BREAKING AND MAKING BODIES AND POTS
Material and Ritual Practices in Sweden in the
Third Millennium BC

Åsa M. Larsson
Abstract


In South Sweden the third millennium BC is characterised by coastal settlements of marine hunter-gatherers known as the Pitted Ware culture, and inland settlements of the Battle Axe culture. This thesis outlines the history of research of the Middle Neolithic B in general and that of the pottery and burial practices in particular. Material culture must be understood as the result of both conscious preferences and embodied practices: technology can be deliberately cultural just as style can be un-selfconscious routine. Anthropological and ethnoarchaeological research into craft and the transmission of learning in traditional societies shows how archaeologists must take into consideration the interdependence of mind and body when interpreting style, technology and change in prehistory. The pottery crafts of the Pitted Ware and Battle Axe cultures were not just fundamentally different technologically, but even more so in the attitudes toward authority, tradition, variation and the social role of the potter in the community. The Battle Axe beakers represent a wholly new *chaîne opératoire*, probably introduced by a small group of relocated Beaker potters at the beginning of the period.

The different attitudes toward living bodies is highlighted further in the attitudes toward the dead bodies. In the mortuary ritual the Battle Axe culture was intent upon the creation and control of a perfect body which acted as a representative of the idealised notion of what it was to belong to the community. This focus upon completeness, continuation and control is echoed in the making of beakers using the ground up remains of old vessels as temper. In contrast, the Pitted Ware culture people broke the bodies of the dead by defleshing, removal of body parts, cremation, sorting, dispersal and/or reburial of the bones on the settlements. The individuality of the living body was destroyed leaving the durable but depersonalised bones to be returned to the joint collective of the ancestors. Just as the bodies were fragmented so were the pots, sherds and bases being deposited in large quantities on the settlements and occasionally in graves. Some of the pots were also tempered with burnt and crushed bones. At the end of the Middle Neolithic the material and human remains show evidence of a growing effort to find a common ground in the two societies through sharing certain mortuary rituals and making beakers with a mix of both traditions, stylistically and technologically.

Keywords: Middle Neolithic, Late Neolithic, Pitted Ware culture, Battle Axe culture, Corded Ware culture, pottery, pottery technology, craft, *chaîne opératoire*, mortuary archaeology, mortuary house, burial, ritual, defleshing, cremation, secondary mortuary practice, osteology, ethnoarchaeology, culture, culture change, identity, ethnicity, practice, cognition, body, embodiment

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In Loving Memory of Inga, Olle, Sussi and John
Forever part of me

Motho ke motho ka batho
People are people because of other people
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Birgitta Hulthén: The Pottery of the Battle Axe (Corded Ware) Culture.
Craft and vessel function versus the nature of contacts
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As so many researchers have before me I started out my PhD project with a plan – half of which has survived the subsequent years and half of which has changed fundamentally. My initial aim was just to concentrate on the end of the Middle Neolithic and the changing relationship between the Pitted Ware culture and the Battle Axe culture leading up to the Late Neolithic, focusing on a few mortuary houses and certain atypical pottery vessels. After a while I realised that it was quite impossible to talk about these changes without first outlining something about the background. This meant first and foremost a greater focus on the pottery craft, especially since a growing body of research into craft, practice and learning structures afforded me some very rewarding approaches to material culture. I also felt it was necessary to revisit some of the concepts and definitions about the archaeological cultures of the third millennium BC. The resulting work is therefore rather bulky as it includes a great deal of research history. Sometimes it is necessary to return to the beginning (almost) in order to proceed forward.

Writing a dissertation can feel like very lonely work at times, yet research is never done in an ivory tower. Relationships make us who we are and without the many, many people I’ve met, lived with, worked with, talked and debated with over the years this present text would not exist. I will try to mention most of them, but I cannot hope to mention all and I apologize beforehand for leaving some of you nameless. Fredrik, you mean the most to me so I will leave you for last. My supervisor Anders Kaliff has been with me from the start of my PhD project until the very end, never giving up on me for which I thank him. Jan Storå has been my associate supervisor, making sure I had a place at the Osteological
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I

The Premise
This thesis is the result of a question and an opportunity. The question was one that had nagged at me since I was an undergraduate: how does change in material culture come about, especially drastic change? Archaeologists may argue about the significance of the distribution of certain pots, decorations, arrowheads or burial practices across geographic areas, or lack thereof, yet there is no denying that change in their appearances can and does happen in quite a drastic manner. In the early days of prehistoric studies the answers given were just as sweeping: diffusion or migration. The cause for each was usually presented in evolutionary or functionalistic terms: technological and/or spiritual superiority, famine and/or ecological change, conquest and/or inevitable ascension on the ladder of development etc.

Few of these ‘grand narratives’ survive today. More detailed knowledge of the variations present in the archaeological source material, better dating methods and less overall certainty regarding human society in general have deconstructed most of those early models. The problem still remains, however, and closely associated with it is the question of how do we even determine what is similar, and what is different? Which artefacts are the most important, and which aspects of these hold the most significance? Is there even a link between society and identity on the one hand, and material culture on the other?

We know that societies and ethnic groups in the past were not self-contained units, existing in spatial and cultural isolation from each other. There were extensive interactions and networks in place to ensure continued contact and exchange of ideas. We also realise that contact does not automatically mean change or acculturation. This has in a way shifted the problem from explaining change to the problem of explaining continuity. Why does change occur at certain periods and in certain groups, but not others?

THE THIRD MILLENNIUM BC

This question of what material culture patterns signify, and what the apparent changes over time might mean, has occupied me since the mid 1990s. One time period seemed to me to offer a great opportunity to study this closer: the third millennium BC in South Sweden (Fig. 1.2:a). During the most of this millennium two archaeological cultures can be found in the region – the Pitted Ware culture along the coast and the Battle Axe
culture in inland locations. The former apparently marine hunter-gatherers, the latter
associated with animal husbandry, small-scale farming and inland hunting. As with all
such cases, beneath this general description lies a far more complex situation. The
archaeological material is of course incomplete and at times meagre, and the material
culture as defined by archaeologists includes inconsistencies and variations within each
culture, as well as similarities between them in terms of shared artefact types. The most
consistently different type of artefact for the cultures in question is the pottery, not just in
terms of shape, but also decoration and use. It has been suggested, however, that these
differences do not reflect cultural diversity as much as diverse ritual and domestic uses
within the same society. One reason for this interpretation is the fact that battle-axe
pottery is most often found as burial gifts.

Fig. 1.1. Illustration of contrasting interpretations of the archaeological material from the
fourth and third millennium BC from a publication on the Neolithic in South Sweden. The
authors responsible for the sections Southern Sweden, Western Sweden and Eastern Central
Sweden could not come to an agreement on whether the Funnel Beaker culture (TRB), Pitted
Ware culture (PWC) and the Battle Axe culture (BAC) represented different cultures or
segments within a larger mutual society (modified after Edenmo et al. 1997:fig 5:47).
There also seem to be two kinds of burials during this period. Specifically, crouched inhumations in which battle-axe beakers and battle axes are found and another kind of inhumation with the dead placed on his/her back, accompanied by tools and adornments associated with marine hunting. So, are these vessels and graves evidence of different cultural/ethnic identities, or are they signs of a differentiated society with various economic specialisations and/or competing religious ideologies? It is striking how Scandinavian archaeologists for the past century have interpreted the same material remains in fundamentally opposed ways, depending not just on their preconceptions about what human society is and how it works, but also what material culture is (Fig.1.1).

