped, sod-built middle mound that was observed in the exposed cross section (Figure 6.26). The middle mound was built on top of a rich male grave from the early Bronze Age. The first phase of the mound had been a circular rock cairn covering the remains of a Late Neolithic burned wooden structure and grave. The entire mound lay over an earlier Neolithic plowed field and subsequent settlement with at least three houses.

The last construction phase—the round barrow—was largely destroyed, and there were no graves or other features found associated with this structure. The mound had been built with large chunks of grass sods, 10–45 cm (4–18″) in length and 10–25 cm (4–10″) thick, stacked carefully to build the mound. The upper levels of sods were from an area of more humic soils, perhaps placed intentionally to provide good topsoil for the vegetation that would grow over the barrow.

The construction of the barrows, which involved a substantial amount of labor, is a statement about the wealth of the interred. The earthen barrows in southern Scandinavia are built up of layered concentric rings of grass sods with

Figure 6.25.
West-east section through the barrow showing the stone floor and cairn and the stages of construction. Most of the original barrow has been dug away. The center of the original 5 m (16′)–high barrow would have been about 4 m (13′) on this side of the section wall.

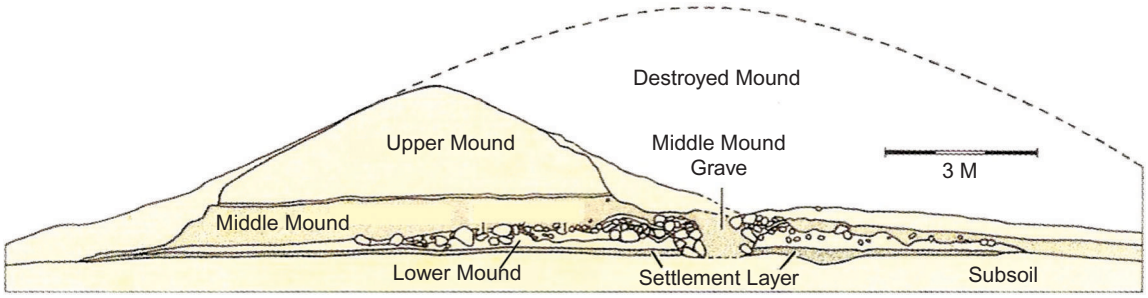
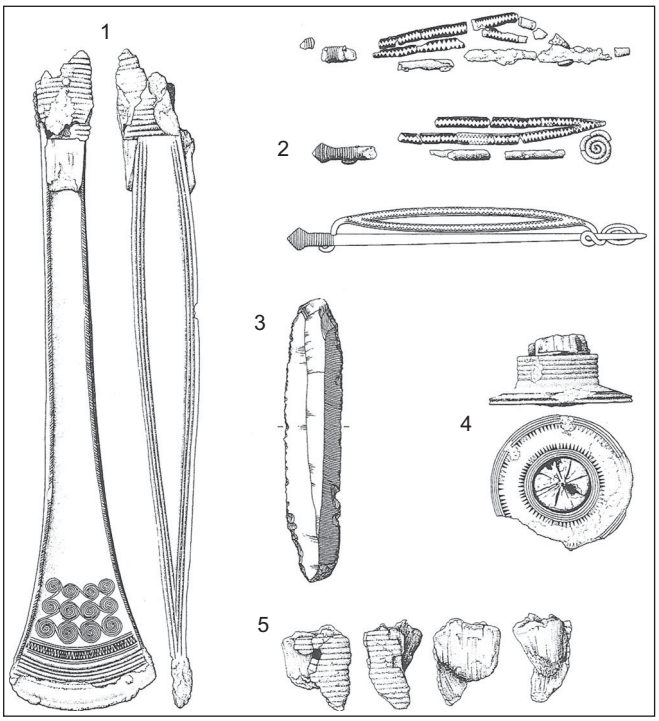


Figure 6.26.
North-south section of Divershøj barrow showing destroyed portion, construction stages, grave, and Neolithic settlement layer beneath the mound.

a thick soil footing. A medium-size barrow like Diverhøj would have required more than 4 ha (10 acres) of sod. (Two American football fields together are one hectare in size.) Removing the topsoil from such a large area would have sacrificed good farmland for decades and created a rather barren zone around the barrow for some time.

The second stage of barrow construction—the disc-shaped middle mound—was also made of sods and about 80 cm (32″) high. A Bronze Age grave was associated with this stage of the mound. A pit had been dug into the lower mound and a rock cairn and wooden coffin placed in this chamber with the deceased individual and a number of grave goods. The grave chamber was 3.3 × 1.75 × 0.6 m (11′ × 6′ × 2′) deep. The poorly preserved coffin appears to have been a single hollowed-out log, approximately 2.7 × 0.65 m (9′ × 2′) in size. The coffin itself was supported and buttressed by head-sized stones placed against its base and sides. The coffin and supporting stones were buried beneath a 50 cm (18″)–thick pile of large stones. Very little remained of the skeleton other than a badly preserved bone that was probably the right femur.

Figure 6.27.
Artifacts from the Bronze Age grave at Diverhøj: 1. bronze axe, 2. three fibulae, 3. flint strike-a-light, 4. sword pommel, and 5. iron pyrite.



The contents of the coffin are of particular interest (Figure 6.27). Near the head of the interred individual was a bark container. Partially beneath the container lay a spectacular flanged bronze axe with spiral decoration. The wooden shaft of the axe was observed during the excavation, but its very poor condition prohibited recovery. A round bronze ferrule, or end piece, was found at the base of the wooden shaft. A cylindrical holder of bronze and three pieces of bronze wire were noted around the butt end of the axe where it was secured to the haft. Two fibulae were found lying parallel on the chest of the deceased. On the right side of the burial were found a piece of iron pyrite, a flint strike-a-light, and an unidentified piece of bronze. Two preserved small fragments of

wool cloth were found on the bronze axe, and the possible remnants of a cowhide were observed in the bottom of the coffin.

The lower mound or cairn had been partially destroyed by the tomb construction associated with the middle mound. A flint dagger and fragments of amber beads found in the soil dug out for the Bronze Age grave chamber suggested that an earlier Late Neolithic grave had been destroyed when the Bronze Age tomb was made. The cairn itself appears to have been associated with the remains of a burned wooden structure connected to that grave and burial, perhaps some kind of mortuary house (Asingh 1987).

Finally, beneath the mound and cairn on the original ground surface were the remains of a Late Neolithic settlement, first seen as a dark cultural layer 15 cm (6″) thick filled with flint, pottery, and charcoal. Beneath that layer were a number of pits and around 50 postholes associated with three houses (Figure 6.30). The two-aisled houses were oriented east-west, similar in shape and size, and directly adjacent to one another. The houses had a sunken floor in the central part of each structure. House I was preserved for 18 m (60′) of its length and was 6 m (20′) wide. House II was observed for a length of 13.5 m (44′) with a width of 5 m (16′). House III was preserved for 13.5 m (44′) as well and was 6 m (20′) wide. It is entirely possible that these houses were built sequentially by the same set of inhabitants.

In fact, the construction of burial mounds in the Bronze Age over the remains of contemporary or earlier settlement is a common feature of these barrows. Rasmussen (1993) estimates that approximately half of the excavated Bronze Age barrows in Denmark lie atop some form of settlement remains. This pattern is certainly not coincidental, but must reflect the importance of place to Bronze Age society, as well as the significance of connections to home, family, and ancestors.

Hågahögen, Sweden

The Håga barrow (Hågahögen) or King Björn's Mound is a Bronze Age barrow on the outskirts of Uppsala, Sweden (Figure 6.28). The grave is one of the richest known from the period. Hågahögen can be dated on the basis of the bronze artifacts to Period IV of the later Bronze Age, ca. 1000 BC (Victor 2002). The mound today is 7 m (23′) high and 45 m (150′) in diameter, located along a former inlet of the Baltic. The mound was excavated in 1902–1903 by the Swedish archaeologist Oscar Almgren, together with the crown prince and future king Gustaf VI Adolf (Almgren 1905). The main body of the mound was built of grass sods over a rock cairn. This rock heap covered a timber chamber that held a hollow oak coffin. The interior of the coffin contained the cremated remains of a small man, his personal equipment, and additional human bones that may be from a sacrificial victim at the funeral ceremony. These bones had been split probably to extract the marrow.

The coffin contained valuable bronze and gold objects that had not been cremated, including a sword, a razor, two sets of tweezers, two brooches (one a gilded example of a so-called spectacle brooch), a number of thickly gilded buttons and tacks, and various other objects (Figure 6.29). They may all have

Figure 6.28.
The Bronze Age barrow at Hågahögen, Sweden.

come from the same workshop in Sjælland, Denmark, based on the similarity in design and craftsmanship. Sadly, the spectacle brooch was stolen from the Swedish Museum of National Antiquities in 1986 (Lamm 1989). The thief must have been disappointed to find out that only a thin gold gild covered the bronze brooch. He or she destroyed the treasure just outside the door to the museum. Several pieces were found on the ground when the snow melted in the spring of the year.

Hågahögen stands tall in an area with a number of other barrows. About 150 m (500′) from the mound, another prehistoric feature known as Håga Church survives as a large stone foundation, some 45 × 17 m (150′ × 55′) in size. The structure predates Hågahögen by a century or two. This foundation did not house a church, of course, but was probably the remains of an earlier cult house associated with other burials in the area. There are about 80 of these ritual, or cult, houses known from Bronze Age Sweden and more from Denmark, northern Germany, and elsewhere across Europe north of the Alps.

There are two general types of cult houses found with burial mounds in Bronze Age Scandinavia. Stone foundation structures, like the one at Hågahögen, are large, 10–45 m (33′–150′) in length and 6–12 m (20′–40′) in width, with walls of stone and rounded gables. These were probably associated with funeral rites and rituals and may perhaps be thought of as homes for the ancestors. The lack of finds inside these structures suggests that they were not used by the living. The absence of doors at Hågahögen suggests that the interior of the house was of less significance than the structure itself and its exterior. The lack of a door may also reflect concepts about keeping the dead in their place. In northern Denmark, these stone foundation cult houses were often built directly adjacent to the burial mound, usually where secondary burials had been dug into the earlier mound (Nielsen

and Bech 2004). At Sandagergård in northern Sjælland, Denmark, described below, stones engraved with open hands and several standing stones were found in association with a similar Late Bronze Age cult house (Kaul 1987, 2006).

The second type of cult house is a post-built roofed structure, smaller in size and often D-shaped. Such ritual houses, like the burials, were often placed in strategic topographic locations, highly visible and adjacent to the main routes of communication. Artifacts and cremations graves have been found with these structures, usually near cemeteries or individual graves (Victor 2002). There are also indications of food production and perhaps metallurgy at such locations in the form of querns, ovens, and fragments of crucibles (Artursson 2011). The ovens may have been for baking bread or roasting grain for malting. These activities may have been associated with feasts at funerals or commemorative ceremonies.

Figure 6.29. Some of the grave contents from the Bronze Age barrow at Hågahögen, Sweden. These include a gilded bronze sword, gold wire, gilded tacks and buttons, a razor, tweezers, and an elaborate gilded brooch (photo by Soren Hallgren).

An early post-built cult house was found near Hågahögen which contained an interesting combination of features. This structure had been erected before Håga Church and abandoned when the large stone structure was built. The foundation was fire-cracked rock and clay pieces taken from wattle and daub structures elsewhere, placed between two parallel lines of larger stones. The burned rock and clay probably came from a nearby settlement, domestic waste from residential structures. These walls were 2.5 m (8′) thick, and the interior of the house was only 1.8 m (6′) in area, which is strangely atypical. Most of the finds—pottery and fireplaces—at this ritual house were either in the walls themselves or outside the house. Curbstones had been placed around the outer wall of the house.

These ritual houses are probably best understood as dwellings for deceased ancestors. They manifest the importance of both the "old ones" and their descendants as a connection to family, origins, house, and property. Ritual structures as homes for the ancestors at or near graves and tombs are an explicit, visible expression of these relationships. These structures made a strong statement about the power and importance of the family that built them and their place in society and on the land.

Sandagergård, Denmark

The cult house at Sandagergård was discovered in 1985 as part of the archaeology being done ahead of a new natural gas pipeline in northern Sjælland, Denmark (Kaul 1987). This area has one of the densest concentrations of both megaliths and Bronze Age barrows in Scandinavia. The topsoil was removed ahead of construction,

and archaeologists surveyed the freshly exposed ground. At Sandagergård, scatters of charcoal were seen in the earth, and further excavation revealed an intriguing structure with a number of unusual features. The finds of pottery and other objects at the site allowed it to be dated to the first part of the Late Bronze Age. The structure appears to have been isolated, but there is a Late Bronze Age settlement a few hundred meters to the north.

This was a large structure marked by a rectangular enclosure of two rows of large, rounded stones about 0.7 m (2.3′) apart (Figure 6.30). This enclosure was 18.5 × 7.5 m (60′ × 25′) on the outside and 16 × 4.5 m (53′–15′) on the inside. The details of the building were unclear, as post holes and other structural features were not preserved in the sediments. There were stones missing on the east side, and it is unknown whether this was an entrance or simply a part of the structure that had later been disturbed by plowing. Buried in the floor of the structure were three Late Bronze Age cremation urns, each covered with a flat stone. These burials may have been the reason for the construction of the building.

In addition to the three cremation urns, the contents of the house are atypical and clearly not refuse from a residence. There were no flint tools or production

Figure 6.30.
The cult building at Sandagergård, Denmark, directly adjacent to the pipeline.

waste inside the structure, a common aspect of domestic houses. There were a number of potsherds, but most surprisingly, there were many small fragments of crucibles and molds for melting and casting bronze (Figure 6.41). The structure may have been a focus of metallurgical activities. There were, however, no fireplaces found in or around the building.

Just to the south of the structure were several unusual features that emphasize its special nature. There was one large, somewhat pointed stone more than 1.75 m (almost 6′) long, and just beneath it a deep hole of the same shape as the base of the large stone. This stone must have stood in the hole at one time. Fragments of a very similar stone were found just a few meters away to the east. At least two large stones may have stood as sentinels at the south end of the large structure.

Between these two stones was another extraordinary find, four stone slabs with very similar engravings of open hands. The arm and hand vary in length on these stones from 30 to 37 cm (12″–15″). Above the hands on all four stones are four parallel lines (Figure 6.31). Three of the stones are granite and the fourth is sandstone. Clearly, this hand is a symbol. Other examples of almost identical hands are known across southern Scandinavia, in southern Norway and Middle Sweden. These stone hands are often found in association with graves and tombs and may signal a taboo of some kind, perhaps prohibition of access to the structure. They may also be related to keeping the dead in place. Their true meaning is completely unknown.

Lusehøj, Denmark

Around 800 BC, a huge barrow named Lusehøj was built in southwestern Fyn, 36 m (120′) in diameter and 8 m (25′) high. The mound would have been visible for several kilometers in all directions. Lusehøj was built on top of an earlier settlement from around 1000 BC. The settlement was abandoned, new fields were plowed on the spot, and then a cemetery of small burial mounds was located on

Figure 6.31.
The four flat stones with a hand and four lines. The bent thumb is found on three examples. The longest hand and arm is 37 cm.

Figure 6.32.
The contents of the first chief's grave at Lusehøj: large drinking vessel and lid with amber impressions, two large piece of amber, two razors, one of gold, a bronze socketed axe, one gold and two bronze toggle buttons.

the same site. Finally, the mound of Lusehøj itself was constructed (Thrane 1984).

A stone cist was built first, either on or adjacent to one of the small, earlier mounds. The deceased man had been cremated and his ashes placed in an unusual bronze vessel, probably used in drinking ceremonies. The bronze vessel may have been made in the southeastern Alps, based on its shape and decoration. Before being placed in the large bowl, the man's ashes and personal possessions were wrapped in a fine cloth made of nettle fibers. His personal property, also placed with the ashes, included a gold arm ring, two razors, and four toggle buttons, two of gold and two of bronze (Figure 6.32).

The bronze vessel and its contents were placed in the cist along with three small bronze cups, a bronze beaker, and a bronze axe. The large bronze vessel had a lid covered on both sides with a thick layer of resin or birch pitch that sealed the vessel. This resin retained the impressions of a number of pieces of amber that had once been embedded in its surface. The lid was sealed to the vessel with more resin, and a cord was used to bind the whole package together. The entire package was wrapped up in a piece of wool blanket or carpet and then an oxhide. It was placed in the cist, which was then covered by a thick layer of heavy stones.

Not long after, a second tomb was added for another important chief. Six large posts were placed in the ground, and a deep pit was dug. The posts may have held scaffolding on which the body of the second man was displayed before the funeral. The body of the chief was probably brought to the mound in the bed of a wagon, along with his personal possessions. Evidence for the wagon was found among the remains in the tomb. Perhaps this wagon box was displayed on top of the scaffolding before the entire structure was burned and the remains were cremated. The bones, ashes, and pieces of his possessions were collected and placed in the deep pit, which was then covered with a layer of clay and marked by four wooden stakes. Straw mats were placed on the clay layer, and a rectangle of wicker fencing was built around the grave.

The large barrow of Lusehøj was then constructed over the graves of the two chiefs. To raise a monument of such dimensions obviously required sophisticated techniques. A series of wicker fences were erected, radiating out from the center of the mound to separate and support the sections of grass sods that were used for the fill. When finished, the mound contained at least 3,200 m^3 of grass sods removed from more than 7 ha (17 acres) of surrounding grassland. An estimated 13,000 work days at 10 hours/day were needed to complete the mound.

The personal possessions of the second chief, cremated in the bonfire, were badly damaged and difficult to identify. There were parts of a sword. There were

pieces of bronze sheet of varying thickness, parts of which apparently came from a small container. There were also pieces of a chain with an associated tin rattle. The contents included approximately 400 small tin pins and rivets, probably part of a leather belt. There were at least 90 bronze tacks in four different sizes, along with a number of rings and rods that may have been decorative pieces on a bucket or wooden wagon box. There were also 26 grams of gold from an original form unidentifiable after the cremation.

Recently, some fascinating new evidence regarding the nettle cloth that wrapped the cremation ashes in the first grave has come to light. Analysis of the cloth has suggested that it may have been made from nettles grown in Austria (Bergfjord et al. 2012), based on its isotopic composition. The drinking vessel itself also was probably made in eastern Austria or nearby, based on the decoration present. It is intriguing to think that the cremated individual may have died in Austria and his remains returned to Denmark wrapped in cloth, inside the bronze container.

Borum Eshøj, Denmark

For an example of a well-preserved coffin burial, we turn to Borum Eshøj, one of the largest Bronze Age barrows in Denmark, located near the modern city of Aarhus. The original mound was almost 9 m (30′) high (equivalent to a three-story building) and 40 m (130′) in diameter. The barrow was first opened in 1875 by the landowner who was removing the rich soil of the mound to add to his fields (Figure 6.33).

This huge mound had been built over three oak coffins containing an older man and woman and a young man, who was probably their son. Each of them had been wrapped in oxhides and buried in fine woolen clothes. Bronze and wood objects accompanied them, probably personal possessions. Two of these coffins have been dated by tree rings to around 1350 BC. One can only wonder about the cause of death and the almost simultaneous burial of these three individuals in the middle of the fourteenth century BC.

Preservation in the mound was extraordinary (Figure 6.34). The body of the older male, 50–60 years of age, was so well preserved, with the muscles still holding the skeleton together, that it had to be dismembered for transport to Copenhagen. His hair was intact; the man had been blond. He was clean-shaven and had manicured hands and nails. His body had been placed on a cowhide and covered with a woolen blanket. He was dressed in a dome-shaped hat, a kidney-shaped cloak, and a short kilt with a rope belt, and cloth was wrapped around his feet. All the textiles were wool. The only other object in the grave, apart from the clothing, was a wooden needle or pin attached to the collar of the cloak. Piles of wood chips around the coffin indicate that the oak trunk had been hollowed out on the spot.

The older woman was also well preserved. She was 50–60 years old and 1.57 m tall, relatively short and stocky; traces of muscles on her bones revealed that she had done hard physical work. The first item found when the coffin was opened was a cowhide with the hairs still intact. Beneath the hide was a wool rug on top of the woman's body. She was buried wearing a skirt and tunic of brown wool, a tasseled

Figure 6.33.
A watercolor of the excavations at Borum Eshøj in 1875.

belt, and a hairnet of wool thread with her long hair still inside. A comb made of horn was found next to her hair. Various bronze objects in the coffin included a pin, a dagger with a horn handle, a belt disk, two ornamental bronze plates, and rings for her fingers, arms, and neck. The grave also contained a pottery vessel and a wooden box.

The 20-year-old man at Borum Eshøj was very well preserved. Muscles and other soft tissues connected the bones. His hair was preserved in a pageboy style. The young man was dressed in a woolen shirt held together by a leather belt and a wooden button, as well as a cloak and kilt also of wool (Figure 6.35). He may have been wearing a pair of leather shoes. His grave goods included a bronze dagger

Figure 6.34.
The older female and male from the log coffins at Borum Eshøj.

in a wooden sword scabbard, a horn comb, a bark box, a bone needle, and the wooden button.

The burial monuments from the Bronze Age of southern Scandinavia have a lot to say about the society that constructed them. Clearly, status and role in life were publicized in death and commemorated, validating the living. The massive labor, large size, strategic location, and high visibility of the mounds leave little doubt that they were reserved for people of high rank. The contents of the tombs help define the nature of social identity in the earlier part of the Bronze Age.

Personal appearance and material culture were important in building social identities in terms of gender, age, and status. High-quality clothing and other possessions were the signs of the elite, much like today. Bronze swords in a finely made wooden sheath were a symbol of high rank and warrior status, and perhaps of adulthood as well. The sword was hung at the waist or worn diagonally across the chest. Personal equipment (razors, pins, tweezers) and equipment such as birchbark buckets, decorated wooden bowls, folding wooden stools with otter-skin seats, and antler spoons were also placed inside oak coffins.

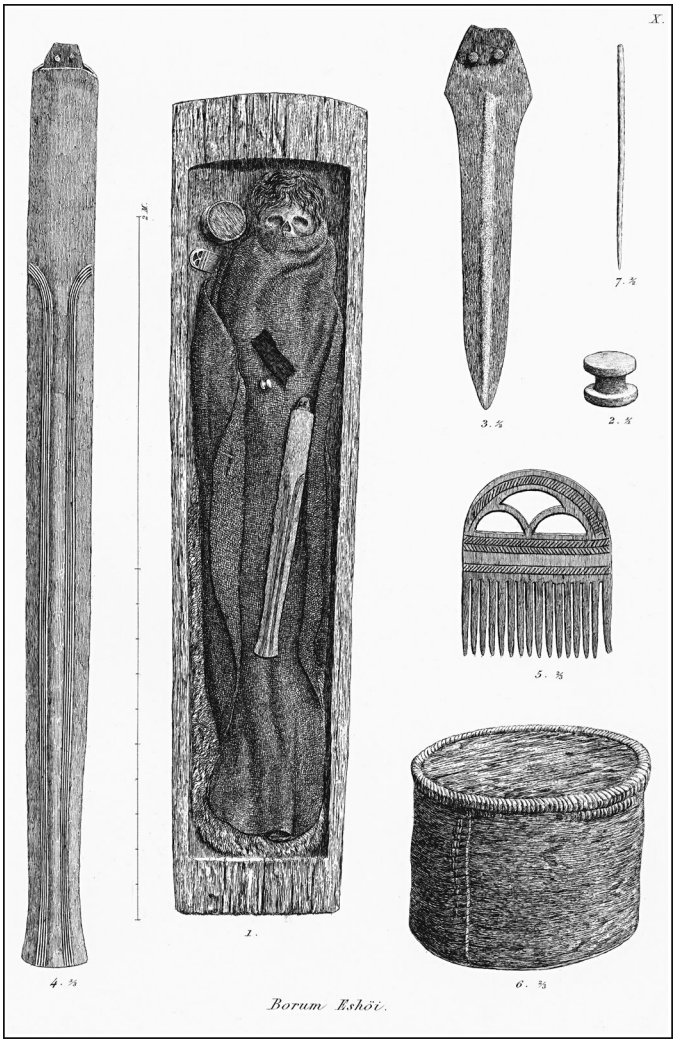


Figure 6.35.
The young man's coffin and grave contents from Børum Eshøj.

Female dress varied with status and age. A clear distinction is seen when a woman reached adulthood or married. A corded miniskirt was worn by a 16- to 18-year-old girl in the Egtved burial described in the next section. The older woman from Borum Eshøj and older women in other graves were dressed in long skirts. Elaborate hairstyles with a covering net or cap may also be part of the costume of elite married women. All women wore a long-sleeved blouse. A spiral-decorated bronze belt plate worn on a belt at the waist was nearly de rigueur for the high-status female. Smaller button-like plates, elaborate safety pins, neck collars, and various rings of gold and bronze for the ears, arms, legs, neck, or hair completed the female costume. Small personal items, such as antler combs and bronze awls, were sometimes carried in a small purse or box or attached to the belt.

Egtved, Denmark

The Egtved girl was born around 1387 BC and died in 1370 BC during the early Bronze Age. Her body was placed in a coffin hollowed from the split trunk of

an oak. She was dressed in fine clothes and some of her possessions were placed with her in the coffin. The coffin was then buried beneath a large earthen mound, 4 m (13′) high and 22 m (70′) in diameter, in southern Denmark near a place called Egtved. Time passed, and flesh and bone slowly decomposed in the strange chemistry of the burial environment. Fortunately, however, some organic materials survived. Her body had been placed on a cowhide in the coffin. When the coffin was opened in AD 1921, the skin of the hide had decomposed but the hair of the animal stayed in place. The impression in the hide from the weight of the girl's body could still be seen. Her body and possessions had been covered with a woolen blanket that was still in place. A summer flower, a yarrow blossom, had been placed on the side of the coffin.

Of the body, only the blond hair, part of the brain, the teeth and nails, and a small bit of skin survived. Her clothing survived in good condition and is particularly notable. She was dressed in a small, long-sleeved top and a knee-length corded skirt. These corded skirts have garnered a lot of attention and appear to have been rather common in the Bronze Age, often decorated with hollow bronze tubes that would have flashed brightly in the sunlight and perhaps clinked together when the wearer moved. The small female bronze acrobat figure in the hoard at Grevensvænge, Denmark (discussed above), was depicted in a corded skirt. A large bronze disk or belt plate was found at the waist of the Egtved girl, along with a woven belt. A hair comb made of horn was attached to the belt. She wore two bronze arm rings and one earring. A small bark box containing a bronze awl and the remains of a hair net were found by her head. At her feet was a small bark bucket that had been filled with some kind of beer. There was also a small bundle of clothing with the cremated remains of a 5- or 6-year-old child, perhaps a relative who had died earlier or perhaps a sacrificial victim, part of the funeral ceremonies.

Skrydstrup, Denmark

The southern part of the peninsula of Jylland is rich agricultural land today. It was the same in the Bronze Age, as witnessed by an abundance of large barrows and other archaeological remains (Figure 6.24). The Bronze Age evidence from Skrydstrup was located about 2 km (1.2 miles) from the Oksevejen (the ox road, also known as the Hærvejen, or military road) that ran along the watershed divide of Jylland as a major north-south route for the movement of cattle, millitary units, and various commodities. The road led to Hamburg, Germany, where it connected with other routes crossing Europe. This route from northern Jylland has probably been in use at least since the Late Neolithic.

At Skrydstrup, just west of the town of Vojens, there is a fascinating combination of Bronze Age barrows and large houses from the same century BC. One of the larger barrows at Skrydstrup was excavated in 1935 and contained an oak coffin with the body of an 18-year-old girl. She was 170 cm (5.7′) tall. The cause of her death was not apparent. A few years earlier, the graves of two men had been found in this same mound, but poorly preserved, as their graves had probably been looted in antiquity.

Because of the remarkable conditions of preservation that are sometimes present in these oak coffin graves, the clothing, hair, and grave furnishings of the

Skrydstrup woman were still intact. Her body had been placed on a cowhide, strewn with flowers, and covered by two worn blankets. She was wearing a dark hat or bonnet, a brown short-sleeved woolen blouse with embroidered sleeves and neckline, and a long brown woolen skirt. Her hair was combed, piled on her head, and held in place by a hair net. Spiral rings of 24-carat gold by her ears reflected her high social standing in Bronze Age society. On her feet were leather shoes lined with fur, pieces of clothing, and tufts of dry grass. There was a decorated horn comb at her waist, along with a white woven wool belt. She had been buried on a summer day in 1275 BC (Randsborg and Christiansen 2006).

Not far from the Skrydstrup barrow, excavations have uncovered one of the largest prehistoric houses ever found in Denmark (Figure 6.36). This structure is 50 × 10 m (165′ × 33′), covering an area of 500 m^2 (5,400 ft^2), slightly larger than a basketball court. The house is extraordinary and must have been the home of a powerful person in early Bronze Age society.

This building was divided into several rooms and had a number of distinctive features (Figure 6.37). The focus of the interior was around the heating and cooking fireplaces that were built of stone and centered in the west end of the structure. A built-in bench along the wall probably served for sitting and sleeping. The entrances in the middle of both long walls of the house had exterior pavements

Figure 6.36.
Air photo of the two houses at Skrydstrup, Denmark. The post holes and pits have been outlined in white.

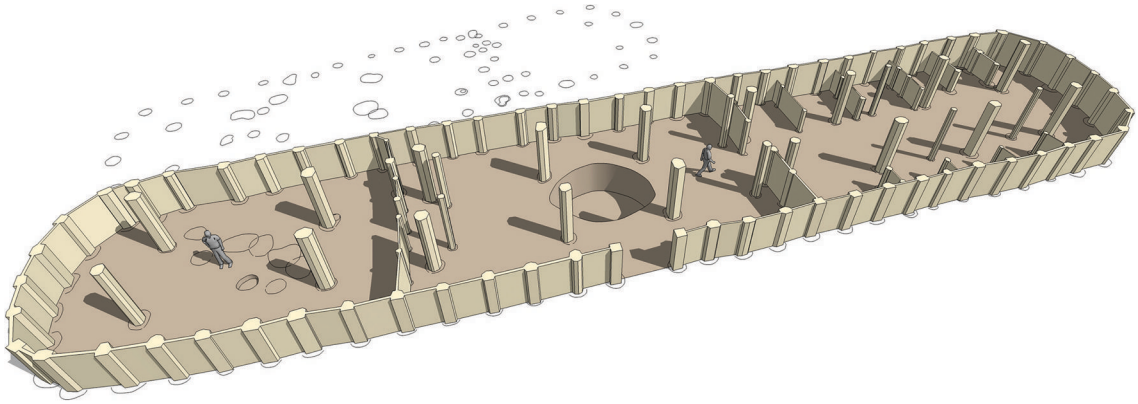


Figure 6.37.
A computer reconstruction of the floor, posts, and walls of the 50-m-long house at Skrydstrup. There are two human figures depicted inside the structure for scale (computer reconstruction by J. Andersen).

made of small stones. Along the central axis of the house, several deep pits had been dug and lined with wood to serve as root cellars and other storage. A loom weight was found in the house, documenting weaving activities. The east end of the structure was apparently used for animal stalls. The hole in the floor in this area may have served as a manure pit to collect fertilizer.

A second, slightly smaller house was found directly next to the 50 m structure. This building is also quite large, approximately 30 × 7.5 m (100′ × 25′), a total of 227 m^2 (2,500 ft^2). The radiocarbon date for this structure, 1380–1220 BC, is contemporary with the age of the coffin in the Skrydstrup barrow. The buried woman probably lived in or visited this house during her lifetime.

Uggårde rojr, Sweden

Uggårde rojr is the largest burial mound on the Swedish island of Gotland in the Baltic Sea and dates from the Early Bronze Age. It is in fact an enormous rock cairn, 7 m tall (23′) and 50 m (165′) in diameter. The cairn is located in a rather open bog about 200 m (650′) from the coast in the island's southeastern corner. The mound itself has never been excavated—a forbidding task—but recent excavations around the margin of the cairn are revealing some of the ceremonial activities associated with its construction.

Bredarör, Sweden

The Bronze Age cairn known as Bredarör lies near the present town of Kivik in southernmost Sweden (Figure 6.38). A cairn is simply a pile of stones made by people. Kivik is also sometimes used as the name for the site. Bredarör is one of the largest burial monuments in northern Europe. The name means broad cairn in Swedish. This monument is also known as the King's Grave in reference to the tomb inside the cairn. The monument is 75 m in diameter. The restored height is 3.5 m (12′), but the original rock mound may have been substantially higher. Stones have probably been removed from the cairn for centuries for use elsewhere. The tomb inside the rock cairn was looted in 1748, according to historical records.

Archaeological excavations took place in 1931, and the tomb chamber and cairn were then restored. There is a path through part of the mound, leading to

Figure 6.38.
The Bronze Age stone cairn at Bredarör.

a monumental stone entrance. The modern restored version of this entrance features a massive copper door, but this was not a prehistoric feature. The date of the monument is debated but it is likely from the early Bronze Age, ca. 1500 BC (Kristiansen and Larsson 2005, Randsborg 1993). These stone cairns are the equivalent of the earthen barrows of Bronze Age Denmark such as Borum Eshøj.

Bredarör is justifiably famous for the size of the cairn enclosing the tomb, but the tomb itself is remarkable. Inside the tomb chamber, there is a large stone cist with elaborate rock art. Some human bone, remains of cremations, and fragments of bronze grave goods that survived the looting were also found in the cist. Ten slabs formed the inner sides of the 4 × 1.5 m (13′ × 5′) stone cist and are decorated with petroglyphs (Figure 6.39). The images carved into the stones depict people, animals (including fish and birds, or more probably human figures wearing bird masks), ships, bronze horns (lurs) being played, symbols, and a chariot or cart with four-spoked wheels, drawn by two horses. These images may relate to a funeral procession and ceremony for the deceased.

In fact, it appears there were originally two cists in the tomb. At the south end of the large cist, there was another set of standing stone slabs, 1.2 × 0.65 m (4′ × 25″) in size, that probably contained a second individual. Recent examination of the surviving bones indicates that several individuals were buried in the grave later in the Bronze Age. The site also includes a separate cemetery and a number of other structures, possibly cult houses.

Sagaholm, Sweden

Sagaholm is a large early Bronze Age earthen mound located just south of the modern town of Jönköping, in the central part of Middle Sweden. Sagaholm is similar to Bredarör in that there are engraved stone slabs present, in this case forming a circle around the mound (Figure 6.40).

At Sagaholm, these slabs are sandstone, and they stood in a circle inside the base of the mound, probably buried when the mound was enlarged after its original construction (Goldhahn 1999). There would have been close to 100 such slabs

Figure 6.39.
The engraved slabs at Bredarör, Sweden.

at that time, but only 45 remain today. Eighteen of the slabs were engraved with petroglyphs of ships, animals, and people. The interpretation of the petroglyphs and their meaning remains controversial (e.g., T. Larsson 1993).

NORTHERN BRONZE AGE

A situation similar to the later Neolithic, with farming communities extending up the west coast of Norway, continues in the Bronze Age. Certain areas with more productive agricultural land witness the formation of chiefdoms

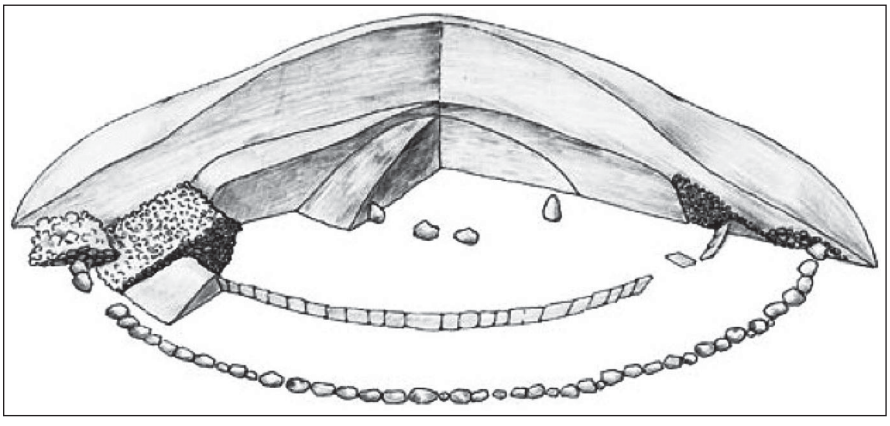


Figure 6.40.
An artist's reconstruction of the building stages of Sagaholm. Some of the stones in the inner circle have engraved petroglyphs of ships, animals, and humans.

as the trade in metal involves leaders in the north with networks of alliance and exchange to the south. Figure 6.41 shows the distribution and number of Bronze Age metal finds in southern Norway. Most of the finds come from coastal areas, along the coasts of the deep fjords, and from southern and western Norway. There are very few finds north of Trondheim. Small farming communities occupied the coastal areas to the north, and hunter-gatherers continued their occupation of the interior. In the far north, hunter-gatherers utilized both coastal and interior resources and may have supplied valuable trade goods (e.g., fur, walrus ivory) to the farmers to the south.

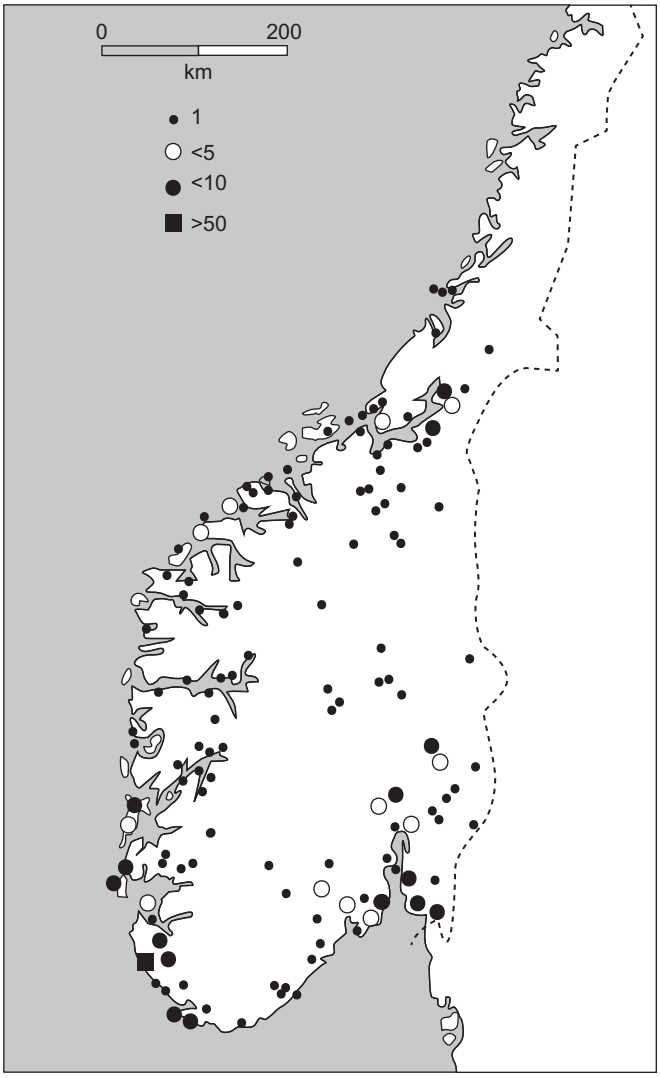


Figure 6.41. Bronze Age metal finds in southern Norway. The symbols represent different quantities of finds (Hagen 1983).

Several trends are observed in northern Sweden and Norway during the Bronze Age. Interaction with groups to the east in Finland, Russia, and the eastern Baltic tend to dominate external relationships, documented by asbestos-tempered ceramics with textile-impressed decoration along with distinctive stone projectile points. This period witnessed the placement of rock art where smooth rocks were available near sources of water, either along the interior rivers or on the coast. A number of the abstract symbols at Nämsforsen—footprints and the sun disk, for example—likely have origins in the Bronze Age cosmology of southern Scandinavia.

The coastal region of northern Sweden becomes a center of activity in the Bronze Age. Burial cairns of stone substitute for earthen mounds. In Sweden, approximately 3,000 stone cairns were built along the Baltic coast, some with internal stone cists for housing the deceased. Preservation is poor in these cairns and grave goods are few, but the monuments themselves mark the presence of a substantial population. Finally, farmers again colonized parts of the coastal area. Pollen evidence from the region around Umeå documents a decline in spruce pollen between 700 and 400 BC that may reflect efforts at land clearance and the encouragement of deciduous tree growth for leaf fodder for animal herds. After 400 BC, there appears to have been a substantial decline in the use of the area, corresponding perhaps to climatic deterioration (Broadbent 1978).

In Norway, the so-called Gressbakken phase of the Late Stone Age dates from 2000 to 500 BC, largely concurrent with the Late Neolithic and Bronze Age in

southern Scandinavia. The stone industry was dominated by slate artifacts. A new type of slate arrowhead—small and triangular, with a concave base—appeared throughout the region, including northern Sweden. Asbestos-tempered pottery came into use, likely introduced from Finland, where it was known from 3000 BC (Jorgensen and Olsen 1987). There was a heavy reliance on marine resources—fish and mammals—along the north coast of Norway (Helskog 1984, Renouf 1991). There were also changes in technology introduced from contact with the Bronze Age cultures to the south (Baudou 1960). There is, for example, some limited evidence for cultivation as far north as the mouth of the Alta Fjord dated to the second millennium BC—barley pollen and polished stone axes.

Most of the artifacts and house remains from this area, however, point to the continuing presence of northern hunter-gatherers. The first millennium BC is somewhat of a puzzle, as pit houses disappeared from the archaeological record and artifact concentrations were few and far between. At the same time, this may be the time when the Saami people or their ancestors emerged in northern Scandinavia. Perhaps the seminomadic lifestyle of these groups left fewer visible traces on the landscape of northern Norway and Sweden. More on the Saami appears in chapter 7.

TREASURES

The Bronze Age is about treasures. Much of the evidence from this period comes from elite grave goods and hoards of highly valued items. A few examples are described here because of their extraordinary nature. Several of these items must have had exceptional significance as ceremonial objects, in addition to the remarkable craftsmanship and valuable materials they exhibit.

The Trundholm bog in Denmark gave up the remarkable sun chariot—one of the premier treasures of the National Museum in Denmark. Bronze lurs have been found in some numbers in various hoards and provide an insight into the activities and sounds in Bronze Age ceremonies. The Mariesminde hoard contains a set of almost identical golden bowls used in drinking ceremonies in the later Bronze Age. The offering at Trushøj included several valuable personal objects along with a ritual vessel of exceptional size and appearance. The razor from Arnitlund is decorated with a fascinating scene from Bronze Age mythology. The justifiably famous rock art at Alta in northern Norway was created between 5000 and 200 BC and is included here for comparison with the depictions at Tanum, discussed at the opening of this chapter. The art at Tanum was made by farmers and traveling merchants, that at Alta by hunter-gatherers.

Trundholm, Denmark

Some of the remarkable artifacts from the Bronze Age reveal a fascination with solar or celestial objects and time. The Sun Chariot from Denmark is a bronze model of a mare pulling the sun across the sky (Figure 6.42). The horse would probably have pulled the sun with a rope. The entire piece is around 50 cm long and 30 cm high (18″ × 12″). Dated to the early Bronze Age, ca. 1400 BC, this is

Figure 6.42. The Trundholm Sun Chariot from the Danish Bronze Age.

one of the earliest representations of a domesticated horse in Europe. The sun disk has two sides, made by putting two separate disks together. Both disks are ornamented with intricate decorations arranged in concentric circles. The horse and sun rest on six wheels to provide motion and symbolize movement.

The Sun Chariot was originally discovered in 1902 when the bog called Trundholm Mose in the northwestern corner of the Danish island of Sjælland was drained and plowed for the first time. The finely made spiral decorations on the sun disk indicate it was probably made in eastern Denmark, as such patterns are particularly well documented there. The pieces of the Sun Chariot were cast in bronze using the lost wax technique. The sun was an important aspect of Bronze Age religion. The basic cosmology of existence at that time may have revolved around the journey of the sun across the vaulted heavens during the day and through the underworld at night. One side of the disk is covered in gold leaf, probably to indicate daytime; the other side is dark bronze, likely representing the night (Figure 6.43). A divine horse is often depicted as pulling the sun through the sky. Ships also play an important role in this ideology, carrying the sun through the darkness at night.

Bronze Lurs

A lur is a long horn without finger holes that sounds something like a trombone. It is essentially a long tube or pipe of several fitted pieces with a kettle-shaped mouthpiece at the small end and an ornamental plate at the wider end (Figure 6.44). The length is between 1.5 m and 2 m (5′–6.5′). Lurs can be straight or curved in various shapes. The lost wax casting technique was used to make the bronze lurs, which probably developed from earlier cow horn instruments. Bronze Age lurs were often deposited in bogs in pairs. Sixty examples are known from Denmark, southern Sweden, northern Germany, Norway, and Latvia. Thirty-seven come

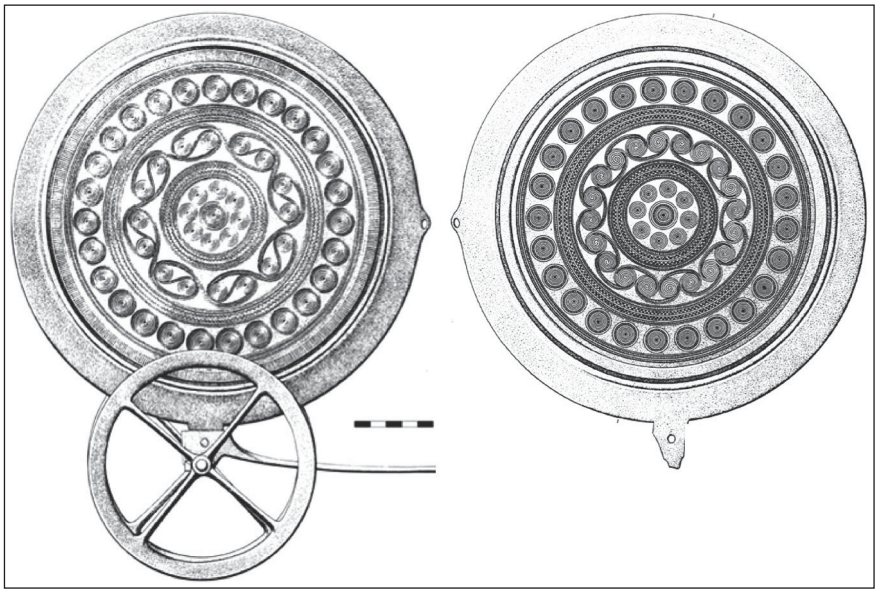


Figure 6.43.
The two sides of the sun chariot disk, day (left) and night (right). Scale is in centimeters.

from Denmark alone. Illustrations of lurs have also been found on rock carvings across Scandinavia.

The first lurs found in Denmark came from a bog in central Sjælland and were completely remarkable. They were found by a farmer digging peat for fuel in the Brudevælte bog in 1791. Three pairs of lurs were recovered by the farmer. They must have been placed as a sacrifice, or for safekeeping, in the lake before it dried up. The Brudevælte lurs date to approximately 800–700 BC, toward the end of the Nordic Bronze Age. The remarkable preservation of these instruments permits them to be played today. They are tuned differently. One pair is in C, one in D, and one in E. These instruments, designed to be played while carried, must have been used in ceremonies and processions, in all likelihood activities related to the worship of the sun. A number of lurs are shown in the Bronze Age rock carvings of Sweden (Figure 6.44).

Mariesminde, Denmark

One of the many treasures of the National Museum in Copenhagen is a set of gold bowls found in 1862 near the town of Mariesminde on the Danish island of Fyn. The poor farmer who found the rich hoard, a 61-year-old father of five, was given a reward equivalent to eight years' income from his farm. A large bronze amphora had been filled with 11 gold bowls and buried in the ground (Figure 6.45). The gold itself weighs more than a kilogram (2.2 lbs.). The bowls had been hammered from a single sheet and then decorated with spirals, lines, and circles stamped on the inner surface. Most of the bowls have an elaborate gold handle made of a bronze bar wrapped with gold wire that ends in a horsehead of Nordic design. These handles may have been added to the bowls at a later date. The bowls may have originally come from northern Germany and likely date to the later Bronze Age. The bowls and amphora were likely used by the elite during drinking ceremonies and feasts. The contents would probably have been some variety of wine or beer.

Figure 6.44.
Bronze Age rock engraving with lur in action.

Figure 6.45.
The Mariesminde hoard, a bronze amphora and 11 golden bowls.

Trudshøj, Denmark

One of the more fascinating artifacts from the Nordic Bronze Age is the so-called bronze *kedelvognen*, literally "kettle wagon," from a mound called Trudshøj in

southern Sjælland, Denmark. The site is often called Skallerup after a nearby town. A radiocarbon analysis from the grave provided a date between 1399 and 1308 BC. This object (Figure 6.46) is basically a rolling party—a large, elaborate punch bowl on wheels. This vessel, 35 cm (14″) high, was likely made in east-central Europe between 1300 and 1100 BC before it traveled to Denmark (Jensen 1984). The shape and design of the vessel are known from the Central European Urnfield Bronze Age culture (Kossack 1999).

Although the small wagon was completely crushed under the weight of the barrow in which it was found, a careful reconstruction has been made. The two curved bronze rods of the undercarriage are independent, with two wheels attached to each. The two ends of each rod carry a small bird effigy. The bowl itself is of hammered bronze in two halves that were riveted together. The vessel is decorated with abstract hourglass shapes and several birds. There are twisted bronze handles on the vessel attached to a rather wide rim around the mouth. Some 12 leaf-shaped tin pendants were hanging on large pieces of chain from the rim and would have acted as chimes and bangles on the moving vessel. The bowl was almost certainly used to hold an alcoholic beverage of some sort—wine, beer, or mead.