**BOLLBACKEN - A MEANS TO AN END**

In 1993, at a rescue excavation on a Pitted Ware settlement at Bollbacken in Västmanland, a small house was found, surrounded by a ditch in which cremated human and animal bones were found. Additional features with cremated human remains were found around the house as well. Almost all of the pottery found at the site was pitted-ware, but a few battle-axe beakers were also found, some of which displayed traits normally associated with pitted-ware. Just a few kilometres away a Battle Axe house was found at Fågelbacken (Fig. 1.2:b). Most of the pottery found here comprised typical battle-axe beakers, but one sherd was decorated with a horizontal row of large pit impressions, something that is normally only found on pitted-ware. As it happened, that same summer another house was found at Turinge in Södermanland. It was remarkably similar to the mortuary house at Bollbacken, same construction details and the ditch was filled with large quantities of cremated human bones. However, the pottery found with these bones was uniformly battle-axe beakers, and interestingly one of these also had a row of pit impressions.

My undergraduate field course was located at Fågelbacken, and I visited Bollbacken during the excavation. I wrote my exam paper on the subject, and later analysed the bones at Bollbacken for my exam paper in osteology. This dissertation is in many ways the culmination of fifteen years of thinking about and studying the third millennium BC using Bollbacken and associated sites as a starting point, a means to an end. What I wish to study is the relationship between material culture and social identity, and the processes through which people resist or accept change.

Human culture cannot be divided into wholly separate pieces, e.g. economy, religion, material culture, political organisation and kinship structure, but to take everything into consideration of both the Pitted Ware culture and Battle Axe culture would be too monumental a task. I have chosen to focus specifically on the pottery and mortuary practices of the Pitted Ware and Battle Axe cultures, in part because they represent the material culture and practices that archaeologists have considered to differ most notably between the cultures. The subjects were also a natural choice because pottery vessels and bones have held equal fascination for me for a long time. The former in many ways represents the physical remains of lives, in that ceramics were made and used by people in the course of their lives. Clay is a uniquely malleable material, which has invited the
creation of a vast array of shapes and objects, as well as artistic expression in decoration. The latter are of course the actual remains of the people themselves, but to archaeologists they represent mainly the way in which the living make sense of bodies, and in effect of themselves, once that life has ended.

In both the Pitted Ware culture and the Battle Axe culture pottery and bones/bodies are also intimately linked together in very different and revealing ways. Practices involve deliberate breakage and destruction on the one hand, and the making of the ideal and imperishable body/vessel on the other. I have therefore divided this dissertation in five parts, which I will now outline:

**PART I – THE PREMISE**

The first two chapters are present the main premise and theoretical foundation of the dissertation. Chapter 2 is a very short introduction to archaeological and anthropological theories on culture and change in the past 150 years. I place a special emphasis on the prevailing fixation on evolutionary models to explain human society and social change. I then outline my own theoretical approach, focused on embodied experience and cognition, to bridge the gap between the purely intellectual and the purely biological in the study of humanity. As archaeologists we are dealing with material culture, and I believe this school of thought offers great insights and potentially practical results in the study of prehistory. I return to the theoretical foundations later in the dissertation, in terms of making material culture in chapter 6 and dealing with dead bodies in chapter 12.

**PART II – THE MIDDLE NEOLITHIC B**

Although I touch upon both earlier and later periods, the main focus of my research is the Middle Neolithic B. In Sweden this is defined as c. 2900/2800 - 2400/2300 BC, during which time the Pitted Ware culture and Battle Axe culture co-existed in South Sweden, although the Pitted Ware culture was established far earlier than that. It should be noted that in most other parts of northern and central Europe this period is generally known by other names, such as the Late Neolithic or the Chalcolithic (Copper Age). In South Scandinavia the Late Neolithic is formally defined as c. 2400/2300 – 1900/1800 BC. Another potential source for confusion is the name Battle Axe culture. It is generally considered a regional version of the continental Corded Ware culture, present in South Sweden and southern Norway. The Battle Axe culture is also known as the Boat axe culture. The latter name derives from the shape of many of the Swedish battle axes in this period, which might be described as ‘boat’ or ‘canoe’ shaped when held upside-down. Both names are still in use among archaeologists in Sweden (i.e. *Stridsyxekultur*, *Båtyxekultur*), and are completely interchangeable. I have chosen to use the former as it is the term chosen by Mats P Malmer, whose dissertation is still the definitive work on this period, and it is also the term most often used in international publications.

Chapter 3 includes a very brief presentation of the archaeological cultures of the Middle Neolithic B. It also discusses the problem concerning the definition of Pitted
PART I

Ware culture, especially regarding coastal sites on the West coast, and the relationship between the Corded Ware complex and the Battle Axe culture. Chapter 4 has an extensive history of research into pitted-ware pottery, as any discussion about Pitted Ware culture tends to hinge upon how this is defined and dated. Chapter 5 discusses battle-axe pottery in a similar manner. Both chapters also aim to present an overview of classical archaeological attitudes toward pottery, typology and style in the twentieth century, and the problems inherent in approaches that do not attempt to understand the context in which such a craft is taught and practiced.

PART III – LIVING BODIES

The paradox of archaeology is trying to discover something about past lives with no living informants. Yet the material left to us was once made by living human beings. While we often tend to treat the artefacts as the result of either functional needs or symbolic ideas that were given shape, the reality is more complex. Making an object involves both body and mind, conscious and sub-conscious choices, embodied practices and deliberate preferences. Chapter 6 takes a closer look at ethnoarchaeological studies of pottery craft in small-scale societies, and what they can tell us of the emergence and change of material culture patterns. Of particular note is the concept of the chaîne opératoire, as well as the processes involved in teaching and learning the craft, and the embodied practices that are a result of this. Chapter 7 and 8 apply the conclusions drawn from this on the pitted-ware and battle-axe pottery. Thin section analyses of the respective tradition are compiled and compared in the light of chronological, regional and local diversity and similarity. It is shown that the difference between the two traditions go far deeper than the surface, and involve the organisation and social structuring of pottery craft, as well as the role of the potters in the communities.

PART IV – DEAD BODIES

The treatment of the dead is another aspect that sets the two cultures apart. Chapter 9 begins with an overview of the practices of defleshing, removal of body parts and cremations in Pitted Ware culture contexts, showing that the mortuary custom is more complex than what has been previously recognised. It continues with a more detailed presentation of the mortuary houses of Bollbacken and Turinge mentioned above, and a few other similar structures of the period. Chapter 10 is devoted to an osteological analysis of the human and animal bones from the mortuary area at Bollbacken. The state a dead body is in – fleshed, defleshed or dry – affects the way the bones colour, crack and fracture when they are cremated. By conducting a more in depth study of the bones at the site details about the mortuary practices, as well as cultural attitudes towards the human body and animals, are revealed.
PART V – SYNTHESIS

Chapter 11 compares the pottery craft traditions of the Pitted Ware and Battle Axe cultures, as well as the very different attitudes that exist in each regarding the use ('life') and deposit ('death') of the vessels. The appearance at the end of the Middle Neolithic of apparent 'hybrid' types of pottery is discussed in the light of this. Chapter 12 compares the mortuary traditions of the two cultures. Ritual practice and what it might tell us of social structure and cultural values is discussed. Examples from anthropological literature is presented both to point out some interesting cross-cultural phenomena associated with secondary mortuary practices involving dead bodies, and to note the complexity of trying to interpret prehistoric societies through historically situated ethnographic examples. Finally, chapter 13 summarises the results of the project, especially the relationship between bodies and pots in the third millennium BC, and between the Pitted Ware and Battle Axe cultures.

Fig 1.2. a.) Map of the southern Baltic Sea region. The area designated as South Sweden in the dissertation is roughly marked, as are the regions referred to as Western and Eastern Sweden. The latter also includes Eastern Central Sweden and Southern Sweden, two regions that receive particular attention in the dissertation. A star marks the location of Bollbacken.
Fig 1.2. b.) Västmanland in Eastern Central Sweden, late Middle Neolithic shoreline of 30 m.a.p.s.l. 1: Pitted Ware culture settlement at Bollbacken, Tortuna parish. 2: Battle Axe culture settlement at Fägelbacken, Hubbo parish.
What can we possibly know of societies who have left few or no written evidence as to what they thought, felt, did or believed? The only clues left to us are strictly material, and our interpretations depend wholly upon social and philosophical theories: what does it mean to be human, and what is the relationship between humans and their material creations?