The mound at Trudshøj is suitably impressive in light of the rich grave goods found inside; no doubt a chiefly person would have been buried there. The mound was 7.5 m (25′) high and 44 m (145′) in diameter. The tomb was robbed by the landowner in 1895 in spite of efforts by the National Museum to protect the mound. He described an oak coffin 4 m long beneath a pile of stones 2 m (6.5′) high at the bottom of the mound. The coffin contained the large bronze bowl, used as a cremation urn for the deceased, along with a gold bracelet, a sword, a razor with a horsehead effigy for a handle, a knife, and tweezers, all of bronze and highly fragmented, along with the poorly preserved remains of wood, clothing, skins, and horns. There are several examples of these rolling vessels from southern Scandinavia and northern Germany (Thrane 1964). What is most remarkable is

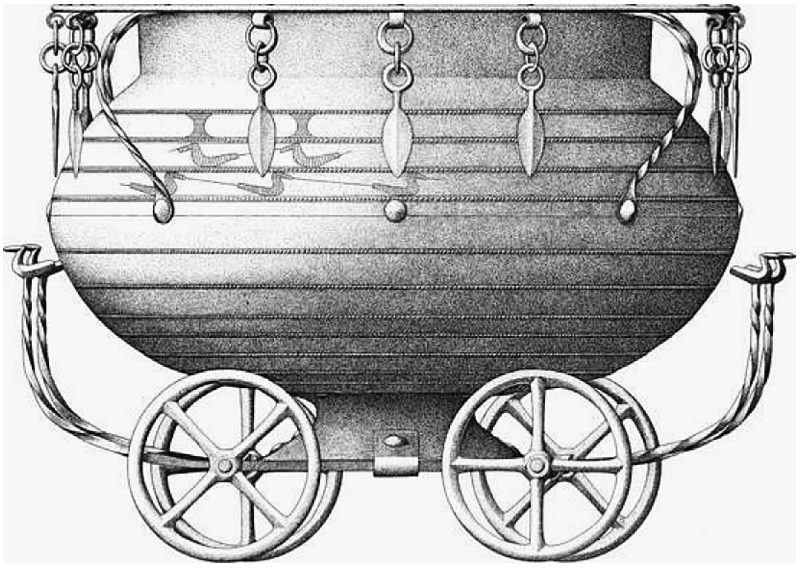


Figure 6.46. The wheeled vessel from the burial mound at Trudshøj, Denmark, 35 cm (14″) high. Other objects in the tomb included a twisted gold arm ring, a razor, a knife, and fragments of a horn artifact (Aner and Kersten 1973, #269).

the presence of an almost identical mound and set of grave goods at the site of Peckatel in Schwerin, Germany, some 250 km (150 miles) southeast of Skallerup. Such coincidences point to the strong connections among elite leaders in Bronze Age society.

Figure 6.47. The bronze razor from Arnitlund, Germany, ca. 1000 BC, approximately 10 cm (4″) in length.

Arnitlund, Denmark

The bronze razor seen in Figure 6.47 was found in a stone-lined grave beneath a barrow near the town of Arnitlund in southern Denmark. It dates to approximately 1000 BC. The handle is to the right, and the curved cutting edge is at the top. Razors were important personal equipment for elite males in the Bronze Age, and quite a number have been found (Kaul 2013). Appearance was important. A beardless face may have been one of the primary symbols of status. These razors were often decorated with scenes of ships, horses, and other creatures.

The razor from Arnitlund depicts two major features. A stylized ship pulling a circle was made in inlaid gold. This motif almost certainly depicts a ship pulling the sun across the sky, a theme from Nordic cosmology. A long snake or dragon of inlaid copper is shown above the ship. The precise meaning is uncertain, but Egyptian mythology refers to nightly battles between the serpent and the sun-god's ship (Jørgensen and Vang Petersen 1998).

Alta, Norway

The first World Heritage site in Scandinavia was established at Alta in the far north of Norway in 1985. There, an extraordinary collection of rock art has been recorded at several locations at the mouth of the Alta Fjord. The first rock art in this area was not discovered, or at least reported, until the 1950s. More continues to be found as the region is explored. Inside the Arctic Circle, Alta is home to more than 6,000 registered depictions, both carvings and paintings, created by the hunter-gatherers who occupied this region from 5000 to 200 BC (Gjerde 2010, Helskog 1988, 2014). Rock carvings from the earliest period show some similarity with those of northwestern Russia, indicating communication across a broad zone of Europe's Arctic.

A wide variety of animals are shown in the rock art, including reindeer, elk, bear, dog or wolf, fox, hare, goose, duck, swan, halibut, salmon, and whale (Figure 6.48). In addition to the animals, there are figures of people, boats, tools, and various geometric patterns and designs. The depictions are generally of individual animals, but a number of scenes or activities are also to be seen, including hunting, fishing, gathering, sailing, and dancing. The images also show hunter-gatherers who managed herds of reindeer, built strong boats, went deep-sea fishing and whaling, and practiced shamanistic rituals involving the worship of bears and other animals. In some places there are long, curving, ladder-like patterns that may represent fences for hunting drives or herding animals.

Figure 6.48.
One of the panels of rock art from Alta, Norway, features elk, reindeer, humans, boats, and various unidentified symbols.

SUMMARY: THE WAY OF THE WARRIOR

Many of the big changes that took place during the Nordic Bronze Age resulted from the intensification of patterns that had begun in a few areas in the Late Neolithic. Specifically, status differentiation and social inequality were formalized in the early Bronze Age. There are clear indications of substantial differences in wealth among burials in this period. There are a number of very rich tombs, in contrast to the simple graves of more common people. Warfare intensifies; conflict must have been a regular aspect of life during much of the period. Craft specialization, particularly in metals and rare stone, also sees dramatic growth. Cottage industries develop in metals, textiles, and other items of wealth and status. Metal work is largely in weapons in the context of continuing warfare. Production of pottery, textiles, oxhides, foodstuffs, and other materials for local consumption and exchange led to an expanding economy.

Status differentiation was also expressed in individual appearance. For the first time, items of personal items such as razors, tweezers, earwax scoops, and toiletry equipment show up in grave goods in wealthy burials. Most significant, however, are the metal objects themselves, with function and value to actively build social identity. Metal objects assumed important roles in creating and maintaining individual identities relating to gender and status and displayed social distinctions. High-status males carried bronze swords and daggers; wealthy females had bronze and gold jewelry, belt buckles, and other objects. These items were also placed in the graves to accompany these individuals in death.

Warfare and conflict must have been frequent visitors to Bronze Age society. Violence, or at least the prospect of violent acts, can clearly be seen as having a structuring effect on society, as it helps define "us vs. them" and acts as a rallying

cry to unite a society. A warrior mentality appears to permeate the mores and worldview of the Bronze Age and may have structured everyday life for many (e.g., Schmidt and Schröder 2001). The ideology of the Neolithic appears to favor equality, communal behavior, and social identity. In stark contrast, Bronze Age society appears to be dominated by hierarchy, competitive—even predatory—social behavior, and individual identity.

Kristiansen and Larsson (2005) argue that well-travelled elite individuals were key figures in the social and symbolic world of the Bronze Age, returning home with new knowledge and skills that enhanced power and prestige. Travel was not only associated with trade and the exchange of material goods, but was also directly linked to knowledge, ideology and cosmology. For example, they suggest that the twin god/twin ruler model from the Near East was adopted in the Bronze Age societies of the north in the form of dual religious and political leadership, with a high priest and a warrior chief. War chiefs recruit warriors to support their power and to conduct raids and deal with conflicts against competing chiefdoms. Becoming a warrior probably offered a path to higher status, by serving a prestigious chieftain and participating in raids and warfare.

Kristiansen (2010) writes further about how political power is elaborated in decentralized societies such as Bronze Age Scandinavia. There are no towns or even large villages in this period, although this latter point is debated—Artursson (2009) argues that villages are in fact present during the Bronze Age. Individual farmhouses are the norm, with chiefly/magnate estates at nodal points in the landscape. Resources such as amber and cattle pasture are limited and widespread and difficult to manage from central places. A prestige goods economy provides a means for individuals to gain power and build political power (Clark and Blake 1994, Helms 1993, Earle 1997). Portable, high-value prestige goods allow the accumulation of wealth and can be easily gifted. Chiefly individuals operated in networks of alliances and relationships that were fostered by gifts and commerce in competitive alliances.

Perhaps one way to characterize the nature of organization in the Bronze Age is to invoke the contrast between corporate and network leadership strategies for accumulating and maintaining power (Feinman 1995, Feinman et al. 2000, Skoglund 2009). Corporate leadership involves dispersed economic resources and less personal wealth and shared power, decisions are made in consultation, and ideology and public works serve to integrate different social interests. Network strategies employ individual power and concentrated wealth displayed with prestige goods. Leaders utilize a network of personal connections to enhance and expand their power and authority. These strategies represent a continuum, but the elite of Bronze Age Scandinavia appear to have been heavily involved in such networks, both local and long-distance, and to have been at the center of substantial power and wealth.

Social status was communicated in various ways during the Bronze Age. Conspicuous display of rare and unusual objects, patronage of feasts and ceremonies, ceremonial deposits of hoards, and burial with prestige grave goods in large monuments are signals of power and authority. Rich burials, and especially the earthen barrows, serve as long-term markers of the power of the ruling elite and their descendants.

There is a noticeable decrease in the number and size of barrows and in the size of longhouses during the Late Bronze Age, from 1100–500 BC (Artursson 2009). Cremations placed in urns buried in cemeteries or older barrows or cairns became the more common practice. Although some have interpreted this shift as

an indication of more egalitarian society, Artursson (2009) points out that monumental graves and large halls continued to be built in this period, and hoards in fact were more common and with wealthier contents.

The end of the Bronze Age in Scandinavia appears to have been closely tied to changes in the production and circulation of metals in Central Europe and a decline in the supply in the ninth and eighth centuries BC. The Iron Age reached Central Europe several hundred years before it arrived in Scandinavia. As iron became the metal of choice, the production of bronze (the standard in Scandinavia) decreased significantly. New connections between Central Europe and the Mediterranean in the late Bronze Age meant that Scandinavia was marginalized in a larger European context. There are also indications that intensive forest clearance and land use may have resulted in decreased agricultural productivity in the later Bronze Age (Kristiansen 1986). Networks and alliances based on the exchange of gifts and the use of bronze ceased to function, and the Nordic Bronze Age came to an end.

CHAPTER SEVEN

THE AGE OF IRON, 500 BC–AD 750

PEOPLE OF THE PEAT

For centuries, peat was the home heating fuel for much of northern Europe—especially in places where wood was scarce—until it was replaced by coal and eventually oil and natural gas. Peat has probably been a source of fuel since before the Iron Age in southern Scandinavia, and its use continued into the twentieth century. Peat was also used during the Second World War, when oil and coal were rationed or unavailable. It still fuels energy plants in Ireland and Finland.

Peat occurs as deep deposits of decaying vegetation that accumulated in low wetlands, usually referred to as bogs or mires. To utilize this resource, the peat must be dug out of the bog and dried before burning. People digging for peat in the bogs of northern Germany, Denmark, and southern Sweden have found many unusual things, including hoards and sacrifices from the past. Certain bogs were sacred places, and a variety of offerings were made—weapons, hoards of precious jewelry and ritual paraphernalia, braids of hair, food, animals, and people. The Roman historian Tacitus described the practice of bog sacrifice,

> At a scheduled time to meet . . . in a sacred forest . . . There by publicly sacrificing a man, they begin the horrible solemnity of their barbarous worship.

The special conditions in some of the bogs—waterlogged, oxygen-free, and nonacidic—have preserved many of these sacrificed items and individuals to the present. In 1879, a worker cutting blocks of peat in the Huldremose bog in Jylland, Denmark, uncovered the body of a woman (Figure 7.1). She had been placed in the bog in the second century BC. The woman was more than 40 years old when she was executed or murdered. A violent blow with a sharp weapon had cut off her upper right arm shortly before she died. The woman was preserved as a bog body with skin, hair, clothing and stomach contents. Her last meal consisted of coarsely ground rye grains, along with traces of animal tissue, perhaps some kind of gruel with meat.

Her clothing was amazingly well preserved (Figure 7.1). The local doctor who examined the body after its discovery wrote to the National Museum in Copenhagen, "the clothes are now hanging in my yard to dry after being cleaned." Like a number of bog bodies in southern Scandinavia, the Huldremose woman was fully dressed, wearing a plaid wool skirt, a checked scarf, and two leather

Figure 7.1.
The body of the Huldremose woman and her clothing, including a checked woolen skirt, a scarf, and two skin jackets or capes.

jackets. Her hair was tied up with a long woolen cord, which was also wrapped around her neck several times. The skirt was held together at the waist with a narrow leather strap in a woven waistband. The scarf was wrapped around the woman's head and fastened under her left arm with a pin made from a bird bone. The inner jacket was dark lambskin with the wool to the inside. The outer jacket was dark sheepskin with the wool to the weather. The woman wore a ring on one finger and two amber beads around her neck, and carried a pouch of amulets or souvenirs in her jacket.

Some of the dead in the Iron Age were cremated and some were buried. A few ended up as corpses in the bogs. In some cases, the cause of death is quite obvious: strangulation with a leather strap, a massive blow to the head, or a slit throat. In the case of the Huldremose woman, it is not clear whether she was sacrificed or a victim of foul play. This woman was a member of one of the societies across northern Europe that were changing dramatically during the Iron Age.

THE IRON AGE IN EUROPE

The introduction of iron after 1000 BC brought new tools and weapons to Europe. Iron produced sharper, more readily available implements and was in great demand. In contrast to copper and tin, whose sources were limited to only a few areas in Europe, iron ores were found in many places across the continent in a variety of different forms. At the same time, the collapse of the dominant civilizations of the Aegean area changed the flow of ingots and finished products across Europe. However, new centers in the Mediterranean—the classic civilization of Greece, then the Etruscans in Italy, and later Rome—brought written history to Europe as powerful empires emerged.

The Iron Age in central Europe—the time of the so-called Celtic tribes—is divided into two phases, Hallstatt and La Tène. Hallstatt, the earlier period, approximately 800–450 BC, was centered in Austria, southern Germany, and the Czech Republic. La Tène covers the last half of the first millennium BC, from ca. 450 BC until the Roman conquest ca. 50 BC. La Tène culture flourished in eastern France, Switzerland, Austria, southwest Germany, the Czech Republic, Slovakia,

and Hungary. By the early La Tène period, Celtic-related groups had expanded to the British Isles, Iberia, and across parts of the Balkan Peninsula to Anatolia. Italy and the central Mediterranean were flourishing at this time, with the Etruscan civilization in Tuscany and the classical Greek civilization of Athens, Sparta, and other city-states. During the early Iron Age in Central Europe, salt and iron production led to increased trade, economic boom times, and the colonization of new areas. After 400 BC, however, economic competition and political conflicts brought extensive warfare.

The arrival of iron coincides with the emerging identity of Celtic and Germanic peoples. These terms were often used to describe the societies living across much of Europe during the time of the Roman Empire after 44 BC. "Celt" and "German" in large part reflect the Roman view of the world and how they named those around them. The concepts were created by the Romans for political and social reasons. Defining exactly who the Celts really were is challenging. "Celts" is a word used today to refer generically to the people of Iron Age western Europe, groups that for the most part fell to Rome and, with some exceptions, adopted Romance languages. Celtic societies were highly varied, both geographically and culturally, yet shared languages and religious beliefs and developed a superb artistic style, at the same time flamboyant and hypnotic.

Both Hallstatt and La Tène are defined primarily by "Celtic" styles of artistic representation and motif and by distinctive types of pottery. Complex patterns of concentric circles, spirals, and meanders and a variety of bird and animal figures appear on metal and ceramic objects. Disembodied heads with almond-shaped eyes and fierce mustaches, willowy figures of women, and long, fanciful horse heads characterize the tradition. Weapons, tools, jewelry, and everyday equipment were often ornamented with this lively and distinctive art.

A very different sequence of events took place in the Mediterranean. By 800 BC, the effects of growing population and urbanization led to the emergence of Greek city-states as major powers. Conquest and continuing population expansion led to Greek colonization of several areas east and west of the homeland. Colonies appeared in Sicily, southern Italy, southern France, and Spain, as the central Mediterranean could not contain the growing numbers of Greeks, Etruscans, and Carthaginians. Local demand for Greek goods was high in these areas. At one Spanish site, for example, 1,400 Greek pottery vessels were found in a single small excavation. At another site in Spain, a single grave contained gold objects that included a seal from Syria and an earring from Egypt.

THE GERMANIC TRIBES

The Germanic peoples are those groups speaking Germanic languages, a linguistic branch of Indo-European origin, in much of Central and Northern Europe. The languages of the people of Scandinavia are classified as North Germanic, whose oldest attested representative is Old Norse. The runic writing system for Germanic languages, borrowing from written Latin, developed sometime around the second century AD.

Julius Caesar described the Germans in his *Commentarii de Bello Gallico* (*The Gallic War*)—a biased account written at some point in the middle of the first century BC:

> Their whole life is occupied in hunting and in the pursuits of the military art; from childhood they devote themselves to fatigue and hardships. Those who have remained chaste for the longest time, receive the greatest commendation among their people; they think that by this the growth is promoted, by this the physical powers are increased and the sinews are strengthened. And to have had knowledge of a woman before the twentieth year they reckon among the most disgraceful acts; of which matter there is no concealment, because they bathe promiscuously in the rivers and [only] use skins or small cloaks of deer's hides, a large portion of the body being in consequence naked.

Roman authors described Germanic-speaking peoples in four tribal regions, centered in Poland, the lower Rhine, the Elbe River, and Jylland and the Danish islands. The names given to these groups in Scandinavia changed over time; they include Cimbri, Suiones, Angles, Jutes, and Danes. Wandering Germanic groups spread through Europe during the Migration Period between AD 400 and 800. This period began when barbarian peoples, including the Goths from northern Europe, sacked Rome and began to settle across western Europe. Much of this sequence of events was actually initiated by the expansion of the Huns—Central Asian nomads—into eastern and central Europe. The Huns defeated the Goths in the region of the Black Sea around AD 375 and precipitated enormous migrations. Between AD 375 and 450, the Huns were an important political force in barbarian Europe and a catalyzing element in the demise of the Roman Empire (Hedeager 2011).

The Germanic tribes resisted and eventually outlasted Rome. After the fall of the Roman Empire, Germanic tribes in northern Europe continued their way of life in the Iron Age for another 500 years, essentially until the arrival of Christianity. In Germany, Scandinavia, and Eastern Europe, the Germanic tribes continued and flourished. These societies were composed of small, productive agricultural communities, often of less than ten households. A variety of buildings have been found in these villages—farmhouses along with smaller structures such as granaries, workshops, and storage rooms. The Germans were farmers involved in both agriculture and animal husbandry. Cattle herding was important as a source of dairy products, leather, meat, and draft animals as well as a basis for wealth and social status. Cattle and humans often used different areas in the same house. Barley and wheat were the most common agricultural products and were used for baking bread as well as brewing beer. Hunting forest game contributed to the larder. Important craft industries included weaving, leather making, pottery production, and the manufacture of iron tools and weapons.

Through time, these communities grew larger and more powerful, gradually forming alliances to create larger polities, usually referred to as chiefdoms. Larger farming settlements are known, along with princely estates associated with a magnate farm. The ruling class was distinguished by the possession of such large farms and rich royal burials with grave gifts such as wagons, Roman cauldrons and drinking vessels, weapons for the men and gold and silver jewelry for the women, and imported earthenware.

THE IRON AGE IN SCANDINAVIA

The Early Iron Age in Scandinavia from 500 BC to AD 400 is divided into two periods: the Pre-Roman Iron Age (500 BC–AD 1) and the Roman Iron Age (AD 1–400). These terms emphasize the influence of the Romans across the European continent, even though Rome never conquered Scandinavia and knew little of it. The Late Iron Age is also known as the Germanic Iron Age and dates from AD 400 to 750. In Sweden, the Late Iron Age is divided into two segments: the Migration Period (AD 400 to 550) and the Vendel Period (AD 550–800). The term Merovingian is sometimes used as well for the Vendel Period in Norway and Sweden. The Viking period follows the end of the Germanic Iron Age and in many ways represents the culmination of the Iron Age in Scandinavia prior to the spread of Christianity and the onset of the medieval period. Figure 7.2 shows the chronologies for Mediterranean and Central Europe, as well as southern Scandinavia, during the Iron Age.

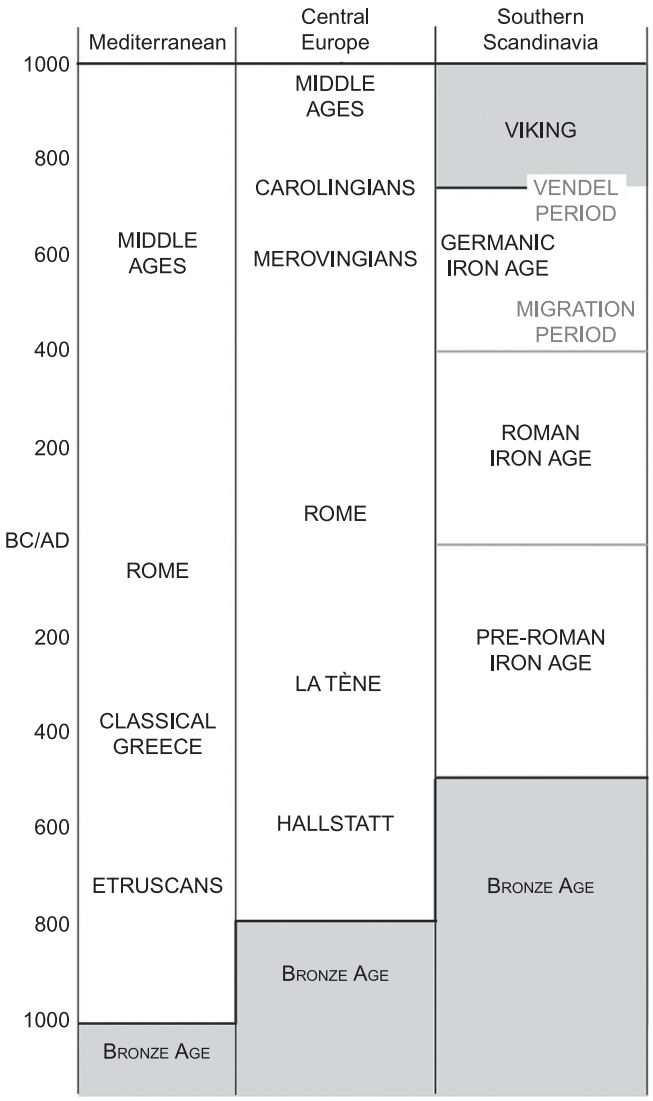


Figure 7.2.
The Iron Age chronology for the Mediterranean, Central Europe, and Scandinavia. The terms Migration and Vendel period in Scandinavia are used primarily in Sweden for the later Iron Age.

The Roman Empire, for the most part, did not extend north and east of the Rhine. Most Iron Age groups living in eastern Europe, central and northern Germany, and Scandinavia did not directly experience the edicts or legions of Rome. The economic tentacles of the empire were felt, however, as Roman goods and commodities moved across all of Europe and local materials and products were traded in return. Glass, weapons, pottery, and a range of luxury metal objects from Roman manufacturers are known from virtually every modern country in Europe.

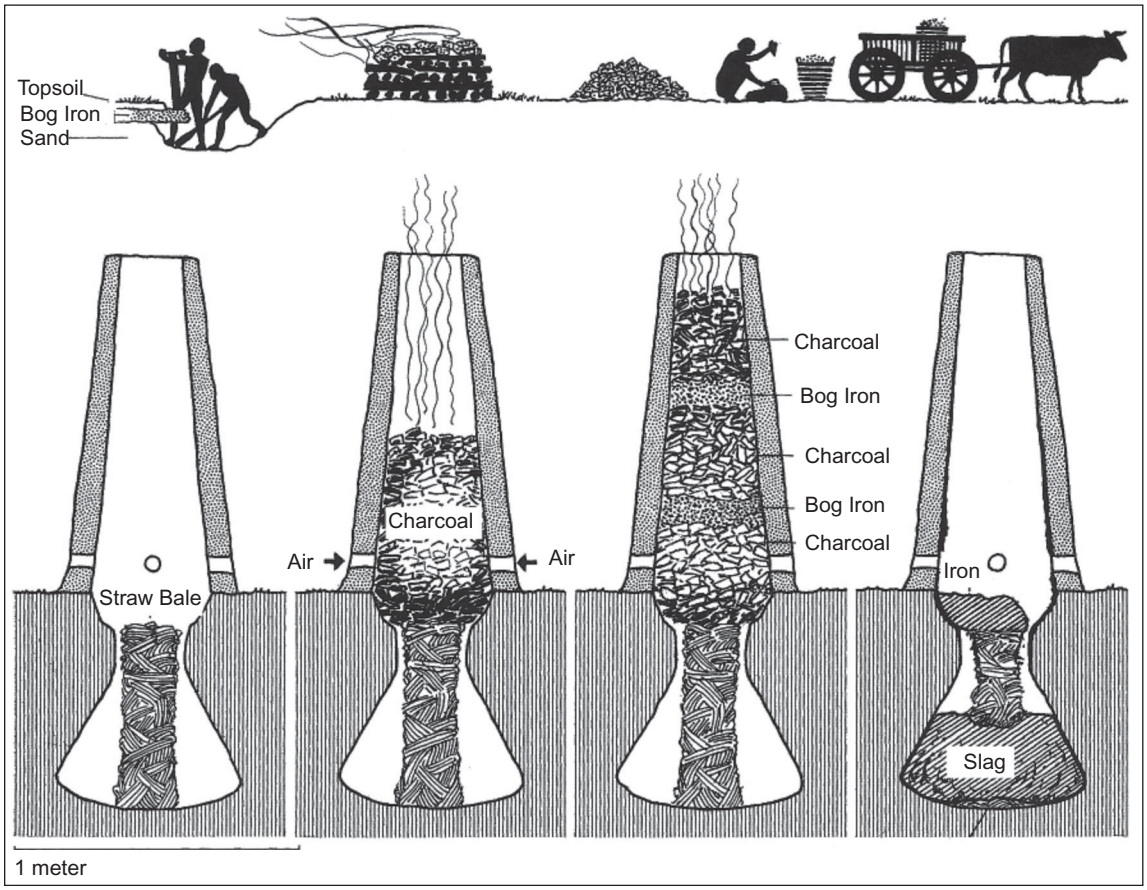
After 500 BC, the denizens of Scandinavia began to extract iron from local deposits. Both iron ores and bog iron were utilized to make a variety of tools and weapons. The process of iron production is discussed in more detail below. In subsequent sections in this chapter, some of the major characteristics of the Iron Age in Scandinavia are considered in terms of Farms, Villages, Estates, and Towns; Graves and Tombs, Warfare and Conflict, the Bog Bodies, the Iron Age in the North, and Treasures, followed by a Summary: Centers of Power. The locations of the sites discussed in this chapter are shown in Figure 7.3.

Figure 7.3.
Location of some of the sites mentioned in chapter 7.

MAKING IRON

Iron was a stronger and more suitable metal for weapons and tools than bronze. Iron making was discovered in Turkey shortly before 2000 BC (Strahm and Hauptmann 2009). The technology was probably a well-guarded secret for some time, to retain a military advantage. The new metal was used initially to make stronger, more durable weapons and later for making more practical tools and equipment. Iron came to Europe around the beginning of the first millennium BC, slightly earlier in the eastern Mediterranean and slightly later in the northwestern part of the continent. Iron tools are rare in the archaeological record of the early part of the Iron Age, probably because the metal was less common and worn-out equipment was recycled.

Iron ore, in a variety of forms, is widely available in Europe. Important sources occur in Iberia, Britain, the eastern Alps, the Carpathian Mountains, the Holy Cross Mountains of Poland, the Hunsrück-Eifel region of Germany, and Etruria in Italy (Geselowitz 1988). Most iron could be obtained from the surface by open pit mining, but there were shaft mines in the Alps and elsewhere. Bog iron—thin layers of iron nodules that accumulate in certain wetlands—provided a source of ore for the smelting furnaces of northern Europe. Concentrations of bog iron in Scandinavia sponsored the rise of powerful centers in control of this important resource. One such center grew up around the bog iron deposits of northern Skåne and Småland (Fabech 1991).



Iron production is a complicated process. The stages and method of producing iron from bog deposits are shown in Figure 7.4. Iron has a melting temperature of 1,536°C. Sophisticated furnaces and techniques are required for smelting the ore. The technologies—furnaces and temperatures—came from western Asia (Strahm and Hauptmann 2009). Furnace temperatures in the European Iron Age were generally not sufficient for casting. Objects were made of wrought, or hammered, iron (Nørbach 2003). Wrought iron is inferior to bronze in terms of strength and durability, so a process known as carburization—heating iron in the presence of carbon, usually charcoal—was used to harden the edges of tools and weapons.

Iron production is also an expensive process, involving large quantities of wood, ore, and labor. Reduction techniques are used to speed the transformation of the ore to metal. Layers of iron ore and charcoal are placed in a shaft furnace, the fire is ignited, and a temperature of more than 1,500°C is maintained for several hours. After the furnace cools, it is broken apart and the bloom, a spongy mass of impure iron, is removed. This mass has to be reheated and hammered repeatedly to produce usable iron. Depending on the type and quality, 100 kg of iron ore will produce about 70 kg (150 lbs.) of iron. Production of 1 kg (2.2 lbs.) of iron requires approximately 10 kg (22 lbs.) of charcoal and 25 hours of labor.

Figure 7.4.
Stages of iron production using bog ore. In the upper panel, bog iron is collected from natural deposits, burned to remove impurities, and broken into small pieces and transported to the furnace. The clay shaft furnace is loaded with fuel, charcoal, and bog iron and fired to temperatures around 1,536°C. The iron smelts into bloom iron, a kind of spongy mass ready for the forge (drawing by Fleming Bau).

SETTLEMENT: FARMS AND ESTATES

In the early Iron Age, farms were generally dispersed and usually consisted of a longhouse as a residence for a family and at least some of their animals, along with one or two outbuildings. The farmhouses were rather similar. The hearth was near the center or in the west end of the house and divided the organization of activities into two different zones, or three if stables were present (Webley 2008). Food storage and processing normally took place at the eastern end of the structure, while other activities were less specific in terms of location. Storage and the processing of food involved large storage vessels or built-in silos and querns or mortars to grind the grain. Outbuildings were normally used for craft activities such as iron working, pottery making, or weaving. Some examples of these outbuildings have evidence indicating use as residence, perhaps seasonally or for other inhabitants of the farm. These farmers were cultivating cereals such as barley and oily seed crops and rearing cattle, sheep and pigs. The importance of crops versus domestic animal production varied considerably through time (Hedeager 1992, Robinson 1994). Social relationships appear to have been largely egalitarian based on the relatively simple nature of settlements, house sizes, and grave contents.

Changes in the size and organization of Iron Age farmhouses can be traced over time from smaller constructions with two functional areas, living quarters and stables, to much larger structures in the later Iron Age which may have served administrative and storage functions as well as being residences for magnate rulers or nobles (Axboe 1999a). Some of these larger structures continued to have stable areas at one end, but the functions of the larger buildings were clearly becoming more multipurpose and related to political and commercial interests.

A shift from dispersed, short-lived farms to aggregate communities with long-term stability took place in western Jylland toward the end of the Pre-Roman Iron Age. Farmhouses were more substantially built and were often rebuilt several times on the same place. It is also during this shift from short- to long-term settlements that fences began to demarcate the individual farms. The fences reinforced the independence of the farms and their resources and helped to structure relationships among the inhabitants of the community.

Sunken floor huts (also known as pit houses) were another type of outbuilding common at Iron Age sites. This was a relatively easy structure to build. A small rectangular hole, perhaps 2 × 2 m (6.5′ square), is dug in the ground. Because the construction was semi-subterranean, the walls of the hut were earthen and the structure was well insulated. A roof-bearing post on each side of the hole held a horizontal timber that probably supported a thatch roof. The floors of these huts were sometimes covered with wooden planks. One or two such structures are often found associated with farms, and tens, even hundreds, are known at the large central places of the Iron Age, where they appear to have been used for craft production and perhaps seasonal living quarters. Other uses may have been for storage, as root cellars, or as separate kitchens.

It is possible in some areas of Scandinavia to trace settlement history and changes over a very long period of time. Göthberg (2007), for example, has reported the number of excavated settlements in the Swedish province of Uppland from the Late Neolithic through the Viking period (Figure 7.5). The data are fascinating.

Settlement numbers are relatively low during the Late Neolithic and Bronze Age and then almost double at the beginning of the Iron Age, perhaps as a result of new crops and more intensive agricultural practices. Shortly after AD 1, the number of settlements almost doubles again in the Roman Iron Age. A gradual decline in number begins around AD 300, and a precipitous drop of almost 75% is seen after AD 600 from the maximum number in the Roman Iron Age.

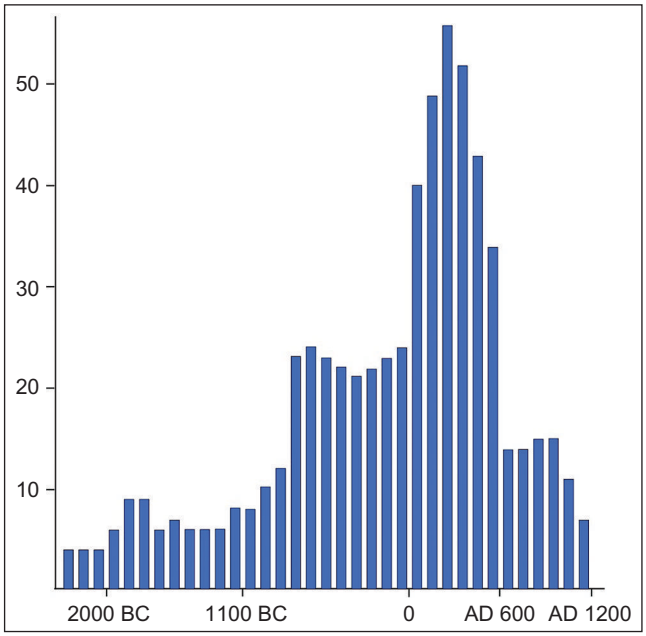


Figure 7.5. Number of excavated settlements in the Swedish province of Uppland in the period between 2000 BC and AD 1200. Note the dramatic drop in sites after AD 600.

In the sixth century AD in eastern and central Sweden, the majority of villages were abandoned, a number of which had been occupied for more than 1,000 years (Gräslund and Price 2012). This trend was present, albeit less pronounced, in southern Sweden as well. Several lines of evidence tie this decline in settlements and population into a global climatic event known as the AD 536 "dust veil" (Gunn 2000). Tree rings from this time in the northern hemisphere indicate unusually cold summers from 536 to approximately 545. Temperatures in northern Sweden are estimated to have dropped by 3–4°C (5–7°F). Various historical sources from the sixth century describe a sun that hardly cast shadows because of darkened skies, causing cold weather and ruined crops. Even Mesopotamia experienced frost and snow in the summer of 536. The exact causes of this dust veil are uncertain, but they are likely related to one or more massive volcanic eruptions, perhaps in conjunction with meteor impacts (Gräslund and Price 2012).

Some Scandinavian archaeologists have suggested that an increase in sacrificial gold deposits seen in the sixth century may be connected with this climatic catastrophe as well (e.g., Axboe 1999b). Others would implicate this event as the source of the legend of the *Fimbulwinter*, the harsh, cold period of three years of winter without summer that takes place before Ragnarök, the twilight of the gods—the end of the known world and the birth of a new era—from Norse mythology.

It was not uncommon for villages to be abandoned and communities relocated. This happened, for example, when farming exhausted the soil around a village or catastrophe struck. The farmhouses must have been significant fire hazards. Excavations at Nørre Tranders in northern Jylland, Denmark, revealed a long farmhouse that had been consumed by fire (Nielsen 2007). The burned remains of five people were found in the barn area of this house along with two horses, seven cows, five sheep, two lambs, a small pig, and a puppy that also perished. It seems likely that the people were trying to save the animals, but were overcome by smoke. This fire must have been a rapid event. A number of such Iron Age houses are known from northern Denmark, burned either accidentally or intentionally. An example from a place called Ginderup is described below.

Experimental burnings of reconstructed Iron Age houses have documented the dramatic consequences of such house fires. A reconstructed house at the experimental research center at Lejre in Denmark was intentionally set afire around the hearth area. Within three minutes, flames emerged through the roof. It began to collapse after ten minutes and was almost completely gone in fifteen. Temperatures inside the house reached 1,100°C (2,000°F).

A number of examples of different types of settlements in the Iron Age are described below to document the changes that take place over this long and dynamic period of time. An early pattern of small, isolated farmhouses changes with growth, aggregation, and differentiation. Houses in the village at Ginderup burned and were intentionally buried after the fire, preserving the in situ contents and documenting use and activities. Large-scale excavations at sites such as Hodde and Vorbasse provide complete plans of Iron Age villages and the changes in settlement location that took place over a thousand-year period. Clear indications of the emergence of local leaders or rulers can be seen in increasing differences in house size. During the Roman and German Iron Ages, important centers began to emerge in Scandinavia, primarily as a consequence of the development of long-distance trade and interaction. Sites such as Gudme, Uppåkra, Gamla Uppsala, and Sorte Muld are described below to document the rise of elite residence and the power of the rulers of Iron Age society at this time, as well as the economic demands of the Roman Empire and later European civilization. The evidence from these centers speaks dramatically to the wealth and authority of the rulers of these places.

Figure 7.6.
Excavation of early Iron Age houses at Vestervig in northwest Jylland. The ancient *byhøje* or mound can be seen in the road cut.

Ginderup, Denmark

North of the Limfjord in western Denmark, a series of settlements from the Pre-Roman and early Roman Iron Age are visible on the landscape as large, low mounds (Figure 7.6). These villages were actually small tells, accumulations of domestic materials from human settlement that result in a mound because of continued residence at the same location. In the ancient Near East, where such tells are well known, collapsed mud bricks from the houses and domestic trash results in the accumulation of tall mounds. In northwestern Denmark, it is

the construction of sod houses with earthen walls 1 m (3.3′) thick that led to large piles of soil and trash in these so-called *byhøjer* or "town mounds." The incidence of burned houses is around 10% at a number of these sites. Fire seems to have been a constant danger.

After several of these houses burned simultaneously at the Roman Iron Age site of Ginderup, the villagers intentionally buried the houses in place by leveling the sod walls over the house floors (Kjær 1928, 1930, Hatt 1935). Excavations revealed these structures and provided a remarkable view of household contents and activities. House I provides one of the best examples of such burned structures. The house itself was about 12.5 m (40′) long and almost 5 m (16′) wide. There was a single entrance on the south side of the house. The east end of the house, with a clay floor and hearth, was the residence, and the west end contained stalls and animal pens.

A plan of the remains reveals a wealth of information (Figure 7.7). There seems to have been a windbreak added to the west end of the house, perhaps to protect against the prevailing winds. The long narrow objects are pieces of burned wood. The area of wooden sticks and other material in the northeast corner of the house may represent collapsed shelving. A number of internal features and pits can be identified. There was a fired clay platform in the center of the floor that served as a hearth. These features were often decorated with geometric designs when installed and they served as the focus of the domestic area. There was a second hearth in the stable area, made up of a circular pavement of small stones on top of a larger flat rock. A piece of a cut and burned rope halter for a large animal was found by the north wall in the west end, suggesting that the animals had been freed and escaped the fire in this structure.

The large wattle screen near the entrance may have been part of the doorway. Large slabs of burned clay (olive green) on the floor of the house are likely from a daub coating on the wall. Other large slabs of clay (white) had probably fallen from the floor of the loft, made of sticks and straw, with a clay/sand covering (Nielsen 2007). A large circular grain silo or storage bin was constructed in the southeast

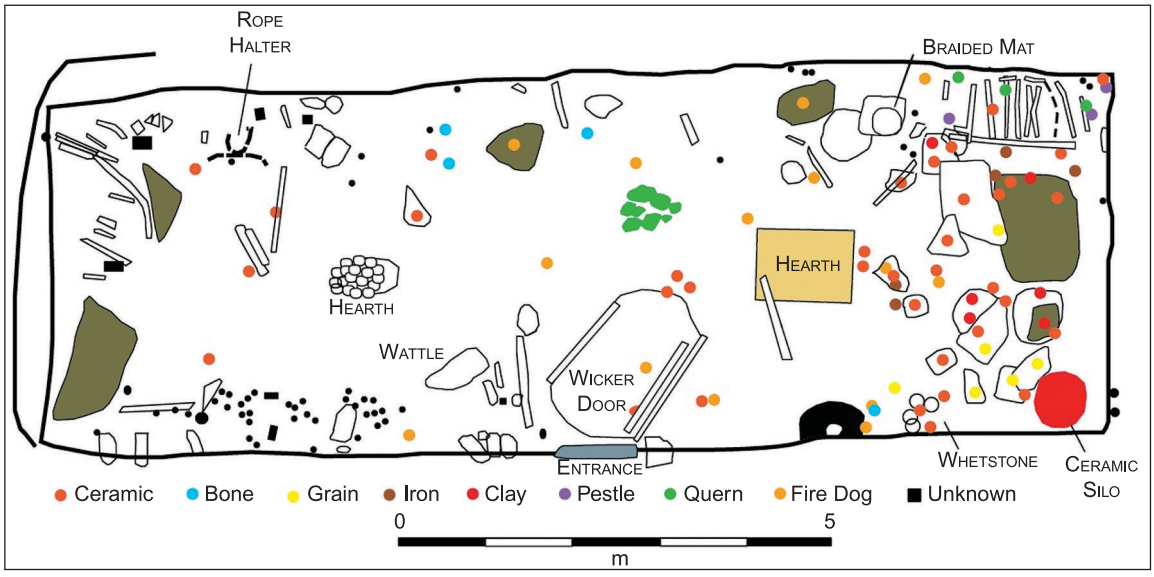


Figure 7.7.
Plan of House I at Ginderup, Denmark, and some of the finds inside the structure.

corner of the house. Most of the artifacts are concentrated in the residential east end of the house. A number of pestles were found in the northeast corner, suggesting this was an area of grain processing and food preparation. The firedogs scattered around the floor are cone-shaped ceramic objects used in cooking.

The wood and plant remains found inside the house provide a remarkable account of the environment, both domestic and natural, that provided the resources for the inhabitants of Ginderup (Jessen 1933). The charred wood in the house included a number of species from a mixed-oak forest that is completely absent today in the northwest of Jylland. There was also evidence of heathlands in the form of heather sods in the house area. Heath grows on open landscapes with sandy soils and is often used for sheep pasture. Seeds from various species were found stored in ceramic containers in the house and were likely for use in the next planting season. These seeds came from barley, oats, woad, corn spurrey, and flax. The spurrey was probably used for fodder and the woad for fabric dye. The flax may have been used both for the oily seeds and the fiber. A number of different weed species were also found among the seeds.

Hodde and Vorbasse, Denmark

The countryside of southern Scandinavia has been farmed for almost 6,000 years. The original ground surface from much of the Bronze Age and the Iron Age has been cultivated out of existence. In that time, the plow, completely reworking the soil year after year, has eradicated the surface where farmsteads and hamlets once dotted the landscape. Fortunately, the villagers of the Iron Age dug deep pits for posts, for storage, to obtain clay, and for other purposes. Traces of these activities remain in the subsoil beneath the plow zone.

Since the 1960s, archaeologists in northern Europe have used earthmoving equipment to remove topsoil and open large, horizontal areas for excavations. This method has proved to be particularly effective at sites where the occupation layer itself had already been destroyed by more recent plowing and only deeply buried traces of prehistoric activity remained. Information from these large excavations has painted a rather detailed picture of village life and change through time in the Iron Age.

Villages of farmhouses and outbuildings became a common feature of the landscape of southern Scandinavia in the Iron Age. Dispersed single farms, typical of the Neolithic and Bronze Age, were much less common. Practices such as manuring and perhaps crop rotation improved soil fertility. Fields appear to have been used for long periods without exhaustion, and villages stayed in or near the same location. It is possible to trace the development of individual communities over very long periods of time. In this section, I discuss two sites in central Jylland, Hodde and Vorbasse, where this continuity can be observed.

The village at Hodde was occupied during the Pre-Roman Iron Age, from approximately 150 BC to sometime around AD 1. Hodde was a rather large village for its time and had several distinctive features (Hvass 1985a). There were four discernible building stages over the lifetime of the village. Originally, the settlement consisted of three farmsteads, but that number increased to 27 before it was abandoned. At its maximum, Hodde probably had a population on the

order of 125 to 150 people in the 27 farmhouses, as well as perhaps 400 cows and some horses (Jensen 2004). The villagers grew a variety of crops for food and fodder. A palisade surrounded the entire village, and some of the individual farms also stood inside their own walled enclosures where access was carefully controlled with gates and doors. There was a large, open common area in the center of the village that may have been for holding animals, storing materials, and/or community activities.

The longhouses at Hodde were three-aisled structures that ranged in size from 9.5 to 22 m (30′–70′) in length (Hvass 1985a, 1985b). There was a good bit of variation in the size and complexity of the individual farms (Figure 7.8). Some of the houses had interior stable areas, usually on their eastern end. The middle of the house was the entrance area, with a small doorway about 1 m (3.3′) high on either side. The domestic part of the residence occupied the western end of the house with a large hearth and areas for eating and sleeping. Some of the farms had outbuildings of varying size. There were two smithies, along with several potters' workshops. All of the farms appear to have been largely self-sufficient.

At the highest point in the village sat the largest and most distinctive house at Hodde. The owner, perhaps a petty chief or big man, also had the largest farmyard and two large outbuildings inside a strong palisade that enclosed this farm. The house itself was 22.5 m (74′) in length and had stalls for at least 22 animals. The house site was probably the oldest in the village as well, although it had been rebuilt several times. The special nature of the house was also seen in some of the artifacts that were found, including pieces of a fine black pottery. Early in the first century AD, the whole village burned down and the place was abandoned. It is not known if this was an accidental fire or the result of an attack on the community.

Figure 7.8.
An artist's reconstruction of the village of Hodde at its maximum extent. The largest house is in the upper left (drawing by Jens Beck).

A little more than 25 km (15 miles) to the east, the site of Vorbasse continues the story. An area of more than 150,000 m^2 (37 acres), almost 15 city blocks, was uncovered in horizontal excavations (Hvass 1983, 1988). The topsoil was stripped off by machine to reveal the underlying pits and other features. These traces were mapped to obtain the plans of entire settlements. Ceramics and other artifacts found in post holes, pits, and graves documented the date for each stage in the history of the village, as well as providing evidence for different activities within the settlements. Over time, the primary farmhouses became longer and had more rooms. The changes in the size and arrangement of houses and entire communities are intriguing and reveal aspects of social and economic organization in the Iron Age.

The excavations at Vorbasse documented the presence of a single rural community that has been in this area from over two thousand years ago to the present day. The prehistoric village moved a number of times between its founding around AD 1 and AD 1100 (Figure 7.9), shifting location within an area of less than a square kilometer and never more than 1 km (0.6 miles) from the modern village of Vorbasse. The precise location, size, and arrangement of the settlement changed, but the community itself appears to have remained largely the same. Individual farms changed in size and were larger in the third century, the late seventh century, and particularly in the late tenth century AD.

The settlement in the early Roman Iron Age was relatively modest, consisting of a few small farm complexes, each with a longhouse with stables and perhaps an outbuilding or two, surrounded by a fence. The earliest settlement at Vorbasse from the first century AD had two separate, but contiguous, farmsteads. Each longhouse was about 16 m (53′) long and typically divided into a dwelling room on the west end and a stable on the east. Each farm was surrounded by a fence of closely placed posts, with openings in the fence opposite the doorways of the houses. Several cemeteries of cremation graves from this phase were recorded a few hundred meters to the northwest. Four iron-smelting furnaces were found outside the fencing, probably placed there to reduce the danger of fire.

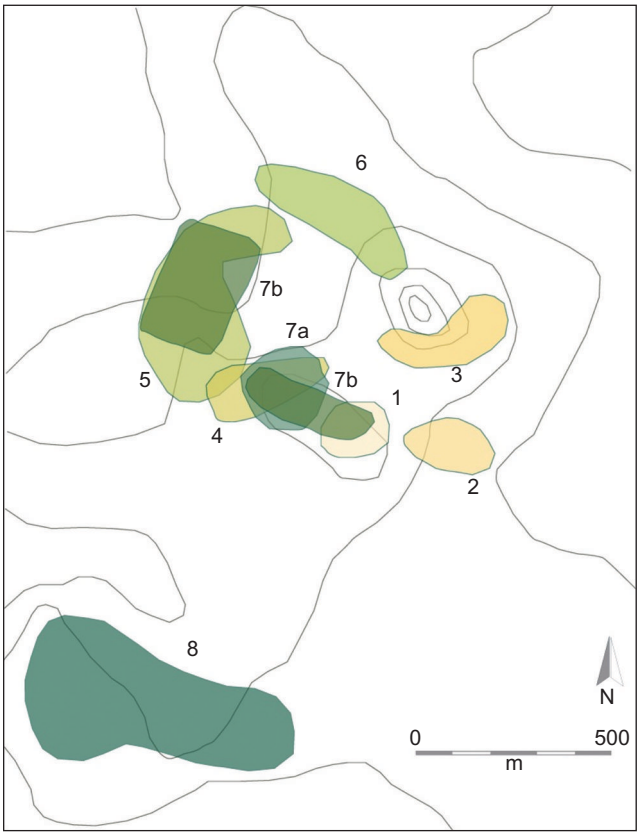


Figure 7.9.
The villages of Vorbasse. The numbered areas 1–7b mark the movement of the village between 100 BC and AD 1100. 8 = the modern village of Vorbasse.

Every period of settlement at Vorbasse had one or two smithies and associated iron-smelting furnaces. The blacksmith's outbuilding was always found in association with the larger longhouses, documenting the predominant role of the wealthy in the economy. There were also stonecutters for making rotary querns for grinding grain, an essential staple for these farmers.

A new settlement, 300 m to the east, appeared in the second century AD, covering an area of 150 × 150 m (500 ft^2) and containing several farms in a cluster suggesting the beginning of village life at Vorbasse. The village from the third century moved back to the first place of settlement. The settlement grew in size and now covered an area of 250 × 300 m (800′ × 1,000′). There was one or perhaps two rows of ten farmhouses of different sizes surrounded by a fence, each with one or two outbuildings. The principle that good fences make good neighbors appears to be in operation at such sites. Farmyards were much larger, up to 2,000 m^2 (0.5 acre). Two or three of these farms were much larger than the entire village of Hodde 400 years earlier. The farmhouses were longer than in the previous village, between 20 and 48 m (65′ × 160′), and appear to have been divided into several segments, with accommodations for animals. Almost all of the houses between the third and fifth century have stalls for 15 to 30 animals, as cattle must have been the basis of the economy. Sunken-floor pithouses appear for the first time as specialized outbuildings in this phase.

In the 4nd century AD, the settlement at Vorbasse moved to the west and covered an area of 400 × 250 m (1,300′ × 800′) (Figure 7.12). The layout of the village was now planned and shows a very regular arrangement. The 20 farms were built in three rows, with open areas between the rows. Each farm was fenced separately, although there were several cases where two farms shared the same fenced yard. One distinctly larger farm was located on the eastern side of the village and stood in the same place through the fifth century.

There were at least three cemeteries associated with the settlement during the third and fourth centuries (Hvass 1983). One cemetery with 16 adult and child graves lay immediately east of the fourth-century village. Each grave contained three to five pots, and most had one to five fibulae. Two males were buried with weapons, one with two spearheads, a large shield with a central metal boss, a sword with a suspension belt, belt buckles and belt pendants, a silver fibula, an imported bronze bucket, and a clay pot (Figure 7.10).