In this chapter I will give a very short and concise background to the major schools of thought in archaeology and anthropology regarding human nature and society, in the past 200 years. Though the approaches have been varied and complex, it is striking how much of these have been filtered through evolutionary concepts. This basic premise underlies not just the models constructed of past societies and cultural change, but also how archaeologists have approached, ordered, categorised and interpreted material culture. The research into and typologisation of pottery, for instance, owes more to this mode of thinking than to a direct understanding of how objects are made, and how knowledge is transmitted across generations.

The aim of this book is to explore the relationship between two contemporary archaeological cultures. It is also an attempt to see if the term ‘culture’ can be said to have a valid correlation to real social groups, emic and/or etic, in the past. For good reason, the archaeological use and application of the word culture has been severely criticised in the past decades. Not only are we not sure how to define it, we have yet to find a consensus on how material culture relates to and mirrors social realities. As awkward as the term is, it is difficult to see how we can do without it in archaeology at the present. The problem does not really lie in the word itself, but rather in our rudimentary understanding about the relationship between people and material culture.

This chapter traces the broad developments in archaeological and anthropological theories on culture and society, and tries to outline how we must try to reconcile the biological fact of the human body with the complexities of the cognitive mind.
2.1 Culture and Change in Prehistory

The concept of ‘culture’ lies at the root of both archaeology and anthropology, yet it has always been problematic, and there have been a multitude of attempts both to define it and to dispense with it completely as hopelessly compromised. Why the term came to be used in the study of prehistory to begin with deserves some elucidation. *Kulturgeschichte* was established by German Romanticists in the eighteenth century, referring to the customs and traditions of rural populations in different countries, as opposed to the ‘civilised’ social classes who shared a more common purpose and habits across national borders due to similar forms of education. In time, culture became shorthand for describing the variations encountered in different groups in Europe as well as around the world. What causes this variation has become a cause for much debate within the humanities and social sciences, a debate that is still ongoing.

There are two very important and opposing views about humanity competing within Western academia since the Enlightenment period. One considers all human beings to be part of essentially the same universal unity, and expect that all will progress through the same basic stages of development. In contrast, the other line of reasoning states that cultures represent the soul and spirit of different peoples, the unique result of that particular group’s history and experiences, and a reflection of their innate value. This latter view was often professed by Romantic scholars and the budding nationalist movements of the nineteenth century (Trigger 1993:76-80, 86-89). Both lines of reasoning had their positive and negative aspects. The Enlightenment movement often championed the idea that differences between peoples are not mainly due to biology, but to historical, ecological and economic circumstances. Each human being (or at least each man) has the same basic capacity and only needs education and proper care in order to reach it. However, this view was often combined with a deep progressive conviction that there was one ultimate road of cultural and social evolution, and that Western culture signified the highest rung on the ladder. For their own good, all other peoples and cultures should be educated to Western values and changed to include Western social structures.

Romanticism and nationalism made the point that not all traditions needed to be sacrificed on the altar of Global progression, and that there was more than one way to live one’s life. Rather than to be forced to abandon one’s way of life, those traditions should be protected and preserved as they represented something invaluable. On a darker note, these convictions were often coloured by qualitative statements about the innate character of different peoples: hardworking, joyful, lazy, aggressive, industrious, childlike etc. It risked trapping people in predetermined roles which they could not escape, as they were often considered biological.
Humanities and the Concept of Evolution

The concept of evolution influenced many renowned thinkers long before Charles Darwin (1809-1882), but with his publication *On the Origin of Species* in 1859 there was finally a comprehensive and well argued case for the theory. It is not always highlighted enough that although many contemporary scientists and scholars advocated Darwin’s proof of biological evolution, many were less impressed with the mechanisms of natural and sexual selection as an explanation. In fact, they tended to ignore most of the implications of his theory. Darwin himself studiously avoided the term ‘evolution’ in his book, and talked instead about descent. Not until the last edition of *Origin* in 1872 was the term evolution actually introduced (*Encyclopaedia Britannica*). The idea of ‘survival of the fittest’ and using natural selection to explain the varying success of both societies and individuals within a society was not put forward by him, but by the philosopher Herbert Spencer (1820-1903). It is an enduring irony that subsequent generations have referred to the ideas of Spencer and others like him as ‘Social Darwinism’. Although Darwin’s book certainly influenced Spencer, he never really abandoned the idea that evolution was inherently progressive which is Lamarckian rather than Darwinian.

The development of culture studies, both within anthropology and archaeology, cannot be understood without appreciating the profound hold the notion of evolution had on research in the West. While the paradigm in itself had little or nothing to do with Darwin’s theory of natural selection, the fact that his work proved that evolution was a reality in nature meant that it could be used to give credence to sociological theories as well. A diverse number of philosophers, historians and ethnologists who wanted to claim scientific credence for their social theory tried to find a parallel with Darwin and natural evolution (e.g. Marx and Engels, see Gould 2003:115). John Lubbock (1834-1913), who grew up as a neighbour of Darwin’s and wrote an early and influential book about prehistory, argued that environmental factors and historical development had caused biological differences between both the human races and different European populations, causing some to be technologically and mentally more evolved (Trigger 1993:142-147; Olsen 1997:32).

**Culture and History**

The researcher that truly established the use of the term ‘culture’ in anthropology and archaeology was Edward B Tylor (1832-1917), in his book *Primitive Culture* (1871). On the opening page he defined culture as “...that complex whole which includes knowledge, belief, art, morals, law, custom, and any other capabilities and habits acquired by man as a member of society.” Tylor’s great contribution was the way in which he argued that human society is more than just institutions and organisation, that the material and spiritual aspects of social life must be taken into consideration as well. Tylor was certainly not devoid of ethnocentrism and prejudice, yet he argued persistently for the physical and psychological unity of humankind. Although cultures could be more or less primitive, the people themselves had
PART 1

it in them to better themselves and achieve a higher level of social evolution – the European way of life (Trigger 1993:197; Bowie 2006:13f).

An alternative view was developed by the American anthropologist Franz Boas (1858-1942). He championed historical particularism, i.e. that each culture must be understood on its own terms as the result of long term historical and environmental circumstances. Each culture was in his view ‘adapted’ to these circumstances and the social institutions served a specific purpose. Like Bronislaw Malinowski, he argued that other cultures had their own set of values, which should not be understood only in terms of what Westerners considered to be developed. Boas’ approach has more in common with the philosophy of Romanticism than with the empirical Enlightenment movement, but it was also heavily influenced by the paradigm of evolutionism in that each culture in a way was seen as its own sub-species, the result of internal adaptation to external events and conditions. Although Boas was to exert considerable influence over American anthropology, and therefore also archaeology, the European research tradition continued to be more interested in using anthropology as a means of ordering the peoples of the world into defined categories. Archaeology in Europe also continued to be more of an historical discipline than an anthropological one, since the aim was often to retrace the prehistory of historically known tribes and ethnic groups (Trigger 1998). It was not until processualism and New Archaeology came along in the 1960s that European archaeologists would start to take an active interest in anthropological works and theories.

The conviction that humanity was essentially one unity was often combined with a progressive and optimistic view about the ability of Man (though perhaps not Woman) to improve his life and circumstances, both individually and for society in general. Change was initiated and driven by the innate inclination in humanity to absorb and imitate successful technical and social innovation. This was certainly true for Oscar Montelius (1843-1921) when he argued for the role of diffusionism in cultural development in prehistory. This approach was unilinear in several respects, in that it generally considered ideas and technology to have one centre of origin from which it then spread to others, very much in the same way that a species can only have one common ancestor. In Montelius’ view that centre was situated in the Near East and Egypt, whereas other archaeologists felt the birth place for great cultural innovation should be connected with the hypothetical homeland of the Indo-Europeans/Aryans. Migration, which was the other contender to explain changes in material culture, had what was essentially a more conflict-focused view of human nature. In this case, change was brought not by Man’s desire to better himself, but the innate drive and ability of some peoples to conquer and dominate others. In a way this theory was as unilinear as the diffusionist model since it assumed one main centre of development, the difference being that it was people themselves that moved, not just ideas. Of course the theories were not mutually exclusive, many archaeologists could advocate migration to explain some changes, and ideas to explain others. A common denominator was that both these explanations saw change as mainly a result of external pressure. Cultures were considered mostly stable and
unchanging, unless climate change or other external factors pressured the group to make changes, which would then in turn affect others.

Over time the various uses of terms like ‘civilisation’, ‘people’ and ‘culture’ merged into practically synonymous terms, though that was not the way they were used initially. Up until V. Gordon Childe (1892-1957) and his books *The Dawn of European Civilization* (1925) and *The Danube in Prehistory* (1929), there were few serious attempts to actually define what was meant by the term ‘culture’ in archaeology. A number of artefacts and features had to commonly occur together, such as pottery, tools, ornaments, burial rites and house structures, to constitute a specific culture. What Childe tried to do was to distance archaeology from a strictly evolutionary exercise, fitting in each culture on a predetermined ladder of development. To determine the spread in time and space of any given culture, empirical studies of stratigraphy and seriation had to be undertaken (Trigger 1993:203-210; Olsen 1997:34-38).

Like Boas, Childe argued that cultures must be understood on their own terms, based on the combined impression gained by studying many aspects of material culture, economy and religious activities (Trigger 1993:203-210; 1998:102). He did feel that it was enough to select a few lead artefacts for each culture as a methodical tool when interpreting assemblages, and that one should mainly focus on those types of artefacts that reflected mainly local tastes and customs: e.g. pottery and burial rites. It was simply assumed, with little or no evidence to back it up, that these were less likely than others to change from external impulses. Tools like axes, knives, scrapers, arrows etc were seen as ‘technological’ with greater functional uses and would therefore be more prone to spread between groups (Trigger 1993:208). In other words, stone technology was generally seen as evidence of contact and trade, whereas pottery was seen as the result of traditional and domestic consumption. It is probably not a stretch to interpret this model as influenced by the preconception that stone knapping and metal smithwork are male activities and pottery a female one. Likewise, rituals were not supposed to change or be altered by people unless pressured to.

Navigating Between Culture and Nature

Post-World War II European archaeology saw a growing attempt to study prehistory as a social history of humanity, rather than a means for the nation states to find their origins. The reasons for this desire were several, but undoubtedly the destructive result of extreme nationalism played an important part. However, as archaeology grew as a discipline with far more excavations and publications, and involving more than just a few professors with informal networks, there was also a perceived need for a more effective and scientific discourse. How should artefacts be described and typologised, how should they be ordered and dated, what did they actually represent? Structural-functionalism had become well established within British anthropology at that time through the influential works of Radcliffe-Brown and Evans-Pritchard. Although especially the latter firmly placed
anthropology within the Humanities, both expressed the conviction that human cultures are structured and inherently rational constructions where economy, religion, ecology, kinship system and social organisation are dependent upon one another. One of the early functionalist archaeologists was Grahame Clark (1907-1995). Bruce Trigger has described Clark as being influenced by Radcliffe-Brown and the ecological interests of many Scandinavian archaeologists. Clark was also taken by the urging by Finnish archaeologist Aarne Tallgren that archaeologists must stop treating artefacts as if they were alive, and instead see them as products of the needs and wishes of human beings (Trigger 1993:315).

In keeping with the structural-functionalist school of anthropology, although altered to accommodate archaeological source materials and questions, Clark formulated the aim to reconstruct the economic, social and political organisations of human societies, as well as their general belief systems. In his view, culture was humanity’s way of creating an adaptive system to the environment. Culture is the way in which individuals are taught to act and work together to ensure success and survival. Change was still seen as mainly brought about by external forces, ecology and environment, to which the social group must respond (Olsen 1997:132-136).

Grahame Clark also helped usher in a more taphonomically critical archaeology, as he noted that not only are different materials more or less prone to survive depending on the local environment, but also that human actions tended to affect how different materials were chosen both for use and deposition. Because of this bias in the material remains, he argued that artefacts mainly provided an idea of the economy and not the social organisation and belief system. In his view technology and economy are shaped to a large degree by ecological factors, as they are the rational means by which humans try to achieve the most effective outcome. Social structure might be restricted by these external factors but it is not created by them. This model has a lot in common with the progressive, optimistic and evolutionary theories of the nineteenth century. Despite the quite materialistic approach Clark was openly distancing himself from the Marxist historical-materialism of Childe by essentially viewing the human being as a biological one, albeit with a unique ability to adapt to nature socially and technologically. (Trigger 1993:316f)

In his book *Archaeology and Society* (1939) Clark had likened an archaeologist to an ethnologist, and stated that the goal of the discipline should be to be able to formulate general conclusions about human society in terms of social science. A similar view was developed among American archaeologists in the 1960s, influenced by the neo-evolutionary theories in anthropology at that time. In North America anthropology and archaeology had always been intimately linked since the prehistory studied here belonged to ‘others’, the native Indians. As a reaction to the Boasian cultural peculiarism, neo-evolutionary theories tried to reveal the underlying rules guiding social and technological developments. Change was still considered a reaction to external forces, but unlike the progressive model of the European unilinear evolutionism it was not really a result of individual or innate desire to better one’s circumstances or improve life. Instead war,
famine, ecological change and competition over resources were often cited as underlying factors. Whereas the nineteenth-century evolutionists often viewed change as positive and even inevitable, neo-evolutionists had a more negative opinion of cultural change. It is not hard to see that this bleaker view of Humanity was the result of two World Wars, economic depressions and environmental destruction. Human beings were still viewed as fundamentally rational however, at least in the short run, trying to find balance and security in the world they inhabited. There was also a growing emphasis on archaeology and anthropology as science, not historical research (Trigger 1993:346f; Olsen 1997:132-136).

When Lewis Binford (1962) wrote the seminal article ‘Archaeology as Anthropology’ in *American Antiquity* he meant anthropology in the tradition of the universalist Lewis H. Morgan, rather than the teachings of Boas. The true aim of both archaeology and anthropology was the explanation of differences and similarities in cultural phenomena across both time and space. Archaeology had done a good job of describing and presenting the prehistoric material, but had managed little in the way of explaining the emerging complex patterns. Binford’s early focus at least was on the similarities more than the differences, since the challenge lay in trying to understand under which conditions analogous structures and behaviours appeared. An important criticism made by New Archaeology was that the culture-historical archaeology had tended to be overly inductive in its interpretations. The ‘if I were a primitive’ line of reasoning where the armchair scholar could think himself into understanding the mindset of other peoples. Binford stated that any such claim must be backed by actual anthropological or historical evidence. Archaeologists must start to build and formulate theories connecting general social models on the one hand, with the observable material evidence on the other: a middle-range theory (Trigger 1993:352-361; Olsen 1997:97-99; Sjögren 1999).

Change was brought about through external pressures on culture systems whose normal state was one of equilibrium (Binford 1965). However, Binford and several other prominent theorists of New Archaeology emphasised that the way in which things changed could only be understood by studying the internal reactions and adaptations. Social groups did not just absorb external influences, and culture was not an assorted collection of customs and historical coincidences.