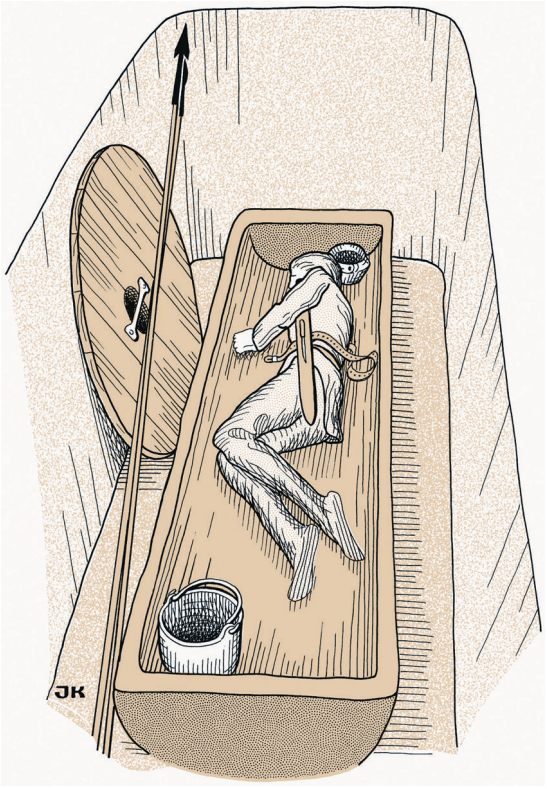


Figure 7.10. Artist's reconstruction of a grave from Vorbasse in the fourth century AD (drawing by Jørgen Kraglund).

Four very rich graves contained females. One adult female was found with four bronze fibulae at her shoulders and chest, a swastika-shaped fibula with silver and gold sheeting and inlaid blue glass pieces, a necklace of amber beads and imported glass beads with a bronze ring worn as a pendant. Her belt had an iron buckle, and attached to it was a knife decorated with silver rivets. Next to her leg were a comb in a case, a bronze spindle whorl, and two small clay pots. On her toes were two small silver rings, and by her feet stood a wooden bucket with a bronze band and a clay pot.

At least some of the inhabitants at Vorbasse were affluent and had enough of an economic surplus to acquire luxury goods. This prosperity was likely based upon the export of cattle. The richly furnished

graves document the external relations that brought glass beads, gold, silver, and bronze jewelry to Denmark from continental Europe. Some jewelry, like the swastika-shaped fibulae, was locally produced. One stone piece with traces of gold suggests that gold was also worked at Vorbasse itself. Vessels of glass and bronze, however, were imported from the Roman Empire and were probably used for drinking wine. Silver and gold coins came from civilizations to the south. Swords were imported in great number, despite numerous attempts by the Romans to embargo the trade in weapons to the Germanic people.

The fifth century shows a new arrangement of the settlement (Figure 7.9). The first row of houses remained, but now a large open space was created between the first and third row. Some kind of crisis must have struck late in the fifth century, as the farmsteads were reduced in size and the number of animal stalls declined sharply. The village moved again and was smaller in the sixth and seventh century, containing only seven or eight houses. This decline is in the general time period of the AD 536 dust veil and may possibly be related to this event.

In the Viking period, from the eighth to the tenth century, Vorbasse was dominated by seven big farms with large houses on plots of land that were three times bigger than previously. Typical timber Viking long houses with curving outer sidewalls were constructed. By the end of the Viking period, the seven large farms were on crofts, plots of land for horticulture that were as much as 26,000 m^2 (6.5 acres) in size—almost as large as the entire village in the third century. A road went through the middle of the village. The largest farm had a typical Trelleborg-style hall along with a smithy and a bronze-casting workshop. Separate buildings for livestock were put up in this period. Most of the structures were built along the fence line that surrounded the farm. The largest farm included 12 smaller structures in addition to the main building and may have held up to 100 domestic cows and horses. This farm was about twice the size of the next largest in the village.

The oldest structure in the present village of Vorbasse, 500 m (1,600′) south of the Viking Age community, is the Romanesque church. The earliest part of this building can be traced back to the thirteenth century. Settlement gradually relocated for the last time to the medieval village that formed around this early church.

Gudme, Denmark

The site of Gudme on the island of Fyn was one of the early trading centers in Scandinavia during the Roman Iron Age. *Gudme* means the home of the gods, and the site is surrounded by three hills with powerful names—*Galbjerg* (Sacrifice Hill), *Albjerg* (Holy Hill), and *Gudbjerg* (Hill of the Gods). Gudme flourished ca. AD 200–600, during the Roman and early Germanic Iron Age (Jørgensen 2011, Nielsen et al. 1994). Settlement continued here on a smaller scale through the end of the Viking period. Gudme was one of the most important sites in Scandinavia during the Iron Age and has exceptional political, commercial, and religious significance.

Lotte Hedeager (2011) has recently argued that the major centers of the later Iron Age may have been modeled on the cosmology of the Nordic gods. Although descriptions of Nordic mythology were not recorded historically until

early medieval times, the origins of these beliefs probably have significant time depth. One of the best ancient historical accounts of Norse mythology comes from the Icelander Snorri Sturluson (AD 1179–1241), the author of a *saga* called the *Prose Edda*, which includes a section called the *Gylfaginning*, a narrative of Norse mythology. (There is a further discussion of Norse mythology in chapter 8.)

Snorri actually suggested in his narrative that the mythological gods may have begun as great human war leaders and kings who were believed by their descendants to be divine. Snorri described Asgaard, the home of the gods, as the location of Gladsheim, the great hall of Odin, and Valhalla, where Odin gathered slain warriors. Asgaard was also a place of skilled craftwork in metals and wood. Hedeager suggests that Gudme and a few other regional centers in Scandinavia—Uppåkra in Skåne, Helgö in the Mälar Valley in Middle Sweden—may also have resembled the mythical description of Asgaard.

Gudme is in fact the oldest of these large central places, emerging first in the Roman Iron Age; it is also the largest, with more massive buildings and a bigger settlement. The place names around Gudme emphasize the sanctity of the place. The site of Gudme is part of a larger, integrated region that includes a coastal port of trade at Lundeborg 4 km to the east and a huge cemetery at nearby Møllegårdsmarken.

The settlement at Gudme itself covers almost one square kilometer and consists of some 50 smaller, fenced-in farms around a central magnate estate, with a total population estimated at ca. 500 persons. The distribution of these farms is dispersed, as the area is one of wetlands. The farms occupy the higher, drier places on this landscape. The individual farms were apparently under the aegis of the large magnate estate. Many of these subject farms were involved in craft production, especially metal, documenting the critical role of magnates in the control of manufacturing and trade. Within the settlement area, more than 6,000 metal artifacts have been found, including five gold and five silver hoards dating from the fourth to the sixth century AD. More than 10 kg (22 lbs.) of gold in total have been recovered from the Gudme area (Figure 7.11). One of the gold hoards alone contained more than 4 kg of gold.

There are more finds of rare and exotic materials from Gudme than any other site in the later Iron Age of Scandinavia. A large number of metal figurines, masks, and other depictions of males are also found in the Gudme area. The range of materials and their places of origin is also extraordinary (Figure 7.12). There are items from most of central and eastern Europe as well as southwest Asia (Thomsen et al. 1993). In addition to the precious metals themselves, there are many Roman coins, pieces of a helmet, Byzantine tableware, a Frankish silver fibula, and much more. Many of the objects were scrap, known as hack metal—cut and broken pieces of complete objects that probably were intended for recasting. One of the most extraordinary finds was a fragment of a bronze heel from a small Roman statue of Hercules. In all likelihood, this object was also brought to Gudme as scrap.

The primary residence at Gudme was characterized by a huge central hall of 500 m^2 (5,380 ft^2) in floor area and a second, smaller hall of ca. 250 m^2 (2,700 ft^2). The main hall was monumental both in size and in terms of its extremely solid construction (Sørensen 1994). The building is almost 50 m in length (165 ′) and

Figure 7.11.
A goldsmith's hoard from Gudme. Five precious stones for rings and other jewelry, pieces of hacked gold from bars, rings, and jewelry, and drops from smelting. The testing stone at the bottom was used to assay the purity of gold.

10 m (33 ′) wide, with eight massive roof posts, 80 cm (32″) in diameter, that may have supported a two-story structure (Figure 7.13). The walls were made of broad vertical planks, and there were large doors on both long sides of the building. The hall was built in the second half of the third century AD and was used for approximately 100 years. This building was likely the first example of such large magnate halls in Scandinavia and represents a new tradition of construction (Hedeager 2011). In total, six large buildings were found in the excavations, as the two main structures were each rebuilt twice over a period of 200–300 years near the original location.

There is little evidence of metal production or food preparation in the large hall. There are, however, a number of valuable finds, including Roman hack silver, bronze and glass objects, gold-ornamented silver neck-rings, silver figurines, and more than 50 denarii—silver coins from the Roman Empire. There are also several ritual sites associated with these two structures. These deposits were probably votive offerings made at the magnate estate.

The cemetery at Møllegårdsmarken east of Gudme is one of the largest prehistoric graveyards in Scandinavia, with almost 2,300 graves dating between AD 1 and 400 (Albrechtsen 1971). This cemetery was probably the major burial ground for the inhabitants of Gudme and the surrounding area. Most of the burials were cremations. Møllegårdsmarken has the largest known number of Roman imports from a single place in northern Europe. Intriguingly, while many of the cremation burials were richly furnished, no weapons were found in the cemetery (Figure 7.14).

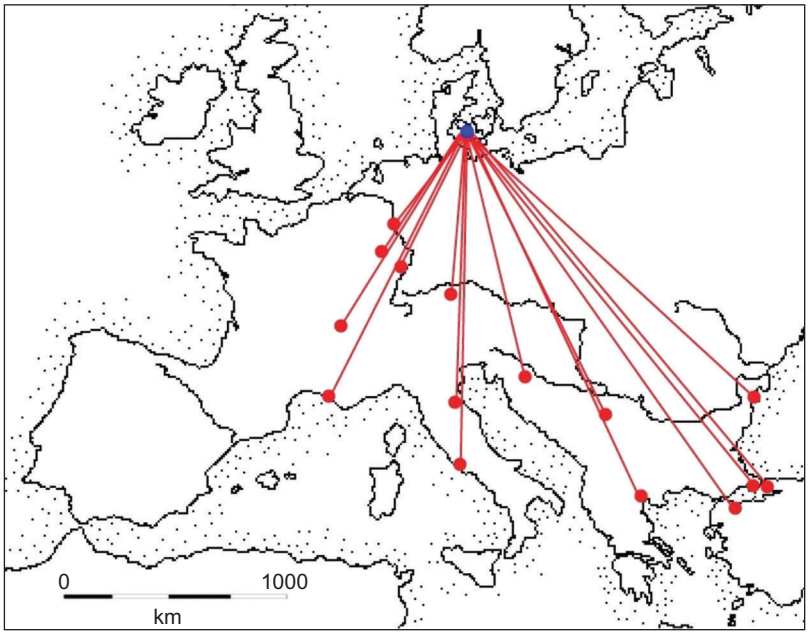


Figure 7.12.
Places of origin of the exotic materials at Gudme, Denmark.

The port of trade at Lundeborg was located on the coast where the stream that runs through Gudme enters the Baltic. This important place was discovered in 1986 during the construction of a new sewage treatment plant (Thomsen et al. 1993). The entire site comprises a zone 50 m (165′) wide that runs almost 900 m (more than half a mile) along the coast. This seems to have been a major area of craft production for blacksmiths and other metal smiths, carpenters, and wood carvers, as well as workers in amber, antler, horn, and bone. This was likely an area of shipbuilding and repair as well; some 8,000 iron rivets for ship construction have been found. Most of the exotic materials from here are Roman—glass beads and vessels and a fine red pottery with a glossy slip known as *terra sigillata*. The glass beads were found everywhere on the site. The glass sherds and *terra sigillata* were very fragmentary, perhaps discarded along

Figure 7.13.
The large hall at Gudme during the excavations.

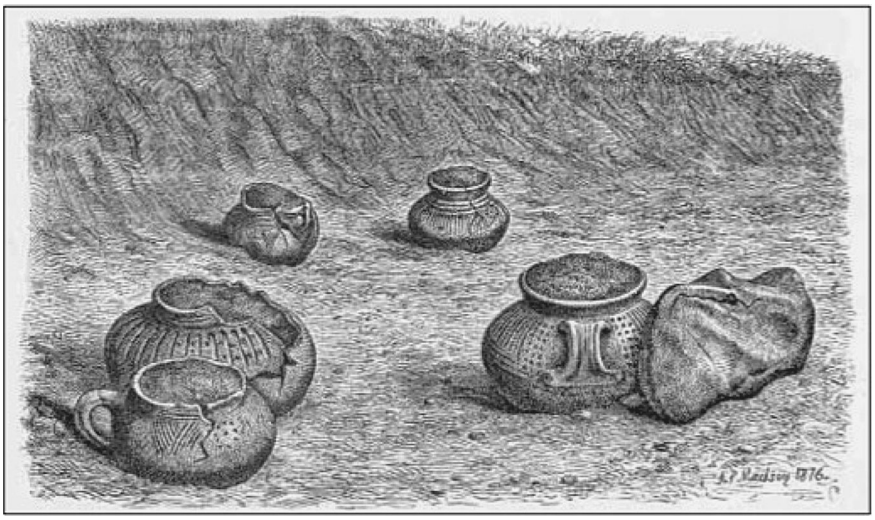


Figure 7.14. Møllegårdsmarken; excavations in 1876 exposed many well-preserved cremation urns, although they were found near the ground surface (Sehested 1878: 133).

the shore after breakage during shipping. There are also objects of German origin, especially jewelry and weapons. Iron ingots were imported from Poland (Thomsen 1994). There were hearths, forges, and many pits at Lundeborg, but no evidence of substantial structures other than small 4.5 m (15′)–square hut floors. The site probably functioned as a market and port of trade on a seasonal basis in the spring or early summer.

A money economy likely did not emerge in Scandinavia until the eighth century in the larger Viking towns (Arrhenius 1994). The economy of the Roman Iron Age was one that involved barter. A barter market required open space with good light so that negotiations could be made under good conditions of visibility. Such markets also required authority and the threat of force to avoid fraud, cheating, and conflict and to provide security for transactions (Arrhenius 1994). This requirement of authority may be one of the reasons that such markets are closely associated with the magnate rulers. The beach at Lundeborg would have been an ideal place, where cargo ships were landing and an open market area would have been readily available.

In sum, Gudme was a very special place during the Roman Iron Age in Scandinavia, with remarkable wealth, a settlement that offered a preview of later towns, an enormous hall rebuilt several times, and a powerful religious geography together in one place. Hauck (1987, 1994) has suggested that Gudme was the home of a cult of Odin that was connected to a sacred ruler at the site. Certainly the control of the commercial, political, and religious components of society in the hands of one man suggests a powerful combination that begins to look like a new form of sociopolitical organization, something more than a chiefdom. Whether Gudme represented a small, early state society in Scandinavia is debatable, but the extraordinary materials and structures assembled here are not. It is at Gudme that the beginnings of the aristocratic power structures that characterize later Iron Age and Viking society are first manifest.

Uppåkra, Sweden

Lund is a lovely university town in southwest Skåne. The university itself was established in 1666. The town of Lund was founded in AD 990 during the Viking Age by the Danish King Canute I as a royal town, complete with the king's compound, a mint, and a bishop's seat. The stone cathedral was built sometime around 1085, at the beginning of the medieval period, the first cathedral in Scandinavia.

But what was this area like before Lund? Was this region important in the Iron Age? In fact, the largest town in Iron Age Scandinavia, Uppåkra, lay hidden and unknown for centuries just a few kilometers outside of Lund. A combination of factors—primarily an absence of mention in historical documents—meant it was largely invisible.

Archaeological interest in the place began in the 1930s with two important events. First, digging the foundation for a farm building revealed human skeletons, pottery, and archaeological deposits more than 2 m (6.5′) deep, dating back to AD 400. Second, again in the 1930s, the local sugar beet industry commissioned a study of the phosphate content of the soils across much of southern Sweden to determine the best agricultural fields for beet production. More than 500,000 soil samples from 500,000 hectares (almost 2,000 square miles) of land were tested. When the results were plotted on a map, high concentrations of phosphate were found to correspond to areas of intensive prehistoric human settlement. Urine and plant and animal tissues, especially bone, contain large amounts of phosphate and enrich the soils at places where people have lived in the past. It was even possible to trace old paths and roadways on the phosphate maps. The area around Uppåkra had the highest levels of phosphate in the entire province of Skåne. Clearly this was a place of archaeological significance.

It was not until 1996, however, that interest, energy, and funding combined to permit more intensive investigations at Uppåkra (Härdh 2002, Härdh and Larsson 2007, Larsson 2001b, 2004, 2007). Soil boring and metal detectors were used to locate the site before excavations were started and to determine areas of dense archaeological materials. More than 20,000 metal artifacts have been found to date, far exceeding any other known Iron Age site. The majority were bronze, but there were also a number of objects in silver, gold, and iron.

Uppåkra was clearly a major center of population and power in the first millennium AD. The town was situated in a strategic location amid rich farming lands, on a ridge top running east-west through the area, along the prehistoric road between Trelleborg and Helsingborg. Uppåkra was the economic, political, and religious center for a large part of western Skåne and may have been a royal seat.

The first indications of settlement are from the first century BC. By AD 400, Uppåkra was southern Sweden's largest community, with up to 1,000 inhabitants. In addition to a royal compound, the settlement contained 30 to 40 farmsteads of various sizes, with dwellings, workshops, storage buildings, and barns and covered an area of 1,100 × 600 m (3,600′ × 2,000′) (Figure 7.15). The maximum occupation area of the site covered almost 40 ha (100 acres). The basis for the growth of the settlement and the wealth of the region was farming and rich agricultural lands. Ceramics, agricultural equipment, grinding stones and querns, whetstones, and loom weights document domestic and agricultural activities at the numerous

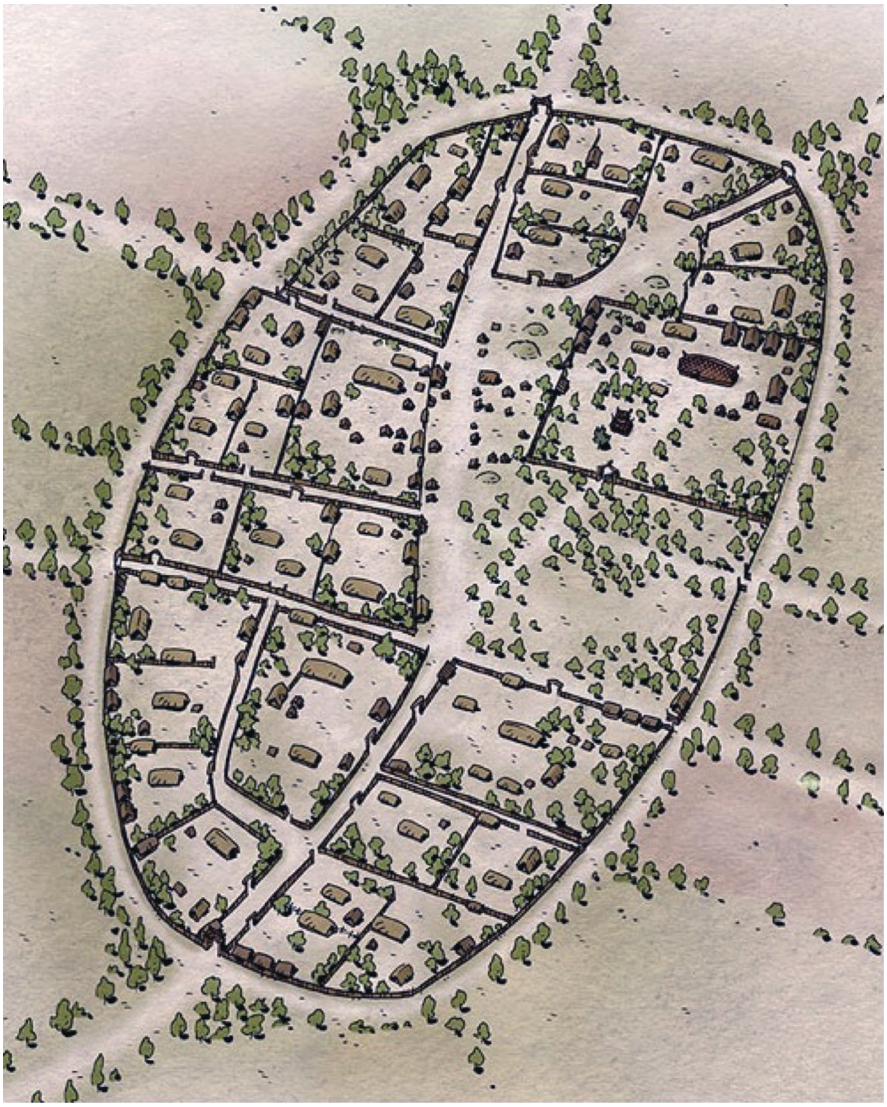


Figure 7.15.
An artist's reconstruction of Uppåkra ca. AD 400 (drawing by Luïc Lecareux).

farmhouses. The most common crop was barley, but wheat, rye, oats, and flax were also cultivated in the fields. Turnips and cabbage were grown in household gardens. Apple and other fruit trees probably provided part of the harvest as well. In winter, the animals were fed with some cultivated hay and straw, but the leafy branches of ash, hazel, and oak were also collected in the fall and used for fodder. The animal bones at the site come primarily from cattle, followed by sheep, goats, pigs, and horses. There were also dogs and cats around the farms. Bones from herring, perch, and cod document the importance of fish in the diet.

Uppåkra was also an important center of trade and manufacturing. There is evidence of a marketplace, with finds of scales, weights, and bits of hack metal. The artifacts from Uppåkra document a high level of craftsmanship and extensive trade with the rest of Europe. Metal smiths produced high-quality jewelry and other objects in gold, silver, various copper alloys, and iron. Iron was probably smelted in Skåne, while other metals were imported from the continent. Broken jewelry, coins, and hacksilver were melted down and made into new items. A distinctive animal style

of decoration, known from the later Viking period, finds its start in the earlier Iron Age, perhaps at Uppåkra. Specialized production of bone and antler artifacts, including hair combs, needles, and other small equipment, also took place at Uppåkra.

Only a small part of the site has been investigated to date because of the deep, rich deposits, which must be carefully removed. Excavations were conducted near the center of the site, the area where the rulers were thought to have lived. Several buildings of various sizes were found, including both houses and larger halls. A few of the buildings had been burned to the ground, and burned human bodies were found in some of the structures. Several of the houses showed repeated episodes of construction, perhaps as many as ten, one atop the other.

Figure 7.16.
The bronze mount from Uppåkra in the form of a winged man.

The finds from these structures included a good bit of metal and other valued items. These buildings were apparently in place prior to the construction of the cult house, described below. One of the most fascinating discoveries was a gilded bronze mount of a man holding a pair of wings (Figure 7.16), probably dating to the Viking Age. The individual depicted in this object was probably a mythological figure known from several sagas as Völundr (Wayland) the Smith. Völundr, as the story goes, was captured by a vicious king who had him hamstrung so he could not run away. Wayland retaliated by killing the king's two sons, raping his daughter, and fleeing through the air using a set of bird's wings (Heimbrecht 2012).

The most unusual structure to be uncovered was also one of the smallest, only 13 by 6.5 m (43′ × 21′) (Larsson 2007). Although the area of the building had been plowed for centuries, some of the floors, posts, and pits that were used in the original construction remained, along with some very unusual artifacts. The structure was first built in the third century AD on the former site of a very big longhouse. The house was rebuilt six or seven times over many generations, the last time in the Viking Age. The construction of this cult house involved four massive posts ca. 70 cm (28″) in diameter in a square arrangement in the center of the structure (Figure 7.24). These heavy posts were buried 2 m (6.5′) in the ground and could have stood 5–6 m (16′–20′) above the ground, capable of supporting a building of more than one story. Such a structure would have been visible for a great distance in the relatively flat landscape of southwestern Sweden.

The walls on the long sides of the structure were slightly convex (Figure 7.17). The construction was all wood, and large split timbers or staves were placed vertically in prepared trenches for the walls. There were three entrances, two on the south and one on the north. The projecting wall additions on the southwest

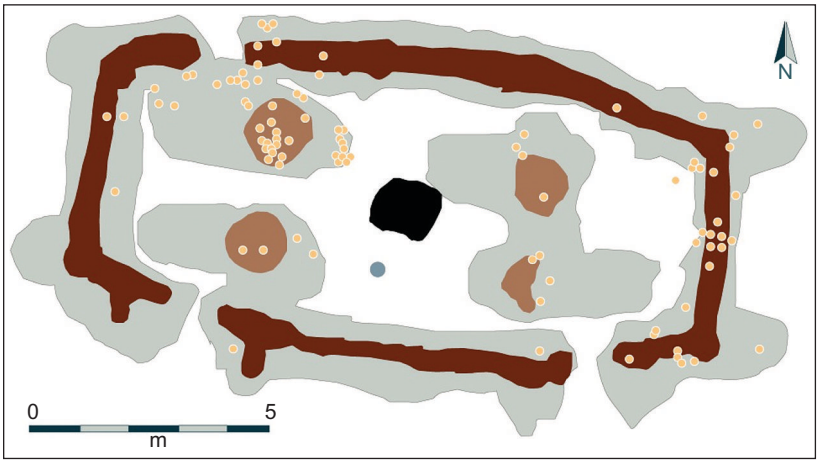


Figure 7.17.
The cult house or temple at Uppåkra. The four massive posts are shown in brown, the hearth in black, the find spot of the beaker and glass bowl in blue, the walls in dark red, and the wall trenches in gray. The yellow dots are finds of *gullgubber* (original drawing by Sven Rosborn).

doorway suggest that this may have been the primary entrance (Figure 7.18). Two massive iron rings were found in and near the building and probably once hung on these doors. There was a large central hearth in the floor of the structure.

The unusual construction and artifacts from this building define it as a cult house or temple for special ceremonies at Uppåkra. A rare glass bowl and a bronze and silver beaker with embossed gold bands were placed as an offering in the floor of the structure (Figure 7.19). At least ten glass vessels are represented in the fragments found in the building. More than 100 small, thin gold foil plaquettes less than 2 cm (less than one inch) high, known as *gullgubber*, with stamped designs of men, women, or couples (Figure 7.20), were found around the large posts and along the walls of the cult house. These small tokens must have been some kind of amulet used as votive offerings. Some of these amulets are made from the same dies as those found at the site of Sorte Muld (described later in this chapter) on the Baltic island of Bornholm and elsewhere (Larsson 2007). Fragments of some of the original dies have been found at Uppåkra, suggesting that many of the *gullgubber* found around Scandinavia were made here.

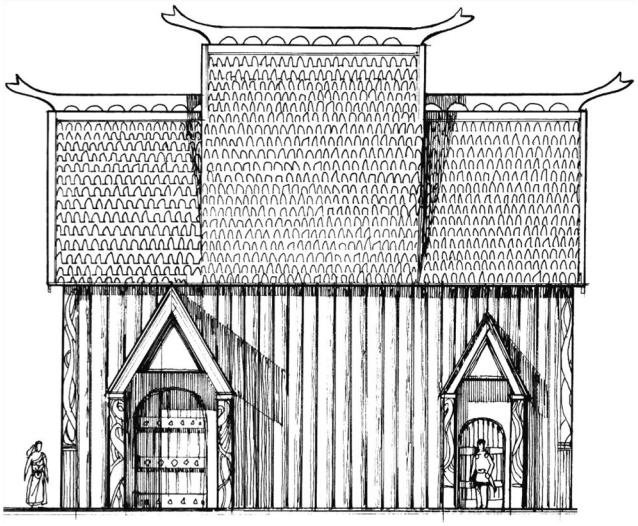


Figure 7.18.
A reconstruction of the temple of Uppåkra with a central tower. Note the human figures for scale (drawing by Luïc Lecareux).

These were several unusual features nearby, emphasizing the distinctive nature of the cult house. There are at least four burial mounds to the west and north of the cult house, probably dating to the early Bronze Age or the early Iron Age, that may have given added significance to the location. A few meters (yards) south of the building, several items of military equipment were found, including parts of a helmet. North and south of the cult house there were stone pavements with weapons sacrifices composed largely of spear and lance heads, parts of shields, and both human and animal bones (Figure 7.21). These weapons sacrifices and other items

Figure 7.19.
A bronze and silver beaker with embossed gold bands and a glass bowl from the cult house at Uppåkra.

Figure 7.20.
Six of the *gullgubber* from the cult house at Uppåkra. The object in the upper right is 1.25 cm high.

had been placed on small mounds around the cult house. Some of the gold objects found in the house were probably manufactured nearby where fragments of crucibles and small grains of gold were found just south of the building.

The cult house was rebuilt several times during the first millennium AD; it was finally razed sometime in the tenth century, during the Viking Age, shortly before

Figure 7.21.
Area of weapons sacrifice near the cult house at Uppåkra.

the founding of the town of Lund. The role of Uppåkra declined quickly after the Danish King Canute ignored the town when he founded the bishop's seat at Lund in 990. Uppåkra was probably largely abandoned by 1000 as the population moved to the new town. Perhaps the king wanted to avoid the pagan connotations imbued in Uppåkra and turn a new page, bringing Christianity to southern Sweden.

Gamla Uppsala, Sweden

Gamla Uppsala is located in Middle Sweden, on the outskirts of the medieval university town of Uppsala. It is one of the best-known archaeological localities in Scandinavia as a sacred site, a place of sacrifice, and the residence of early Swedish kings. Early chroniclers wrote of Gamla Uppsala as the home of the gods, of Freyr and even Odin. The Danish historian Saxo Grammaticus (ca. AD 1150–1220) wrote of Freyr and human sacrifice:

> Frey, the regent of the gods, took his abode not far from Upsala, where he reinstated the old custom of prayer by sacrifice, which had been used by so many ages and generations. He paid the gods with abominable offerings, by slaughtering human victims.

The German chronicler/historian Adam of Bremen (ca. AD 1040–1085) described the ceremonies:

> A general festival for the provinces of Sweden is customarily held at Upsala every nine years. . . The sacrifice is as follows; of every kind of male creature, nine victims are offered. By the blood of these creatures it is the custom to appease the

> gods. Their bodies, moreover, are hanged in a grove adjacent to the temple. This grove is so sacred to the people that the separate trees in it are believed to be holy because of the death or putrefaction of the sacrificial victims. There even dogs and horses hang beside human beings.

Gamla Uppsala is a place of many large earthen barrows, several cemeteries, magnate estates, a royal manor, and a number of farms (Figure 7.22). The area has been settled since the Bronze Age, but the most substantial occupation was during the first millennium AD, in the Roman and Germanic Iron Age and the Viking period. Archaeologists have been exploring Gamla Uppsala for almost two centuries, but in fact rather little is known, in part because the area is very big and most of the excavations were very small. The archaeologists have also focused on the larger monuments, so that less is known of the common farms and the use of the landscape. Research by the nearby university continues today at Gamla Uppsala, and more of the site's mysteries are gradually being revealed.

Uppsala lies at the northern edge of Mälardalen, one of the richest agricultural areas in Sweden. In the late Bronze Age, scattered farmsteads dotted the landscape around Gamla Uppsala, taking advantage of the fertile agricultural land in this area, and particularly the level areas of clay soils, which provided fine pasture. Settlement expanded in the Pre-Roman Iron Age, and animal husbandry, especially cattle and horses, was the predominant form of agriculture. During the Roman Iron Age, settlement expanded again and a number of farmhouses appeared with visible differences in house sizes. Dramatic differences were also seen in the amount and quality of burial furnishings. Such evidence suggests that social stratification was the norm.

Large-scale settlement at Gamla Uppsala began in the sixth century and was focused around the area of the later church. Many of the farms in the wider area were gradually abandoned, and settlement appears to have concentrated toward this new center. The first true villages in the region appear in the Germanic Iron

Figure 7.22.
Air photo of Gamla Uppsala. The long line of earthen barrows in the photo follows a natural ridge in the landscape. Some of the settlement and the large structures around the church were on artificial terraces.

Age as population aggregation continued. A large magnate estate first appeared at Gamla Uppsala in the early Germanic Iron Age. Several very large houses were built on manmade terraces. The northern terrace with the royal manor was built up in several stages with layers of clay and cultural deposits. The terrace held a series of houses, built and rebuilt between the sixth and eighth century. The repeated extension of the terrace created its monumental appearance by the end of the eighth century (Ljungkvist et al. 2011). Large burial grounds are found at Gamla Uppsala in this period as well. Originally there may have been several thousand mounds in the area, but most have disappeared over time because of agricultural and other activities. Even today, more than 250 barrows remain.

Later Iron Age Gamla Uppsala consisted of several distinct areas. The Royal Mounds are part of a line of barrows along a narrow, curving north-south ridge that ends near the church. The Royal Manor or magnate estate was at the center of the site, north of the church. The village itself lies in several parts to the north and east of the line of barrows. Burial grounds are found along the narrow ridge and in a number of areas to the east and west of the ridge. The dates for these various settlement components are not always known, and it is difficult to be certain which parts were used when. It is possible to distinguish two major zones at Gamla Uppsala. An elite sector lies to the west with the large buildings, halls, and terraces and the Royal Manor, along with traces of craft production connected with the royal household. There is also a possible temple construction associated with the site that may have held statues of certain Norse gods. The village settlement to the east lacks these monumental and craft components and appears more closely associated with a farming community, perhaps responsible for agricultural production for the local ruler.

The Royal Manor is represented by the remains of a monumental hall at least 50 m (164′) in length sitting on an artificial terrace. This construction was among the largest in prehistoric Scandinavia. Other examples are known from Tissø on Sjælland, Järrestad in Skåne, and elsewhere. It is intriguing to note that several of these royal manors strongly resemble one another in their construction, with ship-shaped, convex wall trenches that held large vertical wooden staves. Such similarity highlights the interaction and exchange of information among elite individuals in southern Scandinavia and Middle Sweden and the shared concepts of what estates should look like and how they should be built (Ljungqvist et al. 2011). Perhaps the architects and builders were shared as well. Eventually, the manor burned and was then sealed under a layer of clay, preserving the floor of the structure.

There are at least two other burned buildings on this southern terrace that were associated with the craft production of beads, silver jewelry, and other items. The terrace also contains a stratigraphic sequence of houses, built and rebuilt between the sixth and eighth centuries AD (Ljungqvist 2000). There are probably several artificial terraces around the central area of Gamla Uppsala related to large halls and other structures. On the northern terrace, for example, 550 garnets (gemstones from eastern Europe) were recently found in a workshop area (Ljungkvist et al. 2011). These terraces are located in the elite western part of the site, where iron slag and forging pits, along with evidence of bronze and silver casting and other craft production, have been found.

Some of the burial mounds at Gamla Uppsala look enormous, built atop the gravel ridge, which enhances their size and appearance (Figure 7.23). Three

Figure 7.23.
The three largest mounds at Gamla Uppsala. Note the hikers on the path in front of the mounds for scale. The church tower rises above the northernmost barrow.

mounds are 50–75 m (165′–250′) in diameter, one is 45–50 m (ca. 150′), and at least four measure 20 m (65′) or more. There was a fourth large mound, known as the Gold Mound, which was excavated in the middle of the nineteenth century and is now gone. Two of the three major remaining mounds, known as the East and West mounds, have been excavated. The East Mound has been dated to 550–600. The West Mound probably dates to 575–625 (Ljungqvist 2005). The construction of the East, West, and Gold mounds probably took place within the brief span of 100 years.

The individuals buried in these barrows are unknown. The bodies were cremated before burial, and only fragments of the grave goods that accompanied them remain. In the East Mound, parts of a helmet and several fragments of gold objects were found. The bones of a goshawk, probably a trained hunting bird, were found in the West Mound. These items certainly suggest that elite individuals were buried there.

Gamla Uppsala was one of the most important central places in the Iron Age and Viking period in Scandinavia. Like Uppåkra, it emerged in the Germanic Iron Age as a place of cult, a central farmstead with royal connections, and a large village. It was home to political, economic, military, and religious activities that were directed by a powerful elite segment of society. The barrows and monumental construction in the form of halls, terraces, and perhaps a large temple testify to the authority of these individuals and the labor they controlled. Gamla Uppsala was a center of power for a thousand years. Around AD 1150, the area of the Royal Manor was given to the bishop of Uppsala, and the first archdiocese church in Sweden was built there after 1160. Declining influence and a fire in the church late in the twelfth century AD resulted in the growth of a new town a few kilometers away, the present city of Uppsala.

Sorte Muld, Denmark

The Danish island of Bornholm is strategically centered in the southern Baltic and has been an important place for trade and transport since the Neolithic. Bornholm today is a very popular tourist destination in the summer, with rocky highlands to the north and fine, sandy beaches in the south. It is a small island, only 25 by 30 km (15 by 20 miles), with a population of a bit more than 42,000 people. The eleventh-century German chronicler Adam of Bremen described the island as “the

most celebrated port of Denmark and a safe anchorage for the ships that are usually dispatched to the barbarians and to Greece" (Book 4:16).

Written documents from 1569 describe a place on Bornholm where ancient gold artifacts were found. The name given to this place was *Guldagerenn*, or the field of gold. Today it is called Sorte Muld, "Black Earth," for the dark soils that hold the charcoal and waste materials of the settlements that once occupied this place (Figure 7.24). Soil phosphate values in this area, a measure of past human activity, are the highest in Denmark.

The site of Sorte Muld lies in the northeast corner of Bornholm, near the modern town of Svaneke. The site was actually composed of 30 to 40 smaller related settlements scattered over an area more than a square kilometer (250 acres), centered around a larger area along a hilly ridge. This was an important place on Bornholm between approximately AD 1 and 700, with a peak in activity between AD 200 and 500 (Adamsen et al. 2008). The site appears to have been carefully planned and organized. Farmhouses in the settlement areas were set inside squares of land of the same size, defined by ditches. The central area may have contained a princely hall and a temple, and there are indications of a goldsmith workshop. Two km (1.3 miles) to the east are several fine natural harbors that probably served as the site's connection to the sea.

During the Germanic Iron Age, Sorte Muld was probably a royal seat and cult center and one of the more important places in Scandinavia. Comparison of Sorte Muld with other Iron Age sites emphasizes the large size of the site (Figure 7.25). Gudme is somewhat bigger and more intensively occupied. Vorbasse is a bit more concentrated. Sorte Muld has both a very distinctive rectangular arrangement and large size.

Figure 7.24.
The Sorte Muld site today appears as the area of dark soils in the left center of the air photo.

The site is extremely rich in artifacts and other materials. Excavations have recovered a huge number of objects. Preservation in the humic black soils is excellent, and a range of animal and plant remains have survived, including bone, wood, and even a few pieces of leather. Bone artifacts are common. Other classes of artifacts include iron tools and equipment, many glass beads, and broken pieces of glass vessels.

Because the area has been heavily plowed, many of the finds come from the surface of the ground. Amateur archaeologists with metal detectors began to find small gold artifacts at the site in the 1980s, recovering more than 2300 *gullgubber* (small plates of sheet gold with mythological figures), various other metal artifacts, and a

number of rich hoards. One of these hoards is described in the Treasures section at the end of this chapter.

GRAVES AND TOMBS

Practices of human burial and funerary activity vary greatly during the Iron Age. In the Pre-Roman Iron Age, most individuals were cremated. Many had fairly simple grave goods, and the ashes were sometimes placed in urns. Graves have been found singly and in cemeteries of varying size, sometimes with a small barrow. Regional differences in burial patterns are apparent in the Roman Iron Age in terms of grave construction, placement and orientation of the body, type and placement of grave goods, and distinctions of age and sex. Inhumation was common in Skåne, on Sjælland, and in central Jylland, while cremation continued on Lolland, Fyn, and in southern Jylland. Large numbers of very rich graves are known from the Iron Age on the Swedish islands of Gotland and Öland. Regional differences in grave contents are also seen (Ringtved 1988). In burials from the early Iron Age in Northern Jylland, a typical male grave contained two short spears, three pots, a knife, and a comb. In southern Jylland, males on average were given one long spear, two pots, and one knife. Females in northern Jylland had four pots of another variety, several necklaces, and other dress ornaments, in addition to a knife and comb. Women in southern Jylland typically had fewer necklaces, a single knife, and a pot.

Figure 7.25. Gudme (top), Sorte Muld, and Vorbasse (bottom) shown at the same scale.

Burials from the Roman Iron Age with grave goods of Roman origin mark the final resting places of important individuals with commercial and political connections that reached beyond the borders of modern Scandinavia. In Denmark, the location of wealthy burials with Roman grave goods changes in relation to shifts in the location of centers of power. The earliest concentrations of Roman goods were on the southern Danish island of Lolland during the first and second centuries AD (see the site of Hoby below). Later in the second century, more of these burials are found on the larger island of Fyn, and in the third and fourth centuries, Roman goods in graves were more common on Sjælland, particularly in the Stevns area in the east. One example from this region, Himlingøje, is described below. Then, during the Germanic Iron Age, the focus of graves with rich Roman goods returned to Fyn and places like Gudme, discussed above.

Burial in large earthen mounds with abundant grave goods of great value was reserved for the nobles as monuments to the deceased and as documents to claims to power through inheritance by their descendants (Capelle 2000, Hedeager 1992). Ship burials became more common in the later Iron Age and especially in the Viking period in Scandinavia. Several examples are discussed below, including the ship burials at Valsgärde in Sweden. Additional examples, including the Oseberg ship in Norway, appear in the next chapter on the Vikings.

Hoby, Denmark

The richest single grave from the Roman Iron Age in northern Europe was found at Hoby on the south coast of the south island of Lolland (Friis Johansen 1923). The buried man was middle-aged, of average height (186–187 cm), and died sometime in the first century AD. The grave itself was rather inauspicious, a simple rectangular earthen pit about 2 m (6.5′) deep with a wooden coffin. The grave furnishings, however, are completely remarkable and show strong connections with Rome in the form of a bronze table service composed of a washing dish, a wine bucket and ladle, a jug, a tray, and two spectacular silver drinking cups. This table service for drinking wine had been made in Italy around AD 1. Other items in the grave included a large footed bronze beaker, a bronze pitcher and tray, a small silver cup with a handle, bronze fittings from a drinking horn, a bronze knife, a bone pin, some small bronze and iron pieces, a belt buckle, two gold finger rings, seven fibulae, and three pottery vessels (Figure 7.26). Animal bones in the graves were identified as the ham bones from two young pigs, along with a few fragments from sheep or goats.

The two cups are masterpieces of silver working, produced in a Greek-inspired Roman workshop. Both cups are signed by Cheirisophos, the artist who made them. Each cup weighs about one kg and is decorated in high relief with scenes from the Roman version of the story of Hercules. One of the scenes has been recast as Roman propaganda, depicting a Germanic warrior submitting to a Roman leader. The symbols of the Roman military and the power of the empire are clear. The name Silius was written on the bottom of one of the cups; a Silius was the Roman army commander in Mainz, Germany, from AD 14 to 21, and he may have placed the order for these treasures.

There is an intriguing possibility that the man buried at Hoby had been in face-to-face contact with the Romans. History records a voyage by the future Roman emperor Tiberius in AD 5 to the Cimbric peninsula. The Cimbri were a people described by the Romans and others as living in what today is Jylland. An inscription entitled *Deeds of the Divine Augustus* on a bronze column in Rome from AD 14 states:

> My fleet sailed from the mouth of the Rhine eastward as far as the lands of the Cimbri to which, up to that time, no Roman had ever penetrated either by land or by sea, and the Cimbri and Charydes and Semnones and other peoples of the Germans of that same region through their envoys sought my friendship and that of the Roman people.

In the period AD 1–40 there are a series of princely graves found along the coasts in Denmark that have exceptional grave goods of Roman origin—silver, bronze, glass, and gold. There is the off chance that these people or their ancestors met with Tiberius and were gifted as part of a Roman strategy to forge alliances with remote barbarian groups who might be persuaded to fight the Germanic tribes in Central Europe (Storgaard 2003). Certainly the dates for Silius in Mainz suggest a somewhat later origin for the silver cups, but perhaps they came from a continuing connection between Cimbric leaders and the Roman Empire.

Figure 7.26.
The grave gifts from Hoby, Denmark.

Himlingøje, Denmark

During the first millennium AD, princely graves began to appear across central Europe, marking the rise of a new aristocracy, and one with some staying power. The centers where these graves have been found show a continuous history of occupation and wealth, no doubt reflecting centralized political authority. A similar pattern is also found in southern Scandinavia, where one of the earliest series of such graves was found near the modern town of Stevns in southeastern Sjælland. The site of Himlingøje contains some of the most spectacularly rich graves outside the Roman Empire (Storgaard 2003). This area contains more Roman imports during the first half of the third century than anywhere else in Scandinavia, indicating that a dominant center of power and wealth had emerged.

A large number of burials have been uncovered at Himlingøje (Lund Hansen 1995, Norling-Christensen 1951). There were striking differences in the grave contents, ranging from an absence of furnishings to extremely rich graves. Presumably, various classes of the aristocracy and their retinue were buried here, along with servants and slaves. There are at least 13 richly furnished graves at

Himlingøje with Roman imports and items of wealth, including gold ornaments. Most of the burials date between AD 150 and 250. The earliest graves lie under monumental earthen barrows. There are also two empty barrows that may be cenotaphs (graves without a body) and a burial with the dismembered body of a young man who may have been shipped home in pieces from a foreign place of death (Storgaard 2003).

One of the graves contained the skeleton of a wealthy woman between 40 and 50 years of age, buried with extraordinary jewelry and other objects (Figure 7.27). In her mouth was a gold coin, presumably for her journey to the afterlife. There was an elaborate silver rosette fibula on her chest that had fastened her clothing. There were five silver buckles that were parts of her garments. On her wrists were gold bracelets, and on two fingers were gold rings with a snakehead design. A mass of glass beads and amulets of glass, bone, amber, bronze, and silver were found lying in front of her skeleton. These beads and amulets strung together would have been approximately 75 cm (30″) in length. At her feet were a bronze Roman drinking service, a glass beaker, and several ceramic vessels.

Three of the jewelry pieces, the rosette fibula and the snake-headed spiral gold rings, were distinctive symbols of the aristocracy. These items were probably made in southern Scandinavia, perhaps in southeast Sjælland itself. Almost identical objects have been found at the site of Tuna in Middle Sweden, as well as on the islands of Gotland and Öland in the Baltic and in Norway. Comparison with the teeth and skeleton of two of the women buried with these objects in Norway and Middle Sweden suggest that they may have originally come from southeast Sjælland and married foreign aristocracy, perhaps as a strategy of alliance building among the elite of Scandinavia during the Roman Iron Age.

The very rich grave contents suggest that the elite at Himlingøje were individuals of power and influence across a wide region. These nobles must have had good relations with the Roman Empire, based on the quantity of Roman goods present in the graves. The sets of Roman table service for drinking ceremonies are an indicator of diplomatic contacts with the empire (Grane 2007). The grave goods also include silver cups with depictions of Roman swords and spectacular Roman glass. Some of these glass vessels were so well preserved that they were used by the early discoverers for flower vases before they realized how ancient and valuable they really were.

Figure 7.27. Female grave from Himlingøje, Denmark, with rich grave furnishings including gold bracelets and rings.

Valsgärde, Sweden

Valsgärde is the name of a farm on the Fyris River, about 3 km north of Gamla Uppsala, the ancient center of Swedish kings and pagan religion in Sweden. The cemetery at Valsgärde contained the richest burial goods and the largest number of sacrificed animals in Middle Sweden and had never been looted in antiquity. The site was almost completely excavated by professional archaeologists in the last century (e.g., Arwidsson 1983, Gräslund and Ljungkvist 2011, Ljungkvist 2008). The discoveries at Valsgärde closely resemble the famous contemporary finds from Sutton Hoo in Great Britain and include the finest collection of Vendel period objects in Scandinavia.

The site is best known for the 15 boat graves, but also contains some 63 cremation graves and an equal number of inhumations. The place was used for burial in two different phases. The earliest burials are few in number, from the Pre-Roman Iron Age. Burials appear again in the Migration period and continue from ca. AD 475 to 1100. The first ship burial is from the sixth century during the Vendel period (ca. 550–800), and the last graves are from the eleventh century in the Viking period. There is a very long sequence of elite burial at the site, testifying to the lengthy period of power and influence centered in this area of Middle Sweden. Arwidsson (1983) argues that the graves at Valsgärde and several other sites in Middle Sweden were somehow protected in antiquity, as they were never robbed or even disturbed until the archaeologists arrived in the 1920s. Such a situation implies powerful legal forces and a stable society for a very long period of time.

The cemetery is located on a distinctive gravel ridge overlooking the Fyris River (Figure 7.28). An ancient road runs over the ridge and crosses a nearby ford at the river. Many of the burials at Valsgärde appear to be of elite individuals with rich grave goods and, in the case of the boat graves, a distinctive form of tomb. The variety of grave types, in addition to the boat burials, is surprising. There are mounds, stone settings, irregular stone packings, and cairns. The graves include timber chambers and wooden coffins as well as simple earthen burials. Powerful men and women were given boat burials, but everyone else in the Vendel period was cremated, regardless of age, sex, or status. There are several children's graves as well, but child burials are generally rare in the Iron Age.

Many of the cremation graves have little but a piece of pottery or a comb as contents, but a number are richer, with tools and jewelry. The cremation graves were normally placed in small, round stone settings, sometimes with small mounds. The contents of the graves of wealthy men and women are quite different (Ljungkvist 2008). Elite males were buried with helmets (Figure 7.29), weapons, riding gear, glass and metal vessels, and sacrificed animals including dogs, horses, and birds of prey.

Elite Vendel women were buried with elaborate jewelry, including silver and amethyst beads, glass vessels, and a number of sacrificed animals. One of the female graves contains a carved animal head made from walrus ivory with eyes of carnelian. This head was probably at the end of a staff, similar to finds from the Oseberg ship in Norway, and may be an indicator of some kind of religious authority (Gräslund 2001). Several of the Viking period female graves at Valsgärde also suggest substantial power and wealth.

Figure 7.28.
The gravel ridge and cemetery area at Valsgärde, Sweden.

Figure 7.29.
Helmet from a boat grave at Vendel, Sweden (photo by Christer Åhlin).

The elite boat graves are truly remarkable. At the time of excavation, a distinct depression in the ground marked the location of an approximately 10 m (33′)–long clinker-built boat. The wood in these tombs had decomposed, but the size and shape of the vessel were marked by the distribution of iron nails and rivets. These small boats were probably originally used on the rivers and lakes in the Mälardal region and then dragged up the hill at Valsgärde. The boat was probably an important symbol and a means of transport to the place of the afterlife.

The deceased was placed amidships or near the stern, and the boat was provisioned for a long journey. There was usually a single individual in each boat. The dead person was buried on a bed of down and cloth. The bow of the boat was filled with food and cooking equipment such as a kettle, cooking fork, skewer, and fire starter (Figure 7.30). There was even a bowl of hazelnuts in one of the graves. A game board and dice, food bowls, glass vessels, drinking horns, or a beaker for drink were often placed near the body. The quantity of glass in the boat graves suggests that it had become a common material in Scandinavia by the eighth century, probably produced locally at this time. Other tools included an axe and scissors. Clothing was also a part of the burial gear, and, although poorly preserved, there are several

Figure 7.30. Reconstructions of some of the objects found in the boat burials at Valsgärde, Sweden, including a cooking pot, glass dishes and drinking vessels, drinking horns, and meat forks (photo by Gabriel Hildebrand).

remarkable pieces from Valsgärde, including silk embroidered with gold and silver thread. Silk was introduced in Scandinavia during the Viking Age as a result of long-distance contacts to the east and south.