Similarly, change in the total cultural system must be viewed in an adaptive context both social and environmental, not whimsically viewed as the result of “influences”, “stimuli”, or even “migrations” between and among geographically defined units. (Binford 1962:217)

If there was diffusion of ideas and technology there must be a reason for it, and that reason was more important than the material objects themselves. Similarly, migration did not just ‘happen’, and was at the most another fact to take into consideration but not in itself an explanation of anything. Even though New Archaeology tried to distance itself from a progressive evolutionary model of human society, there was still a current of
technological optimism and a belief in the ability of humans to innovate with technology when the occasion called for it. The main difference was that change was seen as abnormal and potentially threatening, not as the fulfilment of human potential.

A positive aspect of the renewed interest in anthropology among archaeologists was the increased awareness of the fact that societies are made up of many different people with different social roles based on age, gender, social status, specialisation, craft skill etc. Approaching cultures as systems meant that there was a move away from elevating just one segment of society to a central position and viewing everyone else as peripheral to that. While Binford divided culture into three main sub-sets – technology, social organisation and ideology – he also suggested that material culture often involves all three aspects in every object. An artefact has technomic aspects relating to its environmental use, socio-technical aspects relating to the social organisation, and ideo-technic aspects connected to society’s ideology (Binford 1965).

Although the 1960s and 70s saw an increased interest in anthropology and environmental explanations of human society and change, anthropology itself was moving away from generalising explanations. There were many reasons for this, not least the critique of colonialism in the aftermath of World War II, and the growing interest in Marxist, critical and post-structuralist theories in sociology and history. A comprehensive presentation of all these is beyond the scope of this dissertation, though I will discuss aspects of the phenomenological theories further below. Some important features need to be highlighted however, especially an important change in approach to culture and society. Most of the models presented until now have tended to view the ‘normal’ state of society as being balanced and mostly unchanging, with different parts such as economy, religion, technology and organisation being interconnected and dependent upon each other. If a system was not balanced it was by definition dysfunctional and needed to find a new equilibrium. Structural-marxism, however, proposed a more dynamic and problematic view of society, where different social segments tended to vie for domination and control. Ideology, which included religious concepts, was used to suppress and distort inequalities that existed and make them seem inevitable and natural (Plattner 1989; Donham 1990; Olsen 1997:145-156).

This was a rather more pessimistic view of society, but it was also novel in that change could be at the same time positive and negative depending on one’s point of view. It challenged Durkheimian sociology by pointing out that there always seemed to be both losers and winners in every system. The social system may be good for some, but it could be bad for others. More importantly, ideology was not just society’s way of worshipping itself, it was the means by which people could be fooled and coerced into doing and believing things that were counter-productive and destructive. This notion certainly posed a challenge to the view of culture as a way for people to adapt and increase the chances for survival. Structural-marxism of this kind was among the first major theories to put forward the idea that social and cultural change can be primarily internally driven, not counting racist theories that proposed some peoples were always innovative while others
were less evolved. External events matter as well, but societies are always in a state of
dynamic processes that can potentially be triggered, causing a chain effect. This shifting
approach to human society helped shed some of the old notions of cultures as closed,
isolated groups of peoples moving across our maps of prehistory. Although classical
Marxism and historical-materialism tended to focus on economy, the researchers of the
1970s and onwards were just as likely to focus their attention on ideology and religion,
which up until that point had tended to be last on the list of things that could be studied

The increased interest in ideology, domination, status and internally driven change was
also an indication of the agency focused cultural theories that were to become extremely
Early contextual archaeology was still very much focused on structure, though now with a
renewed focus on the historical processes and the intentions of the people involved
(e.g. Hodder 1979; 1982; Miller 1982; Tilley 1982b). There was a growing critique of the
whole concept of social structure as something objectively real. The focus shifted instead
to the people that actually brought these structures into being, and the means by which
they supposedly did this. The dynamic force of society was placed in the hands of
individuals again, but not in a technologically/environmentally adaptive or evolutionary
progressive way. What was manipulated and developed were ideas, concepts and symbols
through the use of material objects and physical surroundings. The underlying reasons for
these actions were often portrayed as self-serving for individuals or a segment of society,
as they were trying to compete with each other over both material and intangible wealth
(goods, prestige, power).

Anthropologists like Robert Hertz (1960 [1907]) had showed that biological events like
death are culturally controlled, as is the expression of emotion. These theories had mainly
been used to discuss the way society as a force existing outside human beings structure
their actions. In contrast, the structuration theories of the late twentieth century now
focused more upon how agents within a structure could consciously make use of customs
to control and manipulate both events and people. Identity was something that changed
and developed over time for each individual, not a complete package imposed upon them
by society (Giddens 1979; 1984; Bourdieu 1990 [1980]; Broady 1991; Olsen 1997:158-
162). Increasing interest in historical context, relationships and interactions as created
rather than given, and personal agendas of the members of society, meant that the role of
anthropological analogy changed significantly.

Although anthropology continued to be an important part of archaeological
methodology, at the end of the twentieth century the relationship became more
conflicted. This was in part because anthropologists were themselves embroiled in an
intensive debate about the role and aim of the discipline in the aftermath of post-
structuralism (Ellen et al. 1996; Ingold et al. 1996a; Ingold et al. 1996b; Godelier 2000).
Many certitudes were abandoned as post-structural and post-colonial research highlighted
the ethnocentric bias prevalent in many of the classical works of anthropology.
The developing schism between archaeology and anthropology was perhaps initially due to anthropologists openly distancing themselves from the attempts of archaeologists to use their culture studies as blueprints for prehistoric societies, first within an evolutionary framework and later as a smorgasbord of symbolism and customs. When I studied Cultural Anthropology as an undergraduate at Uppsala University in 1994, our teacher began by asking who in the auditorium were archaeologists. Those of us who confessed were sternly told that the courses we were to take could not be used to make models of prehistory. Anthropology was the study of the present, and possibly near history, but not the past of humankind.

In all honesty anthropologists had some cause for their hostility towards archaeologists at that time. The processual archaeology of the 1960s and 70s had at times treated contemporary traditional peoples as ahistorical ‘survivals’ from the Stone or Bronze Age. Their way of life described more in terms of biology than culture. Although contextual archaeology was more concerned with the historical particulars of the analogies being used, there were often cases of ‘cherry-picking’ a few ethnographic examples and making them into the blueprint of any past society. Another problem was the continued tendency to divide traditional cultures into categories based on an evolutionary ladder of social development: hunter-gatherer/band, small-scale farmer/tribe, farmer-pastoralist/chieftain etc. In search of good analogies regarding anything from burial customs to ideology to gender roles, subsistence was often used as ways of filtering out which ethnographic examples were to be of use.

Archaeologists themselves became more critical of the use of anthropology as a source of answers in the 1990s. The question of ethnicity was a touchstone for growing concerns about the viability of the older models of society, system and material culture. The primordialist (or essentialist) model of ethnicity viewed it as an all but inevitable result of differences in language, traditions and material culture between groups that were in themselves discrete socio-political units. The social bonds they shared were real and not open to negotiation (Siapkas 2003:41-46). There was growing opposition to this view of ethnicity in the 1960s, which has been referred to as instrumentalism, perhaps most clearly presented in the works of Fredrik Barth and the volume he edited: Ethnic Groups and Boundaries (Barth 1969a; b). He made the point that material culture could not be viewed as synonymous with genetic traits that grow more dissimilar the less interaction exists. In contrast, expressions of ethnic identity in clothes and material culture could be amplified considerably if contact and interaction was close and continuous.

Though the naïve assumption that each tribe and people has maintained its culture through a bellicose ignorance of its neighbours is no longer entertained, the simplistic view that geographical and social isolation have been the critical factors in sustaining cultural diversity persists.

(Barth 1969b:9)
Barth pointed out that not only are cultural borders crossed all the time by people and goods, but more importantly that they tend to persist despite this interaction. Often it seemed to be the inter-ethnic relations themselves that played an important part in creating these cultural boundaries. Another important point was that ethnic identity was not necessarily the most fundamental and important aspect of one’s personal identity. Depending on the time and place, and the cultural setting, ethnicity could pervade all social life or it could be highlighted only at certain special occasions (Barth 1969b:10, 14; Olsen 1985; Olsen 1997:160; Siapkas 2003:175-180).

The complexities of cultural and ethnic identities revealed by Barth and many other anthropologists presented a challenge to archaeologists. The prehistoric ‘cultures’ were defined through certain selected objects and features, such as burial customs. Inter-ethnic studies showed how subtle the differences between groups could be and also how common it was for material culture to be exchanged and receive new meaning in different contexts (Marshall & Maas 1997; Lightfoot et al. 1998; Olsen 2000). Even more problematic was the fact that it was apparently extremely difficult to surmise the amount of interaction based solely on similarities of material culture. According to Barth ethnic identity basically resided in self-identification (emic), something completely impossible to ascertain in prehistory. In fact, ethnic categories were little more than a ‘vessel’, used to hold whatever cultural peculiarities were deemed to be important (Barth 1969b:14). The conclusion was that culture in the classical sense had little or even nothing to do with the constitution of ethnicity (Jones 1997:76-78; Siapkas 2003:186).

It left archaeologists wondering just what material culture was, and if it related to social and ideological aspects in any truly meaningful way. Unfortunately, although anthropologists often mentioned in passing the role of adornments, prestige items and everyday objects in traditional societies, material culture studies were generally out of favour. They were associated with the collectors and art dealers of the nineteenth century, not the research discipline of anthropology which was focused on social and religious systems. As anthropologists increasingly turned to questions and problems with little general application for archaeologists, there was a growing interest among the latter in the biological and evolutionary aspects of human culture.

**Sociobiology and Memes**

If the ‘loss of nerve’ leads to failure to address big questions which are of real interest to people, is there any wonder that someone else comes along and fills the gap, especially if they apparently have a new and powerful method of doing so? (Shennan 2002b:13)

Introduced to the general scholarly discourse by the biologist Richard Dawkins in his influential book *The Selfish Gene* (1976), memes are meant to be self-replicating units of culture that can be passed between peoples and generations. Memes are the social equivalent of genes which Dawkins argued should be understood as the basic units of
biological evolution. The whole ‘point’ of evolution, natural selection and replication lies in the continuation of these ‘selfish’ genes – everything else is just a vessel. Transmission of memes can occur both horizontally and vertically (within or between generations) by imitation, or through recorded media such as books, films etc. Several researchers have picked up on this idea that there is an analogous, or even homologous, relationship between genetic evolution and cultural evolution. Anthropologist Robert Boyd and zoologist Peter J. Richerson have also contributed to the growing research into the interaction of biology and culture in human prehistory (Boyd & Richerson 1985; 2005).

The revival of evolutionary culture theories have less to do with the ladder of progressive social development of the nineteenth century, and more to do with the desire to link social sciences to the natural sciences. While this approach had gone out of favour in general in archaeology in the 1980s, there were nonetheless archaeologists who held the opinion that the methodology of biology could be applied to culture studies. The researcher perhaps most associated with this genetically influenced model is Stephen Shennan (1996; 2002b). The theory claims that cultural traits are influenced by selective pressures very much in the same way genetic traits are selected. However, cultural and biological selection are not always necessarily compatible, so a strong selection of cultural traits can actually override negative fitness in a genetic sense (Shennan 1996:287). Unlike the progressive evolutionary model the memes theory tends to view change and innovation as often actively opposed by the social system, continuity and reproduction being the normal state of affairs, albeit with minor alterations due to copying errors.

The sociobiological approach to human culture does not use evolutionary and genetic categories and concepts just as metaphors. The theoretical foundation is the idea that although the mechanisms involved are different, the general processes are analogous. Our genes may not control us directly, but human culture is stored and processed in our brains and is therefore biologically constituted (Boyd & Richerson 1985; Shennan 1996:294; 2002a; Henrich et al. 2008:20). This theory is weak because it rests upon completely theoretical constructions, with few if any attempts to actually falsify the hypotheses in good scientific tradition. To state that human beings imitate and learn from one another is a truism, and it hardly supports the notion of memes above that of any other form of cultural transmission. Since these memes can apparently be transmitted even if they actually have a negative effect on genetic selection all that is left is a circular argument: if a cultural trait is passed on it must have some sort of positive effect, culturally or biologically, individually or collectively. This does not explain anything about which traits are conservative and which are prone to change, why some aspects are spread widely and others are never spread at all.

**Anthropology Reclaimed**

Sociobiology and cultural evolution theories owe some of their success to the fact that the critical discourse within anthropology and archaeology during the past couple of decades tended to officially abandon many of the questions that people wanted to be answered:
what is humanity, why are we different, how are we the same, how does change happen etc? Anthropology, sociology and archaeology were originally established to answer these questions, but the prevailing trend was to avoid them at all costs and even withdraw from public debates with other disciplines (Bloch 2005b; Ingold 2007). As Maurice Bloch has pointed out, curiosity about the human condition is not something that exists only in the Western world. He has encountered it among many people he has lived with and studied. The following quote refers to an evening spent with his hosts in a little village in the Malagasy forest of Madagascar:

After many anecdotes about the linguistic variations they had encountered on their travels, the conversation rapidly took on a more theoretical turn. If people used different words, did they understand the phenomena they designated so differently in the same way? If we are all related, how had this variation come about? Were the speakers of unrelated languages fundamentally different types of moral beings? And if they were, as some maintained, was this due to the language they had learnt, or was the language the manifestation of a deeper cause?

(Bloch 2005b:3)

Many archaeologists and anthropologists feel that the critical theoretical concerns of the last few decades have become stuck in deconstruction and relativism. There is a professed desire both to reclaim material culture as a source of knowledge, and for the disciplines to address global issues of human nature and experiences (e.g. Bradley 1993; Jones 1996; Knapp 1996; Nanda 1998; Sahlins 1999; Godelier 2000; Ingold 2002; Oestigaard 2004; Bloch 2005b; Kideckel 2005; Olsen 2006; Ingold 2008). As subjective and fallible as fieldwork, excavations and artefact analyses are they are still sources of important insights. Fieldwork forces us to remember the complexities of human life and to correct the inevitable tendency to believe that introspection, carried out in tranquillity from the embedded position of our own particular culture and society, is straightforward.

(Bloch 2005a:ix)

The same could be said for the use of anthropological analogy in archaeology. Ethnographic examples will not provide us with clear answers, but they do force us to become aware of the remarkable variation and complexity of human culture (Herbich & Dietler 2008:224). It is never possible to completely shed our own prejudices and preconceptions. We always view things through a cultural filter so any attempt to broaden and challenge that bias should be taken. The critique of anthropological methods and models has been necessary, but it should not blind us to the fact that the discipline still has a lot of concrete results to offer. Most importantly, there is a real need for global studies of several kinds of cultures even if they are historically situated. The alternative would be to only draw upon our own historically situated reality as a source of information about the human condition.
PART 1

The best way out is to concentrate on what we do best, and what has undeniably provided
the best results through the years: studying what real people do and think in real contexts.
(Gosselain 2008a:177, orig. emphasis)

The theoretical approach of this dissertation is based to a large degree on what people
actually do in real everyday life, and to what extent this can shed light on the material
results of these actions. The human being is the only animal to actively create a material
world in which to live and act, and through which we experience our world.

CONCLUDING REMARKS

The term ‘culture’ is problematic both from an anthropological and an archaeological
perspective. It is poorly defined and its premise is even shakier in that the connection
between material culture and specific identities has yet to be fully explored. Conscious of
this fact, archaeologists have at times attempted to substitute ‘ethnicity’ or ‘identity’ for
‘culture’ as a working concept. While both these aspects should be explored in prehistory,
either is a solution to the problem itself – i.e. that we still do not know how and to what
extent material culture reflects identities, structures and agencies. Ethnicity is a very
specific concept, denoting self-acknowledged group identity which may not be of primary
or even secondary socio-political importance for every period or region. Kinship systems,
networks, village alliances or religious affiliation can play a much more central part in both
everyday activities and ritual life. Investigating whether ethnicity may have been important
is a task in itself.