A man's weapons—swords, knives, scabbard, lance, arrows, shields, and belts—were placed in the boat. An elaborate helmet was sometimes present as well (Figure 7.29). Objects from the Vendel Period are typically gold-plated and richly adorned. Graves from the Viking Age, on the other hand, usually contain more silver; weapons and other objects have less decoration. Three shields were usually placed over the body or behind the head. The placement of three shields is intriguing and may be related to the practice of dueling among the warriors (Gräslund 2008). The rules of dueling in later Scandinavia and Iceland stated that a combatant could use three shields, but when these were destroyed the combatant must fight on without one.

Animals were often sacrificed and found in and around the boats. Dogs and horses were particularly common in the boat graves. Dogs were sometimes leashed. Large horses and other animals were probably killed and pushed in from the ground surface above to lie between the boat and the side of the grave. One or two of the horses were buried with saddle and bit still in place. In some cases, small iron studs were observed in the hoofs of the horses, similar to studded car tires, for use on winter ice. Figure 7.31 is an artist's reconstruction of a boat burial from the site of Ultuna, also in Middle Sweden. After the weapons, food, and other equipment had been placed in the grave, a roof was built over the boat burial and the entire grave was covered with earth.

It was not always new or unused items placed in the graves. Many of the objects and materials placed in the boat graves were incomplete, useless, mended, or worn out. There are very few rich items of jewelry or clothing adornments equivalent to those that are known from hoards and other contexts in this period. No personal items such as finger or arm rings were found in the graves. The jewelry that was found was generally gilded, rather than pure gold or silver. Such practices suggest that the family of the deceased may have retained the best items, perhaps as part of their inheritance.

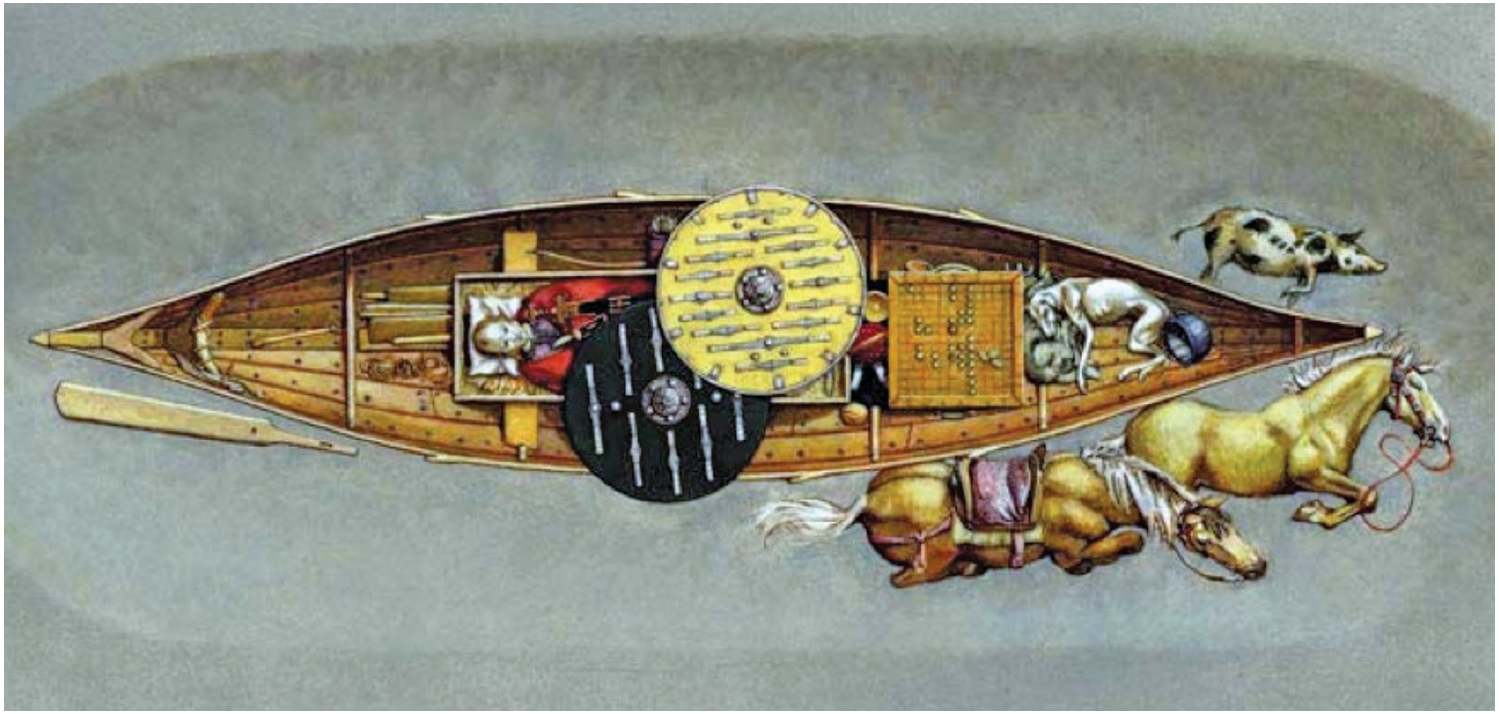


Figure 7.31.
Artist's reconstruction of an elite boat grave from Ultuna, Sweden, similar to those found at Valsgärde (drawing by Thorhallur Thrainsson).

WARFARE AND CONFLICT

One of the distinctive trends in European prehistory, particularly during the Bronze and Iron Ages, was increasing regionalization, militarism, and warfare. The new metals—bronze and iron—first came into use in the form of military equipment. Across Europe, there were more weapons, new kinds of weapons, more defensible site locations, more fortifications, and in the Iron Age more evidence of lethal wounds and violent death in cemeteries and burial grounds. Weapons were often the primary objects placed in graves with deceased males. Theirs was a culture of warriors. Of course, this pattern continued in parts of Europe into the twentieth century AD.

The evidence for conflict and warfare in Iron Age Scandinavia is unavoidable (e.g., Axboe 1999a, Jorgensen and Clausen 1997, Martens 2007). The Roman Iron Age was one of the peak periods of conflict in southern Scandinavia. Chiefs and rulers competed increasingly for land and followers, triggering military conflicts. It was essential for those in power to maintain a strong army and defense. Many male graves contained weapons. There was more construction of defensive works such as naval barriers, earthen ramparts and walls, and roads and bridges than in any other period except the Viking Age (e.g., Näsman 1997, Jørgensen 1997). Ramparts at Olgerdigit and Æ Vold in southern Jylland were built or expanded in the second and third centuries AD (Axboe 1999a, Wulff Andersen 1993). The ancient defensive ditch at Vendeldiget in western Jylland, 3.5 km (more than 2 miles) long, is dated to the same period. The Olgerdigit, a defensive ditch in southern Jylland, covers a distance of some 12 km (8 miles). Ring forts in southern Scandinavia are not well dated, but some of them certainly belong to the Iron Age (Andersen 1992). Central Sweden has hundreds of Iron Age hill forts across the landscape. The stone ring fort at Eketorp, Sweden, described below, offers an example—albeit unusual—of Iron Age fortifications. Some villages were also fortified or placed in defensible locations. The early Roman Iron Age site of Priorsløkke is one example (Kaul 1995b). The famous walled village of Borremose (Figure 7.32) in the middle of a bog in northern Jylland is another (Andersen 1975, Martens 1994).

Some of the more remarkable evidence of warfare in the Iron Age comes in the form of weapons offerings. Fortunately for us, many of these sacrifices—the spoils of victory—were placed in sacred bogs or lakes where the conditions of preservation were exceptional, so that a record of past armies and their equipment has survived. Enemies came from several directions, and there must have been internal conflicts as well. Some soldiers were mercenaries, and the weapons and equipment they carried came from many different places. The Romans described this tradition of weapons offerings among the Germanic people as a way of thanking the God of War. The military and personal equipment of the defeated army was intentionally broken, bent, or burned and placed in a holy lake or shrine. Animals—cattle and horses—were slaughtered at the lakeshore. There are few human bones found in the war sacrifices, however. It is unclear what happened to the dead (and surviving) soldiers of the vanquished army. Perhaps the human sacrifices were made at a different location or treated in a different way.

Figure 7.32.
Air photo of the fortified Iron Age village of Borremose in northern Jylland.

The Roman general Orosius described these practices among the Germanic tribes in the fifth century AD.

> The enemy, who had seized both camps and a huge amount of booty, destroyed everything that had fallen into their hands in an unheard-of and hitherto unknown maledictory ritual: clothes were torn apart and thrown away; gold and silver were thrown in the river; the chain mail of the men was chopped up; the horses' breastplates were destroyed, the horses themselves sunk in the waters; the people were hanged from trees with ropes around their neck so that there was neither booty for the victors nor mercy for the defeated.

New excavations at the bog site of Alken Enge in eastern Jylland are revealing human skeletons that were likely associated with weapon sacrifices in the area. Scatters of human bones record the remains of several hundred individuals that ended up in the bog. The weapons sacrifices at the Illerup site described below, are about 3 km to the east. Perhaps these individuals in the bog at Alken Enge were the unfortunate losers in one of the conflicts represented by those weapons sacrifices.

There are at least 50 of these bog sacrifices of weapons, animals, and other items in southern Scandinavia (Figure 7.33), the results of various battles (Engström 1997). These offerings were concentrated within a 100-year period from the early third to the early fourth century AD during the Roman Iron Age. The large number of weapons sacrifices reflects the increasing role of the warrior ideology and the military's role in society. These weapon sacrifices are among the most famous

finds from any period in Scandinavia—the early and distinctive boat with weapons at Hjortspring, the weapons and boats from Nydam, the silver mask and many trappings from Thorsbjerg, the huge number of weapons sacrificed at Illerup, and the rich finds from Vimose. Several of the more famous weapons sacrifices are described below, including Hjortspring, Illerup, Nydam, and Vimose. Before discussion of the weapon sacrifices, however, two fortified sites—Priorsløkke and Eketorp—are considered.

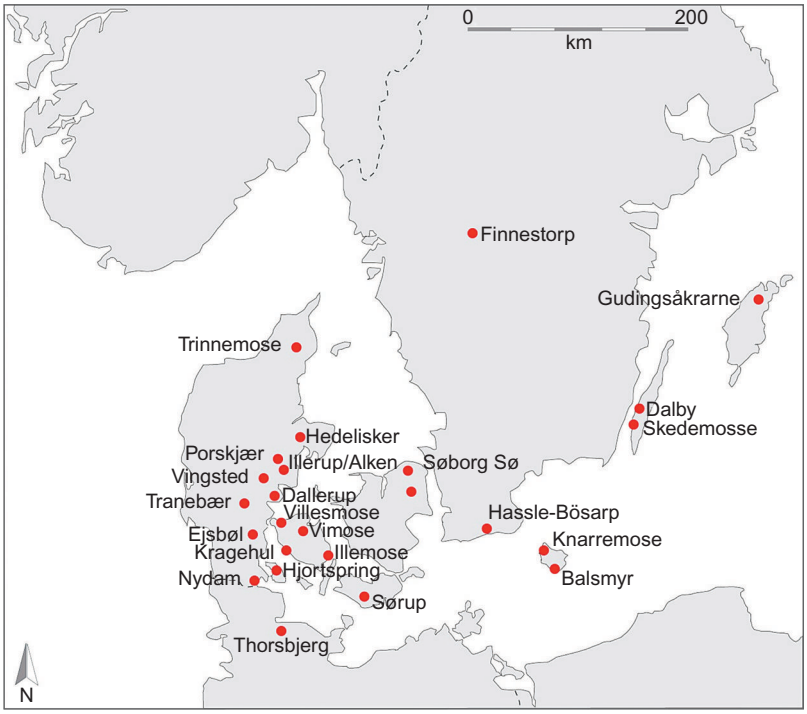


Figure 7.33. Location of major weapons sacrifices in southern Scandinavia.

Fortifications

Priorsløkke, Denmark

Priorsløkke is the name given to an early Roman Iron Age settlement at the mouth of the Horsens Fjord in eastern Jylland (Kaul 1997). The site sits on a low promontory that extends into the fjord and was fully excavated in the 1980s. Some 47 houses were uncovered, recognized from the postholes visible in the fresh excavation surface. Not all the houses were used at the same time, but they were often rebuilt. There were at least four episodes of occupation at the site. Each phase of settlement probably involved 8–15 houses in use simultaneously. Each farm had one large building around 16 m (53′) in length and one or two smaller outbuildings. Population estimates for the village are 60–100 people. The settlement began early in the first millennium and disappeared around AD 200.

Priorsløkke is unusual because it was fortified with a flat-bottomed ditch 1.3 m (4.3′) deep and 3 m (10′) wide, backed by a palisade. The palisade is 220 m (over 700′) long, continuing beyond both ends of the 120 m (400′) ditch (Figure 7.43). At the center of the ditch and palisade were a gate and causeway crossing the ditch. The low promontory is surrounded by wetlands and water that provided the remainder of its defenses. Where the palisade line of postholes reached the wetlands, the bases of some of the actual wooded posts were preserved. The shape and features of these posts made it clear that they had been taken from the houses—large timbers and beams reused to build the palisade. The amount of wood used to construct the palisade would have required virtually all the timber in the village houses. Given the 3 m (10′) length of the house posts, the palisade would likely have stood 2.3 m (7.5′) above the ground, with a burial depth of

70 cm (20″), and 3.6 m (12′) above the bottom of the ditch—a formidable structure. Remarkably, the village appears to have been demolished in order to build the fortifications, suggesting a serious and rather sudden threat. One wonders what was left to protect.

Eketorp, Sweden

During the Iron Age, fortifications were constructed in many parts of Scandinavia as threat and conflict increased in the region. Ring forts and fortified manors are common examples. More than 1,500 such fortifications are recorded, although little remains of most of them (Axboe 1999a). One of the more spectacular examples is at Eketorp on the island of Öland, just off the southeast coast of Sweden. Eketorp was excavated almost completely in the 1960s and 1970s (e.g., Borg and Wegraeus 1976, Wegraeus 1976). A great deal of reconstruction—some would say too much—has been done to recreate the structures that were found (Figure 7.34).

There appear to have been three major phases of construction and use during the Iron Age and the early medieval period. These phases are Eketorp I from AD 300 to 400, Eketorp II 400–650, and Eketorp III 1170–1240 (Figure 7.35). The circular stone ringfort at Eketorp increased in size and complexity over time. The first wall was approximately 57 m (190′) in diameter, while the diameter of the second wall was 80 m (265′). The parapet wall of the structure today stands more than 6 m (20′) high. In each phase, the fortified wall enclosed a settlement of houses and other structures. The first phase enclosed approximately 26 houses and a population of perhaps 150 people. The second phase of the fort enclosed about 50 structures. The third phase utilized the wall from the second phase and added a second outer defensive wall.

Figure 7.34. The modern reconstruction of the last phase of the Eketorp ringfort, Öland, Sweden.

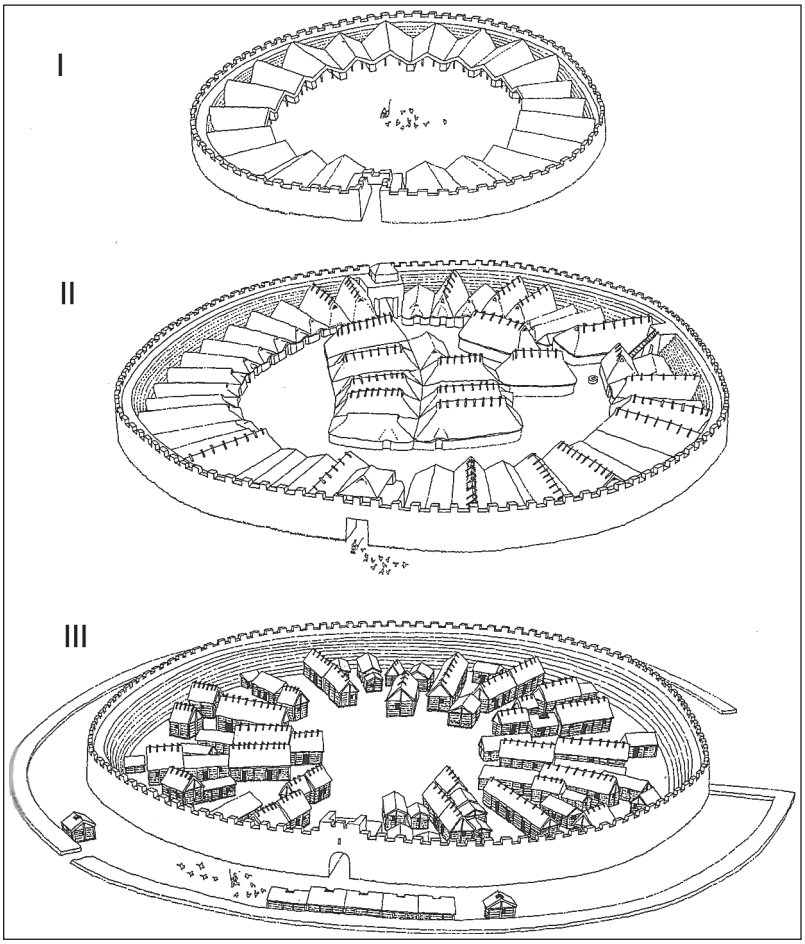


Figure 7.35.
The three construction phases at Eketorp, Öland, Sweden.

Weapons Sacrifices

Hjortspring, Denmark

The war sacrifice at Hjortspring on the Danish island of Als was excavated in 1921 and 1922 and is dated to ca. 350 BC, the oldest of these offerings from the Iron Age (Kaul 2003, Randsborg 1996). The finds appear to be the result of a single event; almost all the materials were found in and around the famous boat. The boat was probably filled with the weapons and equipment of a vanquished enemy, taken out into the small lake at Hjortspring, and deliberately sunk into the mire. A few of the weapons were destroyed before deposition, a common practice in weapon sacrifices. Several animals were also associated with this sacrifice, including a horse, a lamb, a calf, a dog, and a puppy. Spears and paddles had been pushed into the mud and left standing in the water to mark the place of sacrifice.

The sacrifice contained at least 169 spearheads, 11 swords, several scabbards and coats of mail, and 64 rectangular wooden shields with rounded corners (Figure 7.36). None of the swords or lances were identical, and they must have represented the personal weapons of individual warriors. The number of shields is extraordinary and provides a minimum estimate for the size of the defeated army, a total of perhaps 80. That group probably had 10–12 officers, based on

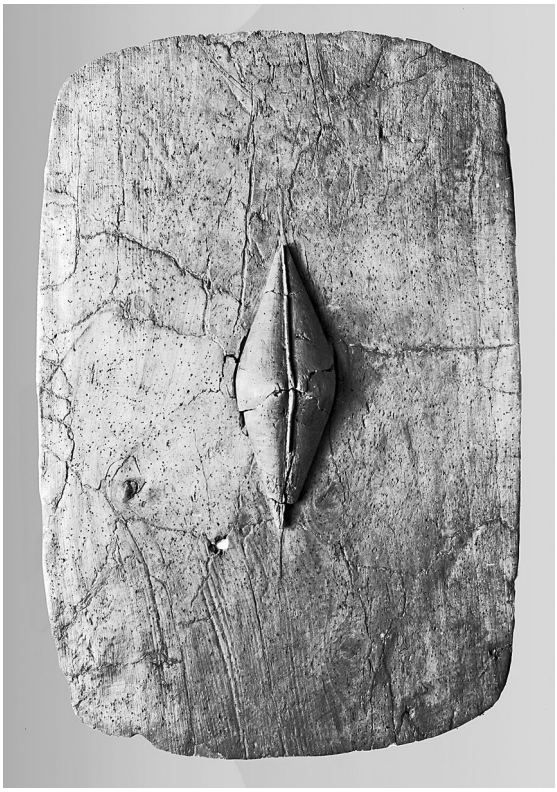


Figure 7.36.
One of the wooden shields with metal boss from Hjortspring.

the number of swords and shirts of chain mail. The precise number of warriors will never be known, because many objects were destroyed or lost during the digging of peat in this bog prior to the discovery of the archaeological materials. There is other equipment in the sacrifice as well, including bailing scoops, wooden containers, a wooden disk and plate, wooden clubs and spoons, a bundle of cords, bronze needles, a mouthpiece for a bellows, and various tools. It has been suggested that the wooden containers may have held face and body paint for the soldiers.

Then there is the Hjortspring boat itself. Following an extensive period of conservation and restoration, the original vessel began to take shape. The boat closely resembled vessels seen in earlier Bronze Age rock carvings having identical double ends at both the prow and the stern—wooden beaks that are extensions of the keel and gunwale (Figure 7.37). The boat is made of lime wood; the paddles are maple. It was clinker-built, 21 m (70′) in total length, 13 m (43′) long inside, and 2 m (6.5′) wide, weighing about 530 kg (1,170 lbs.), and built between 400 and 300 BC. The boat had a bottom plank with two wide planks on either side, sewn together with bast. The boat would have needed a steering oar on either end, since it could travel in both directions, a distinct advantage in narrow waters or at a time of haste.

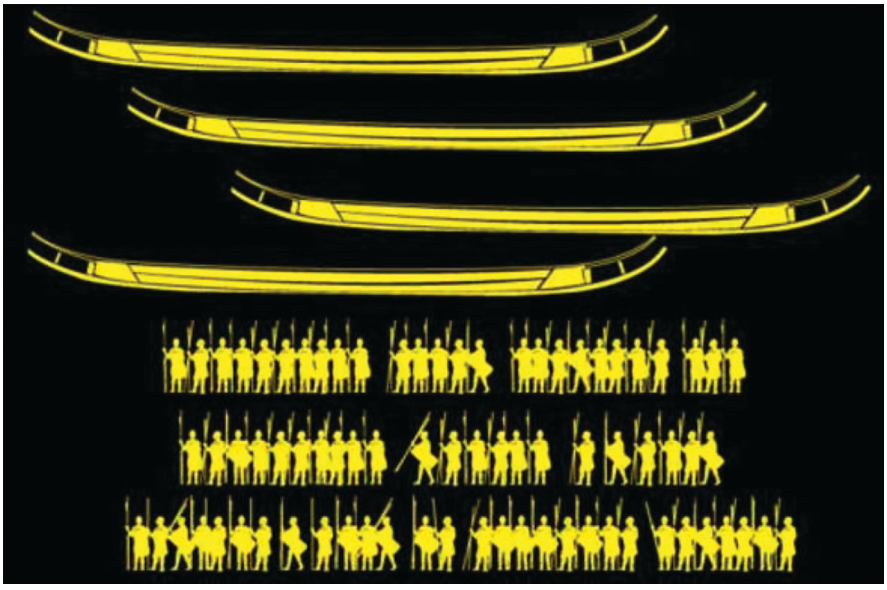


Figure 7.37.
An artist's depiction of four Hjortspring boats and the army of approximately 80 soldiers they carried to battle somewhere near the war sacrifice in the bog.

The boat probably held a crew of 23, with 20 paddlers, a leader, and two helmsmen, one at each end. Based on the number of weapons from the sacrifice, 80 or more combatants would have needed at least four boats to travel to battle (Figure 7.36), although only one was found in the bog. These boats were seaworthy, fast, and maneuverable. A modern reconstruction of the Hjortspring boat demonstrated that it handles well in rough seas and high winds. Under good conditions, the modern version of the ship could travel up to 100 km (62 miles) in a day.

Illerup, Denmark

Another war sacrifice at Illerup in Denmark provides evidence of even larger military units (Ilkjær 1991, 2000, 2007). These war booty offerings represent a series of separate ceremonies over a period of several hundred years in the lake (Figure 7.38). Based on the number of items found from a single offering dating to 200 AD, it has been estimated that the defeated invading army was approximately 1,000 men strong. After the fighting was over, all the weapons and personal equipment of the vanquished were collected, broken, and either thrown out in the lake or dumped in bundles from boats. Animals—cattle and horses—were slaughtered at the shore. The vanquished soldiers may have been executed elsewhere, perhaps Alken Enge as mentioned earlier. The style and characteristics of the personal equipment point to Norway as the place of origin of the vanquished army. The numbers of men

Figure 7.38.
A small portion of the excavations at Illerup enclosed in a wooden frame to facilitate excavation. Visible in the photo are spears, shield bosses, and scabbards The light wood frame is a modern addition to assist the archaeologists in the excavation of these materials.

involved and the distances traveled to attack an enemy bespeak powerful leaders, substantial logistical support, and a major commitment of resources. The reasons for such attacks must have been formidable as well—wealth, land, power, revenge?

Nydam, Denmark

The Nydam bog lies in southern Denmark very near the German border. The place of offering was originally a small lake, about 700 × 200 m (2,300′ × 650′) during the Iron Age. That lake gradually filled up with detritus—organic matter, leaves, sediments and the like—until there was no longer any standing water—the lake became a bog. The first excavations at Nydam took place in 1859, under the direction of Conrad Engelhardt, and continued until the outbreak of the Second Schleswig War between Denmark and Germany in early 1864 (Jankuhn 1983). Engelhardt found weapons, tools, pieces of clothing, and three boats—two intact, one of oak and one of pine, and a third oak boat that had been destroyed before being sunk in the bog (Figure 7.39). The boats were a great surprise—the Nydam bog lies more than 3 km from the sea. Unfortunately, some of these finds disappeared during the Schleswig War. The pine boat, for example, was broken up for firewood by soldiers.

The list of sacrificed weapons included hundreds of swords, shields, spears and lances, bows and arrows, axes, and knives. Personal effects such as belt buckles, brooches, and ornate clasps were recovered. All of these finds, including the boats, had been symbolically or literally killed. The conquerors broke the wooden spears and ax handles, splintered the arrow shafts, and bent the arrowheads and spear points. The very valuable swords were heated and twisted into uselessness and thrown into the lake. The boats were broken up or scuttled, holes hacked in the hull to sink the vessels. This was a sacred act. As one of the excavators of Nydam said, "the lakes were the churches of the Iron Age."

Figure 7.39.
The restored Nydam boat in the museum at Schloss Gottorf, Germany.

The oak boat was the first to be discovered and is the only one remaining (Rieck 2003, Jørgensen et al. 2003). The oak planks from this warship have been dated by tree rings to AD 310–320. The oak boat is the second oldest vessel known from Scandinavia and the oldest known clinker-built boat in Europe. Clinker-built hulls were made by attaching long wooden planks to one another side by side, so that they overlap along their edges. Every plank was made from a single piece of wood, up to 16 m (52′) long. Oak trunks of that length are very rare today. The planks are very thin, only about 2 cm thick (less than an inch). The overlapping planks were fastened with iron rivets. (Technically, the Nydam vessels are boats; ships have to be big enough to carry boats.) It is 23 m (75′) long and ca. 4 m (13′) wide, and built for 15 pairs of oars. The Nydam boat probably weighed five tons when equipped for sailing.

The National Museum of Denmark reopened the excavations at Nydam in 1989 in a ten-year project. Engelhardt had excavated directly around the boats; the National Museum expanded the area of the excavations. A lot of new finds, some 15,000 artifacts, came to light, along with some very important information about the context of the discoveries from Nydam. One of the new finds included a complete steering oar from one of the Nydam boats (Figure 7.40).

It was also determined that the three boats represented three different offerings (Jørgensen et al. 2003). The broken-up oak boat was the oldest, sacrificed around AD 200. The pine boat was put in the lake during the early fourth century and the large Nydam warship around 350. New pieces of the pine boat were found, including a carved "captain's seat" decorated in a style similar to designs from the Swedish island of Gotland. The pinewood itself apparently grew on Gotland or eastern Sweden, suggesting that the vanquished army with the pine boat might have come from that mid-Baltic location. Oak did not grow in southern Denmark

Figure 7.40.
An intact steering oar, or side rudder, from one of the Nydam boats was recovered in the excavations.

at that time, and the wood must have been of distant origin. Large stands of this type of oak were available in southern Sweden, along the Baltic coast, and possibly in parts of northern Denmark.

In addition to the ships, the new excavations identified at least six other large votive deposits of weapons, equipment, and personal gear dating between 200 and 470. A great deal can be learned from the weapons and equipment. Military equipment has been found in Denmark belonging to armies and soldiers with their origins in southern Norway or western Sweden, the Baltic area, and northern Germany. The movement of a thousand soldiers, equipment, and provisions would have required careful planning and preparation and considerable financing. Large quantities of Roman military equipment in several weapon offerings also show that some of the fighting men may have spent time as mercenaries in the Roman army.

The equipment of army leaders can be identified from the precious metals used as inlay in spurs, lance heads, and spearheads. Swords with metal hilts and armor belonged to the upper military hierarchy. Swords with bone or wooden hilts, axes, spearheads, and archery equipment were used by common soldiers. The shields of the higher-ranking officers were furnished with silver gilt ornamental fittings, and the shield bosses could be of solid silver with gilded ornaments. The commanders might wear chain mail, splendid belts with silver gilt mountings and inlay, beautifully carved scabbards with silver mountings, and swords with silver-ornamented hilts. Wooden clubs and other adapted weapons may have been associated with the lower level of the military unit, perhaps the individuals responsible for logistics and support.

From the weapons it is possible to reconstruct the organization of these armies. Finds at the weapons sacrifice at Ejsbøl, Denmark, provided significant details. Most of the warriors were armed with lances, spears, and a large circular shield; about one-third had a sword instead of spears. These weapons appear to have been mass-produced. There were around 200 spears and lances, 120 shields, and 60 sets of belt buckles, swords, and daggers. The numbers suggest around 60 foot soldiers, each with a belt, sword and dagger, two shields, and three spears. A small number were archers. Several beautifully preserved longbows of yew and hazel and hundreds of arrow shafts have been found. A few finds of riding gear indicate a small contingent of cavalry. In one depot, the number of weapons and pieces of equipment and riding gear showed related numbers of different items of horse equipment—nine saddle braces, nine bridles, nine sets of spurs—indicating nine mounted soldiers. The numbers of swords and shields accompanying this deposit indicated approximately 175 food soldiers with shields and another 26 spearmen without shields. These are rough estimates, but suggest that the size of the defeated army was substantial.

The amount of material and the quality of the craftsmanship in these offerings are staggering. Two of these collections are described here. The Nydam II offering included silver scabbard fittings and other finds from the early fifth century. Nydam IV was the last deposit of weaponry, primarily lances, spears, and swords from the latter half of the fifth century.

The Nydam II offering came from the boat area and included horse equipment—bronze and silver belt fittings, a mouthpiece of gilded silver with carved decoration, another mouthpiece of gilded silver with three bands of enamel

inlay alternating with gilded bands with small stamped decoration, and a buckle of bronze with silver rivets. There are a number of swords and scabbards. The scabbards of wood are beautifully carved with various vine motifs. The metal end of one scabbard was silver with a silver ball at its base, from which a gilded head with inlaid black eyes emerged. Some sword pommels were bronze with animal heads on the ends. This offering was probably put in place around AD 400.

Nydam IV, the last deposit of weapons, was dumped in a hole in the bog around AD 475. In a ring around the pile of weapons, 36 swords were stuck into the peat. The blades of these swords had been deeply cut, suggesting intentional ritual destruction. One of the swords had a large gilded pommel of silver, with animal decoration; the others had pommels of iron or bronze. Some of the wooden scabbards were decorated with carved ornamentation. The pile also contained several gilded sword scabbards with silver fittings, and there were three bronze fittings from a Roman military belt.

Small personal items (tweezers, ear scoops, and two wooden combs) were of Nordic origin. Textiles were not preserved, but silver hooks and eyes for fastening clothing were found. Fifteen broken shield bosses document the presence of wooden shields in the deposit. This offering contains about 90 lance heads and 15 spearheads, all broken from their shafts. A swastika was inlaid in silver on the blade of the largest lance head. On the opposite side, the same lance had a tiny depiction of a wolf inlaid in gold (Figure 7.41).

An important question remains. Why was all this warfare taking place? Although raids and plundering for treasure, slaves, or women may have been a part of the conflict in northern Europe, a larger aspect of this warfare appears to have been political and territorial. The large size of the armies that were fielded points to military alliances among several chiefs or rulers in attempts to seize dominion, wealth, and territory. These military activities would be early examples of the consolidation of territory and power that mark the growth of political entities across Europe in the Iron Age and more recent periods.

In fact, the history of the Nydam finds themselves is a story of politics and warfare. After their removal from the bog, the excavated materials from Nydam were stored in the nearby Danish city of Flensburg. However, the Second Schleswig War, lost by Denmark in 1864, resulted in the transfer of the Duchy of Schleswig and the city of Flensburg to Germany, along with the finds from Nydam. After several years, the collections were moved to Kiel. The city was heavily bombed during the Second World War as an important naval base and shipbuilding center for submarines and some 80% of the city was destroyed. Fortunately, the

Figure 7.41.
A stylized wolf inlaid in gold along the edge of a lance head at Nydam.

Nydam collections and other materials from the Kiel museum had been moved for safekeeping to Schloss Gottorf in the small town of Schleswig, an hour west of Kiel, where they remain on display today as the centerpiece of the museum.

Vimose, Denmark

Vimose is a small bog a few kilometers northwest of the modern city of Odense on the island of Funen. Peat digging for fuel and subsequent archaeological excavations in the nineteenth century resulted in more than 4,000 finds at Vimose (Engelhardt 1869). Only about 2% of the entire bog was investigated. Many of these objects had been destroyed—burned, bent, or broken, and often bundled together, tied with cord or clothing, and thrown into the mire. The finds include a large number of offensive weapons—swords, lances, spears, bows, and arrows—as well as defensive equipment such as shields and shirts of mail armor. There are at least four whole bows and a number of fragments from the bog. These bows resemble an English longbow, ca. 1.8 m (5′11″) in length and 3 cm (1.2″) in diameter, made of yew, with a range of almost 150 m. Arrows were of pine and ash between 70 and 90 (28″–35″) cm long, with either bone or iron heads; more than 170 arrowheads were recovered. The one complete shirt of mail contained more than 20,000 iron rings and would have weighed just under 10 kg (22 lbs) (Pauli Jensen 2003).

There were also a variety of personal items of dress and equipment such as belts, knives, fire-making materials, combs, beads and other jewelry, dice and gaming pieces, and a game board. Horse equipment included several kinds of spurs and stirrups, as well as fittings for bridles and harnesses. There was equipment for eating in the form of iron cooking pots and a meat fork, along with wooden dishes, plates, and cups. A number of other wooden objects were preserved in the bog, including a wheel with eight spokes and a heavy rim, a large ladle and hand-carved bowl, tubs, troughs, and buckets. There were also a number of fittings, oars, and iron rivets, suggesting that one or more wooden boats may have been placed in the bog as well. An iron anchor had been pulled from the bog many years earlier. Finally, there were a large number of tools for maintaining an army and its equipment.

These materials were placed in the bog—probably in important ritual ceremonies—in at least three major episodes of deposition and several smaller ones. The largest offering took place in the Roman Iron Age between AD 200 and 250 and contains more than 200 lance heads, 155 spearheads, some 300 scabbard fittings, and 67 swords which appear to be of Roman manufacture. Several of the swords were largely ornamental, worn by officers. Some of the hilts or pommels were of elephant ivory, used to decorate the finest Roman swords. The number of scabbard fittings suggests that the vanquished army numbered close to 300 men.

The abundance of tools found at Vimose was surprising and indicative of the equipment needed to maintain an army in the field. Some have suggested that there may have been one support troop present for every soldier. The tools were for primarily for iron- and woodworking and suggest the presence of smiths and carpenters in the army's camp. These tools included many axes and adzes, an anvil, different types of hammers, pliers, chisels, files, drills, augers, planes, awls, a pump drill, and whetstones (Christensen 2005). There were also pieces of a lathe.

Among the many discoveries at Vimose, the runic inscriptions on some of the objects must be counted among the most important. These inscriptions are some of the oldest known examples of runic writing and appear on several different materials. The bone comb with the word *harja* is probably the oldest known inscription in existence, dated to AD 160 (Figure 7.42). Other objects with writing include a buckle, a spearhead, two scabbard fittings, and a wood plane. The inscriptions are probably the owner's name or invocations to the gods.

Figure 7.42.
A bone comb with runic inscription *harja*, dated to AD 160, the oldest known example of this writing system.

A singular object from Vimose is the bronze griffin head, ca. 12 cm (5″) high. The griffin was a creature of legend among the Romans, a hybrid of eagle and lion, a symbol of military power. This symbol is often found on military equipment in the Roman world. The griffin from Vimose (Figure 7.43) was found in 1849 by workers digging up the peat for fuel. They reported that the object had been found sitting atop a pole with a red and blue flag attached. Unfortunately the flag disintegrated when it was moved. The griffin may have come originally from a Roman cavalry or parade helmet. Clear connections with Rome are indicated by the Vimose finds, and it is important to remember that many of the soldiers fighting in the north may have served as mercenaries in Roman or other armies to the south and carried home ideas, writing, and wealth in addition to weapons.

The ornamental shields with fittings of precious metal from Vimose show a great similarity to those from other weapons sacrifices and also to those from princely graves in Germany and elsewhere in Central Europe. The close resemblance among these shields reaffirms the hypothesis that there was a network of communication and exchange among the elite over a large part of central and northern Europe. The abundance of Roman military equipment at Vimose, along with the rich ornamental shields and horse equipment with precious metals, points to a German warrior aristocracy and an origin of the conquered army to the south in parts of Germany or Poland in closer contact with the Roman Empire.

Figure 7.43.
The bronze griffin head from Vimose bog, 12 cm high.

THE BOG PEOPLE

Archaeologists rarely find flesh on the bones of the past. Much of what we know about our ancestors and their lives comes from the detective work of piecing together information from pieces of pots and broken tools, remnants of house remains and other structures, discarded bones, and buried skeletons—the broken, forgotten, and hidden pieces of what human society once built, made, and used. Unusual

finds, especially human bodies preserved from the past, immediately capture our attention. These discoveries emphasize the fragile nature of the human condition. Egyptian mummies, for example, are of great fascination to most people.

Among the most remarkable series of preserved prehistoric bodies are the "bog people" from northern Europe (Glob 1977). The Huldremose woman described at the beginning of this chapter is but one example. Hundreds of individuals have been found in the peat bogs of northern Germany and southern Scandinavia, dating largely to the centuries around the birth of Christ. These bogs have marvelous preservative powers. The accumulation of peat and organic detritus that fills these swamps and mires contains tannins from the leaves, bark, and wood of certain trees. Tannins, used for tanning hides, are one essential factor in the preservation of the skin of the bog bodies. A second is the waterlogged conditions, which create an oxygen-free, often low-acid environment where bacteria does not break down soft tissues.

The bog bodies are usually not the result of accidental drowning, punishment, or disappearance. They are a curious consequence of the beliefs and practices of early Iron Age society. These people viewed certain bogs as sacred places where sacrifices should be made to the gods. Long braids of human hair were cut off and thrown in the bogs as one form of offering. Gifts of food were made by sacrificing animals and depositing pots filled with various fare. Weapons and jewelry of bronze, iron, and gold were also placed in the mire to appease the gods. Men, women, and children were occasionally sacrificed in the sacred bogs as well. Several of the many bog people are described below, including Tollund Man, the best known because of his remarkable preservation; Grauballe man, one of the most scientifically studied corpses; and the Windeby boy, another well-preserved example from Germany.

Tollund, Denmark

Tollund Man was exhumed from a peat bog in central Denmark in 1950 by P. V. Glob of the Danish National Museum. The body had been placed in the murky waters almost 2,000 years earlier. As Glob described it, the body was very well preserved; even his eyelashes and beard were readily visible. Tollund Man had been strangled; a thin leather garrote was still tightly wound around his neck (Figure 7.44). He was naked except for a small leather cap and a belt around his waist. Tollund Man was well groomed when he died, and his hands were soft and uncallused, probably not used for hard labor. His last meal was a gruel of many different kinds of seeds and grains. He died in the spring, and his execution was likely related to the rituals of Iron Age society, which required sacrifice and offerings for the resurrection of the year and the bounty of the earth.

Grauballe, Denmark

Most of the human remains from the bogs have been examined extensively, as the bodies provide an encyclopedia of information about the past and are a source of

great human interest. One of the most studied examples comes from a place called Grauballe. Grauballe Man, as he is known, was a 30–35-year-old male whose throat had been slashed before he was placed in a small bog sometime around 300 BC. He was put in a small depression in the bog. After more than 2,000 years in the bog, his body came to light again in 1952. Several men cutting peat exposed the body about one meter below the surface of the ground. The local doctor and an archaeologist were then called to the place where one of the most important finds in Danish prehistory would be removed from its resting place.

Figure 7.44. The body of Tollund Man as he was found in the bog, with a leather belt and hat and a leather rope with which he had been strangled.

The body was excavated en bloc, which means that a wooden box was placed completely around the body so that a rectangular block of peat along with the corpse could be removed in situ from the bog. That block was carefully taken to the Moesgård Museum, near the city of Aarhus, for further excavation, cleaning, and study. The body underwent extensive examination and conservation for three years before becoming a focus of great public interest as a museum exhibit in 1955. The conservation of a complete bog body had not really been attempted before. Only the head of the Tollund Man, discovered two years before Grauballe, had been prepared for exhibit. A good bit of care went into determining the best methods for preservation (Figure 7.45). Eventually, it was decided to tan the body of Grauballe Man like fine leather. The interior cavities of the body were filled with chips of oak bark.

On the 50th anniversary of the discovery, at the beginning of the twenty-first century, a new series of examinations were done taking advantage of the numerous technologies that had come into archaeology in the intervening years (Asingh and Lynnerup 2007). This second round of studies involved many disciplines, more than 40 scientists, and many new methods, including radiological examination, CT-scanning and 3D visualization, isotope studies of the hair, new AMS dating, magnetic resonance imaging and spectroscopy of the intestines, botanical study of their contents, and a forensic reconstruction of the face of the Grauballe Man. That's quite a litany of techniques, but the amount of new information that has been obtained is remarkable.

Examination of the body provided an estimate of the height of Grauballe Man of 165–170 cm (about 5′6″), about average stature for the period. His hair was in place on his head, and a reddish stubble of whiskers remained on his face. His hair was 15 cm long (about 6″) with straight-cut ends indicating that scissors had been used. He was originally found with a short beard and moustache, which were lost during the conservation process. The eyes, nose, and mouth were well preserved. He had bad teeth, heavily worn from a diet of coarsely ground grain probably mixed with some grit. He probably suffered from toothaches due to an

Figure 7.45. The head of Grauballe Man.

active infection in two teeth at the time of death. Careful examination of his teeth revealed dark horizontal rings in the enamel of some teeth, a symptom of childhood stress, disease, or poor nutrition.

The arms, legs, feet, and hands were particularly well preserved. The nails on his fingers, and even his fingerprints, were intact. It was suggested after the discovery that the absence of calluses on his hands indicated an easy life, but it is also possible that immersion in the bog had softened the skin and removed any evidence of hard labor.

The insides of Grauballe Man were also well preserved. The gut contents probably contained the remains of several meals before his death, a gruel or soup composed of the seeds of 60 different types of weeds along with about 20% domesticated cereals—rye, oats, barley, and two types of wheat. The botanists who examined this material suggested the gut contents were by-products of grain processing, the material left after threshing and collecting the grains themselves. There were also small pieces of charcoal and sand consumed with the meals. This residual material from the threshing floor is usually food for the poor or fodder for animals. The absence of fresh herbs or berries in the gut contents argues for winter or early spring as the season of death.

Windeby, Germany

The Windeby bog body was found in 1952 near the small town of Windeby in northern Germany. The body has been dated to approximately AD 100. The preserved corpse was originally designated as the Windeby Girl (Figure 7.46), thought to be a 14-year-old female due to a slight build. DNA testing, however, has demonstrated that the Windeby corpse was male. The long blond hair of this individual had probably been tied back with a woolen band. The boy had been murdered, perhaps in sacrifice or as punishment. The body had been anchored by rocks and branches in the waters of the bog.

THE IRON AGE IN THE NORTH

During the Iron Age, with the exception of parts of the coasts, the northern two-thirds of the Scandinavian Peninsula was occupied by hunter-gatherers. The south and west coasts of Norway to Trondheim and the west, south, and east coasts of southern and Middle Sweden were inhabited by populations of farmers with connections to southern Scandinavia and the powerful societies emerging in that area. The farms at Sosteli in central-south Norway, described below,

Figure 7.46.
The body of the Windeby boy from northern Germany, dated to approximately AD 100.

document these farmers in northern Europe. There was some iron production in the north, as furnaces and slag have been found at several localities (Jørgensen 2011). Iron ores were available in various parts of the north, and these provided an important and valuable resource. Several important centers emerged in areas where some farming was possible or other natural resources (e.g., fish, iron ore) provided a source of trade goods and wealth. Examples of such magnate estates include Borg in northern Norway and Högom in northern Sweden, both discussed below.

There is a tendency in Norwegian archaeology to associate large Iron Age burial mounds with the farms of chieftains (Storli 2010). Such magnate farms usually had several buildings, including a large hall, a monumental boathouse (longer than 20 m), and a distinctive court (or courtyard) site. The court site involves a series of side-by-side house foundations in a circular or horseshoe arrangement. A total of 26 court sites have been reported along the Atlantic coast of Norway, and many of them appear to have been used almost continuously during the first millennium. Their function is debated; various suggestions include barracks, a part of the chieftain's farm buildings, or a *thing* (Storli 2010). A *thing* refers to an assembly of people with legislative and judicatory authority as well as the place of assembly. More research is needed to understand these unusual sites.

The coast of northern Sweden in the Gulf of Bothnia saw significant changes through the Iron Age. The first 500 years of the Iron Age were a relatively quiet period archaeologically, with little evidence of human activity in the pollen record for this period (Engelmark 1976). This region would have been utilized by hunter-gatherers, but archaeological finds for much of this period are scarce (Broadbent 1978). That pattern changes significantly after AD 1, with more sites and more indications of humans modifying the environment in the pollen record.

Settlement expanded and substantial finds come from the western part of northern Sweden, where interaction with Norway can be seen in the artifacts. In the southern interior of northern Sweden, large rectangular house foundations and grave mounds are visible on the surface (Broadbent 1978), probably associated with farming groups expanding from the south.

The hunter-gatherers of Iron Age northern Scandinavia were likely the ancestors of today's Saami of Arctic northern Europe. These groups occupied a large part of the interior of the Scandinavia Peninsula prior to AD 1000. The Saami were pushed back into the northern third of Scandinavia (Figure 7.63) by the expansion of farming populations from the south during the Medieval Warming Period, 1000–1300 (e.g., Keigwin 1996). A more detailed discussion of the Saami presence in Scandinavia appears later in this chapter.

Sosteli, Norway

The interior of south-central Norway rises gradually toward the massive plateaus that characterize the highest part of the landscape. The Hardangervidda is Europe's largest mountain plateau, with a cold, year-round alpine climate and one of Norway's largest glaciers. The plateau sits at an elevation of 1,100 m (3,600′) and is home to herds of reindeer. The foothills to the south of the Hardangervidda have a number of fairly level areas that have provided good farmland in the interior of the country during warmer periods. A series of farms were active in this area at around 400 m (1,300′) in elevation during the Iron Age, after which the region seems to have been abandoned.

Excavations at the abandoned farm at Sosteli by Anders Hagen in the late 1940s, along with more recent research in the area, have provided some insight into the functions of these farms and the reasons for their abandonment (Hagen 1953). The occupation of the farm was dated from ca. AD 350 to 550. Hagen recorded three house foundations, several burial mounds, stone fences, and a number of field clearance rock cairns. He also uncovered one structure he interpreted as a temporary living quarters during the very first settlement at Sosteli. Others believe this structure to be a hall, based on the two long hearths inside (Myhre 1980). Iron slag and fragments of iron objects are common in this structure and, along with the deep hearth that was present, may indicate this building was a smithy rather than some form of residence.

Hagen also found a large, 45 m (150′)–long structure that appeared to be a longhouse with a byre on one end. A third structure he thought was a barn because of the absence of hearths and artifacts. Recent investigations at the site have uncovered a fourth structure parallel to the longhouse. This pattern of two houses as a farm, one long and one smaller, ca. 20 m (66′) in length, has been observed at a number of Iron Age farms in Norway.

Moreover, recent study of the environmental pollen record at the site provides a more nuanced picture of human use of this landscape. Radiocarbon dates show that the Sosteli farm was in use for most of the first millennium. The pollen record documents changes in the climate and land use during this period. From 650 to 800 the fields were used for pasture and the cultivation of cereals and hemp. In spite of a wetter climate from 800 to 950, some cereal cultivation continued. After

950, however, the area appears to have been abandoned and the land returned to forest.

Borg, Norway

The seats of Iron Age rulers have been found in northern Scandinavia as well as in the south. On the spectacular Lofoten Islands, inside the Arctic Circle in northern Norway, the site of Borg provides dramatic evidence. This is an area where the sun is not seen for a full month, from December to January, each year. Surprisingly, however, winter temperatures are normally above freezing, and summer temperatures average 14°C (57°F). It is an area that until very recently produced enormous quantities of stockfish for export. Stockfish are fresh-caught fish, normally cod, dried in the cold air and wind on wooden racks along the coast. The dry fish filets have a long shelf life. The great cod fisheries in the Borg region were possible because of a major winter spawning migration through the nearby waters. Another important product of this area was whetstone, used both for sharpening knives and axes and for amulets and jewelry. The dried fish and whetstone objects were exported to the south. Other goods such as furs, walrus ivory, and soapstone probably also moved along this route and helped fill the purses of the local leaders of Lofoten.

The most dramatic evidence of these rulers comes from the longhouse at Borg (Munch et al. 2003). This structure is 83 m (272′) in length and was one of the longest of the great Viking halls anywhere (Figure 7.47). An earlier hall, originally built in the fifth century AD, was 67 m (220′) long, with four rooms and two entrances. The larger structure was built in the seventh century, in the same spot as the previous one, with five rooms and five entrances. The later house was demolished sometime after 950. Both houses were three-aisled, with paired wooden roof-support posts, 19 in the case of the longer house. The houses were built with wooden walls supported and insulated with a thick layer of sods on the outside.

Figure 7.47. A modern reconstruction of the 83 m (272′) longhouse at Borg, Norway.

The houses served a domestic function for much of their use life, and many of the finds were everyday tools and equipment appropriate for a large, active household, including arrowheads, sickles and scythes, and other tools of iron, along with four sword fragments. There were also a number of soapstone artifacts, especially spindle whorls and containers. More than half of the house was used for housing animals. At the same time, rich finds of gold and glass testify to the wealth and long-distance connections that the household must have maintained with other Iron Age groups far to the south. High-status gold-foil figures and sherds of glass beakers were found in the northeastern posthole of the huge hall (Munch et al. 2003). Such finds are regarded as indicators of the high position of important rulers (Larsson 2011).

Högom, Sweden

On the other side of the Scandinavian Peninsula, another important central place emerged at Högom. At the northern edge of the Germanic world, the site of Högom in the modern town of Sundsvall on the Swedish coast of the Gulf of Bothnia lies far to the north of most of the large centers that emerged at the end of the early Iron Age (Ramqvist 1992). It seems clear that some farming was taking place in this region during the Iron Age and that cultivation and animal herding helped to support the populations that dwelled in these northerly areas. Nevertheless, the major economic engine for the region probably came from trade. Wealth had more to do with sources of iron ore and the furs of abundant small mammals. The big attraction must have been the deposits of iron ore. The distinctive ingots produced in this region are found across a broad area (Hjärthner-Holdar 2001).

Ramqvist (1992) has described the area of Högom as a petty kingdom during the late Roman and early Germanic Iron Age (ca. 250–500 AD). The finds from Högom document both the rich graves and the large halls of the rulers of this region. Five seasons of excavation in the late 1980s uncovered three large mounds, two small mounds, two house foundations, and an area of agricultural fields. One of the houses was a three-aisled structure typical of the Iron Age and appears to have been a rather normal farm. The second structure was found beneath one of the large mounds and was highly unusual, with a unique construction that suggests it may have been a meeting hall for people from a large surrounding area.

The mounds at the site contained rich chamber graves. Mound 2 was ca. 40 m in diameter and 5 m high and contained a large, undisturbed wooden chamber 5 × 2 × 1.5 m (16′ × 6.5′ × 5′) in size (Figure 7.48). The grave in Mound 2 was particularly notable as the burial of a rich noble male, perhaps one of the petty kings of the north. The chamber tomb was well preserved. The body of the deceased was placed on a bed in the chamber grave surrounded by his personal possessions—weapons, jewelry, and equipment for the afterlife, along with various containers of glass, pottery, bronze, and wood which probably held various foods and drink for the journey. Preservation of textiles and clothing in the tomb was particularly good (Nockert 1991). The contents included an elaborately decorated sword, shield, lances, arrows, two richly ornamented bridles, a set of spurs, and a saddle. There was a table set for eating and drinking with two glass beakers, a bronze vessel, wooden buckets, four wooden plates, pottery, and a bronze washing

dish with a fine comb. A number of gold objects included finger rings, pendants, a coin, two small bars, and a set of gold clasp buttons found among the clothing (Figure 7.50).

The Saami

The Saami are an indigenous people living today in the Arctic regions of northern Norway, Sweden, Finland, and the Kola Peninsula of Russia, numbering approximately 80,000 individuals. Their distribution extends into central Sweden and Norway (Figure 7.49). The Saami are best known as seminomadic reindeer herders (Figure 7.50), but this tradition appears to have been a rather late development, after AD 1500. About 10% of the population today continues that traditional way of life, but most Saami pursue various modern occupations.

As with indigenous peoples in most parts of the world, the Saami have not been treated well by the countries they inhabit. A series of problems have emerged over the years as a result of discrimination. Two of the major questions involved in debates about the land and rights of the Saami have concerned the timing of their arrival and the extent of their settlement in Scandinavia. A Norwegian historian commissioned by the government in the nineteenth century concluded that the Saami lived in the far north until 1500, when there was an expansion to the south. This conclusion has been heavily debated and rejected in recent years.

There seems today to be a consensus among Scandinavian archaeologists that the hunter/gatherer/fisher populations that later developed Saami identities have occupied Middle/Northern Norway, Middle/Northern Sweden, Finland, and the Kola Peninsula since the Stone Age. There are discussions as to when Saami ethnicity was established among these heterogeneous groups, but it seems to have developed gradually, in part as a reaction to contact with populations from the south. Saami social identity may have appeared relatively late, perhaps during the first part of the first millennium AD (Hansen and Olsen 2013).

Recent excavations in Finland suggest that the first inhabitants of the Arctic interior of Scandinavia may have come from the east rather than the south (Rankama and Kankaanpää 2008, Sørensen et al. 2013). Distinctive projectile points and

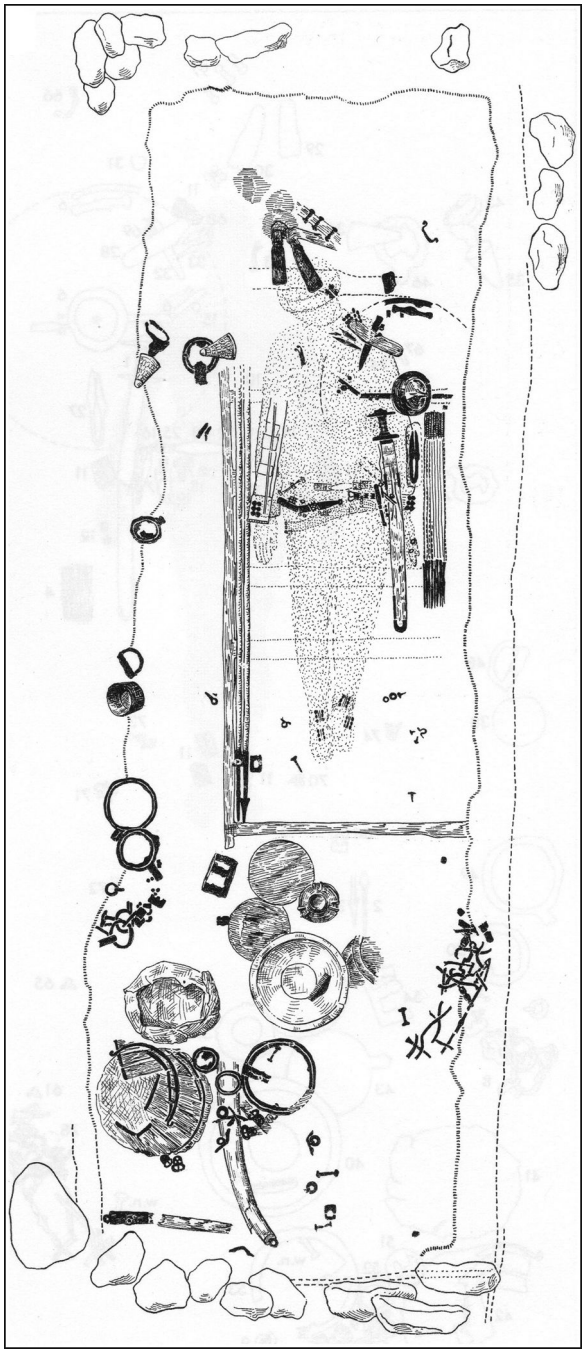


Figure 7.48. The grave in Mound 2 at Högom.

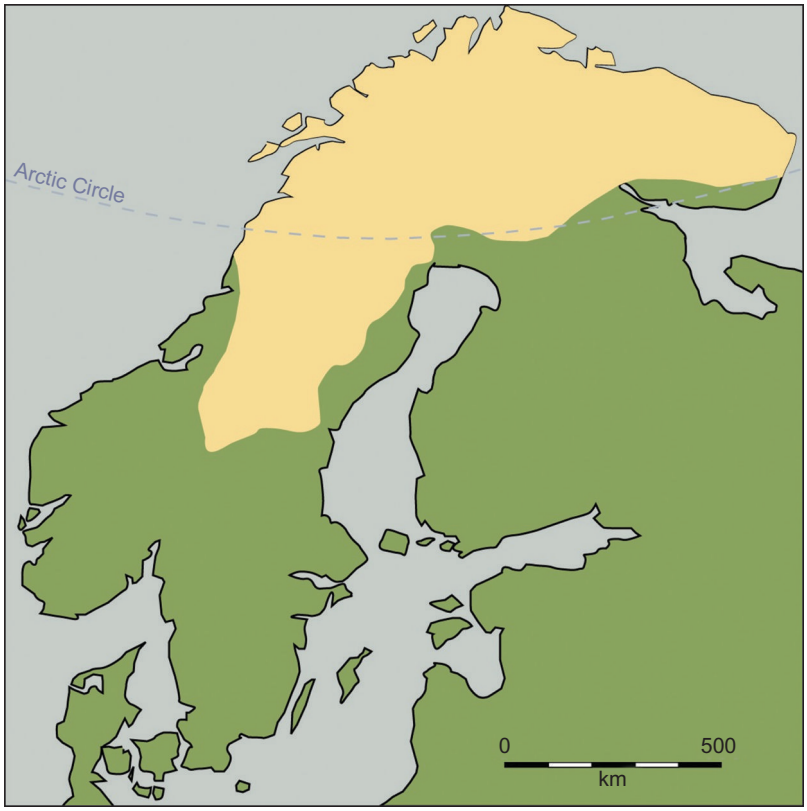


Figure 7.49.
The distribution of the Saami (yellow) in northern Europe ca. AD 1950.

Figure 7.50.
A Saami family in Finnmark, Norway, circa AD 1900.

raw material point to an eastern origin around 8250 BC. There is, however, no specific evidence to associate this material with the Saami. The Saami have probably inhabited the northern arctic and subarctic regions of Fenno-Scandinavia and Russia for at least 3,000 years (Zachrisson 2008). Since the early Iron Age, two different cultural traditions have been present in northern Scandinavia, with farming peoples along the Atlantic coast as far north as Tromsø and hunting groups in the interior and far north. These hunting groups have generally been described as mobile, egalitarian, and Saami (Olsen 2003).

Written sources from ca. AD 550 to 1350 indicate that Saami people once lived much further south on the Scandinavian Peninsula than they do today, and that the Saami and Scandinavians had a symbiotic relationship at that time (Zachrisson 1991). These questions regarding the origins and extent of the Saami remain open, but it seems likely that much of the interior region of northern Scandinavia was inhabited by Saami-related groups and their ancestors deep into the past.

The coastal Iron Age farmers in the North lived in hierarchically organized chiefdoms and established alliances with powerful groups in southern Scandinavia. Marriage and gift exchange maintained their association with the south. Prestige gifts such as exotic furs, walrus ivory, and perhaps falcons were obtained from the Saami in the interior and far north and traded or gifted to the south. The coastal chiefdoms used their power to tax and trade with the Saami in several areas (Odner 1985). The Saami also became dependent on goods and supplies from the farmers in a reciprocal relationship (Olsen 2003).

This relationship was rekindled in the Viking and early medieval period, as the northern fur trade intensified due to demands from adjacent state-level societies in Norway and Russia. This competition and stress from outside demands may well have driven the consolidation of Saami ethnicity and an increase in the archaeological visibility of distinctly Saami material culture (Olsen 2003). The archaeological evidence generally indicates that the relationship between the Nordic and Saami populations was based on cooperation and mutual respect rather than exploitation and harassment (Odner 1983, Hansen and Olsen 2004).

Various archaeological finds document a Saami presence in southern Norway and central Sweden in the Middle Ages (e.g., Broadbent 2010, Gjerde 2009). Connections between the Norse and the Saami can be identified archaeologically by the exchange of exotic material culture in the two regions (e.g., Bitner-Wróblewska 1991), and also from physical evidence of communication routes across the landscape. High in the mountains between Norway and Sweden, an archaeological survey has brought to light a trail marked by standing stones at regular intervals and high enough to rise above the winter snows. In the absence of any cultural material, the erection of the stones has been dated by the growth of lichens on the rocks, documentary evidence, and radiocarbon. Bergman et al. (2003) argue this was not an indigenous trail, but rather constructed by a Norse chieftain around the ninth century AD for safe access to the fur-trading Saami.

TREASURES

The riches of the Iron Age have appeared throughout this chapter, from the magnificent Roman grave goods with elite burials in Denmark to the extraordinary ship

burials at Välsgard and the objects found in the excavations at Gudme, Uppåkra, and elsewhere. The accumulation and deposition of wealth in hoards and graves continued an earlier tradition in Scandinavia. The objects described in this section are other renowned items of justifiable fame found in northern Europe. The list includes the silver cauldron from Gundestrup, the golden horns from Gallehus, a gold hoard from Sorte Muld, the Årslev grave, and the mask from Thorsbjerg. I have also included the wooden figures from the Braak Bog in northern Germany as a contrast to the focus on metal riches in this period. There are literally hundreds of other objects that could be included in this section.

Gundestrup, Denmark

The Gundestrup Cauldron, found in a peat bog in northwestern Sjælland in 1891, is one of the masterpieces in the Danish National Museum (Figure 7.51). The large silver vessel had been placed in the bog in pieces, 17 in all, perhaps as a sacrificial offering. The large gilded silver vessel weighs almost 9 kg (20 lbs.) and is 69 cm (27″) in diameter and 42 cm (16.5″) high. It is the largest known example of silver work from Iron Age Europe and probably dates from the first centuries AD, during the Roman Iron Age. It is also one of the finest examples of Celtic art known anywhere. The cauldron was likely made in a workshop in Central Europe using silver from several sources in northern France and western Germany (Nielsen et al. 2005).

The cauldron is built around a large bowl with a baseplate, seven outer plates, five inner plates, and a rim. The elaborate decorations are hammered in raised relief and depict various gods, goddesses, and other scenes, often militaristic or ceremonial in nature, such as a procession of warriors, a bull sacrifice, and a god with antlers surrounded by lions, deer, and griffins. The base plate shows a large bull being killed or sacrificed by a female with a sword and three dogs. The inner and outer plates show Celtic warriors in full military attire, both cavalry and infantry, and various deities with arms raised in the air, one with horns and a neck ring

Figure 7.51.
The Gundestrup Cauldron.

called a torq, and a person riding a dolphin. There are also two elephants depicted as mythical beasts on the vessel; the elephant would have been unknown in northern Europe in the early Iron Age.

Gallehus, Denmark

One of the many remarkable stories in the archaeology of Scandinavia concerns the Golden Horns. These two artifacts were found near the town of Gallehus in southern Jylland, 100 years apart in time. The first horn was found by a local girl in 1639 and reported to the king. The second, shorter horn was found a few meters away in 1734 (Figure 7.52). The longer horn was 75 cm (30″) in length, with an opening of 10 cm (4″). The total weight of the two horns was almost 7 kg (15.5 lbs.). The two objects must have been part of the same hoard and would have been buried together sometime after AD 400, when they were made. It is unknown whether the horns were for drinking or blowing, although drinking horns were more often made from precious metal.

They were in every way extraordinary. The horns were made of two layers of metal, an outer sheet of pure gold and an inner sheet of gold amalgamated with silver (Hartner 1969). They were decorated with numerous figures soldered or embossed on the surface of the outer sheet. The motifs were both Roman and Nordic in origin. The shorter horn, which was missing one segment, also had a runic inscription placed by the maker to identify his work.

The outer sheet of each horn had a series of rings that divided the length of the tube into segments covered with figures of humans, animals, and mythological creatures. Among the many designs were a number of intertwining serpents, a figure described as a Valkyrie holding a horn, two masked figures armed with sword and shield, and two other armed figures with large horns or antlers similar to the Gundestrup cauldron. There also appear to have been several depictions of Norse gods, including Tyr, Odin, Thor, and Freyr.

Figure 7.52. Copies of the Golden Horns from Gallehus, Denmark.

The horns have had an unfortunate history since their discovery and are no longer with us. Both horns were stolen and melted down in 1802 by a felonious goldsmith. Their exact original appearance is unknown. A set of plaster casts of the original horns were made for a cardinal in Rome, but those were lost in a shipwreck. A second set of casts, sent to a professor in Germany, also disappeared. The molds for these plaster casts were discarded because they were considered to be of little value. Fortunately, detailed drawings were made of parts of the horns in the seventeenth century, so that some information survives. These drawing were used to make new copies in the later twentieth century. These new gilded copies have since been stolen twice from museums in Denmark.

Sorte Muld, Denmark

Among the many metal detector finds from the site of Sorte Muld on the Danish island of Bornholm was an unusual gold hoard. The find contains a number of gold bracteates, a distinctive artifact from the period between AD 450 and 600 in northern Europe. These bracteates are found almost exclusively at large central sites. Bracteates are round pendants of gold, two to three cm in diameter, with a bail for suspending them from a chain or string. The bracteates were decorated with images of Nordic gods, combining wealth and ideology in a single piece of jewelry. Some of the Nordic deities can be identified including Odin riding on his horse Sleipnir. Clearly, Nordic religious beliefs were in place at this point in the Iron Age. The origins of these gods are unknown, but may be related in part to the Roman pantheon, which was familiar to the inhabitants of southern Scandinavia from the beginning of the Roman Iron Age.

The objects shown in Figure 7.53 were found with a metal detector in 2001.The tubular piece resembled part of an automobile exhaust pipe, but further examination showed that was far from the case. The "pipe" turned out to be a silver plate that had been rolled around a remarkable set of gold objects—five bracteates, six

Figure 7.53.
One of the gold hoards from Sorte Muld on Bornholm.

gold Roman coins, two cross-wheel pendants, and two kinds of gold filigree beads. These objects may have been part of a single necklace or chain before being buried in the ground for safekeeping or as an offering.

Årslev, Denmark

Among the many spectacular graves from the Roman Iron Age, the finds from Årslev on the island of Fyn may be at the top of the list. The grave was discovered in 1820 and contained the skeletons of two women, lying side by side (Storgaard 1994). One of them may have been a slave or handmaiden who accompanied her mistress in death. The grave has been dated to the end of the fourth century BC.

The grave was filled with riches—bronze dishes and buckets, a silver spoon, a crystal ball, and an extraordinary set of jewelry (Figure 7.54) Among the jewelry items were seven almost identical gold pendants, each with a small, round gold disk with the face of a lion holding two gold chains from which hung a gold plate with three garnets. There were two exceptional fibulae, one of gold with garnets and another of silver and gold foil. An elaborate gold finger ring held two garnets and a large piece of carnelian. In addition, there was a tubular gold pendant with a garnet on the top end and three half wheel shapes hanging on gold chains, a silver spoon, a gold Roman coin made into a bracteate, and a small crystal ball. Such crystal balls are better known from the later Germanic Iron Age and Viking period. This one has been engraved with a palindrome—a word or phrase that reads the same in both directions. The inscription from Årslev reads *ABLANA⊙ANALBA*; the words mean "You are our Father" and were probably some kind of religious incantation. The material and style of some of the jewelry have very strong links to southeastern Europe, leading some to suggest that the wealthy woman in the grave may have been come to Denmark from that distant region.

Figure 7.54. Some of the grave finds from Årslev, Denmark. The crystal ball with the inscription is in the lower row.

Braak Bog, Germany

The bogs of northern Europe have revealed a number of spectacular Iron Age finds, normally in the form of sacrifices or hordes. These finds usually involve precious metal objects or, in some cases, humans. The bogs hold many other objects, however, and one category of interest involves effigies—human figures. The two wooden figures from Braak Bog in northern Germany were discovered in 1947 and have been dated to the second or third century BC, in the Roman Iron Age (Dietrich 2000). The male and female figures were carved from forked oak branches (Figure 7.55). The male figure was 2.75 m (9′) tall and the female 2.3 m (8′7″). The woman has a bun of hair on the top of her head and the man has short bangs. Both

Figure 7.55.
The two wooden human effigies from Braak Bog, Germany.

had long narrow torsos and exaggerated sexual features. These figures may represent local deities or gods set up in or at the edge of the sacred wetlands (Van der Sanden and Capelle 2001).

SUMMARY: CENTERS OF POWER

The Iron Age witnessed a period of political consolidation and the growth of elite rule in Scandinavia. Conflicts over territory and wealth were common as powerful chiefs struggled to establish themselves in centers of power, controlling people, ideology, crafts, and commerce. Thurston (2001) has written of the Iron Age in terms of landscapes. Early in the Iron Age, political, economic, and sacred landscapes were distinct. Important places in each landscape involved separate locations. The institutions responsible for these landscapes were independent.

The transition from chiefdoms to states in prehistoric Scandinavia took place during the Iron Age. During the early part of the Pre-Roman Iron Age, society was largely rural and the farmstead was the primary unit of settlement. At the same time, it is clear that there were levels of organization above the household and community. The finds from Hjortspring bog document the defeat of at least 60 men, a number that would have required the combined forces of a number of farms or small communities to muster (Axboe 1999). There are also a number of military defenses erected in this period, including a massive naval barricade at Gudsø Vig in southern Jylland (Rieck 1991)—activities requiring collaboration and alliance among several groups of people. By the end of the Pre-Roman Iron Age, social differentiation is clearly visible in places like Hodde, with a single larger, enclosed farmstead within the village. Some rich graves have been found from this time as well, for example, at Langå in eastern Fyn with gold rings, a wagon, and Etruscan bronzes (Axboe 1999, Henriksen 1994).

Ritual activity took place at sacred locations in the landscape. A variety of things and creatures were placed in bogs and buried in the ground as sacrifices or offerings. These objects included both prestige items, such as jewelry, weapons and religious items, and sustenance, including domestic animals and food, sometimes placed in ceramic containers. The famous bog bodies are another aspect of these sacrifices and involved ceremonial execution and deposition in lakes and swamps.

Changes began to appear during the Roman Iron Age, and the three separate landscapes merged as elite individuals took power, organized commerce, and

established centers with sacred places. Very rich graves appear in some areas such as Himlingøje with magnificent Roman objects documenting wealth, status, and active connections to the continent. Recent excavations have uncovered a nearby large estate. The magnate and his retinue represent a new political force in which the initiative for change was to a large extent transferred from farming families and kin groups to chiefs or leading clans or lineages (Larsson 2009).

Conflict is one of the hallmarks of the Roman Iron Age and likely a major engine in the expansion of political power (Carneiro 1970). This was a period of numerous weapons sacrifices, early fortifications, and relatively large military units. Warriors turned into soldiers. One of the big deposits among the weapons offerings at the Illerup Å bog represents the equipment of approximately 350 men, with only 40% of the deposit excavated. It is not difficult to imagine a defeated force of 1,000 individuals from this battle and a victorious army of approximately the same size (Axboe 1999, Ilkjær 2000). The shield bosses from this offering at Illerup appear to reflect a three-tier structure of organization in the military, with 5 silver bosses, 30 or so of bronze, and 300 of iron (Ilkjær 1997).

By the end of the Roman Iron Age, most of the landscape was in use, and settlement nucleation can be seen in a number of areas. True villages had formed. Social relations appear to have become more formalized as rank or class systems were in operation. Valuable imports and other prestige goods are seen in votive deposits and graves. There is a pronounced difference among rich and poor graves in terms of construction, contents, and placement. The burial evidence, along with differences in house size and contents, suggests that hierarchically organized chiefdoms are in place.

Important centers appeared by the end of this period at Gudme, Sorte Muld, Tissø, and Toftegård on Sjælland, Uppåkra in Sweden, and Borg and Avaldsnes in Norway. Places like Gudme document the close relationship among sacred, economic, and political realms, controlled by powerful rulers. At this time there appears to have been a decline in regional differentiation in material culture items in southern Scandinavia and increasing social integration. A number of archaeologists take this change as evidence for the emergence of a Danish kingdom in the sixth century AD (e.g., Hedeager 1992, Näsman 2000). This kingdom would have been centered on southern Jylland, Funen, and Sjælland, but probably had significant influence on or confederation with southern Sweden, Bornholm, and perhaps south Norway.

During the Germanic Iron Age, both luxury grave goods and prestige bog offerings declined or disappeared. These items instead appear at elite residences, perhaps reflecting new rules or expectations about property and inheritance (Randsborg 1982, 1990). The influence of emerging central powers increases dramatically (Näsman 2000). A radical transformation of society is reflected in increased trade, the beginnings of urbanization, and a change of worldview (Larsson 2009). With these changes taking place in the Roman and Germanic Iron Ages, southern Scandinavian chieftains were becoming petty kings; smaller polities were combined into larger ones and political entities expanded, eventually resulting in the state of Denmark during the Viking period, if not before (Hedeager 1992, Thurston 2001).

One model of these developments has been diagrammed by Näsman (1998) to indicate the social and political changes taking place (Figure 7.56). In this scheme, a shift from tribes with chieftains to tribal confederations to kingdoms is portrayed through the first millennium AD. The larger circles are groups of people—tribes

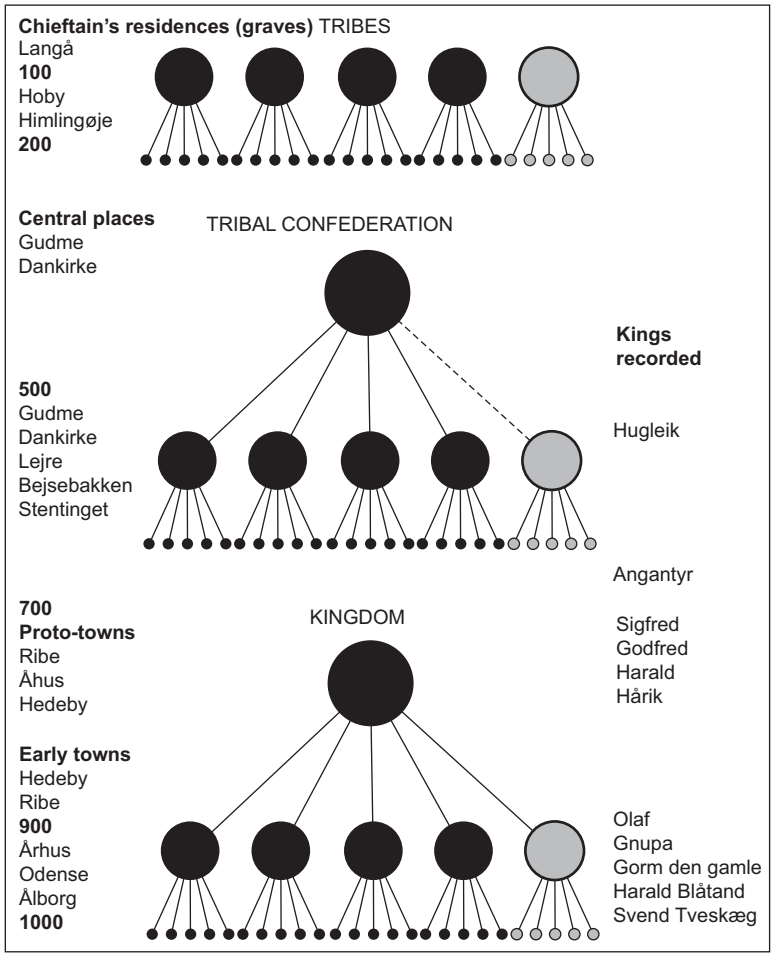


Figure 7.56.
Näsman's model for the evolution of sociopolitical structures in Iron Age Scandinavia.

or clans or lineages—and the smaller connected circles are autonomous settlement areas. The gray circle is the group of a more powerful leader of the collection of groups. A second level of control or power appears in the Tribal Confederation level, with rulers or perhaps petty kings at magnate centers emerging at this time. The dotted line to the paramount leader in the Tribal Confederation level implies less integration. The diagram also lists important sites from these three stages and shows the shift from central places to proto-towns and towns. The names of historically mentioned kings are provided on the right side of the diagram. Such models are, of course, controversial. The details can be argued ad infinitum, but the general picture is probably a useful one for understanding this time period.

The Germanic Iron Age, or the Vendel and Migration periods in Sweden, was apparently a time of reduced conflict and less wealth. Connections with and imports from the continent appear to have declined. With the fall of the Roman Empire and the decrease in long-distance trade, leaders accumulated economic wealth rather than prestigious display goods (Thurston 2001). The legitimacy of the elite to rule and to control commerce must have been institutionalized by this time. This is also the period when very large halls and estates began to appear on the landscape at Uppåkra, Gamla Uppsala, and elsewhere. These places were

centers of political, social, religious, and economic activity under the aegis of a chiefly or princely ruler. Retainers and allies were gifted with some of the less prestigious imports accruing at these central places (Lund Hansen 1995).

The first historical mention of the Danes was recorded at the beginning of the Germanic Iron Age, probably reflecting the growing size and strength of political power in the region (Axboe 1995). By the end of this period, just prior to the start of the Viking Age, a very rich center had been established at Gammel Lejre, near Roskilde, Denmark, where at least four huge halls were built sequentially on the same spot, associated with a thick cultural layer covering almost 100,000 m^2 (25 acres) (Christiansen 1991a, 2007). Gammel Lejre is described in the next chapter on the Vikings. The emporium of Haithabu in northern Germany was in operation by this time, and the Danevirke fortified wall, begun in the seventh century AD, was in place as a southern boundary marker and defense. It is at this same time that the town and market of Ribe on the west coast of Denmark was founded by 710 and the trading town of Aros on the east coast of Jylland was established. Birka in Central Sweden was founded around 750. These places are described in more detail in the next chapter.

Over the course of the Iron Age, events in Skåne and southern Sweden generally mirrored those in Denmark. Relatively early in the Iron Age the province of Skåne became tightly connected to political events in Denmark. During the Viking age, Skåne was part of the Danish state. Gamla Uppsala and the Mälardalen region in Middle Sweden, distant from developments in southern Scandinavia, follow their own, yet similar, course during this period of time. Large halls were built in the later Iron Age, and enormous burial mounds filled with wealth were erected as monuments to fallen rulers. The construction of large mounds at Borre in Norway was also begun around AD 700, documenting the burial of rich and powerful individuals in that area. The rise of these powerful chiefs in Norway may be closely related to increasing trade in iron, slate, fur, and hides with southern Scandinavia and the rest of Europe. The simultaneous development of powerful rulers in these different parts of Scandinavia emphasizes the high degree of the communication and interaction among the elite of northern Europe.

A rich Nordic art style with flowing animal designs arose in the Iron Age, culminating in the justifiably famous art of the Vikings, discussed in the next chapter. Hedeager (2011) argues that the arrival of the Huns in Europe during the fifth century AD instigated major changes in art and cosmology in Scandinavia, as well as political and military innovations. Cavalry became a more important element in the military. Hedeager has raised considerable controversy by suggesting that the Huns actually entered and dominated Scandinavia for a brief period, leaving evidence of their presence, albeit scanty, in the form of specific artifact types (e.g., crescent-shaped, open-ended gold earrings, bronze mirrors, and gold bracteates with depictions of Odin) and the new animal style in arts and crafts. She further argues that Attila the Hun may have been the inspiration for the Norse god Odin. Attila ruled the Huns from 434 until his death in 453 and was known as the "scourge of god" in Europe.

Nordic religion and mythology coalesced in the Iron Age, involving a wide range of gods and other figures with a huge lore of various deeds and their consequences that provided a moral compass for society. In the Roman Iron Age, the

first images of the Nordic pantheon appeared on gold bracteates, deities that in many ways resembled the known Roman gods. In fact, a number of bronze figurines of various Roman gods and household deities have been found in southern Scandinavia. There are also many small bronze figurines of unknown gods and other individuals. In the earlier Iron Age, many of these individuals were nude males, sometimes wearing a collar and/or a belt. Most of these figures have no known identity, but some have been recognized from the Viking Age, the next chapter in our journey.

CHAPTER EIGHT

VIKINGS! AD 750–1050

THE EXPLORERS

An extraordinary series of events began in the North Atlantic in the eighth century AD. Norse raiders, traders, and settlers from Scandinavia—better known today as the Vikings—began exploring in all directions. In addition to parts of the Baltic region, Russia, and Normandy, these groups settled in the British Isles and Ireland, including the Northern and Western Islands of the Orkneys, Shetlands, Hebrides, and Man (e.g., Batey and Graham-Campbell 1998, Clarke et al. 1999, Sharples and Smith 2009, Wilson 2008). One of the first historical records of the Vikings in Britain was a report in the Anglo-Saxon Chronicle referring to a raid on the Lindisfarne Monastery in northeastern England in 793: "*on the VIth of the Ides of June (the 8th) the havoc of heathen men miserably destroyed God's church at Lindisfarne, through rapine and slaughter*." Scandinavian dominance in England largely ended 273 years later with their defeat in 1066.

Across the North Sea, Viking settlement was well established on the Shetland and Orkney Islands by the end of the eighth century. The Orkneys and the Western Isles already had local populations, but Shetland was only lightly inhabited (Davies 1999). Norse colonists reached the Faroe Islands by 825, Iceland by 870 or so, and southern Greenland by 895 (Figure 8.1). These places were largely uninhabited. Greenland held a native population of Inuit, at that time concentrated in the northwest of the huge island. The Norse also settled briefly in North America at L'Anse aux Meadows, Newfoundland, around 1000 (Schledermann 2000, Wallace 2003). By the turn of the first millennium, a common Norse language and culture stretched from western Russia to eastern Canada.

This expansion across the North Atlantic was remarkable, given the distances involved and the dangers of the journey. Straight-line distances from Bergen, Norway, provide some indication of the scale of the voyages: Bergen to Lerwick in the Shetlands, 350 km (220 miles), to Aberdeen, Scotland, 550 km (340 miles), to Tórshavn in the Faroe Islands, 674 km (418 miles), to Reykjavík, Iceland, 1,464 km (910 miles), to Nuuk, Greenland, 2,888 km (1,800 miles), and to St. Johns, Newfoundland, almost 4,000 km (2,500 miles). Under ideal conditions, it may have been possible to sail from Bergen to Iceland in a few weeks. Historical documents make it clear, however, that more than a single return voyage in the sailing season from May until September was exceptional (Vilhjálmsson 2005). The dangers of the voyage were pronounced. Erik the Red was reported to have sailed from Iceland to Greenland with some 25 ships, arriving with only 14.

The Viking colonization began in a period of good climate, known as the Medieval Climatic Optimum. The weather was rather stable and predictable, the

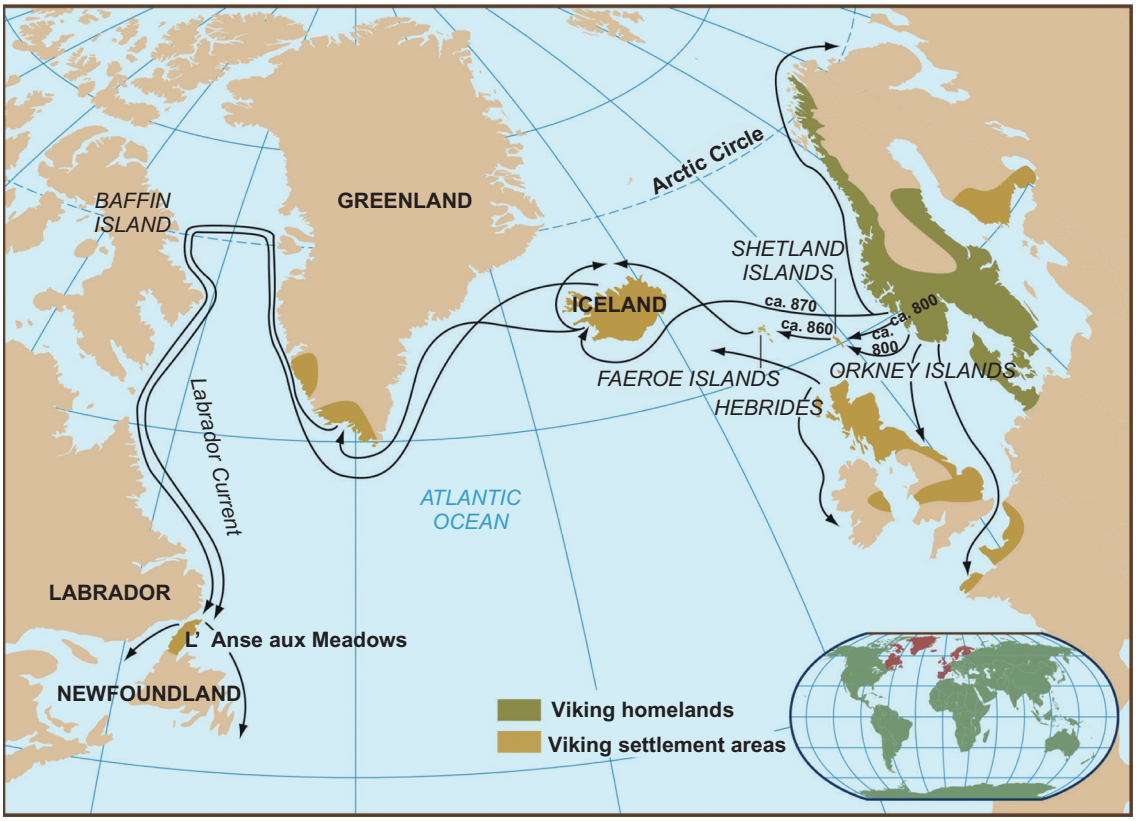


Figure 8.1.
The Viking settlement of the North Atlantic.

seas were calmer and storms less frequent. Harvests were good, fishing was excellent, the sea ice stayed far to the north, vineyards existed 500 km (310 miles) north of their present limits, and famine was rare. Viking farmers in the North Atlantic were able to grow cereals (wheat and barley) and keep herds of goats, sheep, and cattle.

Climatic deterioration began in the thirteenth century with the period known as the Little Ice Age. Glaciers expanded in Iceland, in Norway, and in the Alps. Cold climate reduced dairy production, and extensive sea ice hampered essential trade with Europe. The Little Ice Age was a time of exceptional poverty, misery, and suffering in Iceland as a result of severe winters, major volcanic eruptions, and oppressive Danish colonial rule. Fishing replaced cereals as the main source of food in Iceland. Famine and pestilence ravaged the country. The Black Plague peaked in Europe the middle of the fourteenth century, and the disease reached the islands of the North Atlantic with devastating effect. Greenland was finally abandoned by the Norse after 1480. The human population of Iceland, which had reached 70,000 or so by 1100, had dwindled to only 34,000 by 1708 (Magnússon 1987). Following a huge volcanic eruption in 1783, there was serious discussion of evacuating the remaining inhabitants to Denmark.

Explanations of the Viking expansion have invoked population growth, polygamy and primogeniture, political unrest at home, favorable climatic conditions, ship design, the wealth of Anglo-Saxon Britain, and an adventurous spirit, among other possibilities (e.g., Barrett 2008, Byock 2001, Jones 1986,

Simek 2004). A generally accepted view at one time was that petty chieftains from West Norway immigrated to Iceland to escape the growing power of Norway's first unifying king, Harald Fairhair (ca. 865–930) (Smith 1995). Whatever the causes, the Norse colonization of the North Atlantic was a remarkable achievement.

THE VIKING AGE

The Viking period is the last phase of the Iron Age in northern Europe, dating from approximately AD 750 to 1050. The exact dates for the period are somewhat controversial among specialists. In Sweden the Viking Age begins at 800, although this date is hotly debated. Here I will use the Danish start date of 750. The period ends at 1000, 1050, or even later, depending on whom you ask; 1050 will do for now. The word *Viking* has been used in the last few hundred years to describe these Scandinavians almost interchangeably with the word *Norse*, which is likely closer to the traditional name of these people. The term *Viking* probably comes from the Old Norse word *víkingr,* used in connection with seaborne travel and piracy in later written sources (Brink 2008).

The Vikings were farmers, occupying most of the cultivable lands in their Scandinavian homeland—northern Germany, Denmark, South and Middle Sweden, and Norway with the exception of the high interior and the far north. The Vikings were also rulers and peasants, warriors and explorers, sailors and navigators, merchants and traders, craftsmen and artisans, mothers and children, as well as plunderers and pirates. Their remarkable achievements are often left unspoken among the harrowing accounts of their marauding along the coasts of England and other parts of Western Europe.

The continuing conflicts among myriad chiefdoms of Iron Age Scandinavia, discussed in the previous chapter, had a cumulative effect as conquests and alliances resulted in larger territories and more powerful political entities. Chiefs became kings. No later than the Viking period—and probably earlier—one or more of these polities became a kingdom or early state-level society (e.g., Axboe 1999a, Randsborg 1980).

There is disagreement among archaeologists and historians about the appropriate designation for the Viking polity. Carneiro (1970) defined a state as an autonomous political unit with various communities within its territory, having a centralized government with the power to collect taxes, draft men for work or war, and decree and enforce laws. States are territorial, often predatory, with social classes structuring human roles and status, and can be distinguished from chiefdoms by greater population, size, and complexity, and by having a permanent bureaucracy. States are often associated with monumental architecture in the form of massive earthworks and other constructions. Randsborg (1980) and a few of his colleagues have applied this definition to the Vikings. Others insist on the term *kingdom*. The definition of a kingdom is simpler and less controversial—a political or territorial unit ruled by a monarch. *Kingdom* will be used in this chapter. Whether the Vikings actually constituted a state-level society can be argued elsewhere.

One of the early rulers of large territories during the Viking Age in Scandinavia, King Harald Bluetooth, proclaimed his reign over what is now modern Denmark and a bit more on the famous rune stone at Jelling in 965. By the end of the Viking period, parts of England, Sweden, and Norway were also ruled by a Danish king. There are literally hundreds of Danish and Norwegian place names in England and Ireland today, reflecting the long-term presence of these Scandinavian colonists. The city of York gets its name from the Old Danish term *Jórvík*. The name for Normandy—that part of France colonized by the Scandinavians—refers to the people from the north.

The Vikings built magnificent ships capable of crossing the North Atlantic or sailing up major rivers in Europe. These ships made long-range exploration, stealthy raiding, and extensive trading feasible. Viking ships moved goods and cargo throughout the Baltic and beyond. Long-distance trade with many parts of Europe in items such as codfish, glass beads, steatite vessels, amber, whetstone, walrus ivory, furs, polar bear skins, and slaves had expanded though the Iron Age. Changes in this system during the Viking period were to bring greater commerce to the north as emporia—large, centralized markets or trading places—spread north and across the Baltic area at sites like Haithabu, Ribe, Aros, Kaupang, and Birka.

The Viking period was one of the most dynamic episodes in Scandinavia's past. Within a brief period of 300 years of so, the Viking kingdom ruled parts of England, Ireland, and France; Vikings visited much of Europe and settled the largely uninhabited islands of the North Atlantic. The Vikings also spread along the Atlantic coast of Europe to modern Portugal and Spain, conquering Lisbon and Seville for a short time in 884. Three centuries of the Vikings changed Scandinavia forever. From an almost unknown pagan land at the edge of Christian Europe, by the end of the Viking period much of Scandinavia was ruled by Christianized kingdoms. The north had become an important player in European politics and commerce.

The themes discussed in the succeeding pages in this chapter include Farms, Villages, and Estates, Towns and Centers, Fortifications and Defense, Graves and Tombs; the Viking Ships, and Treasures. The locations of the sites discussed in this chapter are shown in Figure 8.2. These sites were selected because of their importance and what archaeology has learned about them. But first, dramatic evidence for the Vikings in England at a site called Ridgeway found near Weymouth in 2009.

Ridgeway, England

The Vikings' arrival was not warmly welcomed by their English hosts. Conflict appears to have been common between the locals and the invaders (Pollard et al. 2012). There is dramatic evidence for this at several locations in southern Britain, particularly at a site called Ridgeway near Weymouth in the south near Dorset, England. During the course of highway construction, a mass grave was found containing 54 headless human skeletons and 51 detached skulls. The grave is dated to around AD 1000. The skulls were found in a pile next to the mass of headless bodies that had been cast into an old quarry pit from Roman times (Figure 8.3). The quarry and mass grave were alongside an ancient roadway.

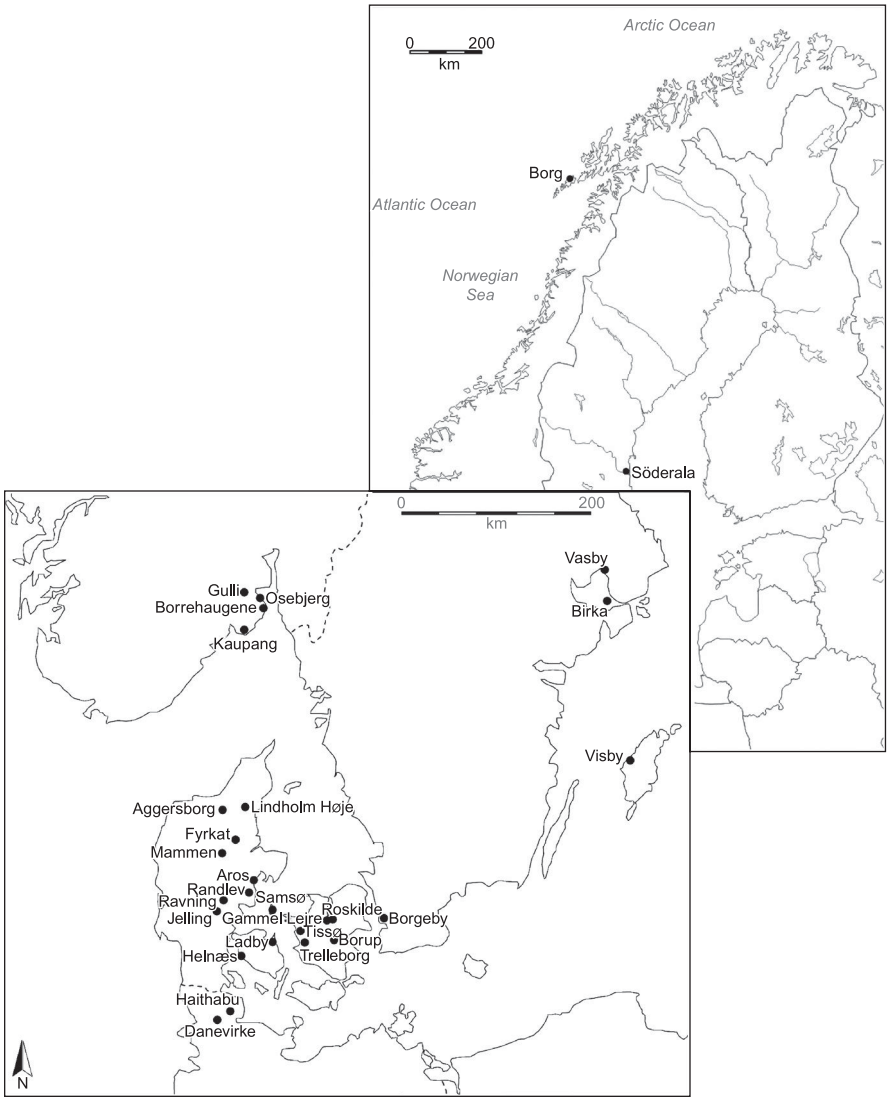


Figure 8.2.
Location of some of the sites mentioned in chapter 8.

The bodies were those of young men, most less than 30 years of age, who were executed following a violent encounter (Boyle 2011). Aside from their wounds, the men were tall, healthy, and robust before their death. There was no indication of clothing, suggesting that the group was naked when they were beheaded. Perhaps this was a group of warriors raiding England, marching up the ancient road, and encountering a superior force. They must have been captured, taken to the old quarry, and slaughtered.

Isotopic analysis of the tooth enamel of some of these individuals points to origins outside of southern England (Chenery and Evans 2011, Chenery et al. 2012). Scandinavia would be a very good candidate for their homeland, based on the isotopic values from that region. The evidence is consistent with a Viking raiding party—50-some men might constitute the crew for a large Viking longship with 25 pairs of oars (Hale 1998). This particular group of raiders met a sudden and unfortunate end.

Figure 8.3.
Excavations underway at the Ridgeway mass grave.

FARMS, VILLAGES, AND ESTATES

There were several kinds of settlements during the Viking period: the common farmsteads of everyman, often found as single residences or in small rural villages, magnate estates, and a few larger towns. The basic unit of settlement was the farm, and the basic unit of the farm was the farmstead—the longhouse dwelling and associated utility buildings and land, sometimes referred to as a toft. The outbuildings were used for cooking and crafts and perhaps as additional residences. This is the context in which the lives of the household, the family, and the individual unfolded. The farm was an independent economic unit, usually enclosed by a fence or ditch to mark the place and property of the family. The farms produced food, clothing, tools, and equipment for daily life. They may also have made surplus goods and commodities for the elite centers in each region. Some of these farms were also the homes of the warriors that defended the realm and raided foreign shores. One example of a farm on Iceland, a site called Sveigakot, is discussed below; it provides important information on the settlement of the island.

Individual farms were common to the north, but less so in Denmark and Skåne, where small villages of three or more cooperative farms were the norm. The site of Vorbasse, discussed in the previous chapter, is the standard example of a Viking community in Denmark, also inhabited during much of the Iron Age. The example of Borup described below was such smaller, cooperative group of farms. Fields were adjacent to the farms, sometimes divided between cultivation and pasture. Cultivated fields were used primarily for barley, rye, and oats. Other important crops were peas, beans, root vegetables, and cabbages. Some fields were apparently left fallow to recover their fertility. Manuring was practiced both by pasturing domestic animals on harvested fields and collecting animal wastes for fertilizer.

Magnate estates were the residences of the noble class in Viking society. There were two types of magnate estates, a very large variety with huge halls that were

rebuilt several times in the same place, with rich finds of metalwork, and smaller estates with large halls with little evidence of rebuilding and lacking a rich find material (Carlie 2008, Söderberg 2005). The rebuilt halls appear to mark the estates of magnate rulers. There are a series of such estates described in this chapter: Tissø, Jelling, and Gammel Lejre in Denmark and Avaldsnes in Norway.

Sveigakot, Iceland

The Vikings' arrival in Iceland colonized one of the last uninhabited places on earth. The Viking Age in Iceland is generally divided into a pagan or settlement period, from initial arrival around 870 until 1000, followed by what is known as the Christian period. There is, however, increasing evidence of the discovery of Iceland by Irish monks around 800, and a few indications of pre-870 Viking sites on the island. The Norse settlement of Iceland is in one sense historical, because there are several later medieval sagas describing the event (Olafsson 2000). At the same time, there are serious discrepancies between the historical accounts and the archaeological evidence, due in part to the fact that the sagas were written several hundred years after the initial settlement and may contain political or personal biases. The sources of information agree, however, that the rate of settlement was very rapid during the late ninth century, after 870. Some of the best archaeological evidence for this comes from the site of Sveigakot in northeastern Iceland (McGovern et al. 2006).

Sveigakot is a pretty unimpressive archaeological site. It was a small farm with a small house on a small plot of marginal land that was largely barren lava fields with some low meadows—not a prime piece of property that would have appealed to the first colonists. The farmhouse was a rectangular sunken dwelling, only 4 × 5 m (13′ × 16′) in size, with an outdoor work area with two small fireplaces (Figure 8.2). The house floor had been refurbished at least seven times, and the house itself had a number of structural modifications over time. Such evidence suggests a long and probably continuous use of the farm in spite of the marginal nature of the land. A second structure was a barn or byre that could have held up to 16 cattle.

The volcanic nature of Iceland plays an important role in this story. The regular volcanic activity that was responsible for the formation of the island along the Mid-Atlantic Rift also provides important chronological markers for archaeologists. These volcanoes frequently spew particles into the air, some of which falls to the ground forming layers of tephra, a fine-grained glassy volcanic ash. These layers are often visibly and chemically distinguishable. One of these layers is known as the *Landnám* tephra, deposited in 871, at the time of the initial settlement of Iceland.

The early evidence for human occupation on Iceland is frequently found directly on top of or just above this tephra. That was exactly the case with the deposits at Sveigakot that document the very early settlement of this marginal land. Both of the structures at Sveigakot were buried beneath a later tephra from 940. These buildings had been abandoned and collapsed for some years before that eruption, again supporting the argument for the early settlement of the site.