The term ‘identity’ may seem less problematic, but since it is just as or even more
vague than culture, it often just becomes a synonym for the latter. Substituting one term
for another without solving the underlying problem resolves nothing. People hold a
multitude of identities in life, and which takes precedence in a given moment depends on
the context. We should certainly make every effort to investigate what types of identities
seem to have been used by people in prehistory, but it does not in itself solve the issue of
what similar assemblages of similar-looking artefacts across a region signify. Since the
material assemblages that I have decided to study in my dissertation have been sorted and
defined as ‘Pitted Ware culture’ and ‘Battle Axe culture’ as part of the history of research,
I will continue to use those terms throughout. I do so both because the historical
perception of these categories is interesting and has generated much debate, and in order
to probe and problematise what these patterns might represent in terms of prehistoric
structures.

While not losing sight of the fact that archaeological cultures are theoretical constructs
of our own age, we cannot at this time completely abandon the terminology. For one
thing, we are always creating categories and groupings which reflect a subjective sorting
method because without these we would not be able to communicate. Bearing this in
mind we must try to challenge and test the categories we have made, and the reasons we
give for choosing one artefact above another, or one type of decoration. More important
than choosing a method of categorisation is arriving at an understanding of what
Chapter 2

processes affect, alter or preserve material culture over time. Unless we understand this we cannot hope to understand the patterns of material cultures that seem to exist during prehistory. As I hope to show in chapters 4 and 5 not even the most detailed ‘objective’ registration of traits is done without some basic theoretical preconceptions on the part of the archaeologist. Worse, without an understanding of how objects are made and knowledge is passed on between individuals and groups, documentation can easily become a meaningless exercise.

The following chapter will discuss the basic tenets of phenomenology, practice theory and cognition, as I believe these may be of help in unravelling the meaning of material culture.
PART 1

2.2 Body and Self: Practice, Cognition and Embodied Experience

The eye – it cannot choose but see;
We cannot bid the ear be still;
Our bodies feel, where’er they be,
Against or with our will

Expostulation and Reply. William Wordsworth

The renewed interest in sociobiology is in part due to the wish for a more scientific study of human culture with seemingly concrete results that can be quantified and visualised in diagrams. Although I believe this supposed objectivity rests on a false premise, there is an important point made by sociobiologists: human beings are more than just intellect, they are also bodies. While no one disputes this, the mind::body dichotomy has deep roots in Western culture, both in the Christian and the Cartesian world view. The question of the extent to which we are ruled by our bodies has always been debated, ranging from biological determinism to extreme intellectualism where the mind is considered to be almost completely separate from physical reality. Finding a balance between the biological body which evolved from a primate ancestor and the remarkable cognitive faculties that sets humans apart from other animals is the challenge that links Life Sciences, Social Sciences and the Humanities together. It is a common goal for which there has seldom been any common means.

Many of the scholars I will refer to in this chapter and throughout the dissertation could be said to work in a phenomenological tradition. This is a complicated statement, however, as phenomenology has been an expansive philosophical school of thought, developing in several directions. Though the term had previously been used by Georg Friedrich Hegel, the ‘founding father’ is generally considered to be Edmund Husserl (1859-1938) who made substantial changes to his own theory over the course of his life. Phenomenology also tapped into other existing lines of thought in Europe at that time, especially structuralism and Marxism, so the subsequent developments are polylinear rather than unilinear. This lack of clear definition and a cohesive school of thought has meant that a lot of attention has been directed at analysing what differs between thinkers such as Husserl, Heidegger, Sartre, Merleau-Ponty and Bourdieu, for instance. I agree with ethnologists Jonas Frykman and Nils Gilje who state: “*How they stood in relation to each other is sometimes less important than seeing what they have in common*” (Jonas Frykman & Nils Gilje 2003:8). What they tend to have in common is an interest both in the physical nature of the world and in the perception of that world by human beings, through experience.
PHENOMENOLOGY criticises both naturalism which seeks to apply the methods of natural sciences to all domains of knowledge, and historicism which states that all thinkers are immersed within a particular historical setting. The basic premise is to accept that we are biological bodies with limitations and boundaries, but also that any perception of the world around us is filtered both through sensory experience and through the unique individual experience which is historically situated. It should be noted that the English language does not differentiate between lived experience in the moment (Sw. upplevelse, Ger. Erlebnis), and the already integrated knowledge through past experience (Sw. erfarenhet, Ger. Erfahrung) (Jonas Frykman & Nils Gilje 2003:15). While phenomenology in the philosophical sense is usually more concerned with the former, both concepts are of valid concern as the experience of the ‘life-world’ is partially dependent upon the past experience of the observer.

You cannot easily transcend the life-world – since it is the reality in which you move about. This is something you think with rather than think about. (Jonas Frykman & Nils Gilje 2003:37, orig. emphasis)

The aim of many that have worked in this tradition is to find a theory of Being that includes insights gained from both natural sciences and human sciences, thereby overcoming the dichotomy of objectivity::subjectivity which goes back to René Descartes. Martin Heidegger (1889-1976) also contributed greatly to the future development and the international spread of phenomenology through his early works, which were influenced by, but also decidedly different from, that of Husserl. The concepts of phenomenology were introduced into sociology and anthropology mainly by Sartre and Merleau-Ponty. It is the latter who has continued to influence the school of thought relevant to me in this dissertation. Maurice Merleau-Ponty (1908-1961) was responsible for formulating a phenomenology that grounded the being in bodily behaviour and perception. In order to understand experience the organism as a whole must be taken into consideration, since it shaped perception and in extension knowledge. In contrast with behaviourism which was very influential in psychology at the time, Merleau-Ponty argued that perception was more than just the physical recording of the senses. Perception has a dimension of action and intentionality, but our actions also have consequences in the world over which we have little or no influence. The thoughts and theories of Merleau-Ponty have continued to influence the cognitive sciences, especially those that criticise the model of the brain as a computational system (Varela et al. 1991; Moran 2000).

While Merleau-Ponty has become better known to anthropologists and archaeologists over the last few decades through the interest in embodied cognition, the phenomenologist that exerted the most influence initially in these disciplines was Pierre Bourdieu (1930-2002), who combined his interest in Husserl with the works of Émile Durkheim, Max Weber and Karl Marx (Broady 1991:11). However, his theory of practice represents something that cannot be viewed simply as a continuation of these traditions.
Unlike the others, Bourdieu had a background as an anthropologist as well as a sociologist, doing fieldwork among the Kabyle in Algeria influenced by structuralist theories (Bourdieu 2000 [1970]). The structuralism was tempered by a conviction that society was more than institutions or even interactions: relations between people and the actions of people were powerful forces as well. Like the other scholars mentioned above he wished to transcend the simplistic dichotomies of objective:subjective and body:mind. Bourdieu’s concept of *habitus* has become especially familiar to archaeologists. The term is used by several other scholars, including Weber, Husserl and Mauss, though not as consistently or systematically as Bourdieu who made it a key concept. It denotes the way in which structures and durable dispositions (i.e. acquired schemes of perception, thought and action) are integrated in and developed by the individual in response to the world around (Bourdieu 1990 [1980]:53; Broady 1991:225-232).

The *habitus*, a product of history, produces individual and collective practices – more history – in accordance with the schemes generated by history. (Bourdieu 1990 [1980]:54)

A key point of Bourdieu is that bodily behaviour and practice know-how are important components of identity and domination, not just access to knowledge and wealth. In this he differed from classical Marxist and intellectualist traditions. The relationships that exist between people are also more than mere mental constructs, though they are not biologically constituted either. Relations are real and durable and cannot be easily negotiated away or into existence. To understand social structures and society one needs to understand the relations that exist between individuals, how they are formed, shaped and reproduced through practice and habitus.