One would expect marginal areas to be among the last settled by colonists. It would appear from the evidence at Sveigakot, however, that was not always the case, making a strong argument for the very rapid occupation of much of the

island. Vésteinsson and McGovern (2012) suggest that as many as 24,000 people were transported to Iceland during the first 20 years of the colonization. A migration of such scale would seem to have required substantial subsidy and organization to succeed. The settlement of the North Atlantic starts to look more like a planned expansion directed from the homeland.

Borup, Denmark

The Danish village of Borup is located in southwestern Sjælland, not far from the modern town of Slagelse. The archaeological discoveries here began with aligned rows of stones that marked the boundaries of fields from the Late Iron Age. Remarkably, a number of ancient fields have been preserved in this area. The Iron Age field system consisted of small, irregular oval and rectilinear plots marked by stone rows and lynchets—stiff banks of earth that resulted from repeated plowing. The Viking fields, on the other hand, were narrow strip plots demarcated by long lines of stones placed in deep furrows. These plots averaged 10 m (33′) in width and 100–200 m (330′–660′) in length. The fields covered a large area on the east side of the local stream, on the order of 50 hectares (125 acres) in size.

In the southeast corner of the Viking field system, a concentration of potsherds along the local stream marked the Viking Age settlement of the villagers who had farmed those fields (Steensberg 1983). A series of farmsteads held the remains of six farmhouses, although in two cases, where rebuilding had taken place, there was more than a single farmhouse (Figure 8.5). Farmhouses were not found on two of the lots. The farmhouses generally dated between 700 and 1000 and represent the remains of a small Viking Age community of three to six farms. The farmsteads themselves were aligned along the stream valley and adjacent to one another, approximately 100 by 50 m (330′ × 165′) in size, separated by stone walls. The Viking farmhouses were indicated by concentrations of stones, pits, and post holes. The farmhouses were on the order of 15–25 m (50′–80′) long and 6–8 m (20′–25′) in width. Hearths and wells were found in the farmyards. Preservation was poor, and pottery was the most common artifact recovered in the excavations. Ceramic spindle whorls for spinning yarn and thread were commonly found in and around the farmhouses. A few fragments of iron tools were also recovered, but bone and other organic materials did not survive.

Tissø, Denmark

The magnate estate on the west bank of Lake Tissø in western Sjælland is one of the best documented archaeologically, providing evidence for the development of such manors in the later Iron Age and Viking period. The site is approximately 7 km from the sea, accessed by a navigable river. The archaeological remains of the settlement have been found along a 1.5 km (approximately 1 mile) section of the lake shoreline, extending 200–300 m (660′–1,000′) inland. The total settlement area covers almost 50 ha (125 acres), about 75 modern city blocks.

Through the years there have been a number of unusual finds, including weapons and jewelry from the nearby lake bottom, two graves of men with their heads placed between their legs, and a wooden bridge some 50 m (165′) long. In

the agricultural fields where the site lies today, there have been a series of gold, silver, and bronze finds, including a magnificent 1.8 kg (4 lbs.) gold necklace, approximately 30 cm (12″) in diameter (Figure 8.4). The necklace is estimated to have had a value equivalent to 500 head of cattle in the Viking period.

Figure 8.4. The massive golden necklace from Tissø, 30 cm in diameter.

Eventually, large-scale archaeological excavations were conducted along the west shore of the lake in 1995–2003. These investigations have provided a detailed picture of the large estate at Tissø and the changes that took place there over time. The project uncovered two magnate residences with associated markets and workshops, along with an important cult house and many objects of rare metals and/or foreign origin (Figure 8.5). The earliest estate was in the northern part of the excavation area, dating from ca. 550, and was some three times larger than an ordinary farm from that time (Bican 2010). The main hall was 40 m (130′) long and very solidly built. A number of valuable weapons and pieces of jewelry were found. This residence burned during the second half of the seventh century, and a new estate was then established 600 m to the south.

The new estate was in operation from approximately 700 to 1050, inside a large timber palisade. A monumental hall covering about 350 m^2 (3,800 ft^2, a narrow basketball court) was the centerpiece (Jørgensen 2003). The posts for this structure were enormous and may have supported a two-story building. Items of wealth and ceremony were abundant in the archaeological materials from the manor, including fragments of Frankish drinking glasses, rich weapon mountings and equestrian equipment, English coins, and jewelry. There were also an unusual number of amulets from the residence, including Thor's hammers and small pendants and

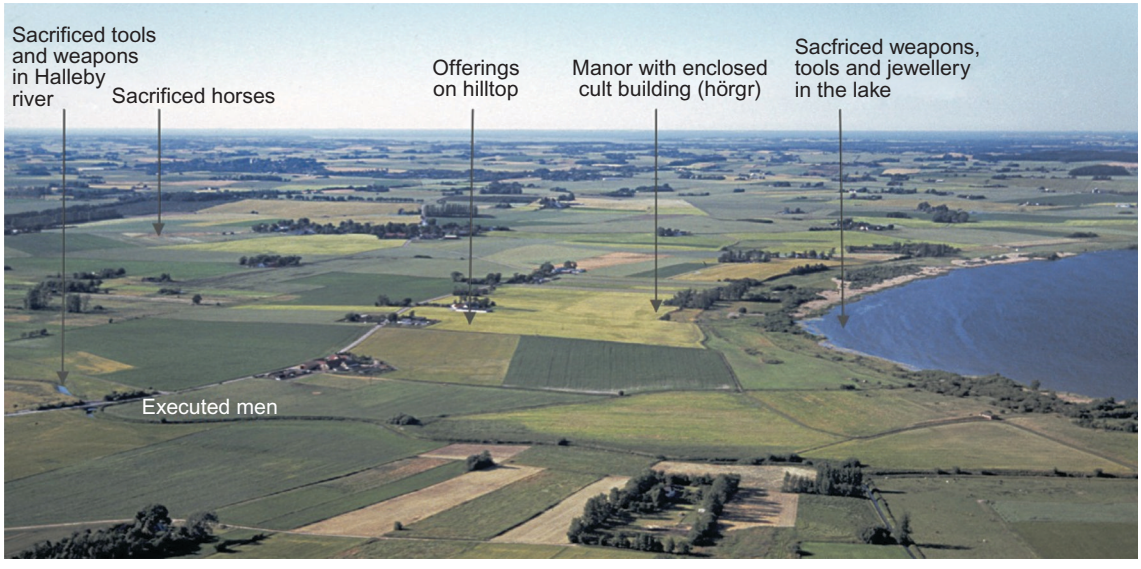


Figure 8.5. Air photo of the site area at Tissø and some of the major archaeological features.

Figure 8.6.
Decorated tuning peg from a lyre found in the great hall at Tissø.

fibulae of silver formed like Valkyries (Jørgensen 2009). Also notable was a tuning peg from a lyre, a musical instrument probably used during feasts and ceremonies (Figure 8.6). Most of this rare and unusual material was found in the eastern half of the hall. This was probably the area where prestigious banquets, ritual activities, and magnate administrative activities took place. The western part of the building was less elaborate, with few finds, and may have been the private residence.

The area around the manor house was also of great interest. There are several workshop areas on the property, including many small pit houses, perhaps hundreds, for the production of various craft items and market stalls or booths, each demarcated by a shallow ditch. Crafts included textile production and metal working. The presence of craftsmen is evident in production refuse, half-finished products, molds and templates, defective castings, tools, bars, and scrap metal. There was also a large area of iron-smelting furnaces at the edge of the property. The pit houses may also have been important as seasonal residences for assemblies of large numbers of the adherents of the noble or petty king in residence at Tissø (Jørgensen et al. 2014).

Of special interest was the presence of a religious building or cult house adjacent to the manor, enclosed by fencing. Enclosed areas around presumed cult buildings connected to large central halls have now been identified at several large magnate residences, for example, at Järrestad in Skåne and Lisbjerg in Jylland. Such associations argue that the elite in later Iron Age and Viking society were in charge of the religious, as well as political and economic, activities of society.

The sacred structure inside the enclosure at Tissø was rebuilt several times in different spots and in different forms during the life of the manor and eventually went out of use sometime in the tenth century. There were several other areas of ceremonial activity. The deposits of weapons and jewelry along the lakeshore have already been noted. Many unusual items, including certain animal bones, pieces of jewelry, silver, and coins, were found on a small hilltop near the magnate's residence that might have been an open-air sacrificial site.

It was a remarkable set of buildings and activities at Tissø. The manor house overlooks the lake. The adjacent shore would have been a landing place for goods, materials, and people moved in and out by boat. Large areas of manufacturing and a market were located at the estate. The local ruler must have been busy. He was probably judge and jury in legal situations, protector of the people and commander of the military. He must also have overseen the craft industries on the estate, arranged and protected the market, and sponsored religious or ceremonial activities for the population.

Jelling, Denmark

Jelling is a small village in central Jylland with a major claim to fame. The Viking Age monuments that were built there more than a thousand years ago are today part of a UNESCO World Heritage site (Figure 8.7). There are a number of components to the site, including rune stones, two huge burial mounds, the largest ship setting known anywhere, and an old church.

Figure 8.7.
Air photo of the recent excavations at Jelling. The two large burial mounds lie above and below the stone church in the upper center of the photo.

Jelling has a preeminent place in Danish history, closely tied to two early Danish kings, distant ancestors of the present monarch. Gorm the Old and his son Harald Bluetooth erected rune stones here. A rune stone is a standing stone with a runic inscription. Gorm's smaller rune stone was in memory of his wife Thyra. Harald's large rune stone was raised in 965 to commemorate his parents, Gorm and Thyra. The figures on the stone were originally painted in bright colors so that they would have been much more visible. The three-sided stone has a depiction of Christ on one side (see Figure 8.59) and a pagan symbol of a snake or dragon on another (Figure 8.8). The third side holds a relatively long runic inscription.

The stone recounts how Harald Bluetooth united the kingdom of Denmark and has the first mention of the name of the modern nation. The stone also records the conversion of Denmark to Christianity under the reign of Harald.

> King Harald ordered this monument made in memory of Gorm, his father, and in memory of Thyrvé, his mother; that Harald who won for himself all of Denmark and Norway and made the Danes Christian.

Harald also built the two large burial mounds at Jelling for his parents. The two mounds are called the North and South Mound. The North Mound sits at the center of the ship-shaped stone setting. A large ship-shaped stone setting, some 360 m (1,200′) in length, may also have been built originally for the burial of Gorm, or perhaps Gorm's father. Sections of this stone setting were covered when the large earthen burial mounds were built.

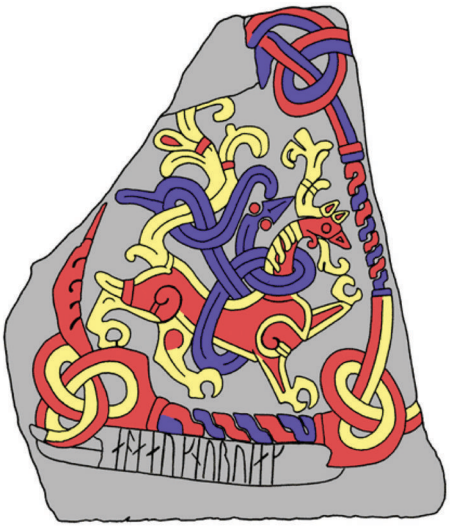


Figure 8.8.
Painted reconstruction of one side of King Harald's rune stone at Jelling.

The North Mound is the oldest, 8 m (26′) high and 60 m (almost 200′) in diameter, and contained a large timber chamber built in 958–959. The South Mound is slightly larger, 10 m (33′) high and 70 m (230′) in diameter, and was built around 970. No burial chamber has been found in this mound. The tomb in the North Mound was opened later in the Viking Age. When Harald converted to Christianity, he had his father's body removed from the large North Mound and placed in a wooden chamber in the floor of a newly built timber church, located between the two mounds, so that Gorm could be christened after his death (Randsborg 2008). The rune stones may have been repositioned at that time as well. Remnants of the contents of the tomb were recovered in a later excavation; they included pillows and silk fabric. The burial chamber was huge, 6.8 m (22′) long, 2.6 m (8.5′) wide, and 1.5 m (5′) high, with walls of oak posts 35 cm (14″) in diameter, placed close together. The ceiling was made of 24 oak logs.

The church that stands today in Jelling was built of stone around AD 1100 (Christiansen 1999). The original stone church was quite small, 5.5 m (18′) square, and was enlarged twice to its present size. The small church was probably the first stone church in Jylland. There are also three earlier wooden buildings beneath the stone church. Two of these may have been wooden stave churches. The oldest wooden building was probably quite large, estimated to have been almost 40 m (130′) long, and may have been a massive hall, part of a magnate estate (Holst et al. 2013b).

Under the floor of the wooden church was a wooden chamber, thought by many to be the grave of Gorm, where his body was placed after being removed from the North Mound by his son. Some small scattered bones from a man 173 cm (5′9″) tall who died between 35 and 40 years of age were found in the chamber. In addition, there were 400 small fragments of thin twisted gold wire from an inlay in silver jewelry with animal heads in the distinctive Jelling style (Figure 8.9), very similar to a silver cup that was found in the North Mound during excavations in the twentieth century.

Interest in the monuments at Viking Jelling has been ongoing for more than 400 years, but the surprises keep coming. Excavations since 2007 have revealed a completely new look for this important place (Holst et al. 2013b, Hvass 2011).

Figure 8.9.
A reconstructed *remendedup* (belt clasp) from the wooden chamber beneath the church floor at Jelling.

Figure 8.10.
A reconstruction of the palisade and its interior at Jelling, Denmark (drawing by Peter Jensen/JP Grafik, Gert Gram).

A massive palisade enclosing a large area around the mounds has been discovered. The entire palisade in the shape of a parallelogram would have been ca. 1,440 m (4,800′) in length and enclosing some 12.5 ha (30 acres) (Figure 8.10). A trench had been dug to support a continuous line of vertical timbers, ca.15 × 35 cm (6″ × 14″), in a stave construction for the wall. These posts were set up to 1.2 m (4′) into the ground, suggesting an original height above ground of ca. 3 m (10′). Heavy support posts had been placed about 1 m (3.3′) apart on either side of the palisade to provide reinforcement. The fence was apparently repaired or rebuilt several times.

The symmetry of these features is remarkable. The northern burial mound sits directly in the center of this huge timber palisade. The north end of the ship-shaped stone setting was found in the new excavations. This enormous stone setting runs north-south from one end of the palisade to the other. The South Mound lies near the southern side of the palisade, and the largest rune stone at Jelling is exactly halfway between the two mounds. The church lies between the rune stone and the North Mound.

Finally, a series of three almost identical buildings were found in the recent investigations around the northeast corner of the palisade. The three buildings are situated at a similar distance from the palisade (half a house length) and aligned with that structure. These post-built houses are approximately 24 m (80′) in length and 7 m (23′) at the widest point. They are almost identical in construction to the so-called Trelleborg houses found at several Viking fortifications around Denmark. These Trelleborg houses are massive wooden halls with deep wall trenches, heavy walls of vertical timber, and several interior divisions (Figure 8.10). The houses at Jelling have extended rooms at three of the house entrances. These large buildings or halls are likely part of a magnate estate at Jelling. Thus the early capital of Viking Denmark may have been a royal manor instead of just an important village.

Archaeology has revealed the significance of Jelling and the monuments that were built to commemorate ancient heroes and important political figures. All of the evidence suggests that this royal place was established quickly in a relatively empty and

peripheral, albeit strategic, part of Denmark. Jelling appears to have functioned as a royal seat for the kingdom for perhaps 100 years until the center of power moved to Gammel Lejre in central Sjælland as Denmark expanded to the east.

Gammel Lejre, Denmark

Denmark has a long and continuous list of kings and queens that starts with Gorm around AD 935 and extends to the present day. Gorm was king of "all Denmark" and is often assumed to have established the first significant large political entity in Scandinavia. There are earlier petty kings, described in various historical sources, going back another century or so, but these individuals probably ruled lesser regions and are sometimes considered more mythical than real.

But legends can have weight. These stories name a place called Gammel Lejre (Old Lejre), outside of modern Roskilde, as a once powerful center. The legends describe a ship sailing there with gold, weapons, and a young boy, a gift to the people from the gods. The boy became King Skjold. For several generations he and his descendants ruled a kingdom at Gammel Lejre. The royal seat was a great "Hjort-hallen" (red stag hall) where many important events were said to have taken place. Eventually, however, rivals for his power killed the king and his warriors and the magnificent hall was razed to the ground around AD 1000. At that time, the center of power in Sjælland moved to the new bishop's seat at Roskilde, just a few kilometers away.

Burial mounds and ship-shaped settings for graves in the Gammel Lejre area emphasize the importance of the place. Excavations at Gammel Lejre by the Roskilde Museum have revealed several large structures that provide additional evidence for substantial wealth and power at an early date, in part corroborating the legend (Christiansen 1991a, 1991b). The fieldwork involved careful excavation; massive post holes and features revealed an enormous wooden structure 48 m (160′) in length and 11 m (36′) wide—a total area of 500 m^2 (5,380 ft^2) (Figure 8.11). The building had convex walls, with sloping timber braces on the outside. This huge hall would have been among the largest buildings in northern Europe at the time. The most powerful person in the land may well have lived there.

Figure 8.11.
Air photo of the great halls at Gammel Lejre, just south of the modern village.

A plan of the post holes that were excavated revealed a ninth-century Viking Age timber hall, built over an earlier, less well-preserved building. The wall posts and the rows of post holes from both interior and exterior supports were visible in the ground. The two halls, although separated by three centuries in time, are of similar construction. The archaeology presents a picture of continuous habitation across the two major episodes of construction. The building were repaired in the intervening period, and some posts were replaced four or five times. Animal bones found in post holes from the oldest hall are radiocarbon-dated around the year 660, documenting the existence of the legendary early rulers before the Viking Age. The rich gold and silver objects found at the site further document the wealth and importance of the rulers who lived here. One of the prestige objects from the site—a small, cast silver depiction of a figure on a throne—is described in more detail at the end of this chapter.

Avaldsnes, Norway

This site lies on the island of Karmøy, 30 km (20 miles) northwest of the city Stavanger, on the Norwegian west coast along an important, sheltered shipping lane from southern Norway to the north. This strategic place was the residence of elite individuals, probably for many centuries. Control of shipping along the coast probably began in the third century AD, based on discoveries of several large buildings from that period. There are a series of Bronze Age mounds along a ridge to the west of the site (Figure 8.12), with two or more ship burials from the late Iron Age (Opedal 1998).

Avaldsnes is sometimes called Norway's oldest capital because it was the primary residence of King Harald Fairhair, who unified Norway into one kingdom ca. 870. After the death of Harald around 930, the sagas say Avaldsnes continued

Figure 8.12.
The church and mounds at Avaldsnes on the island of Karmøy (photo by Anita Langaaker).

to be a royal residence for almost 500 years. Excavations have uncovered what appears to be this residence from the Viking period. Beneath the parking lot of the present-day church, archaeologists found the remains of enormous posts, up to 50 cm (18″) in diameter, dating from the time of Harald Fairhair. In addition, investigations in 2011 and 2012 have revealed large constructions from the Bronze Age and early Iron Age (Skre 2012).

TOWNS AND CENTERS

The Vikings built magnificent ships, capable of crossing the North Atlantic, sailing up major rivers in Europe, and landing on distant shores. Viking ships also moved goods and cargo throughout the Baltic and beyond. Vibrant towns—the first in the north—grew up around trading places like Haithabu, Ribe, Aros, Kaupang, Birka, and others (Figure 8.13). These towns had populations of hundreds, if not thousands, of people. Several of these centers are described below.

Haithabu, Germany

The remains of the ancient Viking town of Haithabu (in Danish, Hedeby) lie across the Schlei fjord from the modern town of Schleswig in the northern German state of

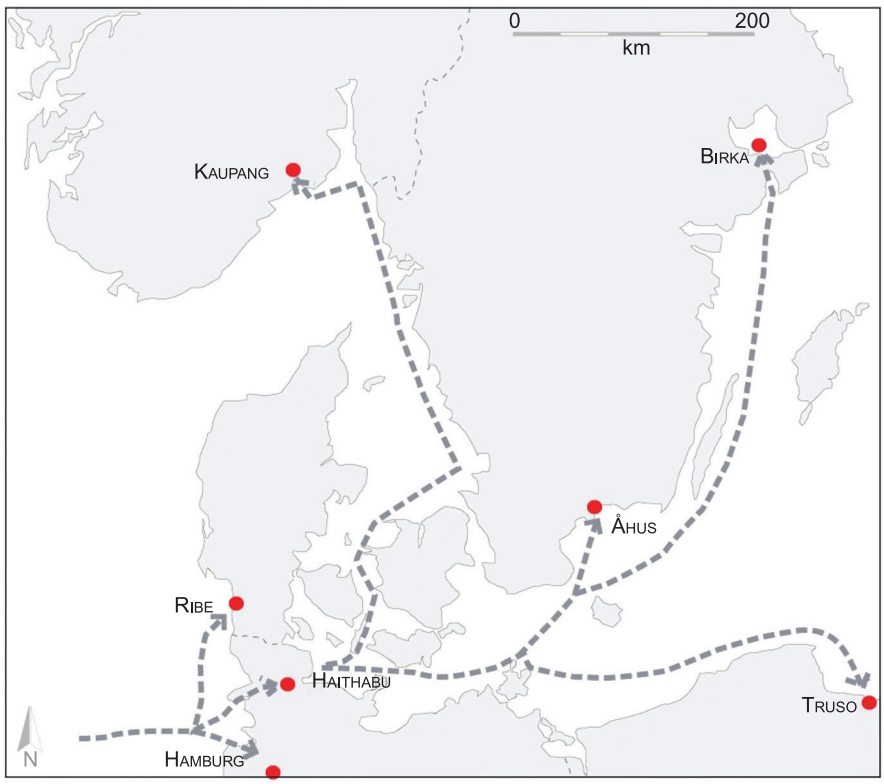


Figure 8.13. Major centers and important trade routes in the Viking Age (after Sindbæk 2007).

Schleswig-Holstein (Figure 8.14). Its location is marked by a massive circular earthwork, roughly 600 m in diameter, that has been the focus of archaeological attention for more than a century. Excavations have uncovered various parts of the town including residential and commercial areas, a variety of burials, and an important harbor.

The Viking Age settlement at Haithabu was one of the first towns in northern Europe. The place grew in importance as a focus of power and trade between ca. 770 and 1066. Haithabu was a fortified center with a massive circular rampart. Haithabu lay at the east end of the Danevirke, a huge, earthen defensive wall that ran across the base of the peninsula of Jylland at its narrowest point. More information on the Danevirke is provided in the section on Fortifications and Defense below.

Haithabu was situated at the crossroads of two major routes of movement. Its strategic location at the base of the peninsula of Jylland played an important role in its rise. From north to south, the ancient Military Road (also known as the Ox Road) ran from Viborg in northern Jylland through Schleswig to Hamburg and points south (Figure 8.14). More importantly, an east-west route for shipping crossed the Jylland peninsula through the waters of the Schlei. Haithabu lay 40 km (25 miles) inland at the head of the long and narrow fjord and offered an excellent, well-protected harbor. Ships were able to bypass the long and dangerous passage around Jylland, taking a shortcut through the Schlei to Haithabu, over a long portage to connect with the rivers Eider and Treene in the west and on to the North Sea, or vice versa. The location of Haithabu was also on or near the boundaries of several powerful groups in northern Europe, including Danes to the north, Frisians to the west along the North Sea coast, Saxons to the south, and Slavs to the southeast, and was an easily accessible place for trade and exchange among these peoples.

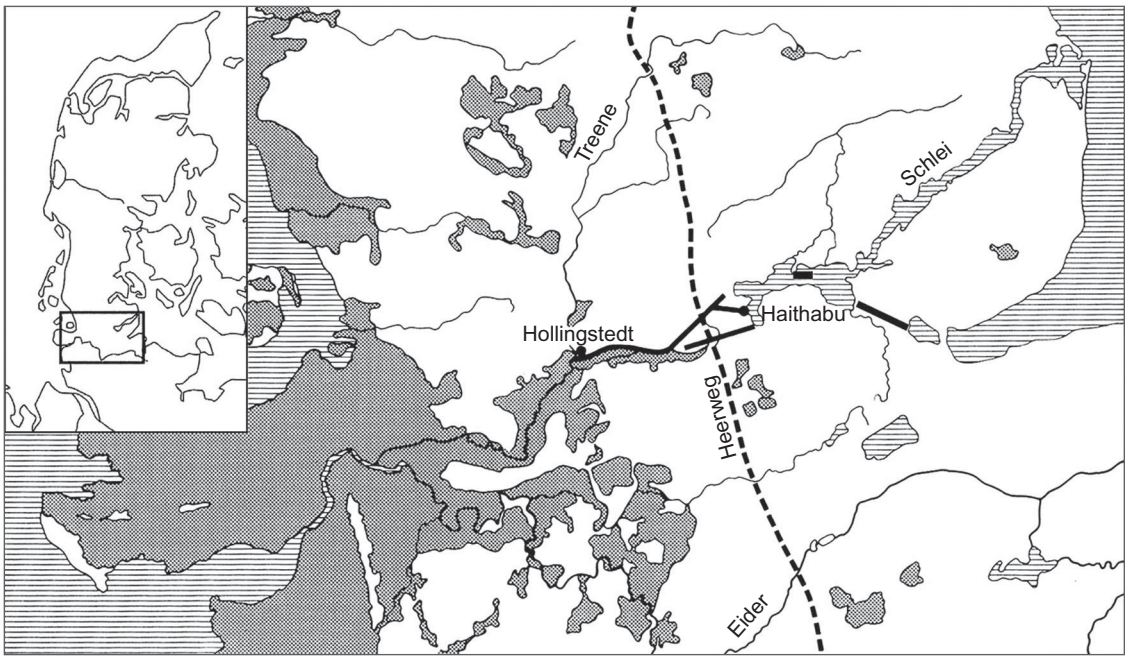


Figure 8.14.
The location of Haithabu at the head of the Schlei in northern Germany, at the base of the Cimbrian Peninsula. The vertical line is the ancient Military or Ox Road. The dark black lines are sections of the Danevirke earthen wall. The shaded areas represent wetlands and marshes.

Haithabu grew quickly from a small village into a fortified town. According to the Frankish Annals, the Danish King Godfred destroyed the Slavic trading post of Reric, near the modern town of Wismar on the Baltic coast of Germany, in 808 and moved the merchants from there to Haithabu. By the middle of the tenth century, the town was encircled on the north, west, and south by a massive, semicircular earthen wall, 9 m (30′) in height, enclosing an area of 27 ha (67 acres). To the east of the town lay the harbor and fjord. Massive piers extended up to 60 m (200′) into the fjord. A recently excavated site at Füsing on the north side of the fjord has revealed what may be an elite residence and magnate seat for the rulers that controlled Haithabu (Dobat 2014). Similar elite residences have been identified near emporia at Kaupang in Norway and Birka in Sweden.

Population estimates are notoriously difficult for prehistoric places, but 1,000–1,500 individuals may be a reasonable suggestion for the number of inhabitants at Haithabu. A variety of goods and commodities were manufactured in workshops at the site for trade. The archaeological evidence documents the presence of smiths, bronze casters, comb and glass bead makers, workers in bone and leather, jewelers, amber craftsmen, and potters (Figure 8.15).

Haithabu was a major trading emporium with connections to most of the then known world (Jankuhn 1986). The importance of Haithabu is seen in several kinds of evidence beyond the great physical size and scale of the site. The Icelandic sagas frequently mention a place called Heiðabær or Slésvík, documenting its prominent geographical location at ancient Denmark's southern border. The sagas also mention actual journeys by Icelanders to that place (Hilberg and Kalmring 2013). The town was described by visitors from England and Spain in other surviving historical documents, as well as important local figures. Adam of Bremen (eleventh century) reported that ships sailed from Haithabu to the Slavic lands, Sweden, Samland

Figure 8.15.
Mold from Haithabu for casting both the Christian cross and Thor's hammer, reflecting the transition to Christianity in Scandinavia.

(near Kaliningrad), and even Greece. The town produced its own coins after 825, the second mint in Scandinavia after Ribe, where the first coins were struck in the early eighth century. Haithabu became the seat of a bishop in 948 and a stop on the pilgrimage route to Rome as Christianity was introduced to the north.

Ibrahim ibn Yaqub al-Tartushi, a tenth-century visitor from Cordoba in Moorish Spain, however, was not impressed by the northern town:

> Slesvig [Hedeby] is a very large town at the extreme end of the world ocean. . . . The inhabitants worship Sirius, except for a minority of Christians who have a church of their own there. . . . He who slaughters a sacrificial animal puts up poles at the door to his courtyard and impales the animal on them, be it a piece of cattle, a ram, billygoat or a pig so that his neighbors will be aware that he is making a sacrifice in honor of his god. The town is poor in goods and riches. People eat mainly fish that exist in abundance. Babies are thrown into the sea for reasons of economy. The right to divorce belongs to the women. . . . Artificial eye make-up is another peculiarity; when they wear it their beauty never disappears, indeed it is enhanced in both men and women. Further: Never did I hear singing fouler than that of these people, it is a rumbling emanating from their throats, similar to that of a dog but even more bestial.

The last years of Haithabu were difficult. The town was sacked in 1050 by King Harald Hardrada of Norway. He burned the town by sending fireships into the harbor. The charred remains of one or two of these hulks were found at the bottom of the Schlei during underwater excavations. In 1066, the town was again sacked and burned, this time by East Slavs (Simek 2004). Following this destruction, the population gradually abandoned Haithabu, moving across the Schlei to the newly founded town of Schleswig (Vogel 1983).

Scientific archaeological investigation began at Haithabu in 1900 (Figure 8.20). The site was particularly rich and undisturbed, since it had been abandoned completely and never reused. The waterlogged soils were ideal for the preservation of organic remains and unsuitable for plowing. Excavations were conducted episodically until the Second World War. Archaeological work started again in 1959 and has continued intermittently ever since. Sections of the embankments surrounding the settlement were excavated, and the harbor was partially dredged, during which the wrecks of Viking ships were discovered. To date, only about 5% of the settlement area inside the wall has been excavated.

A series of cemeteries and burial grounds at the site contain human remains from different periods of the occupation in various types of graves—flat graves, burial mounds, chamber graves, and cremations (e.g., Aner 1952), as well as several boat graves. The wealth and importance of this emporium of the Danish kings is witnessed in the prestigious items and richly furnished burials found in elite graves at the site.

Aros, Denmark

The place called Aros—the mouth of the river—was an important location during the Viking period. An area of trade and manufacturing grew up here after 770,

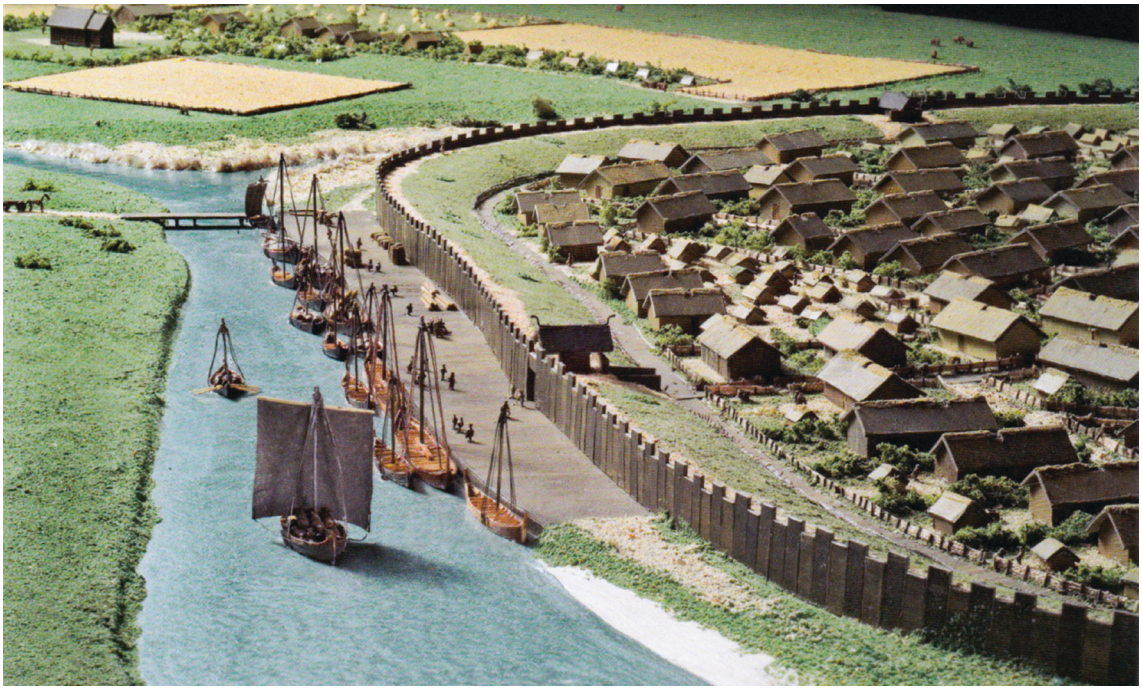


Figure 8.16. One possible reconstruction of the Viking town of Aros, Denmark.

and by 934 Aros had become the third oldest town in southern Scandinavia after Haithabu and Ribe. Today Aros lies beneath the modern city of Aarhus on the east coast of central Jylland, still an important port and the second largest city in Denmark. The remains of the Viking town are sometimes found in excavations within the central part of the modern city (Damm 2005).

Any reconstruction of Viking Aros is highly speculative, including the following, because of the limited evidence available. The Viking town was fortified with a massive wooden palisade and earthen embankment that reached a maximum of 6 m (20′) high and 18 m (60′) in width. The town wall enclosed an area around the present cathedral in Aarhus of some 400 m (1,300′) diameter, approximately 10 ha (25 acres) in size (Figure 8.16). In addition, the small river was apparently diverted to provide a water defense around the entire walled town. Several longhouses, used as both residences and workshops in the Viking Age, have been uncovered in excavations. The population is estimated to have been on the order of several hundred people.

Some six rune stones have been found in and about Aarhus that document the importance of the town around 1000 when the stones were raised, probably by elite individuals. One of the stones, decorated with a large mask, has become the logo of the well-known archaeological museum at Moesgård, just south of the modern city (Figure 8.17).

Birka, Sweden

One travels to Birka by boat over Lake Mälaren, the third largest lake in Sweden, which runs 120 km (80 miles) from east to west in Middle Sweden. The agricultural lands on its shores and islands are some of the richest in Sweden. One estimate

suggests there were 4,000 farms in *Mälardalen* (the Mälaren Valley) during the Viking period and perhaps 40,000 people (Hyenstrand 1982). This region has been a center of population and influence since the Neolithic.

The Viking town of Birka sits on a small island called Björkö at the entrance to Lake Mälaren and the fertile *Mälardalen* region, some 30 km west of Stockholm. The rich farmland supplied food and other resources to Birka. The location was both well protected and strategic. A major navigation route passed from Denmark along the southern Swedish coast to Birka. Lake Mälaren was an inlet of the sea connected to the Baltic during the Viking period. Birka was situated some distance from the open waters of the Baltic along defensible waterways. Merchants came to Birka from Frisia, Anglo-Saxon England, Germany, from the Baltic countries and further east in Russia, and from the Byzantine Empire in the eastern Mediterranean.

Figure 8.17.
The repainted mask rune stone from Aarhus, Denmark.

Birka, as one of the first towns in Sweden, was probably founded by a petty king early in the eighth century to control and expand trade in the region (Ambrosiani and Eriksson 1996). There was a royal estate on the nearby island of Adelsö where the local king likely had his residence. Birka was also the site of the first recorded Christian congregation in Sweden, begun in 831 by Saint Ansgar in an unsuccessful attempt to bring Christianity to the north. The town flourished for more than 200 years until it was abandoned ca. 975, when the political center of Sweden moved to Sigtuna, 40 km north of the modern capital of Stockholm. The decline of Birka may be associated with the closing of the waterways connecting the town to the Baltic due to the continuing rise of the land surface after the disappearance of the glacial ice. The rebound of the land surface has raised the island 5 m since the Viking occupation and for that reason the island was smaller in the Viking period than it is today.

The first view of the island from the water is of its highest point, Ingaberg, an area of bare rock where an oval hill fort of earth and stone was built in the Viking period (Figure 8.18). The western side of the hill fort is a steep cliff face falling to the waters of Lake Mälar. The walls of this structure were 7–8 m (22′–25′) in width and 2–3 m (6.5′–10′) high, with three gates to the north, south, and east toward the town. The rampart would have held a wooden parapet of battlements, and the remnants of this feature show evidence of repeated burning. An extraordinary grave was found beneath the rampart wall. A shaft grave had been dug into the rock and a middle-age man and a horse placed in it; a second skeleton was found among the large stones piled on top of the grave. This rock cairn was then buried beneath an earthen mound, and a large standing stone had been placed on top of the mound. This mound and stone were later incorporated in the foundation of the rampart wall.

Just below the north gate of the hill fort was a garrison for the fortress guards. This structure sat on an artificial terrace, constructed to level the hill slope in this area. The eastern section of the building contained iron locks, keys, and fittings from wooden chests. Weapons and military equipment were common, including armor and chain mail. Spears and shields had been placed along the walls. This

Figure 8.18.
The heights of Ingaberg and the hill fort walls on the island of Björkö, home of Birka. The black earth area of the settlement covers the two green fields to the right, and the earthen burial mounds that dot the slopes in the lower right quarter are clearly visible.

large building must have housed the warriors who protected Birka. The western end of this building contained a rich trove of glass and metal artifacts that suggest this may also have been a place of royal visits. Also on the terrace around the garrison, excavations in the late 1990s exposed a large hall, a three-aisled wooden building 19 m (62′) long by almost 10 m (33′) wide, with bowed walls of double thickness—an outer wall of timber and an inner wall of wattle-and-daub. This structure may have been the home of an important person or a residence for a royal visitor to Birka.

The Viking settlement itself was at the eastern foot of Ingaberg, at the north end of the island, and covered an area of ca. 12 ha (30 acres), about half the size of Haithabu. Population estimates for Birka are between 500 and 1,000 people. According to early historical descriptions, the town itself was fortified and the harbor protected by a line of wooden pilings. The rampart around the settlement was 7 to 12 m (22′–40′) wide, 2 m (6.6′) high, and ca. 700 m (2,300′) long, and was connected to the hill fort. Regular openings in this defensive wall probably held fortified wooden towers in the Viking period. The zone of residence and manufacturing inside the rampart is described as the Black Earth area because of its dark soils and heavy organic content, a remnant of dense human settlement and use during the Viking period. Two kinds of houses have been found at Birka, wattle-and-daub walled structures and timber or log buildings caulked with clay. Craftspeople in the town produced wrought iron tools and equipment, jewelry of bronze and precious metals, as well as objects of bone, antler, and horn. Birka had three harbors, two natural harbors to the north and an artificial harbor enclosed by pilings to the west.

The first archaeological excavations were undertaken at Birka in the seventeenth century and have continued sporadically ever since. The harbor area was recently a focus of underwater excavations, and the discoveries continue. Divers have found evidence of wooden pilings with stone foundations at a depth of almost 8 m (26′), approximately 100 m (330′) from the coastline. These pilings probably supported

large piers extending into the harbor area and perhaps even buildings and residences. The marine archaeologists suggest that the town may have been up to one-third larger because of the extension over the water. Many well-preserved artifacts have come from the sea floor in addition to the information on the pilings and piers.

As a major center of trade, Birka offered furs and craft goods in exchange for the products of much of Europe and western Asia. These furs were obtained by exchange or threat from the Lapps, Finns, and Russians, as well as local trappers, and included bear, fox, marten, ermine, otter, beaver, and others. Many examples of trade goods have been found in the graves at Birka, such as pottery from the Rhineland, glass, metal objects, and clothing and textiles including Chinese silk, Byzantine embroidery with fine gold thread, tassels, and trim, heavy gold brocades, and plaited cords of the finest quality. Some of the brocades were imported, while others are clearly Scandinavian and of equally fine quality. Birka and Haithabu are the only two Scandinavian locations where these fine ceramics have been found. Other Scandinavian goods were traded at Birka, including items made of reindeer antler such as hand-carved combs, objects of walrus tooth ivory, amber, and honey from southern Sweden. Coins found at Birka include gold Frisian examples and Arabic Samanid silver, but English and Carolingian specimens are rare (Figure 8.19). Coins minted at Haithabu and elsewhere in Scandinavia appear as early as the ninth century at Birka.

Some of the richest sources of information from Birka are the many graves present on the island (e.g., Aner 1952, Gräslund 1980). There are in fact a number of cemeteries in and surrounding the settlement area. There are several other cemeteries as well as isolated graves in various parts of the island. There are at least 2,000 cremation burials under small mounds recorded outside the fortifications of Birka, and a minimum of 1,000 inhumation graves are known inside the walls. The Hemlanden cemetery to the north, just outside the settlement, is the largest Viking period graveyard in Scandinavia and contains some 1,600 earthen mounds of varying size. There are also rich chamber graves without mounds that became visible as the ground subsided into the depression left by the decay and collapse of the timber chamber. Bone ice skates, iron ice axes, and crampons for shoes were found with some of the burials, documenting the long winter in eastern Middle Sweden. The grave goods in earlier graves come primarily from Sweden and northwestern Europe; the contents of later burials have furnishings that suggest an eastern connection.

Figure 8.19. Silver treasure (2.2 kg) from a hoard at Birka in the form of 249 coins, bracelets, clasps, and wire. The youngest coin is from AD 963.

Hjalmar Stolpe was a pioneer in archaeology, excavating at Birka in the 1870s. His remarkable sketches provide great detail on the finds and particularly the graves that he discovered. The sketch in

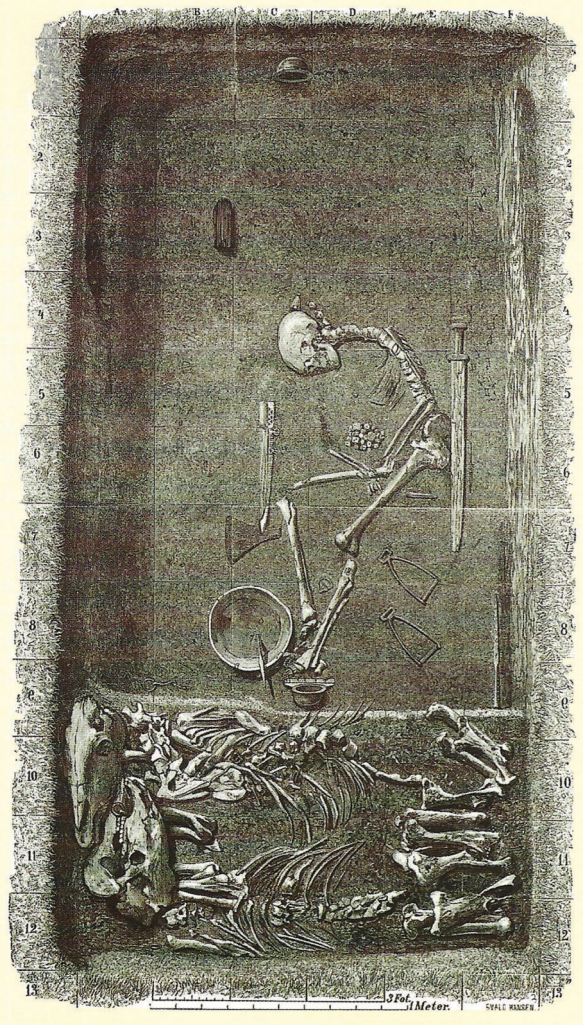


Figure 8.20.
Grave 581 at Birka, excavated and drawn by Hjalmar Stolpe in the 1870s.

Figure 8.20 shows Burial 581, a timber chamber grave containing a man and two horses along with a great deal of equipment, including a sword, two spear heads, a battle axe, two shield buckles, stirrups and other riding equipment, silver tassels, a silk cap, a knife and sheath, a whetstone, a bronze dish, dice and gaming pieces, arrowheads, Arabic coins, an antler comb, and a circular brooch.

There are several types of Viking graves, reflecting different traditions of funerals and burial. Cremations were a common form of treatment for the dead, with the ashes placed under a small mound or ship-shaped stone enclosure. There are also inhumation graves present, sometimes with rich contents, sometimes with very few or no grave goods. The graves and their contents reflect a marked social stratification in the Viking population at Birka. The large timber burial chambers, like Grave 581, usually contained the bodies of men with their weapons, horse gear, food and drink, horse, and dog. Sometimes the body of a woman was also found in the grave, perhaps a wife or slave. Most of the women's graves at Birka were inhumations in simple wooden coffins. Nearly half of the children in Birka died before the age of ten. Life was not easy in the Viking period.

There are also a series of distinct inhumations in coffins and chamber graves, found at the edge of the town. These burials are thought to be those of foreign merchants and craftsmen and their families. Some of the individuals have been identified as Christian because of a general absence of grave goods and the occasional presence of small crosses. In some cases, a Christian cross and Thor's hammer have been found in the same grave, reflecting this transitional period in religious belief.

Birka disappears from history about 975; after that year there are no dated coins found from the site. Its role as a center of Baltic trade was taken over by the island of Gotland. Political and administrative functions moved north to Sigtuna, the medieval successor of Birka, which flourished as a royal town, bishop's seat, and commercial center for the next 250 years.

Kaupang, Norway

South of Oslo, archaeologists uncovered the remains of one of Norway's first towns and the great hall and sacrificial temple of the king who ruled it. Investigations from the 1960s to the present have uncovered a rich archaeological locality and

confirmed this place as the long-sought site of Kaupang, known from the sagas but undiscovered for centuries (Skre and Stylegar 2004). The town, which eventually stretched for more than 500 m (1,640′) along the seashore near the modern Norwegian town of Larvik on the west side of the Oslo Fjord, was founded in the AD 780s. The richness of the finds is remarkable: Persian rock crystal jewelry, Islamic silver coins, Baltic amber, carnelian and amethyst beads from southern Russia and India, pottery from France and the Rhineland, and Italian glass. There are also several Anglo-Saxon silver book-mounts from the excavations—almost certainly ripped from illuminated Bibles looted from monasteries in Northumberland and Yorkshire. The town may have been the embarkation point for many of the marauders who terrorized Britain, Ireland, the Low Countries, France, and other parts of Europe.

Research projects at Kaupang have revealed a great deal about this early and important Viking place. The town appears to have been intentionally founded, as there is no evidence of occupation prior to the division of the land into separate plots of regular size. The establishment of Kaupang as an emporium may have been done under the direction of a Danish king. The area of settlement covers some 54,000 m^2 (13.3 acres) along the shoreline. Another zone of 34,000 m^2 (8.4 acres) without traces of permanent construction may have been a temporary residential area for seasonal visitors during the trading season. Occupation of the site declined after 930 and ended ca. 970, perhaps due to a change in trade routes and the rise of new trading centers.

There are a large number of burials at the site, both cremations and inhumations, perhaps 1,000 or more in total (Blindheim 1982). Small earthen barrows are numerous. These burials were found in several different cemetery areas. Some 204 graves have been excavated and recorded.

What was probably the original magnate residence has been discovered by the Oslo archaeologists just a kilometer from Kaupang (Skre 2007). Excavations have revealed the remains of a partly stone-paved hall, 33 m (108′) long and 11 m (36′) wide, with massive curved, boat-shaped walls. It was built on a manmade 300 m^3 (10,500 ft^3) platform of stone and earth located at the top of a 13 m (45′) cliff. Such a terraced construction had never been found in Norway before. Even before the town developed, this hall was probably a royal center and may well have been the residence of a famous early-eighth-century king known as Half Dane the White Leg. The names of some of the Viking leaders are simply marvelous.

FORTIFICATIONS AND DEFENSES

The Roman Iron Age and the Viking period were times of substantial conflict in southern Scandinavia, during which a large number of defensive structures were built to increase the security of the inhabitants and rulers. In the Viking period, these constructions included large earthen walls (e.g., the Danevirke), ditches, barricades, and blockades in the fjords and other narrow water passages (such as the intentionally sunken ships in the Roskilde Fjord, described below), fortresses, fortified towns, and bridges and improved roads (Figure 8.21) for more efficiently moving warriors and materials. In addition, there were warning systems for enemy

Figure 8.21.
An excavated Viking Age road in southern Sjælland, Denmark. Here a wooden plank road connected to stone pavement across a wetland area. An old wooden wheel and a wooden sled were laid down as part of the foundation for the plank section of the road.

attacks that used horns and signal fires on high hills. The town of Aros, Denmark, for example had an elaborate warning system that extended 30 km or more to the east to islands in the Storebælt (the Great Belt, the waters between Jylland and Sjælland).

A number of these fortifications and defenses are discussed in this section, including the Danevirke wall in northern Germany, the Samsø canal in Denmark, Ravning Bridge in Jylland, and the famous Trelleborg fortresses in Denmark and Sweden (Figure 8.22).

Danevirke, Germany

The Danevirke is a massive earthen wall that crosses the base of the peninsula of Jylland from the Viking town of Haithabu in the east to the marshes and wetlands near the town of Hollingstedt in the west (Figure 8.18). The wall is about 30 km (20 miles) long, with a height varying from 3.6 to 6 m (12′–20′). This extraordinary construction is a reflection of the growing power of Danish polities and their ability to organize and carry out large-scale projects. The remains of the wall are still visible today along much of its length (Figure 8.23). The original and only known gate was found during excavations in 2010 where the Hærevejen (the ox road, aka the military road) crosses the Danevirke, a few kilometers west of Haithabu.

Construction began about AD 650, according to radiocarbon dating. The original structure may not have been defensive at all, but rather a ditch or canal for ships as a shortcut across the peninsula (Andersen 2004). The fill from the ditch would have been piled to one side, creating a wall. The ditch and earthen wall were later reinforced with a timber palisade and even later with stone and brick in some places. The wall was enlarged and strengthened a number of times. The sequence of construction continued into the twelfth century, and the wall was even sporadically defended during the Second World War.

Samsø, Denmark

Samsø is a strategic island in the Storebælt straits between the larger Danish islands of Sjælland and Fyn. Samsø is rather long (almost 27 km, 17 miles) and narrow in places, oriented north-south (Figure 8.24). Around 726, according to tree rings from posts in the banks, a canal was cut across the middle of the island at its narrowest spot to allow the passage of ships. The canal is almost 1 km (0.62 mile) long, 11 m (36′) wide, and only a couple of meters (6.5′) deep. More than just a

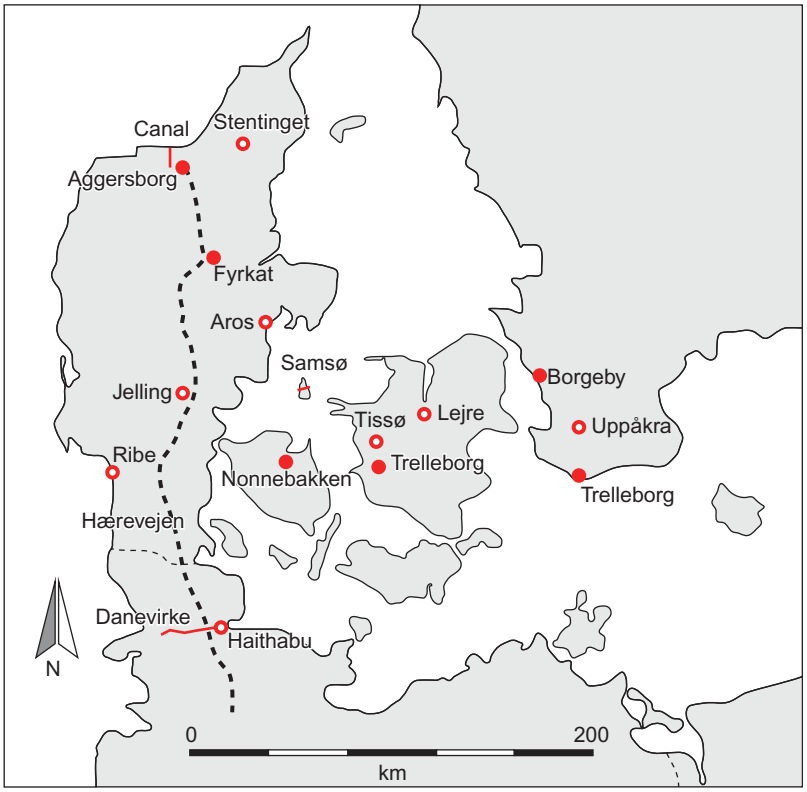


Figure 8.22.
Centers and fortresses in the Viking Age. Fortresses are shown with a solid dot. The dotted line down the Jylland peninsula is the Hærevejen—the Ox Road, also known as the Military Road.

shortcut, this passage was probably used for surprise attacks on enemy ships moving through the Storebælt.

Trelleborg, Denmark

As one of the most impressive archaeological monuments in Scandinavia, the tenth-century fortress at Trelleborg on the island of Sjælland has played a central role in studies of Viking Age society. The site gives its name to a series of six similar and contemporary constructions found across Denmark and southern Sweden (Figure 8.25). There is even some place name evidence to suggest a Trelleborg-type fortress in the Oslo Fjord area, but this possibility has never been verified. In fact, a new ring fortress, the first in 60 years, was discovered near the town of Køge, south of Copenhagen, in the summer of 2014.

These fortresses were all built at approximately the same time, around 980, and appear to have been used for less than 50 years. Interpreted previously as training camps for warriors who were supposed to reconquer lost Danish territories in eleventh-century England, the Trelleborg fortresses are better understood as centers of royal power, established as a means to control and administer the provinces of the emerging Danish kingdom under King Harald Bluetooth in the late tenth century (Dobat 2010).

The Viking Age fortress at Trelleborg was first recorded archaeologically in 1937. Subsequent excavations resulted in the exposure of a large complex. Its

Figure 8.23.
Air photo of a portion of the Danevirke in northern Germany. This view to the east shows the wall as a ridge and line of trees running from bottom to top in the photo, ending at the circular Haithabu earthworks.

Figure 8.24.
Air photo of central Samsø showing the remains of the Viking canal crossing the island.

most distinctive feature is a massive circular rampart with gate openings at the four points of the compass (Figure 8.26). The outer diameter of this structure is 180 m (almost 600′). The inner area of the circular fortress was organized into four quarters or yards, each with four longhouses, providing space for at least 50 people per house. Outside the circular rampart was a second area, enclosed with a rampart and ditch that effectively closed off the end of the peninsula where Trelleborg sits. This second rampart and ditch must have been added after the construction of the original fortress (Nørlund 1948, Olsen and Schmidt 1977, Andersen 1996). Within this expansion, there are additional longhouses and a cemetery.

The fortress cemetery appears consciously integrated into the overall layout of the complex, underlining the synchronic use of fortress and burial ground. The cemetery is assumed to have been the burial place for deceased residents of the fortress (Nørlund 1948, Nielsen 1990). Altogether 133 graves have been excavated, containing 157 individuals. The majority of graves held a single individual, while three of the graves contained mass burials (one with 11 individuals, and two with five individuals each). Only three graves contained weapons, in the form of axes. One of the graves is very rich, containing an enormous iron broad axe with a long, narrow blade with elaborate silver and copper inlay. Apart from the axe, this grave contained a small bronze bowl, glass beads, and a knife with silver wire decoration.

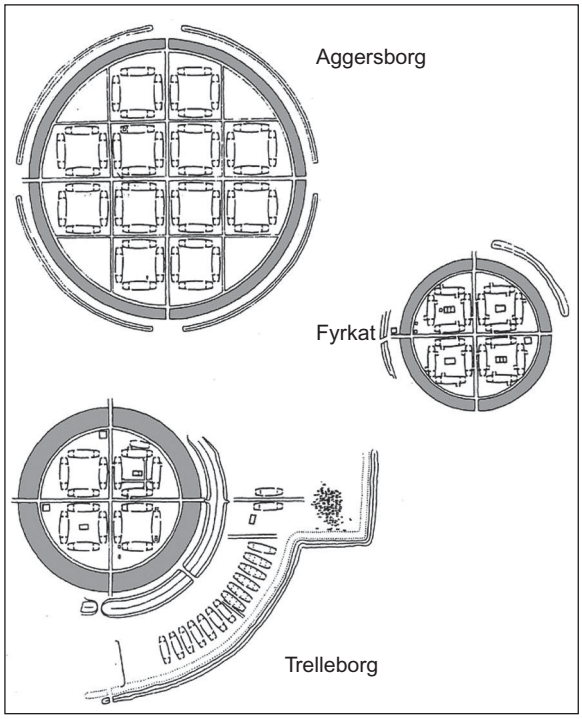


Figure 8.25.
Three of the Trelleborg fortresses in Denmark drawn to the same scale, Aggersborg (top), Trelleborg (center), and Fyrkat (bottom). The cemetery at Trelleborg is inside the second wall where it makes a 90° turn.

Figure 8.26.
The Trelleborg Fortress in west-central Sjælland. Note the circular fortress and second outer rampart and ditch.

Trelleborg is one of at least six almost identical structures, known as Viking Age ring-forts or circular fortresses. These include Aggersborg in northern Jylland, Fyrkat near Hobro, Nonnebakken at Odense in Denmark, Trelleborg in southernmost Sweden, and Borgeby near modern Lund in southeastern Sweden. They all share the same uniform appearance, strictly following an architectural master plan in layout and construction. This similarity argues for the almost simultaneous construction of the fortresses towards the end of the tenth century. Fire horizons evidence the violent destruction of some of the structures.

The function and background of the fortresses is debated. They should probably be viewed as closely connected with the process of state formation (Dobat 2010). They may have been established as centers of royal power to control and administer the northern and eastern provinces of the Danish realm under King Harald Bluetooth of the Jelling dynasty. One of their primary functions seems to have been as military strongholds and barracks. Additionally, they must be supposed to have held economic, religious, and symbolic significance. At the same time, they might have functioned as defenses against potential foreign enemies (Olsen and Schmidt 1977, Randsborg 1980, Roesdahl 2008, Sindbæk 2005).

The finds at Trelleborg reflect far-reaching exchange and/or the presence of peoples from distant regions. A considerable proportion of the ceramic materials resemble tenth-century pottery from Slavonic settlements along the southern coast of the Baltic Sea. One can also trace a Slavonic influence in other find categories, such as spindle whorls and antler combs (Dobat 2010).

At Fyrkat, one of the two Trelleborg fortresses in northern Jylland, a significant number of the finds have parallels in Eastern Europe or elsewhere in Scandinavia (Roesdahl 1975). In addition, the enormous quantity of soapstone vessel fragments at Fyrkat is unique in a south Scandinavian context and points to relationships with the Scandinavian Peninsula, presumably to a source of soapstone somewhere in Norway (Sindbæk 2005).

GRAVES AND TOMBS

The cemetery at Trelleborg is an unusual example of a graveyard with a high proportion of young adult males. The practice of human burial was highly varied in the Viking period. Cremation was the common form of burial, and placement in cemeteries was more common than in isolated graves. At the same time, numerous high-status graves occurred as inhumations in rich tombs. Some of these are described elsewhere in this chapter, including the Oseberg ship and some of the rich graves at Birka and Haithabu.

The use of ship-shaped stone settings for graves grew during the early part of the Viking period, and entire cemeteries of these stone ships have been found. One of the best known is at Lindholm Høje, on a hillside near the modern Danish city of Aalborg at the mouth of the Limfjord (Figure 8.27). The earliest of the some 700 graves at the site come from the fifth century AD, but the majority are likely

Figure 8.27.
The ship-shaped grave settings at Lindholm Høje, Denmark.

Viking in age (Marseen 1992, Ramskou 1960). Most of the burials were cremations, although inhumations have also been found.

In a cremation ceremony, it was common to burn the corpse and personal possessions on a pyre, where the temperatures reached 1,400°C (2,500°F)—hotter than modern crematory furnaces. Large fires with abundant smoke were preferred, to insure the passage of the deceased to an afterlife in the heavens. Such ceremonies are described in the Ynglinga Saga (Smyser 1965):

> Thus he (Odin) established by law that all dead men should be burned, and their belongings laid with them upon the pile, and the ashes be cast into the sea or buried in the earth. Thus, said he, every one will come to Valhalla with the riches he had with him upon the pile; and he would also enjoy whatever he himself had buried in the earth. For men of consequence a mound should be raised to their memory, and for all other warriors who had been distinguished for manhood a standing stone; which custom remained long after Odin's time.

Burial patterns undergo a major shift with the arrival of Christianity after 1000 or so. Christian graves were simple inhumations, and cremation was no longer practiced. The Christian ethic disavowed wealth and the need for material goods in the afterlife. Grave goods were rare—perhaps a cross—or nonexistent. There were exceptions, of course, but in general simple graves dominated. Status and gender were no longer identified in the furnishings of the grave chamber or tomb.

Examples of various kinds of burials from the Viking period appear throughout this chapter, including the huge mounds at Jelling, the large cemeteries at Birka, the various types of graves at Haithabu, the Gokstad ship burial in Norway, as well

as the discoveries of graves found at Randelev and Mammen in Denmark and at Gulli and Borrehaugene in Norway, described below.

Gulli, Norway

The site of Gulli, on the west side of the Oslo Fjord not far from Borrehaugene, is a Viking Age burial ground with several different types of graves dating from 750 to 1050 (Gjerpe 2005). A number of the graves have a circular ditch surrounding the burial that may have held posts or other markers of the place of burial. Unfortunately, organic preservation was poor, and bone did not survive. However, the contents of the graves, particularly metal and glass objects, were recovered in the excavations.

A total of more than 30 burials had been placed in simple inhumation graves, chamber graves, or boat graves (Figure 8.28). Some of the graves had been looted in the past, and little information was available. Twenty of the excavated graves retained their contents and were described in detail in the archaeological reports. Both men and women were buried in the cemetery, identified from the grave contents. Male graves included swords, spears, arrowheads, and/or shields. Women's graves contained spindle whorls, oval brooches, and glass beads. Several of the graves must have contained horse heads, identified by a distinctive stone platform in the burial area.

Randlev, Denmark

Randlev was a wealthy village during the ninth and tenth centuries, located near the modern town of Odder in Denmark, about 20 km south of Aarhus. The village cemetery was located on a nearby ridge 300 m (1,000′) outside the village. The graveyard was located near a burial mound from an earlier period and contained approximately 104 graves, including 20 cremations. The inhumations were placed in simple wood coffins or wrapped in blankets or skins. Grave goods were few and

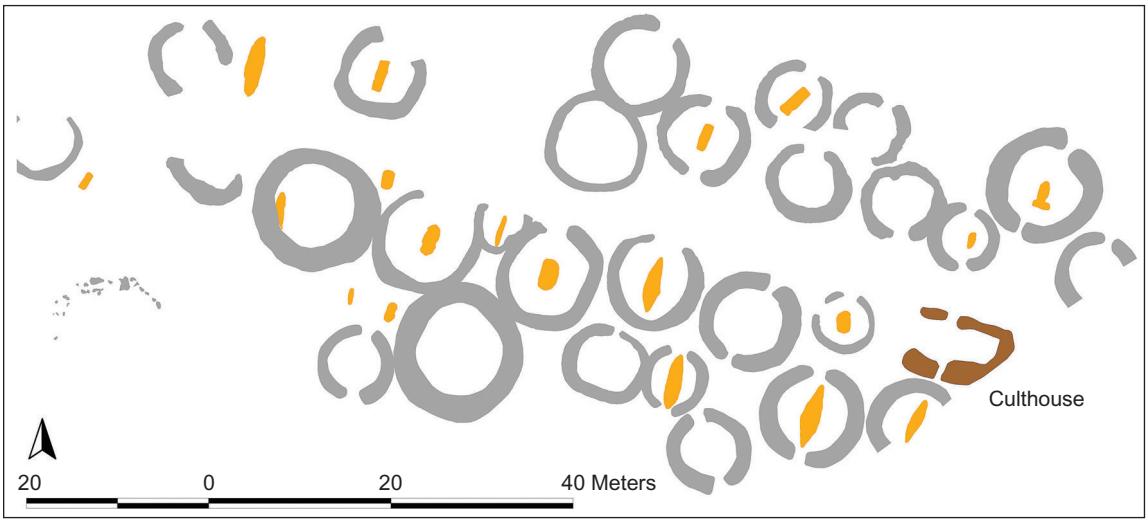


Figure 8.28. The Viking Age cemetery at Gulli, Norway, with ring ditches, boat graves (yellow), and a culthouse (illustration by Magne Samdal).

Age/Sex	Female	Male	Unknown	Total
Infant (0–6)			1	1
Adultus (20–35)		3	7	10
Adultus/Maturus (25–40)	15	6		21
Maturus (35–55)	2			2
Total	17	9	8	34

Figure 8.29.
Sex and age distribution in the Randlev Viking cemetery (Sellevold et al. 1984).

consisted primarily of personal belongings such as knives and whetstones, belt buckles, and a few ornaments (Damm 2005). There were only a few graves with richer items. The largest number of grave goods was found with a mature female. Much more wealth was found in hoards and as loose finds in the village area than in the cemetery.

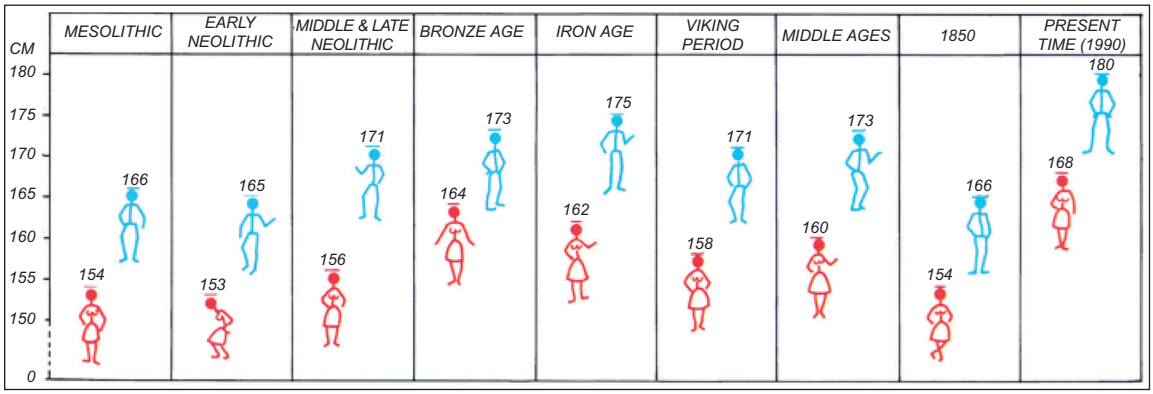
The human remains at Randlev were generally well preserved, making it possible to investigate the demography and physical characteristics of the population (Figure 8.29). A total of 34 individuals could be identified with regard to age and/or sex. Interestingly, most of the graves (17) were those of women; a relatively small number of males (9) were present. There was a single child (1.5 years of age). Almost all of the females were in the adult/mature category, with two older mature women. The skeletal remains generally had bad teeth, with many cavities and substantial tooth loss. The women lived to an average age of 41.3 years and the men to 39.2.

The average height was 172 cm (5′8 ″) for the males and 165 cm (5′5 ″) for the females at Randlev. Bennike (1993) has compiled a wonderful graphic of changes in average height in Denmark over time (Figure 8.30). Maximum average heights for men were during the Iron Age and for women during the Bronze Age. There was a slight decline in the Viking period. Stature is a reflection of health and nutrition, and there were clear changes in these conditions in prehistoric Scandinavia. Modern stature is of course the highest.

Figure 8.30.
Average stature for males and females in Denmark from the Mesolithic to the present (Bennike 1997).

Mammen, Denmark

The area around the modern town of Mammen must have been a very wealthy region in the Viking Age. Both a spectacular hoard and a rich burial mound



have been found in the area. The mound called Bjerringhøj yielded one of the more important finds from the Viking period in Denmark. A local farmer was digging in the mound in 1868, probably to add soil to his fields, and encountered a richly furnished grave. A wealthy and powerful magnate had been buried in the winter of 970. He had been placed on a bed of down pillows in a wooden coffin inside a large wooden chamber that was then buried beneath an earthen mound.

There were two iron axes at his feet, and a bronze bucket and two wooden buckets in the chamber. The buckets probably contained food and/or beverages. A wax candle had been placed on the lid of the coffin. Such candles were rare in Viking Scandinavia, and this one was large, 10 cm in diameter and ca. 60 cm (24″) long, made of beeswax. Candles were normally associated with churches and convents, and they have been found in only a handful of Viking Age burials in Scandinavia and Russia. The candle in the Mammen grave may reflect the special status of the buried individual and perhaps some Christian aspect to his life.

The most remarkable finds in the tomb were the surviving fragments of the man's clothing, decorated with purple and red silk, as well as embroideries in red and blue, interwoven with gold and silver thread. The silk must have come from China or India. A modern reconstruction of the costume is shown in Figure 8.31. He probably was wearing a belted woolen tunic over a pair of blue pants made of lightweight material. He was also dressed in a wool cape lined with marmot fur and decorated with the best examples of tablet weaving known from tenth-century Denmark. The designs included leopards and other animals, bird masks, and leaves in red, blue, and yellow.

Figure 8.31.
A reconstruction of the magnate's costume from Mammen, Denmark.

One of the iron axes has an elaborate design in inlaid silver with a motif that contains both pagan and Christian elements. There is a tree depicted as well as an animal, perhaps a rooster or phoenix on one side. The phoenix is a mythical Christian animal and the rooster is a part of Nordic mythology. The presence of the wax candle may also reflect a Christian element in the grave.

The hoard from Mammen was exposed during gravel quarrying not far from the magnate's chamber grave. It contained two fine wooden harness bows with fittings and decorations of gilded bronze (Figure 8.32). The two pieces would have been placed on the backs of two draft horses. Besides being decorative and indicating wealth, they functioned as a guide for the reins on wagon horses. The hoard also contained fittings for a wooden box and several copper dishes and a jeweler's mold for making jewelry.

Figure 8.32.
A reconstruction of one of the wood and gold harness bows with gilded bronze fitting from a hoard near Mammen, Denmark.

Borrehaugene, Norway

One of the largest groups of monumental burial mounds from the late Iron Age and Viking period, sometimes called the Kings' Graves, lies on the west side of the Oslo Fjord, about 60 km (35 miles) southwest of the city. The site is located near a strategic narrow point along the fjord that could have controlled shipping into the Oslo area itself. Snorri's saga suggests that this place, Borre, was the burial site of the Norwegian kings from the Ynglinge dynasty, which probably ruled for about 100 years between the second half of the ninth century and the late tenth century.

The site is known as Borrehaugene—the grave mounds—and dates from approximately 560 to 1050. The long continuity in the use of this location for rich graves points to the importance of the area. There are at least seven large mounds and some thirty smaller mounds or cairns (Myhre 1982, 2003, Østigård and Gansum 2009). Many of the smaller mounds were cremation graves. All of these had been opened and looted in antiquity. Other mounds may have disappeared completely. There are reports of at least two additional large mounds that are no longer visible on the surface. Only one of the large mounds has ever been excavated, and that one under adverse circumstances. Mound 1 was discovered in 1852 during removal of fill for road construction. The mound itself was probably 40 m (130′) in diameter and contained the remains of a Viking ship 17 to 20 m (56′–66′) long, the first ship burial found in Norway. There were also three horses in the tomb, along with trappings and stirrups, several iron cauldrons, a glass vessel, weapons, and tools. Unfortunately, it was destroyed by the road builders. In all likelihood, this was a burial comparable to the Gokstad and Oseberg ship burials described in a later section of this chapter.

Using ground-penetrating radar and a magnetometer to look for features beneath the surface, archaeologists have searched the area around the mounds in recent years and made some extraordinary discoveries. These new methods revealed the remains of at least two large halls, only 100 m from the mounds, that evidence the residence of a powerful and important person. One of the houses was at least 14 m (45′) long, the largest prehistoric structure found in this part of Norway. The hall dates to between 700 and 800. A reconstruction of the large hall has been

Figure 8.33.
Several burial mounds at Borrehaugene.

built near the site and has become a major tourist attraction (Figure 8.33). These halls may have served for ceremonial more than residential purposes. The artifacts found include weapons, jewelry, and the remains of feasts and drinking rituals. They may also have been the places of weddings, funerals, and other rites of passage in local society.

Several tombs were also recorded in the remote sensing of the underground. One of the newly discovered tombs at Borre appears to hold a fully armed warrior in a sitting position. Another tomb was found in a nearby river valley, apparently intact and sealed with a large stone. In all likelihood, Borre was the center of a small kingdom in the later Iron Age, ruled by individuals with connections to Sweden, and perhaps England and Denmark as well. Borre has a rather tainted history more recently, because in the 1930s it was used as a nationalist symbol of Norway by the extreme right-wing Nazi party, Nasjonal Samling, which held large meetings at the site.

THE VIKING SHIPS

The tradition of ships and shipbuilding has a long history in Scandinavia. The spread of the first settlers in western Sweden and Norway took place by boat during the late Paleolithic. These groups bypassed large areas of ice-covered shoreline in the only way possible, using some form of watercraft. Skin boats are a likely option, as there were no large trees in the late Pleistocene landscape of northern Europe. Later boats in the first half of the Holocene were dugout canoes made from hollowed lime-tree trunks during the Mesolithic. A number have been recovered, and an example from Tybrind Vig was discussed in chapter 3.

There are fewer examples of watercraft from the Neolithic, and again they are dugouts. However, at this time, it seems clear that people were not only crossing

the straits between modern Denmark and Sweden and traveling among the Danish islands, but also navigating from northern Germany and western Poland to Bornholm and southern Sweden. A staggering amount of high-quality flint was transported to Bornholm from southern Sweden during the Early Neolithic. The very early dates for domesticated plants and animals in Skåne argue strongly for an overseas connection with continental Europe and the farming groups in that region.

Bronze Age ships are often depicted in the rock art of this period, and one actual example of a boat was found at Hjortspring, described in the chapter on the Bronze Age. These unusual double prow and stern ships foreshadow the ship technology that flowered in the Iron Age. The ships found in the weapons offerings such as Nydam document the size and construction of these larger ships, capable of carrying crew and cargo across the sea.

It is the Viking ships, however, that are most renowned in Scandinavia. Their beautiful lines and their function as warships have brought a great deal of attention to the vessels. And many examples have been preserved, either beneath the sea or buried in earthen mounds as tombs. In previous pages I mentioned the finds from Valsgärde, Sweden, and below I discuss the ship grave from Oseberg, Norway, the many ships found in the Roskilde Fjord, and the Ladby ship burial in Denmark.

In addition to the ships that have been recovered from the Iron Age and Viking periods in Scandinavia, there are also several shipyards and places for repair and outfitting that have been uncovered. The new finds at Henne Kirkeby on the west coast of Jylland, Denmark, suggest the presence of an important shipping and ship-provisioning locality. A shipyard of some sort has been excavated along the Fibrøde Å on the Danish island of Falster (Madsen and Klassen 2010). There the archaeologists found rich layers containing ship parts, tools, and discarded wood from the eleventh–twelfth century. This was probably not a shipyard as such but rather a dock, offering repairs and occasionally building a new ship. A similar but much earlier site from the third and fourth centuries AD has been found inland, 35 km northeast of Göteborg, Sweden, along the former course of the Grönån River. A change in the course of the river led to the silting up of an old channel and the burial of a number of ship remains (Nordqvist 2011). This site may have been located inland for access to the rich forests and abundant timber available in the area.

The average speed of the Viking vessels at sea varied, but was in the range of 5–10 knots (ca. 10–20 km or 6–12 miles per hour). The maximum speed of a longship under favorable conditions was around 15 knots (25 km or 15 miles per hour). Sailing times were highly variable and dependent on the vagaries of the weather and the fortunes of navigation (Brøgger and Shetelig 1971, Hale 1998). Ships on the open sea likely averaged 50 km (30 miles) per day. Englert (2007) deduced from a ninth-century account of voyages along the coasts of Norway and Denmark that a Viking ship had sailed from northern Norway to the mouth of the Oslo Fjord in about a month.

The map in Figure 8.34 shows estimated sailing times in days from the Viking town of Aros to various ports of call in southern Scandinavia as a rough guide to the length of voyages (Damm 2005). Some sailing distances as the crow flies

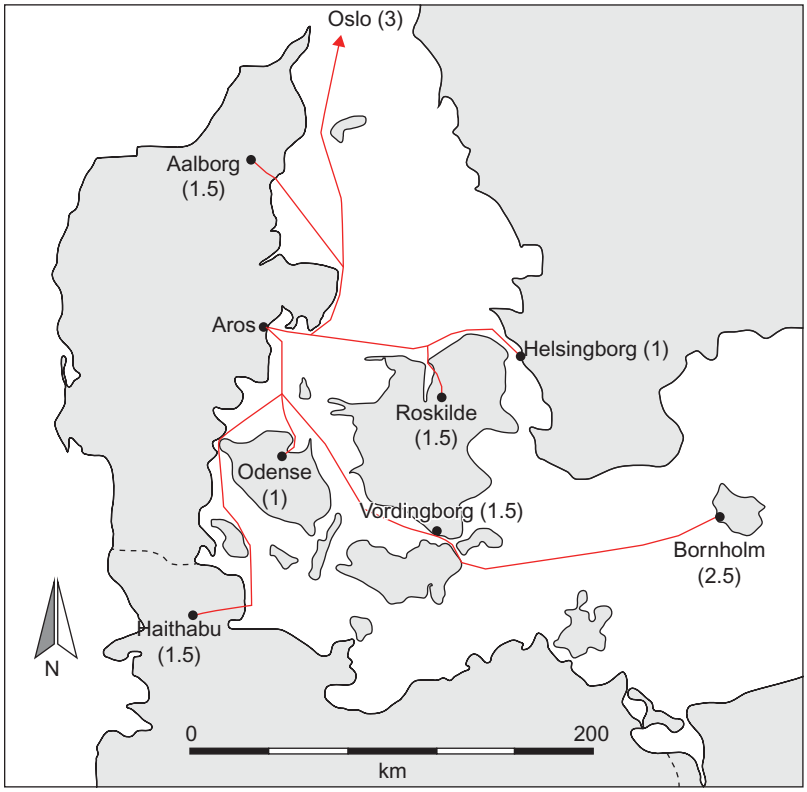


Figure 8.34.
Approximate sailing times in days (in parentheses) from Aros to other ports of calls in southern Scandinavia.

are Aros–Oslo 420 km (260 miles), Aros–Bornholm 360 km (225 miles), and Aros–Haithabu 240 km (150 miles). Most of southern Scandinavia could be reached within a maximum of three days, depending of course on the weather. Adam of Bremen reported that it was possible to sail from Ribe on the west coast of Denmark to England in three days if the weather and winds were favorable. Sailing in the summer offered many more hours of light with the "white nights" of the north, often under good conditions.

Oseberg, Norway

The Viking Ship Museum in Oslo is one of the treasures of the archaeological world—a shrine to the glory of the ancient Vikings and some of the most spectacular archaeological finds in Europe. Three ancient Viking ships from places called Gokstad, Tune, and Oseberg rest in this dramatic, apsed hall. These ships and their extraordinary contents had been buried under large clay and earthen mounds as tombs and monuments for dead rulers. The Gokstad ship is the largest, the Tune the least well preserved, and the Oseberg the most intriguing.

The mounds were plundered in antiquity, the burial chambers opened and the remains of the dead and some of their grave furnishings removed or dispersed. The magnificent ship at Oseberg was largely intact (Figure 8.35). Parts of two skeletons were found in the tunnel that the robbers had opened

(Shetelig 1928). Precious metals and certain other valuable items like jewelry are missing from this royal tomb. Fortunately, an extraordinary set of textiles and wooden artifacts were ignored by the thieves. These included four elaborately decorated sleighs, a richly carved four-wheel wooden cart, three beds, and a number of wooden chests. Agricultural and household equipment was also left behind in the mound, along with the bodies of a number of animals.

Figure 8.35
The elaborate carving on the prow of the Oseberg ship.

The date of the destruction can be established as the second half of the tenth century from the wooden spades left behind by the grave robbers. Both the Oseberg and Gokstad ships were probably robbed in the same year, only a little more than 100 years after the original Oseberg burial in 834. There is a possibility that the desecration of these mounds was done intentionally by new powers coming to Norway, bringing the Christian religion. The arrival of the Danish king Harald Bluetooth during the tenth century may have resulted in the deliberate destruction of the symbols and monuments of his pagan predecessors in order to denigrate the interred rulers and their descendants (Bill and Daly 2012, Randsborg 1998).

The preservation of the ships and the grave contents is remarkable for materials more than a thousand years old (Figure 8.36). Fortunately the burial sites, about 100 km (60 miles) southwest of Oslo on the west side of the Oslo Fjord, lie on a former sea floor with thick deposits of marine clay (Sjovold 1969). A deep trench had been dug in this clay to hold the Oseberg ship, and the clay and peat were used for the mound to bury the ship. The burial mound was approximately 40 m (130′) long and 6.5 m (20′) high and completely covered the ship. This clay enclosed the ship in a wet, largely anaerobic environment and preserved the contents in very good condition. The excavators reported, for example, that fragments of skin were still present on the body of an ox in the tomb, and the stomach contents of the animal produced an unpleasant odor. Almost 95% of the wood from the ship was preserved, although it had been crushed and twisted by the weight of the mound. Restoration took many years, but the planks were returned to their original form and the ship was reassembled.

Studies of tree rings in the ship's wood and grave contents revealed that the trees for the ship were cut around 820 and that the ship itself was buried in 834. It was excavated in 1904. The Oseberg ship is 21.5 m (70′) long, with a width of

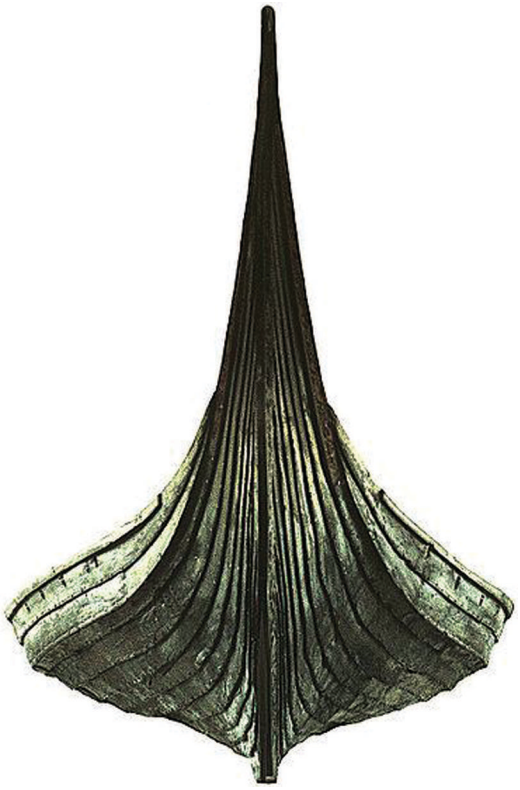


Figure 8.36.
The frontal view of the Oseberg ship at the Viking Ship Museum in Oslo.

5 m (16′). The ship was clinker-built of oak planks and had a steering oar, an iron anchor, a gangplank, a bailer, and a pine mast. Its bow and stern were covered in elaborate carvings (Figure 8.53), as were most of the wooden objects in the grave. The ship had 15 pairs of oar holes in the sides, which suggests a crew of at least 30 individuals. With a mast of ca. 10 m (33′) and 90 m^2 (almost 1,000 ft^2) of sail, the Oseberg could probably move at speeds of up to 10 knots (11.5 miles) an hour. In terms of seaworthiness, however, the ship is rather delicate, and it may have been a pleasure craft or purpose-built for the burial of an aristocrat.

The fragments of two tents were found in the center of the ship; they probably covered the burial place of the two women whose bones had been removed or scattered in the robber's tunnel. Other remains on the ship included 14 horses, four dogs, and two oxen. These animals were sacrificed to accompany the dead to the afterlife. The abundant amounts of grain and fruit found in an elaborate wooden chest, along with the quantities of other foods encountered, suggest the burial took place around harvest time in the fall.

The older woman, 60–70 years of age, had a rather severe case of arthritis. The younger woman was 25–30 years of age. One woman was buried in a luxurious red wool dress with a twill pattern and a fine white linen veil in a gauze weave; small strips of exotic silk had been applied on a tunic worn under the red dress. The other wore a plain blue wool dress with a wool veil, suggesting social differences in their costume. It is not known, however, which woman wore which dress.

The burial of a large, elaborate ship with rich grave goods indicates that this was the grave of a very high-status person. It is sometimes suggested that one of the individuals was the historically known Queen Åsa, mother of Halfdan the Black, one of the first kings of Norway. The other woman was presumably a servant who was sacrificed at the death of her mistress. There is no proof for such assumptions, however, and the identities of the interred remain unknown. Androshchuk (2005) makes a good argument that the primary burial in the barrow was actually male and that his remains were completely removed by the plunderers. He points out that there were three sets of several items, such as the beds, shoes, and combs in the tomb, which suggests another individual.

The wooden items placed in the mound are spectacular, often covered in elaborate carvings and metal fittings. A number of wooden buckets probably held food and drink. One of the buckets contained a wooden ladle and wild apples. Another had a spectacular handle ornament of enameled brass showing a figure sitting in lotus position (Figure 8.37). Three of the wooden sleighs were decorated with ornate

carvings. There are also three bed frames with beautifully carved posts. Other items included a small wooden chest and a vertical loom. Among the tools and equipment were an iron cooking cauldron and two small axes, found with other kitchen implements near a butchered ox. There were also troughs of wood, frying pans, kit boxes, knives, a hand mill for grain, and a kitchen stool with four legs. Two additional oak chests were found in the chamber, containing two iron lamps, iron scissors, horseshoe nails, a wooden box for wood, an awl, a spindle, and more.

The wooden cart from the Oseberg ship is a masterpiece of craftsmanship and the only known complete Viking Age example (Figure 8.38). The cart is very elaborate and may also have been built specifically for the funeral, perhaps to carry the deceased to the place of burial. One of the numerous tapestries found in the mound depicts a number of carts and people moving in one direction and might represent a funeral procession (Figure 8.39). The cart is about 5.5 m (18′) long including the shafts, with a width of 1.5 m (5′) and a height of 1.2 m (4′). The wheels are made of beech, with heavy rims and hubs, while the spokes are somewhat lighter. The body of the wagon is an open box with a rounded cross section. Each end consists of a single piece of wood covered with carvings. The sides and bottom are made of nine boards fastened together at the ends with iron rivets. Two boards on each side are decorated; the others are plain.

Figure 8.37.
The enamel bronze figure on the bucket handle from Oseberg.

Figure 8.38.
The Oseberg cart, restored.

Figure 8.39. Reconstructed scene from one of the Oseberg tapestries.

One of the carved panels of the wagon body contains elements of the legend of Hercules adapted to a Norse context (Ettlinger 1976).

The Oseberg burial contained a number of rare examples of Viking Age textiles, including woolen garments, carpets of wool and linen, imported silks, and fragments of narrow tapestries. There was a great deal of equipment and material for making thread, yarn, and weaving, including the vertical loom, lots of wool, dyes, and a variety of weaver's tools. There were also a large sail, pieces of rope and cord, and many other fragments of fibers, fabrics, and textiles. The textile collection from Oseberg was not published for more than 100 years after the excavation, and many pieces still have not been separated from the compacted piles of cloth that were removed from the burial chamber (Christensen and Nockert 2006).

Roskilde, Denmark

There are many lovely landscapes in Scandinavia. The deep fjords of Norway are justifiably famous, and the rocky archipelagos of the Swedish coasts are beautiful places. The serene summer landscapes of the Danish countryside, with green forests, fields of golden grain, red poppies along the roadside, and a view to the blue sea, are unforgettable. The Roskilde Fjord, just 20 minutes west of the capital of Copenhagen, is a place of such vistas. The fjord is a narrow inlet that runs 40 km (25 miles) inland from the Kattegat in the north to the city of Roskilde in the south. These waters are normally shallow, less than 6 m (20′) deep, and can be waded in many spots. Navigation of the fjord is always tricky, and channels must be kept open to permit boats to pass.

The latter half of eleventh century in southern Scandinavia was a time of threat and danger. The inhabitants of Viking Roskilde decided in 1070 to blockade the narrow navigation channel 20 km (12 miles) north of the town in order to prevent

surprise attacks from the sea. They took five old ships, filled them with rocks and scuttled them at the spot. More rocks were added to create a substantial submerged barricade. In 1924, fishermen from the nearby village of Skuldelev were clearing a new passage through the channel and pulled up an old wooden mast step. In subsequent years, divers retrieved ship parts from the same waters, drawing interest from the Danish National Museum. Underwater investigations at the site were undertaken from 1957 to 1959, and the ship remains were identified as rare examples of Viking vessels.

In 1962, a large-scale excavation lasting four months recovered the ships. A cofferdam was built around the entire site and the sea floor pumped dry so that the excavations could take place in the open air (Crumlin-Pedersen and Olsen 2002). The delicate work had to proceed quickly, and the wood had to be constantly sprayed with water to insure preservation. It was an arduous task, but in the end the remains of the five Viking Age ships were recovered. The wood was soft and deteriorated, and many years of treatment and preservation were required before the jigsaw puzzle of refitting the fragments back together into their original shape could be completed. A large museum was built to provide a place for restoration and reconstruction and to house the finished vessels. The Viking Ship Museum in Roskilde is now one of the more popular tourist attractions in Denmark.

The five are a remarkable assemblage of Viking Age ships, ranging from cargo to warships, each different and each full of information on boat-building skills and techniques (Figure 8.40). The site was designated as Skuldelev and the individual ships are numbered 1, 2, 3, 5, and 6 (4 was discovered to be part of vessel 2). All the ships were clinker-built sailing vessels equipped with oars and all date to the

Figure 8.40. The restored Skuldelev 2 warship inside the Roskilde Viking Ship Museum.

eleventh century. The boats were generally old and worn, and had been repaired several times before they were scuttled.

Skuldelev 1, a seafaring trading vessel, 15.8 m (52′) long with a crew of six to eight, was built in western Norway of pine, oak, and lime wood. Skuldelev 2 is a 30 m (100′) oceangoing oak longship with a draft of only 1 m (3.3′), made in Dublin around 1042. This warship had 60 oars and a crew of 65 to 70 men. Under sail, a modern replica of this ship reached a top speed of 12 knots (14 miles per hour). The third ship, Skuldelev 3, is a 14 m (46′) coastal trader made of oak planks with an average speed of four to five knots (5 miles per hour) and a crew of five to eight. The ship was built in Denmark in 1040. Skuldelev 5 is a small 17 m (56′) longship built in Denmark of oak, pine, ash, and alder from ca. 1030. The ship had a crew of around 30 and places for 26 oars. A shield rack was found along the outer rail of the boat. Skuldelev 6 was an 11 m (36′) fishing boat that could be rowed or sailed, built of pine, birch, and oak around 1030 in western Norway.

And now the rest of the story. Some years after the Skuldelev ships had been salvaged, preserved, and reconstructed, the museum continued to grow. Expansion to a new artificial island was planned for additional storage and boatyards to build modern replicas of ancient Viking craft. A channel had to be dug to create this island, and the work began in 1997. During the course of these excavations, nine new ships were discovered and eventually excavated (Croome 1999). One of the ships, the Roskilde 6, is incomplete but estimated to have been 32 m (120′) in length, the longest Viking warship known. A ship of this size must have been the property of a king or noble. Both the timber and craftsmanship were of the finest quality. The ship would have had 78 rowing positions and a crew of 100 men. The mast would have held a single square sail of perhaps 200 m^2 (2,150 ft^2). The ship was built around 1025 and was recently put on exhibit after extensive conservation and analysis following its excavation. The archaeologists have speculated that a major storm may have sunk a number of the ships at Roskilde and buried them out of sight in the silt. Wreck 2 appears to have been fully rigged when it sank, suggesting a catastrophic end. The majority of these ships date between 1100 and 1250.

Ladby, Denmark

A large earthen mound lies along the coast of the Kattegat northeast of the city of Odense on the island of Fyn. At one end of the mound is a modern steel door—the entrance to the underground exhibit of a Viking ship burial, the only one in Denmark. The mound still holds the remains of the ship and its contents in the exact place where they were found. This is the Ladby ship, the tomb of an important Viking chief dating from the early tenth century.

The mound itself had actually been plowed away long ago. The place was discovered in 1934 by a local amateur archaeologist who noticed a ring of stones in the field that he thought might mark an ancient burial mound. He began digging and found several unusual iron spearheads that later turned out to be decorations of the ship's dragon tail. Then he noticed that, although there was no wood preserved in the mound, there were rows of iron rivets in the shape of a ship (Figure 8.41). The National Museum was notified and completed the excavation. When the dig was finished, the project had exposed a Viking grave and more than 600 objects from the ship burial and its contents (Thorvildsen 1975).

Figure 8.41.
The remains of the Ladby ship, marked by rows of iron rivets, enclosed by the glass exhibition case inside the earthen burial mound (photo by Malene Thyssen).

Only the impression of the ship in the soil remained, but the 2,000 or so iron rivets clearly mark the lines of the missing wooden planks from the ship. The ship was large, 21.5 m (70′) long and 3 m (10′) wide, built for 30–32 rowers. The presence of a sail on the ship was identified from the remains of seven iron shroud rings along the railing. The ship had a prow in the form of a dragon's head, although only the iron curls of the dragon's mane survived in the ground (Figure 8.42).

The ship had been dragged from the nearby harbor to the top of the small rise at Ladby and placed in a prepared trench in the ground. A wooden hut was built just behind the mast as a tomb for the deceased and the weapons, personal items, food, and valuables for his journey to the afterlife. Eleven horses, one with full riding gear, and three or four dogs were sacrificed and placed in the front of the

Figure 8.42.
The dragon's mane on the prow of the Ladby ship (photo by Malene Thyssen).

ship. The ship's anchor and chain were left on board. The ship was then burned in place, wooden planks placed over the ashes, and the entire area buried under an earthen mound some 29 m (95′) in diameter (Sørensen 2001, Thrane 1987). The burial was robbed in antiquity, perhaps not long after the interment took place. Only fragmentary human remains have been found in the tomb, suggesting that the body may have been removed either for Christian burial by the deceased's descendants or perhaps as a political act by his enemies to destroy his aura.

The contents of the tomb represent the property of a rich and powerful individual. Traces of feathers found during the excavations suggest that the deceased was placed on a quilt or comforter filled with down. Among the most notable finds were a silver belt buckle, fragments of a silver plate and a bronze platter, a gilded dog leash, and the remains of the chieftain's clothing with gold thread. Other finds included a buckle for a sword belt probably made in France, spurs and stirrups, a shield boss, an axe, 45 iron arrowheads, a small gold and silver knife-set in a wooden case, and a game board.

RUNES, RUNE STONES, AND PICTURE STONES

Runes are the letters of the angular runic alphabet used in writing the ancient Norse language. Most of the written examples are inscriptions on stone or names on personal artifacts. Most of the inscriptions are either single words or brief statements. Later inscriptions on rune stones were somewhat longer. There are few lengthy documents on parchment or other materials until the early medieval period (Figure 8.43). Runic is also the script used in the graffiti carved into the wooden furniture and buildings in Bryggen, the medieval quarter of the Norwegian city of Bergen, excavated in the 1950s and '60s, as well as scratched on a wall of the Hagia Sophia in Istanbul by visiting Vikings.

Figure 8.43. The Codex Runinus, a runic document of Scanic law, dating from ca. 1300, probably a revivalist use of the obsolete alphabet.

The oldest examples of runic inscriptions come from southern Scandinavia and appear around AD 150. The precise origins of the script are debated, but it clearly seems borrowed from the capital letters of an earlier form of Latin, probably carried to Scandinavia by mercenaries returning from service in the Roman army. There are no local historical written documents for this period in Scandinavia. The few accounts that do exist are foreign reports. Thus the runes provide a limited, but important, record. The runic alphabet was largely replaced by Latin when Scandinavia converted to Christianity after 1000. The written form of Old Norse, the ancestor of modern Scandinavian languages, evolved during the Middle Ages.

A rune stone is a standing stone with a runic inscription, although boulders and bedrock are sometimes seen with these carvings as well. The first rune stones date to the fourth century AD, and they continued to be erected for approximately 800 years (Sawyer 2000). Many of them date from the Viking age and served various purposes. A number of motifs were used on the rune stones in addition to the script. Snakes and ships were particularly common, and the body of the snake often contained an inscription. Runestones were originally painted in bright colors, but this decoration has usually disappeared over time (Figure 8.44).

Figure 8.44.
A recently repainted rune stone from Sweden.

Rune stones recorded a variety of messages. The inscriptions provide indirect information on topics such as the growth of royal power, the inheritance customs of the period, and the conversion of Scandinavia to Christianity (Sawyer 2000). One of the oldest, largest, and most famous inscriptions is on King Harald's stone at Jelling. This monument commemorates his parents and records the unification of Denmark and the arrival of Christianity in a remarkable arrangement of iconography and runes (Figure 8.45).

The inscriptions were sometimes memorials to deceased individuals. The stone at Helnæs, in southern Fyn, Denmark, for example, is missing one section but reads: "*Roulv, gode (priest) of the nuRa, raised this stone in memory of Gudmund, his brother's son, . . . (They) drowned . . . Åver painted [i.e., carved or painted the runes].*" In this context, the monuments were often a testament to inheritance and property rights (Sawyer 2003). The rune stones were also used for self-aggrandizement, which appears to have been more acceptable in the Viking age than in modern Scandinavia. One Swedish inscription conveys this impression very strongly: *"Vigmund had this stone carved in memory of himself, the cleverest of men. May God help the soul of Vigmund, the ship captain. Vigmund and Åfrid carved this memorial while he lived."*

Rune stones are found in many places where the Vikings lived or traveled. The distribution of rune stones in Scandinavia is of interest. There are roughly 3,000 such stones in Scandinavia, with some 250 in Denmark, 50 in Norway, and more than 2,500 in Sweden. The Swedish district of Uppland has the highest concentration, with almost 1,200 (Harrison and Svensson 2007). The geographic distribution of rune stones in Sweden highlights a dense concentration in the Mälardalen region around Stockholm and another group to the south on the east side of Lake Vättern. There is another major cluster of runic inscriptions on bedrock and boulders on the Danish island of Bornholm in the middle of the southern Baltic Sea.

The rune stones can be roughly dated on the basis of the inscription style and content, so some changes in the placement of these monuments over time can be observed. Randsborg (1980) has argued that the distribution of the rune stones marked the borders of the Danish kingdom, where they served as something

Figure 8.45.
The Christian image on a reconstruction of the Jelling rune stone at the National Museum in Copenhagen.

like legal documents at the margins of authority. Interestingly, rune stones are found in Norway and Sweden before they appear in Denmark. The earliest rune stones in Denmark are an eastern phenomenon on Sjælland and Fyn during the eighth century, perhaps reflecting the continuing importance of this area from the later Iron Age.

Figure 8.46a shows the distribution of rune stones from approximately 800 to 1000 in Viking Age Denmark. Jylland is the center of rune stones raised in the early tenth century. Later in the tenth century, there are just a few examples elsewhere in Demark and northern Germany. Figure 8.46b shows the distribution of rune stones following the conversion to Christianity after 1000, when elaborate burials were no longer the norm. There is still a concentration around Jelling in middle Jylland and a scattering in the northeastern part of the peninsula. The location of new rune stones shifts to northern Jylland and Skåne. Many memorial rune stones were probably erected in this period as a marker of status outside the grave, circumventing the new Christian ethic.

There is a second category of decorated standing stone monuments in Scandinavia known as picture stones (Andreeff 2012). These stones usually lack runes and convey their message with images (Figure 8.47). Picture stones date from the later Iron Age and the Viking period. They were probably memorial stones for the deceased, but were often placed along roads and near bridges where they would be more visible. There is occasionally a short runic inscription on these stones, usually just the name of the deceased individual. Some may have functioned as boundary markers as well. Motifs on the stones are numerous, but ships are very common along with horse riders, other people, and animals, often with scenes from myths and legends. The vast majority of these stones are known from the island of Gotland.

NORSE RELIGION

Described as pagan by the Romans and Christians in southern and western Europe, the Germanic tribes practiced a form of religion with a pantheon of gods and other supernatural beings to whom they looked for moral guidance and civil behavior. The Norse religion involved festivals, sacrifice, and ancestor worship. Their religion was animistic and polytheistic, with a belief in the cycle of time. There were major religious centers at Uppsala, Old Lejre, and Kaupang as well as many minor cultic sites. As DuBois (1999) described it, Norse religion is probably best understood as

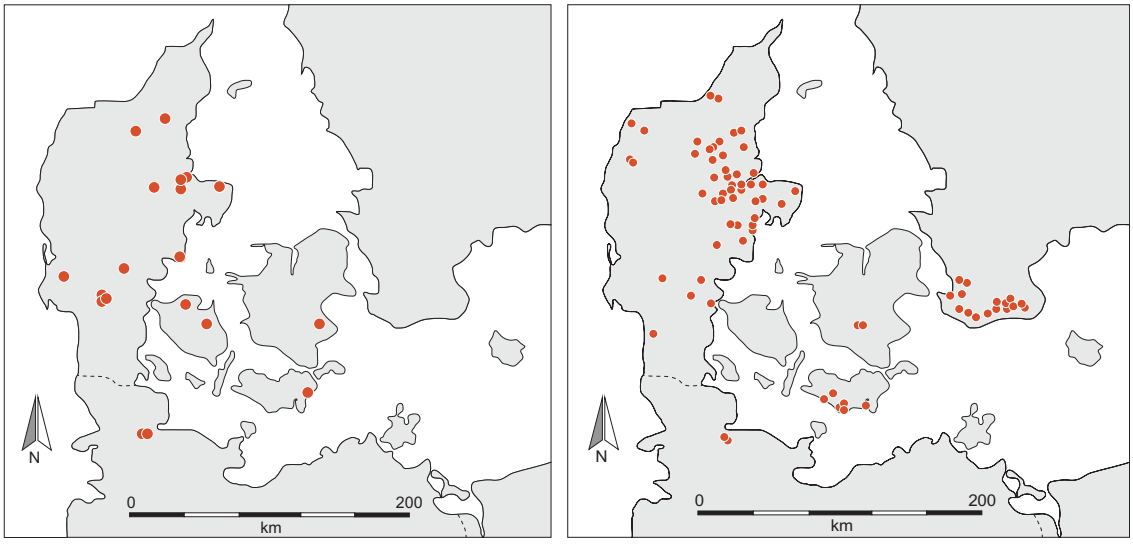


Figure 8.46. Left, distribution of rune stones in southern Scandinavia from 800–1000. Right, distribution following the conversion to Christianity after 1000.

broad concepts shared across a large area, but realized locally by communities that adapted certain beliefs and deities to immediate contexts and needs.

Norse religion included a pantheon of gods divided into two houses, the Æsir—the warrior gods, including Odin, Thor, and Tyr—and the Vanir—the fertility gods and goddesses, including Freyr and Freyja, twin brother and sister, the deities of love, sex, and reproduction. A range of other beings, giants, elves, and dwarves, were minor gods and spirits of varying power and significance.

Norse mythology is the story of the gods and the other beings in the course of conflict, affection, betrayal, and myriad human relationships. These legends and myths provided a foundation of morality tales and values that helped structure Norse society. Ymir was a primeval being born of venom. The origin myth of the Norse involved the Æsir, who raised Ymir's body out of the sea and created the earth. Ymir's flesh became the soil, his bones the mountains, his blood the oceans, and his teeth boulders and stones. And over land and sea they set Ymir's huge skull as the dome of the sky.

The god Odin created the first human beings from an elm and an ash tree. The gods were thus revered as the creators of humans and the world. The world was thought to be an evergreen ash tree, known as Yggdrasil, with nine different realms within its branches. Asgard (heaven) was located at the top in the canopy where many gods lived, including Odin in Valhalla. In addition to Asgard, two other realms—Vanaheim (home of the Vanir) and Alfheim (home of the "light elves")—were located at higher levels. Humans lived in Midgard, the mid-section of the tree. Nidavellir (home of the dwarves) and Jotunheim (home of the giants) were also in the middle parts of the tree. At the base of the tree were three roots that connected Asgard, Midgard, and Niflheim, a realm of primordial ice and cold. A number of creatures lived in the world tree, including a dragon, an eagle, and four stags.

Thor appears to have been the most popular of the gods, smashing the foes of humanity with his hammer; he was married to the golden-haired goddess Sif.

Figure 8.47.
The so-called Stora Hammar picture stone on the island of Gotland.

Odin is another powerful god; assisted by a pair of ravens and a pair of wolves, he pursued knowledge everywhere. Associated with wisdom, death, and poetry, he was the ruler of Valhalla, where those slain in battle were carried by the Valkyries to await resurrection at Ragnarök. This concept of the apocalypse involved a great battle, the death of many of the gods, natural catastrophes, including the flooding of the earth, and the eventual rebirth of the world.

Our knowledge of the Norse religion comes largely from several sagas as well as archaeological evidence. Burial practices, sacrificial victims, votive deposits, and cult buildings testify to aspects of this belief system (Parker Pearson 2006). Certain artifacts, like Thor's hammer (Figure 8.15), a common piece of jewelry from the Viking period, testify to the importance of the gods in daily life. Other objects, like the seated figure of Odin from Gammel Lejre (Figure 8.54), depict the gods as powerful figures. The cult buildings at places like Tissø, Denmark, and elsewhere document the importance of religion and the role of the elite in fostering such beliefs.

Christianity was brought into Scandinavia by the elite in Viking society, as it fostered their power and privileges, emphasizing a better life after death and encouraging selflessness among the common people. The polytheistic beliefs of the Norse likely facilitated the arrival of Christianity, adding one more god to the pantheon.

TREASURES

There are a great number of magnificent objects from the Viking period, many of them booty from the raids on the west. At the same time, there was a distinctive Viking style of decoration that is seen in various media, including wood, metal, stone, and textiles, and is regarded as one of the most intricate and beautiful anywhere. The delicate sophistication of Viking "animal style" art contrasts strongly with the stereotype of the howling barbarian. This lively art often portrayed abstract animals and plants in elaborate interlaced patterns. The decorative art was used on weapons, tools, jewelry, buildings, ships, and many other items. Figure 8.48, for example, shows some of the elaborate wood carving that decorates the exterior of the Urnes Stave Church in Norway, built approximately 1130 and still standing. Several other examples are described below in order to convey an impression of this art and some of the objects on which it appears. Other examples have been mentioned throughout this chapter.

Figure 8.48.
The animal style of Viking decoration on the exterior of the Urnes Church in western Norway (photo by Nina Aldin Thune).

Bamberg, Germany

This spectacular object is known as the Bamberg Casket because it came from a church in the town of Bamberg in south Germany, where it was used for many years as a relic box (Figure 8.49). The decoration is dated to 975, in a distinctly Viking style (similar to the designs from Mammen). The box may have been a gift from the north during the early medieval period. The oak box is covered with carved walrus ivory panels and gilded bronze framing. The square casket is 25 cm (10″) on a side and 23 cm (9″) high, with an elaborate keyhole in the top. The lid is slightly raised and has two crossing supports decorated with four animal heads near a crystal sphere in the center. The carved relief of the ivory is typically Viking animal style, with birds and animals alone or in pairs encircled by the tendrils of

Figure 8.49.
The Bamberg casket, a wood, bronze, and ivory box made in Viking Scandinavia, found in southern Germany.

vines and large leaves. One of the panels on the lid shows a triangular human mask with moustache, hair, and beard that grow into the elaborate coils and tendrils characteristic of the Mammen style. The casket is now one of the treasures of the National Bavarian Museum in Munich.

Birka, Sweden

Beads were a popular commodity and trade item in Viking Scandinavia and were imported from much of Europe as well as produced locally (Figure 8.50). Raw glass was acquired in several forms—unfinished glass lumps, broken glass objects, and glass mosaic pieces from the Roman Empire—and reworked into beads in the trade centers of the Viking region. Bead workshops are known from Ribe, Haithabu, Birka, Kaupang, and elsewhere. The beads were produced from small pieces of molten glass wound around a metal wand or molded in a forge or very hot fire. The millefiori technique was used to make rods of glass of different colors that were then combined into new glass of mixed color. Other beads were made by carving amber or jet. The beads were part of the jewelry of wealthier

Figure 8.50.
Beads of bronze, glass and gold in a six-strand set. Grave find, Stora och Lilla Ihre, Gotland.

Viking individuals. They were worn primarily by women, often on strands hanging between two large oval brooches on the bodice of a dress.

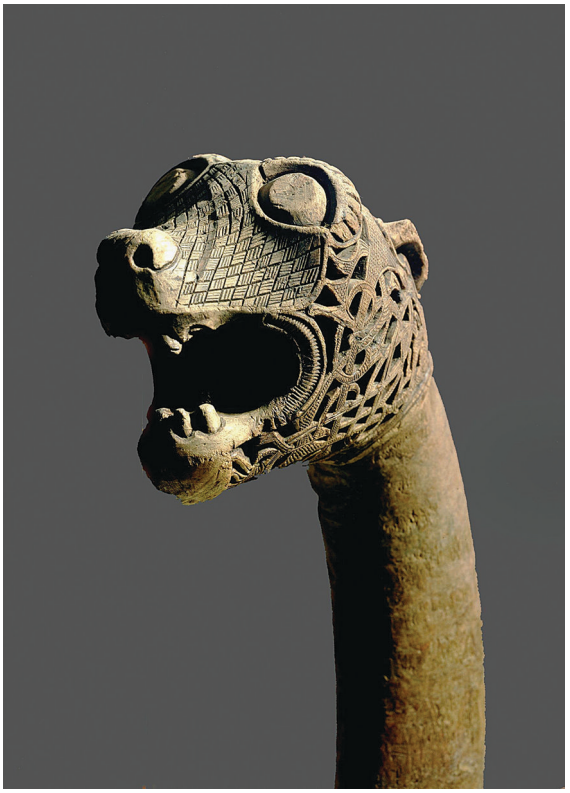


Figure 8.51.
One of the animal head posts from the Osebjerg ship burial.

Oseberg, Norway

Among the many magnificent carved objects found with the Oseberg ship burials were a series of five wooden posts with the heads of mythological animals. Each of these posts depicted a different animal. The posts had a slotted base, suggesting they may have been carried as part of the funeral procession. The creature in Figure 8.51 is one of these, perhaps a dog or serpent or a hybrid of some form. A master woodworker must have carved the deep relief and the powerful expression that appears on this beast. The open mouth and bared teeth suggest a dangerous animal, perhaps intended to protect the deceased on the journey to the afterlife.

Söderala, Sweden

There are at least eight metal banners or wind vanes known from the period between 1000 and 1300 from Norway, Sweden, and Denmark. These wind vanes would have been placed on the masts of sailing ships to track the direction of the wind. They were sometimes placed on medieval churches after their use aboard ship. One of the most famous of these weathervanes comes from Söderala in northeastern Middle Sweden (Figure 8.52), where it adorned the village church for many years. The vanes were generally made from gilded copper. The animal ornaments that often stand on top of the vane at the outer end were also largely copper with various other metals, but always of a slightly different composition than the vane itself. The Söderala vane is 95% copper with a 1 mm gilt layer. The lion on top is made of 80% copper and 20% zinc. The elaborate design in the body of the vane depicts a winged dragon in an arcing style of interwoven curved lines. The vane probably dates to ca. 1025.

Vasby, Sweden

A spectacular silver brooch was found in 1791 at Vasby, not far from the Viking center at Birka. Its size and relief create a rather massive baroque look (Figure 8.67). The brooch has a diameter of 7 cm and is 3 cm high, with a pin to fasten it to clothing. There is a metal loop on the bottom edge of the brooch,

Figure 8.52.
The Söderala weathervane from Sweden (photo by Gabriel Hildebrand).

presumably to hang a chain or string of beads. The base of the brooch is a domed square of silver. On top of the dome are several sets of animals. On each of the four corners is the head of an animal watching the central scene in the middle. There are four horses standing with their heads turned away from a central crown gripped by four beasts. The entire brooch was at one time enameled with several colors that highlighted specific parts of the animals (Figure 8.53). Much Viking metal jewelry was in fact enameled in various colors that have usually disappeared over the centuries.

Lejre, Denmark

One of the more extraordinary—and controversial—finds in recent years was made in 2009 at the site of Gammel Lejre, outside of the modern city of Roskilde. The site itself was described earlier in this chapter. The find is very small to create such a stir—less than 2 cm^3, about the size of an ice cube, and weighing only 9 g (0.3 oz). This particular object was cast from silver around 900 and depicts an individual sitting on an elaborate chair or throne (Figure 8.54). The figure appears to be wearing a floor-length skirt, an apron, four necklaces, a cloak, and a hat. Two birds sit on the armrest, and two animal heads decorate the back of the chair. Black niello (an alloy) and gold were used to add contrast and highlight certain features of the object.

The controversy surrounds the identity of the individual in the chair. Tom Christiansen (2009), the excavator of Gamle Lejre, argues that it is Odin. The

birds would be the two ravens, Huginn and Muninn, that collected information for Odin, and the animal heads on the back might be the two wolves, Geri and Freki, which also belonged to Odin. Others have argued that the figure is dressed in women's clothing and is probably the Norse goddess Frigg or Freyja. Christiansen counters that the upper line on the face of the figure is in fact a moustache and that only males wore brimless hats. The debate has not concluded and may have a long life.

SUMMARY: THE VIKING LEGACY

The end of the Viking period brought an end to the Iron Age and the start of the medieval period in northern Europe. Dramatic changes during the Viking period included the expansion of the Scandinavian population to parts of both eastern and western Europe and the North Atlantic, changes in settlement with the growth of towns, changes in burial practices, the adoption of Christianity, and new relationships with the rest of Europe. The political process of alliance and unification brought southern Scandinavia to the level of other kingdoms in western Europe. That was quite a series of achievements in a period of 300 years.

The northern part of Scandinavia at this time was occupied by the ancestors of today's Saami, hunter-gatherers largely in the interior of the region, preying on reindeer and elk and bear, trapping, fishing, and foraging. A distinction between Sea Saami and Mountain Saami reflects the presence of some groups in coastal areas, where marine resources were a focus of subsistence. The Saami developed a successful adaptation to a cold and difficult landscape. That was also quite an achievement.

The evidence from Harald Bluetooth's rune stone at Jelling documents the emergence of a kingdom in Denmark and the conversion of the Danes to Christianity after 960. Christianity came quite late to Scandinavia compared to the rest of Europe. Christian monks were living on the rocky islands off the west coast of Ireland in the fifth century and may in fact have discovered Iceland in the eighth century. The long delay in the arrival of Christianity in Scandinavia was likely due to initial resistance from the chiefs and kings of the region. The Christian dogma of love and self-denial would seem to be the antithesis of the Viking worldview.

Winroth (2012), among others, argues that the adoption of the new religion resulted from a shift in political, economic, and cultural interests of local elites and rulers who wanted to expand participation in the larger European commercial

Figure 8.53. Three views of the Vasby brooch from Sweden (illustration by Michael Neiss).

Figure 8.54.
The silver seated figure from Gammel Lejre, Denmark.

sphere to the south. The divine rights of kings, coupled with the morality of selflessness and promises of a better life after death offered by the Christian faith, placed a yoke of subjugation on the common people. That is probably why the Viking nobility erected Christian churches in the middle of their estates. Christianity was used to justify an exploitative nobility and to enhance their control of the populace. Hundreds of stone-built churches were erected in the twelfth century in southern Scandinavia.

There are myriad achievements in infrastructure, engineering, and commerce that culminated in the Viking Age. The Vikings built or enhanced existing roads, bridges, and canals. They built ships of remarkable strength and agility and massive buildings in the form of great halls and cult houses. The large towns and ports of trades that were established around the Viking homeland brought trade and foreign interest from all parts of Europe and beyond. They created a distinctive art style that remains mysterious and alluring to this day. The Vikings formalized the Norse religion prior to the arrival of Christianity, and the traits of their mythological heroes appear to manifest themselves in the explorers, warriors, and heroes of the Vikings themselves. The impact of the Norse gods is still present. Several of the days of our modern week are named after these gods: Tuesday = Tyr's day, Wednesday = Odin's day, Thursday = Thor's day, Friday = Frigg or Freyja's day.

There are many lasting impressions of the Vikings, but perhaps the strongest comes from the beautiful wooden ships. These vessels connected the Vikings to Europe, the North Atlantic, and the Byzantine Empire. They moved people and their possessions, warriors, food, goods, and wealth across the waters and carried the Vikings into history.

CHAPTER NINE

A VIEW TO THE PAST

One cannot understand Scandinavia without being aware of the division between the north and the south, defined by the limits of cultivation. Two very different kinds of adaptations were and are present. In the south, cultures change more rapidly and these changes are more pronounced and far-reaching, created and fostered in large part by agricultural surpluses and the rise of more complex societies. Some of these changes reached the north, but often in muted form. The basic way of life involving hunting, fishing, and collecting did not change significantly in the interior of northern Scandinavia until the Industrial Revolution, and remains in a few places today.

The first inhabitants of Scandinavia came into northernmost Germany and southern Scandinavia from the south around 13,000 BC, shortly after the sheets of glacial ice disappeared from the continent and the Danish Isles. These early groups were largely reindeer hunters and left small scatters of flint tools, rock, and charcoal at the places where they stopped. Only rarely are the remains of the animals they killed or of the tents they erected found in the earth. A series of named archaeological cultures filled this time period through the end of the Pleistocene at 9700 BC. The Hamburgians, the Bromme, and the Ahrensburgian were known for their shouldered and tanged spear and arrow points. A fourth culture, the Federmesser, was present during a slightly warmer episode. These people hunted large game such as elks, red deer, and aurochs when reindeer were largely absent.

Human settlement very gradually moved further and further north during the Late Paleolithic as the climate improved and the landscape became more hospitable. The Ahrensburgian people appear to have had a marine component to their diet and range. The Hensbacka culture, very similar to the Ahrensburgian in terms of artifacts and technology, appeared in the islands of western Sweden shortly before the end of the Pleistocene when this area was the major outlet for the glacial meltwaters from the Baltic region. The only access to these islands was by sea, and these groups must have rowed there, probably in skin boats, as sizeable timber did not yet grow in the region. They also shifted the focus of their hunting to the sea; seals and fish appear to have provided a significant part of their subsistence.

Hensbacka groups continued to expand across the Swedish islands and the south coast of Norway, traveling by boat and bypassing those areas of the Scandinavian Peninsula still covered with ice. Hensbacka-derived groups of fisher-hunters in western Norway are known as the Fosna culture, continuing a similar way of life with a closely related technology. The sites from the period suggest small groups, perhaps only one or a few households, traveling in boats along the coast and living in small tents, usually in places where fishing and sealing were exceptionally good.

As these groups moved further north, the name of the relevant cultural group changes to Komsa above the Arctic Circle, but the basic pattern of adaptation and technology remained the same. Some inland reindeer hunting began as the ice retreated to the higher mountains in northern Scandinavia. One of the unanswerable questions of the Late Paleolithic concerns why these groups were expanding so rapidly into more northerly regions.

As the last Paleolithic hunters were entering the far north at the beginning of the Holocene Epoch, 9700 BC, the Mesolithic period was getting underway in southern Scandinavia. The same basic chronology of cultures is seen across the entire southern region—Maglemose, Kongemose, and Ertebølle are the names given to the early, middle, and late Mesolithic cultures. In the early Holocene, the environment became heavily forested and was inhabited by a variety of wild game. Red deer, roe deer, and wild boars were the primary prey of hunters in the later Mesolithic. Hazelnuts and acorns were available in mass in the forests.

The biggest challenge to the lives of these hunter-gatherers came from rising sea levels. Early Mesolithic groups were primarily terrestrial, as the sea was still low and distant from much of southern Scandinavia. Continued melting of glacial ice refilled the seas and flooded large areas of dry land on the floor of the North Sea. By around 4000 BC, the sea had reached the present shorelines of the region. Mesolithic hunter-gatherers began to focus on the marine resources. Residence was concentrated on the coasts, and more than half of the diet came from fish, shellfish, and marine mammals. Huge piles of oyster shells document the presence of Mesolithic groups in certain coastal regions of southern Scandinavia.

These successful groups of fisher-hunter-gatherers constructed an effective technology of wood, stone, and eventually ceramics to utilize their environment—boats and paddles, bows and arrows, and a variety of other fishing and hunting equipment. Several cemeteries have been excavated, indicating more attachment to specific areas marked by the burial of the dead. Exchange operated at a small scale, and certain products of the Neolithic farmers to the south found their way to Mesolithic groups in southern Scandinavia. There was also limited exchange among groups of Mesolithic hunter-gatherers. For whatever reason, these people resisted the introduction of agriculture for almost a thousand years. Farmers appeared to the south in northern Germany by 5000 BC, but farming did not arrive in Scandinavia until around 4000 BC.

The introduction of agriculture was remarkably rapid when it finally took place. Within a few hundred years, farming practices had spread from northern Germany to the limits of cultivation in Middle Sweden and to the Oslo Fjord region in Norway. Domesticated plants and especially animals defined these early agricultural groups, along with distinctive Funnel Beaker pottery and the new polished stone axes. These groups quickly began to build monuments in the form of earthen long barrows and eventually the large stone tombs known as megaliths. The first elaborate tombs were for individuals, suggesting status differentiation; later graves were communal and collective. Palisaded enclosures were another distinctive construction from this period. Conflict in the first half of the Neolithic appears to have been rather rare. A number of individual houses or farmsteads are known from the Early Neolithic, but villages were not a feature of this period. More long-distance exchange is evidenced, particularly in axes, but in other objects as well. The first

metal—copper—begins to appear during the Early Neolithic, probably coming from southeastern Europe.

The later Neolithic—the Middle Neolithic (MNB) and the Late Neolithic—was a time of dramatic change in southern Scandinavia as new groups entered the region from the south. The second half of the MNB is known variously as Corded Ware/Battle Axe/Single Grave Culture, originating in east-central Europe. Pitted Ware Culture also appears in the MNB, between 2800 and 2400 BC, probably originating in southern Norway and Middle Sweden.

The Late Neolithic began around 2350 BC and ended by 1700 BC with the start of the early Bronze Age. The Bell Beaker Culture may have been the catalyst for the onset of the Late Neolithic. The Bell Beaker Culture likely had a western origin, possibly in Britain or the Netherlands, and arrived in northern Jylland, perhaps to exploit the rich flint deposits located there. The Bell Beaker introduced more trade and more metal to a large region. The Late Neolithic is also known as the Dagger Period because of the widespread distribution of these objects. There was an increase in both copper and gold, occasionally found in graves. This period also witnessed a major intensification in exchange, leading to a series of innovations ranging from costume to burial ritual. Bronze began to appear after 2000 BC. Metal production was focused primarily on weapons—axes, spearheads, and swords.

In all likelihood, the beginnings of inherited rank and the warrior ideology can be traced to this period. The increase in conflict and wealth likely reflects pronounced social inequality, which became manifest in the Bronze and Iron Ages. Population increase is indicated by the growing number of farmhouses, still isolated or grouped in small hamlets for the most part. Large halls and rich graves confirm the impression of status differentiation and hierarchically organized society. It is in this same period of time after 3000 BC that changes are also noted in northern Scandinavia, with larger communities, particularly in the far north, and longer-distance exchange both to the south (daggers, amber) and to the east (flint, pottery, asbestos). Subsistence remained based on marine resources and inland hunting or reindeer or elk and other species. Rock art flourished across much of northern and middle reaches of Scandinavia.

The shift from egalitarian to hierarchical structures that was witnessed following the origins of agriculture was one of the most significant changes in the evolution of human organization. Hierarchical organizations have one or more levels of control vested in a minority of the population. Higher status characterizes these elite and privileged groups that control much of the wealth, power, and decision-making in society. In such a hierarchy, detailed information and requests, goods and materials, flow from the base of the hierarchy upward; policy, protection, and demands flow from the top down. Two new forms of sociopolitical organization emerge—chiefdoms and states. Both are hierarchical, with a ruling elite. Chiefdoms are organized by kinship, and status is ranked by lineage and birth order. Monumental construction, warfare, and extensive exchange of prestige goods are common. States are larger, often territorial, societies where relationships are defined by inequality. Status is hereditary and assigned by class affiliation. Organization is hierarchical, with a permanent political structure. Agriculture is usually intensive and relations with other societies often conflictual.

A chiefdom level of society probably best defines much of the Bronze Age, which lasted from 1700 BC until 500 BC. The hallmarks of this period are tombs and hoards with lots of metal. The abundance of ceremonial and ritual objects found in the hoards speaks to the important role of belief systems and religions that remain rather unfamiliar to archaeology. Amber fueled the wealth of southern Scandinavia and the rise of the ruling elite in the Bronze Age. Amber and other materials went to Central Europe and the Aegean area in exchange for metal ingots, finished metal products, and other prestige goods. Remarkably, there are more Bronze Age swords in Denmark than in any other country in Europe. The wealth of society was concentrated in the hands of the elite magnates and chiefs who ruled this warrior society. There was competition for resources, wealth, and power that led to increased conflict and warfare, cross-cutting the integrating ties of trade in metals and other commodities. The martial tones that highlight the Bronze Age have their sources in the new metals and weapons.

The preservative powers of some of the larger Bronze Age barrows have provided an extraordinary insight into the life and death of these elites. Weapons, personal items, clothing, and food as well as human tissue have survived in waterlogged oak coffins in a number of these tombs. Both finished metal products and ingots came to southern Scandinavia. The ingots were cast into locally distinctive jewelry and weapons. Domesticated horses are present in some numbers in this period, probably for military reasons.

Single farmsteads continue to characterize the settlement pattern of the majority of families. House size increased during the Bronze Age, reflecting a transformation in social and political relationships. The larger houses or halls were the residences of the elite. A settlement hierarchy with a large central farmstead surrounded by smaller farms may be emerging in the later Bronze Age.

The collapse of the early Aegean civilizations of the Minoans and the Mycenaeans at the end of the second millennium BC led to a restructuring of external relations in Scandinavia. The Iron Age began in eastern and central Europe by 1000 BC, but reached northern Europe only after 500 BC. This period lasted until the appearance of the Vikings ca. AD 750. In fact, the Vikings can be considered as the end of the prehistoric Iron Age in northern Europe.

The three phases of the Iron Age—Pre-Roman, Roman, and Germanic—witnessed an intensification and elaboration of some of the trends in social and political organization, commerce, and ritual that had their roots in the Bronze Age and even the Late Neolithic. Iron ores were available and metal production was underway in Scandinavia. The first villages appeared during the Iron Age. The size and location of farms within these villages documents the social differentiation that had become a part of life. These villages became the standard of community organization for almost two millennia. The famous bog people of northern Europe, more than 100 bodies from sacred bogs where the preservative powers of the waters have protected human remains for 2,000 years or more, come largely from the Iron Age. These individuals were executed in pagan rites and offered to the gods or, in some cases, they may have been victims of murder.

The influence of Rome, although not its presence, was strongly felt in the region. Trade with central and southern Europe brought Roman goods into the north, along with new ideas and inventions. The control of commerce once again

fueled the power of the elite. During the Roman Iron Age, important central places were beginning to appear in strategic parts of the landscape, in part as commercial nodes. Gudme on the Danish island of Fyn was an early central settlement, with a rich magnate hall, a port of trade, and a large cemetery. By the Germanic Iron Age, major centers at Uppåkra, Gamla Uppsala, Sorte Muld, and elsewhere document the presence of powerful rulers controlling trade and production, religion, and the military, supported by a large collection of dependent farms.

The Iron Age witnessed the continuing growth of elite rule in Scandinavia. The rich tombs from the Iron Age document both the extraordinary wealth of these individuals and the long-distance exchange relationships that must have been in place to bring such exotic goods to southern Scandinavia. Many of these graves contain the products of the Roman Empire, including glass vessels, bronze and silver wine serving and drinking dishes, and fine jewelry. The treasures of this period—e.g., the golden horns from Gallemose and the Gundestrup Cauldron—reiterate the wealth and reach of Iron Age rulers.

The intensification of conflict in the Iron Age is well documented by the construction of various kinds of fortifications and especially by the numerous weapon offerings from the bogs of southern Scandinavia. These sacrifices contain the broken equipment, animals, and sometimes the boats of vanquished foes from battles within the borders of the region. Human remains are rare, but historical accounts record the execution and destruction of all elements of the enemy army. The numbers of combatants must have been in the hundreds or even thousands in some cases, given the quantities of destroyed weapons and equipment.

The Vikings are perhaps the best-known prehistoric culture in Scandinavia. The 300 years of their existence, from 750 to 1050 AD, were an extraordinary time. During this dynamic period, the Norse (or Vikings) expanded beyond the boundaries of Scandinavia proper east into Russia and south to the Ukraine and Turkey. They went south and west to France, England, Scotland, and Ireland and established large colonies and ruled parts of these lands. They sailed north and west to the islands of the North Atlantic, in some cases as the first inhabitants, establishing permanent settlement and opening new lands as far west as Nova Scotia.

Politically, the kingdom of Denmark was consolidated by King Gorm, with its boundaries reaching to southern Sweden and perhaps southern Norway. The power of the king was vested in a landed aristocracy and an army. Fortresses and defense works were constructed around the kingdom from the southern border near one of the first true towns at Hedeby (Haithabu) to the ring forts established across the region. New centers at Jelling, Ribe, Aarhus, Tissø, Kaupang, and Birka were emporia as well as aristocratic estates or, in some cases, fortified royal towns. Commerce and trade were an important element of Viking growth, in addition to the wealth accrued by raids on the west.

This wealth was displayed and interred at the rich funerals of Viking kings and nobles. Most spectacular of all the tombs from this period are the ship graves. The preservation of wood and other organic materials in the massive Norwegian ship burials is remarkable and documents both extensive foreign trade and the remarkable skills of the Viking craftsmen who built the ships and created most of their contents. The end of the Viking period saw the conversion of Scandinavia to Christianity and the beginning of the historical medieval period. By this time,

kings ruled state-level societies in southern Scandinavia, and trade and travel extended through the continent and into Asia as well as across the North Sea and North Atlantic.

A major event in medieval Scandinavia was the arrival of the black plague that peaked across Europe between 1348 and 1350, estimated to have killed between 25% and 50% of the population (Byrne 2004, Twigg 1984). The plague was particularly severe in Scandinavia, where deaths reached between 45% and 55% of the population. Caused by bacteria carried on fleas, the plague spread as far as Greenland, where it killed more than 60% of the population and may have been partly responsible for the eventual Norse abandonment of the island.

The introduction of Christianity and the rise of the landed nobility led to an impoverished life for the common man in Scandinavia during the medieval period. Feudalism and serfdom were established only in Denmark in Scandinavia, but pronounced social and material inequality were the norm throughout much of Europe prior to the Renaissance and land reform. Of course, the church was also a major owner of wealth and property during the medieval period. The reformation in Denmark in 1536 led to the confiscation of the church's lands and riches (Grell 1995). At that time, the church owned about 40% of the arable land in the country. The partnership between the church and the aristocracy had been a profitable one for both institutions. But the reformation shifted more power and wealth into the hands of the nobility.

Historical records from the eighteenth century indicate that 80% of the land in the area around Ystad, Sweden, was owned by ten noble families. By 1800, much of the environment was in decline, with peat and forest resources depleted, former pasture under cultivation, crop yields falling, wetlands drained, and heathlands expanding. In the late 1860s, southern Scandinavia was hit by drastic crop failures and famine that, combined with high unemployment and a lack of available land for new farms, led to the emigration of large numbers of the local inhabitants to North America and elsewhere.

Slowly, a series of legal and technological developments increased agricultural productivity and improved the conditions of human life. Early in the eighteenth century, the Swedish king introduced the *enskifte* system—the consolidation of the scattered holdings of small farmers—and outlawed the sale of indentured peasants. The previous strip plots and three-field system were replaced by larger, more efficient fields. Moreover, the royal lands formerly leased to nobility were parceled into smaller plots for single peasant families. These reforms very gradually took hold. With land ownership came land stewardship, and the environment began to recover. Royal decrees in Denmark in the late eighteenth century brought land reform and the emancipation of the serfs, creating the foundation for the positive attitudes toward peace, equality, and respect for the monarchy that characterize the country today.

With the industrial revolution, productivity was greatly raised by new crops, all-field rotation, extensive drainage, and the addition of marl and fertilizers to the fields, supporting increased population and denser settlement. Today southern Scandinavia is industrially farmed by large agribusinesses that have created a species-poor landscape of enormous fields and little native vegetation in many areas (Christianson 1997). This productivity requires large quantities of pesticide,

fertilizer, and fossil fuel. The small farmers have largely disappeared, and young people have left the rural areas for larger towns and cities.

THE YSTAD PROJECT

The preceding discussion provides a broad overview of the prehistory and later history of Scandinavia. In some instances, it is possible to go into even more detail—to trace changes in human settlement and the environment over very long periods of time in specific places. One of the more important archaeological investigations in Scandinavia in the last 50 years was the Ystad Project, a multidisciplinary study of settlement and land use by the University of Lund. The research area covered approximately 20 × 25 km around the city of Ystad in southernmost Skåne and was conducted in the 1980s (Berglund 1991, Larsson et al. 1993). The goal was to map the locations of archaeological sites and investigate changes in environmental conditions from the Late Mesolithic to the present day, using archaeological survey and excavation, historical documents, and environmental proxies such as pollen. This project provided a glimpse at the changes in human settlement in the countryside of Scandinavia for much of its prehistory.

The distribution of sites from the Neolithic, Bronze Age, Early Iron Age, and Viking periods is shown in Figure 9.1. The modern city of Ystad appears in the lower left of the map. The majority of human settlement is either in the glacial till soils to the west or along the two stream valleys in fine sand and gravel deposits to the east in the study area. Neolithic settlements in particular appear to be concentrated in the till, while Iron Age and Viking settlements, fewer in number, are found almost exclusively in the stream valleys. Settlement is rare outside the stream valleys in the eastern half of the study area.

A series of time slices can be used to describe some of the changes. The first substantial inland settlements appeared during the Early Neolithic, occupied by farming populations cultivating the lighter coastal and upland soils to grow several species of wheat and barley and raise cattle and pigs. Only a few sites are known from this period, and houses are rare. The Late Bronze Age, 2,000 years later, witnessed climatic change, with cooler, wetter summers. These farmers built larger houses and moved their cattle indoors in the winter for protection from the elements, also providing for the accumulation of manure for fertilizing the fields. Some decline in settlement and decrease in population characterizes the end of the Bronze Age.

During the Roman Iron Age, a milder, drier climate prevailed, but longhouses with interior cattle stalls remained in use, now found in small groups as true villages. Another cooler climatic shift during the Migration period reduced population and productivity between 400 and 700 AD, but mild weather returned during the Viking Age in the Medieval Warm period. Iron tools and heavier plows allowed the farmers to remove more forest and expand their fields, cultivating the rich clay soils of the region and opening the landscape further for agrarian activities. Agriculture was intensive, with a rye-barley rotation of crops, cultivated meadows, and large areas of open woodland pasture. In the northern part of the study area,

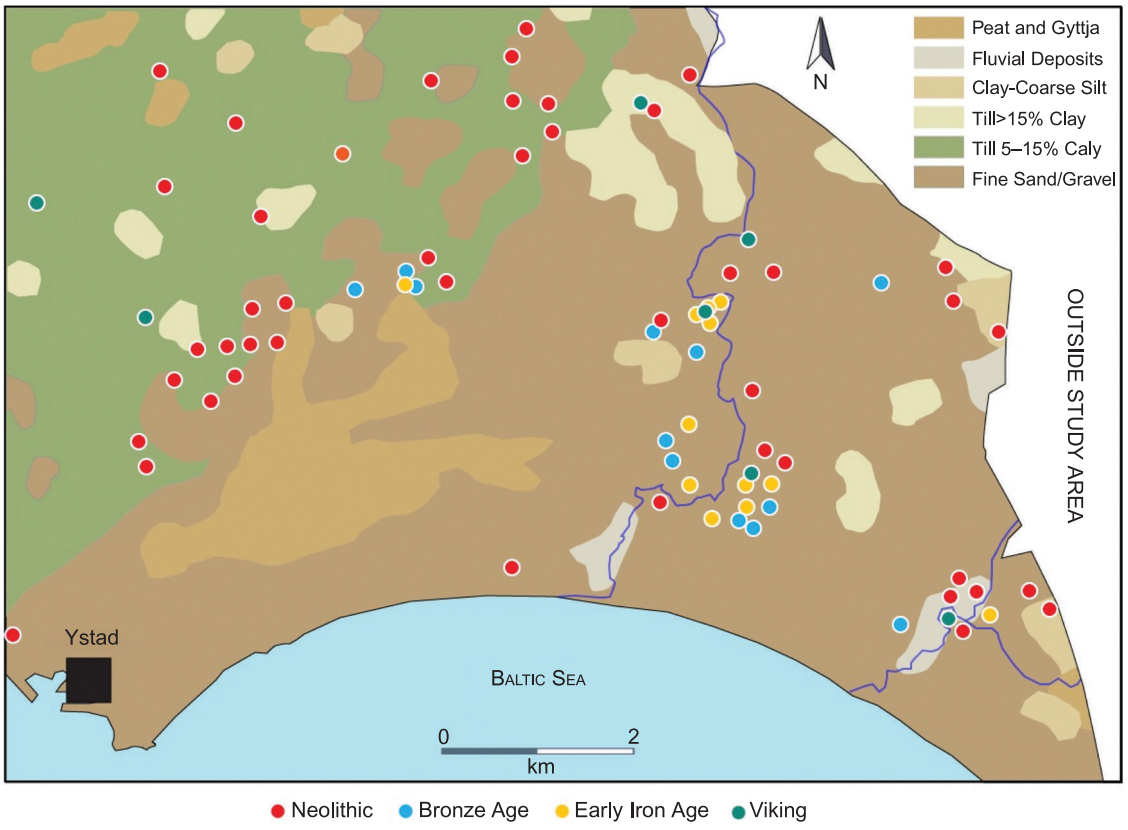


Figure 9.1.
The distribution of prehistoric human settlement in the Ystad study region.

some woods remained as heather began to spread across the sandy soils of the southern zone. The great halls and runestones associated with the Viking elite make an appearance in the east at this time.

It is possible to examine changes in house size and construction over time with the archaeological evidence from the Ystad Project. Sten Tesch (1993) has provided a masterful analysis of changes in houses and farmsteads over time in the study area. One result of his study was a comparison of typical house plans, seen in Figure 9.2. Several patterns emerge. A single row of roof-bearing posts characterizes the Neolithic and medieval houses, while three-aisled houses are the norm in other periods. Neolithic houses are generally small.

House size varies over time, although there is a gradual decrease in the later Iron Age and Viking period. The availability of timber may be a consideration as the amount of forest shrinks in proportion to cultivated land over time. Other factors of possible significance include family size and the presence or absence of stables inside the house. The medieval houses are quite small, perhaps a reflection of the power of the nobility and the conditions of life for the peasants. Some of the largest houses are seen in this area during the early Bronze Age and the Pre-Roman Iron Age. Linderoth (2012) reported the recent excavation of a huge Roman Iron Age hall some 35 m in length with a large fenced yard, thick cultural layer, and several outbuildings in the eastern part of the Ystad study area.

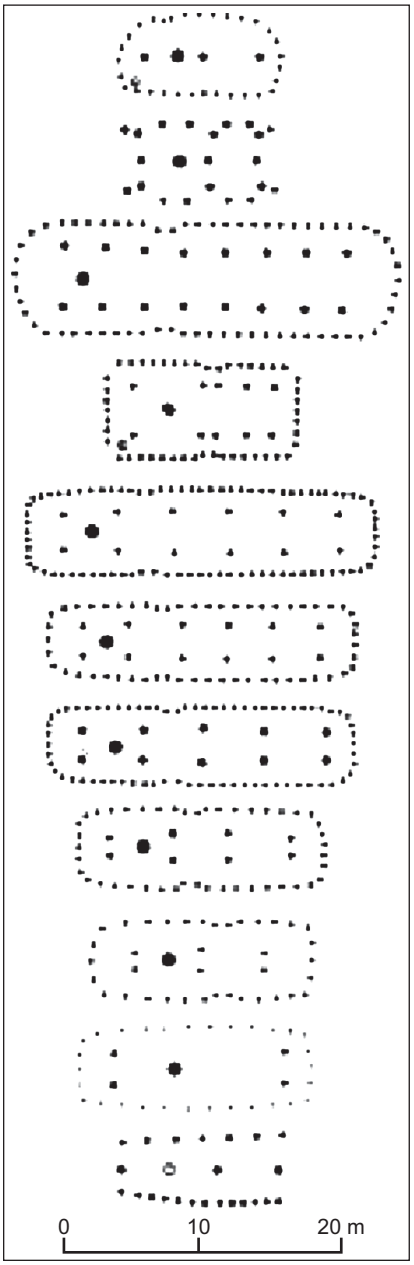


Figure 9.2.
Changes in house size and construction from the Early Neolithic to the early medieval period. The small circles indicate the location of the hearth, commonly on the west end of the structure. a. Early Neolithic, b. Late Neolithic, c. early Bronze Age, d. middle Bronze Age, e. early Pre-Roman Iron Age, f. later Pre-Roman Iron Age, g. older Roman Iron Age, h. younger Roman Iron Age, i. Migration Period, j. late Viking period, k. early medieval period (Tesch 1993).

CARING FOR THE PAST

Appreciation of the past is pronounced in Scandinavia. Ancient monuments, especially megalithic tombs and Bronze Age barrows, are seen in many areas. There is a strong interest in prehistory. Almost 300,000 Danes visit their National Museum in Copenhagen every year, about 60% of the total number of visitors. The number of Danish museumgoers is equivalent to 5% of the total population, a very high proportion. Museums are constant destinations for school classes. There are two popular magazines in Danish for persons interested in archaeology. One of them, *Skalk*, has been publishing for more than 55 years and has approximately 19,000 subscribers, a large number for a nation of 5.5 million. The popular American journal *Archaeology* has approximately 240,000 subscribers from a national population of roughly 320 million people, proportionally about one-quarter of the Danish audience for *Skalk*. *American Antiquity*, the flagship professional journal of the Society for American Archaeology, has around 7,000 subscribers.

There is lots of archaeological research conducted in Scandinavia. The public interest translates into financial support for archaeology in national budgets and private foundations in all the Scandinavian countries. In Denmark, for example, the Carlsberg Brewery provides significant funding for research in the sciences and humanities. In Sweden, enormous resources are available from the Sveriges Riksbank and the Rausing Foundation, among many others. In Norway, funding for archaeological investigations comes largely from developers, as more than 95% of all excavations and basic research are financed through cultural heritage management.

In each of these countries, there are government-directed policies and substantial financing for the long-term protection and care of cultural resources. The value of the past and of history is recognized and respected in these countries. That is not to say that there are not mistakes that result in the destruction of important

archaeological sites or historic places. It is also the case that better policies are needed in some areas. Nevertheless, the primary goal of the legislation that is in place is to protect and preserve the past, and it generally works very well.

Many countries around the world have laws in place to establish state ownership of valuable antiquities discovered within their borders, without reimbursement to the finder. Denmark has legislation regarding *danefæ* (treasure trove) that establishes a finder's fee to be paid to the discoverers of such objects. This law of treasure trove can be traced back to the Middle Ages, when the king or queen was considered as the owner of all such finds. Other countries believe that such payments only encourage looting and empower the antiquities market. In Scandinavia, however, the citizenry is very good about turning over valuable finds to the state, and the reward program probably saves many exceptional archaeological pieces from foreign markets.

In spite of the significance of the archaeology of Scandinavia, there are only a handful of world heritage sites in the region: the Tanum rock carvings in Sweden, the Alta rock art in Northern Norway, the Danish Viking Age site of Jelling, and the Swedish Viking center at Birka. Certainly this list will grow in the future, as there are many excellent candidates. Haithabu and several of the Viking ring fortresses are currently being considered. Gammel Lejre, Gamla Uppsala, and a number of other places should be added in the future.

Public interest is at the heart of caring for the past in Scandinavia. Because archaeology concerns ancestors, because visible ancient monuments are reminders, because the population is generally well educated, because there is an awareness of the importance of the past, there is a concerted effort to preserve what remains. Schoolchildren are taught about archaeology and the past, classes regularly visit museums and archaeological sites, and archaeologists are respected members of the community.

LESSONS FOR THE PRESENT

What have we learned from the past? There are hints of the past in the norms and behaviors of Scandinavian people today. National character may be a notional misnomer and generalizations are always dangerous, but there is a Viking-like attitude in Scandinavia—prams with infants and very young children are put out in the cold and damp for a nap; some folks swim year round in the cold waters of the Baltic and North Sea, there is a pronounced disdain for hats, umbrellas, and gloves in the face of inclement weather; medical care often recommends tea or a return visit when you have a troublesome malady. The Norwegians believe the best way to cure a hangover is to go for long hikes in the mountains. Danes, Swedes, and Norwegians walk or bike long and often. Moving people—skiing, hiking, running, biking—are a constant hazard in many parts of Scandinavia.

Some of the more distinctive traits of Scandinavian people today include reserve, independence, and self-reliance. It is easy to imagine that these characteristics have been present in the population for millennia. Innovations generally came later to Scandinavia, in part because many new things like agriculture and new metals originated in the Near East and had to cross the European continent.

However, even when innovations such as farming or Christianity had reached adjacent areas, there was a clear delay of hundreds of years before they finally entered northern Europe. Autonomy and self-reliance may well help in part to explain this slow acceptance.

The principles of equity and opportunity in Scandinavian society today sit in stark contrast to the concentration of wealth and power in the small numbers of powerful elite individuals seen from the Late Neolithic to the Medieval period. As recently as the late nineteenth century, Danes, Swedes, and Norwegians were leaving their native lands in droves to escape the harsh conditions of virtual servitude on the estates of rich landowners across the region. The 1910 novel *Pelle the Conqueror* by Danish author Martin Andersen Nexø and the more recent film portray this tragic situation vividly.

One consequence of the stark disparity in the past may be the strong counter-reaction to such inequality seen today. Modern Scandinavians believe strongly in egalitarian relations and flat organizations without hierarchy, along with the endless committee meetings needed for democratic decision-making. One guiding principle, called *Janteloven* (the law of Jante) emphasizes the collective in place of the individual and discourages those who choose to stand out as achievers. At the same time, however, these countries retain monarchies and are home to some of the richest people in the world.

These modern social democracies reflect an enormous change in attitude toward human rights from the past. On the other hand, discrimination and racism have reared their ugly heads in recent years in Scandinavia, particularly with regard to immigration. Some portions of the population want to disown or expel others who have worked for them and with them for many years. Prehistory tells us, however, that Scandinavia has always been a land of immigrants. The first outsiders arrived only 13,000 years or so ago—a moment in archaeological time—as hunting groups spread from central and western Europe to the north. There is another argument made for the migration of eastern groups into northern Scandinavia during the ninth millennium BC, bringing Mesolithic technology to the region (Sørensen et al. 2013). Later, at least some of the first farmers must have been immigrants, bringing the materials, technology, and knowledge of agriculture to Scandinavia. The Bell Beaker people, the Corded Ware groups, perhaps the Huns, and others came from foreign places and brought innovation and change to the north. Immigration was a constant in the human past. Its consequences often resulted in change, in new developments and improvements in the human condition. The present concern with immigrants in Scandinavia seems closely allied with racism and totally inappropriate for nations known for tolerance and their support of democracy and human rights.

Outside Scandinavia, national tendencies are sometimes more visible. In the United States, at least, Danes and Swedes tend to assimilate with local society and become rather indistinguishable. Norwegians, on the other hand, stick together, maintain the traditions of the old country, and revel in their Norwegianness. In Wisconsin, where I have lived, the Norwegian community has built a "Sons of Knut" hall for meetings and other festivities and annually celebrates Syttende Mai, the Norwegian independence day. You can buy lutefisk in some supermarkets, and wooden statues of trolls decorate several small Norwegian-American towns. There

Figure 9.3.
A Danish 50-kroner note from the 1960s depicting a Neolithic tomb.

was even a tourist attraction called Little Norway with a wooden stave church and miscellaneous farm buildings from the old country.

Heritage and archaeology play a large role in creating the mythology, in supporting the perseverance of the state, and in validating rights to land and property. The present Queen Margrethe of Denmark traces her lineage back more than 1,000 years to old King Gorm as one way of justifying the monarchy and its place in Danish society. Denmark's currency carries depictions of the past in the form of ancient artifacts and monuments (Figure 9.3). The dolmen has become a symbol of Denmark and an icon of Danish prehistory (Ebbesen 2006). The role of archaeology in nationalism is well known (e.g., Arnold 1990, Kohl 1998). Mention has already been made of the site of Borrehaugen in connection with the rise of the Nazi party in Norway during the 1930s.

IS THIS THE END?

What else do we learn from the past? There are a number of messages. Humans are survivors—our species has managed to thrive in the harsh and demanding conditions of northern Europe for millennia. There is every reason to expect that situation to continue. In spite of drastic climatic change and occasional natural catastrophes, over the long run the population of Scandinavia has flourished. Archaeology and climate studies identify a series of dramatic changes in the last 15,000 years: rapid global warming at the end of the Pleistocene, sharply colder periods such as the Little Ice Age in the medieval period, floods and storms that wreak havoc on human settlement, diseases that kill large numbers of the population. Rapidly rising sea levels during the early Holocene drowned large areas of dry land in the North Sea and flooded the coasts of northwestern Europe, continuously pushing population inland. The cooler climate and stormy seas of the Little Ice Age were at least partially responsible for the abandonment of Greenland by

the Norse. At the same time, however, the Inuit groups in northern Greenland expanded as the conditions for hunting on the sea ice improved.

Invasion, warfare, and disease are threats to the human condition. Conflict and almost constant warfare seem to characterize much of the last 3,500 years of the Scandinavian past. The evidence is abundant—fortifications, weapons sacrifices, mass graves—yet, in spite of such difficult conditions, human populations survived, responded, and rebounded. Mesolithic populations in the shrinking landscape of early Holocene southern Scandinavia thrived, and the descendants of the Norse returned to Greenland. Adaptation and change are powerful human responses to the vagaries of climate and nature, and to threats from other humans as well. There are many reasons to have hope for the future of the species.

Another lesson from the past is that human societies became larger and more complex over time—in behavior, knowledge, beliefs, technologies, and institutions. The laboratory of change in human society that is prehistoric Scandinavia clearly documents this pattern. Life and society become more complex over time. There are more parts, and more connections between the parts, in how we live and work today than ever before. This trend began very long ago. Hand axes became flake axes, polished stone axes, bronze axes, iron axes, and eventually steel. Small hunting bands became households of farmers, who became villagers who were combined into larger chiefdoms with powerful leaders and emerged as the state of Denmark, with tens of thousands of citizens ruled by King Gorm. The nations of Scandinavia today, with populations in the millions and enormously bureaucratic governing structures, are a consequence of a past that began thousands of years ago.

The biggest of these changes have been accompanied by massive shifts in technology and interaction. These changes have been real revolutions in the trajectory of human society. The introduction of agriculture brought enormous alteration to

Figure 9.4.
A romantic watercolor of a Danish dolmen by J. Kornerup, 1853. The juxtaposition of the dolmen and the distant Roskilde Cathedral to the right in the painting is by no means accidental.

the landscape, major increases in population, and the beginning of social hierarchy and commerce. The introduction of bronze and long-distance trade brought another quantitative increase in land use, conflict, and sociopolitical organization. Power and wealth became major engines in social change. Certainly the industrial era was another driver of major change in Scandinavia and throughout much of the world with urbanization, increasing social inequality, and, again, greater human population. It is not difficult to imagine that computers, the Internet, and faster travel are bringing another round of revolution to our lives today that involves globalization, a clash of major religions, the demands of the developing countries, and, again, growing population. Scandinavia moves toward greater integration. The construction of tunnels, bridges, roads, and railways connects the region ever more closely. The cities of Copenhagen and Malmö face each other across 25 km of the Øresund straits, but growing infrastructure is gradually joining the two into a single megapolis.

The connections from the present to the past provide an interest in and empathy for what has come before. Archaeological interpretations of that past are often like black-and-white drawings—lacking the color and depth necessary for a clear and vibrant picture of what took place (Figure 9.4). Yet there seems to be more tint and perspective in these "pictures" from Scandinavia. The extraordinarily rich archaeology of the region permits greater insight and a better understanding of the past, and perhaps instills a greater sense of self and society with the knowledge of where they came from and who they were among the people who inhabit the region today. The prehistory of this part of the world is a fascinating story, and I hope you have enjoyed this version of it.

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CHAPTER 2

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CHAPTER 6

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CHAPTER 7

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CHAPTER 9

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