**Cognition: body and brain**

While the philosophical notions of phenomenology, practice and embodiment had several committed adherents in the 1960s and 70s, this approach received less international attention than the more intellectualist theories centred on the construction of identities and history in the social sciences and humanities. Evolutionary biology was also more concerned with the newly successful field of genetics, which broke down bodies into their constituent parts. However, another discipline was quickly developing which would meet phenomenology half way: cognitive science. Here was the empirical methodology that finally connected philosophical ideas with experimental biology.

The study of cognition (processes of consciousness and knowing) has a long history in several different disciplines, from linguistics and psychology to neuroscience and robotics, some of which have preferred to think of the brain as a computational device. In contrast to the ‘brain as computer’ model, some biologists, philosophers, neuroscientists and linguists have argued that the human mind is intrinsically shaped and dependent upon the body and its senses/perceptions. The mind is not separate from the body and never can be: linguistic structures, mental concepts and cognition are constructed through the
body’s position in space and perception of the world around it through its senses. We do not just form symbolic representations of the world in our mind, since representations of the world come to us from bodily senses combined with the unique capacity of the brain (Varela et al. 1991; Lakoff & Johnson 1999; Gärdenfors 2000; Herrmann et al. 2007).

Reason is not disembodied, as the tradition has largely held, but arises from the nature of our brains, bodies, and bodily experience. This is not just the innocuous and obvious claim that we need a body to reason; rather, it is the striking claim that the very structure of reason itself comes from the details of our embodiment. The same neural and cognitive mechanisms that allow us to perceive and move around also create our conceptual systems and modes of reasoning.

(Lakoff & Johnson 1999:4)

A result of the merging disciplines of cognitive science and phenomenology is that the human being as a product of evolution is introduced into the humanities without the biological determinism that so often follows. Rather than seeing humans as just another animal dependent on the same formal rules of biology as most other mammals, cognitive neuroscience is very much concerned with how the human mind has both developed from and differs from other animals. There can be no question that humans are animals and share a common ancestor with primates in the not so distant past, as well as common ancestors with virtually every other organism on the planet if we go back far enough. It is also clear that intellectual faculties that have developed in the human brain have fundamentally altered our conditions compared to other animals.

The philosopher and cognitive scientist Peter Gärdenfors has written about the evolution of cognition, collecting insights gained from behavioural and psychological experiments with animals, primates and human children of all ages (Gärdenfors 2000 [Engl. edition 2006]; 2007). He points out that it is a gross oversimplification to state that we have only five senses: perceptions of temperature, pressure, pain etc are accepted as senses in their own right by scientists today. Balance and time awareness are other senses that have been added to the old Aristotelian list of five senses. There is also proprioception that allows us to know the position and movements of our body parts even if we cannot see them, provided we are not inebriated. Although emotions, unlike other senses, do not have particular receptors whose reactions can be measured and quantified (to a degree at least), they are still physiological to such an extent that it is next to impossible to separate them from physical reactions in the body. Even a pure fantasy can cause physiological reaction in the body, from blushing, to watering of the mouth, to trembling and increased heartbeat. The body is governed by biological processes that are evolutionarily speaking older and more primal than our mental faculties (Gärdenfors 2000:16, 21).

An important characteristic of the mind is its ability to remember, but there are many different kinds of memory. Procedural memory which is connected with motor skill is common among most organisms, as it allows them to remember the connection between stimuli and responses. As we are driving a car our feet find the right pedal without
conscious thought, bicycling our body knows how to adjust to keep the balance once we have learnt how, and the potter at the throwing wheel can centre the lump of clay based on this bodily situated memory. *Semantic* memory allows us to picture things that are not within immediate perception, and it helps us create a ‘mental model’ of the world. *Episodic* memory allows us to remember not just past events, but also when the events happened in relation to other memories. Without this ability we cannot formulate stories and narratives. Gärdenfors (2000:17f) and others argue that the memories listed here probably represent an evolutionary process in the mind, and that it is probably only the human being that has developed episodic memory.

Problem solving is still often better performed through action of the hand and body than by mental reasoning. As an example researchers have found that in a game of Tetris the truly experienced players test each falling piece by twisting it around to fit, rather than first mentally figuring out which is the best way for it to be positioned. The eye and hand work quicker and more efficiently than the mind. Thinking is therefore not something restricted to the brain, but permeates the entire body – we think with our bodies and our perceptions (Gärdenfors 2000:21). Indeed, for an infant to learn about the world around it sight cannot communicate anything about the physical properties of the world around it until knowledge of these have been added to the memory through touch and taste. The most effective way to learn about soft/hard, smooth/rough, sweet/bitter etc is by putting things in the mouth, to the despair of many parents.

Gärdenfors separates ‘sensations’ (immediate sensory impressions) from ‘perceptions’ (interpreted sensory impressions), and also adds ‘representations’ which are not directly ruled by sensations. Representations and perceptions together build up the inner world of the human mind. Neurological studies of the cerebral cortex of human beings show that the same areas of the motor cortex receive increased blood flow when a person thinks about doing something, as when he actually does it (Gärdenfors 2000:51). As the cerebral cortex continued to develop and grow as humans evolved from primates, unique abilities appeared that have just as much to do with the body as with intellectual thought. Unlike any other primate, the human being can aim when throwing an object, and can keep a rhythm. Both these things come so naturally to us that we rarely think of them, even children only a couple of years old can move with the rhythm whereas chimpanzees cannot be taught to drum an object to the beat of the music. The special ability to ‘play’ which exists among mammals but not reptiles is also developed to an unprecedented degree among humans, who not only play more throughout life, but also have the ability to ‘play pretend’ and to deceive. Chimpanzees in captivity can learn to play pretend to a certain degree, but learning how to deceive another primate/human in order to gain access to food or just for fun is extremely difficult and next to impossible for them. The human brain still contains many of the basic elements that constitute the brains of mammals and reptiles, but the neocortex which makes up a large portion of our brain has added capabilities beyond what rules animal behaviour in general (Gärdenfors 2000:chp 3-
4, 158-161). This is a prominent reason why ecological and ethological theories cannot hope to explain and predict human history.

As the ultimate step of the evolution of the human mind, which can create representations free from external sensory perception, is that we have started to create our own external material representations. Gärdenfors mainly discusses this in terms of pictorial representations in figurines and paintings, and then the first written language. While these are undoubtedly important touchstones of human history, I believe he and many with him tend to overlook the significance of the creation of material culture in general. This is, perhaps, a consequence of being part of a modern Western society which values art and writing above crafts and manufacturing. Even the most functional material objects made by humans have representational qualities and are deposits of social memory. They invoke past experiences and create new ones, they are life-worlds made by people themselves, and the process of making them shapes the life-world irrevocably. A point that I will try to make in the following chapters is that although the existence and use of these material objects is important, it is the making of them that deserves even greater attention. The fashioning and creating is a profoundly embodied practice which invokes sensory perceptions, as well as all forms of memory: procedural, semantic and episodic.

In the course of this dissertation I will try to show that just as we think with and through our bodies, our bodies ‘are good to think with’ (to use a saying of Lévi-Strauss). This has already been thoroughly examined in terms of language and metaphors by George Lakoff and Mark Johnson, and I will discuss how this can also inform us about the use of dead bodies in funerals and mortuary rituals.

**CHAÎNE OPÉRATOIRE**

The French anthropologist and archaeologist André Leroi-Gourhan (1911-1986), who was a student of Marcel Mauss, was an active proponent of the role of the body in the evolution of human mental faculties. Rather than seeing speech as developing from an increasingly evolved brain, he turned the argument around and suggested the brain developed as a result of freed hands when we became bipedal (Leroi-Gourhan 1993 [1964]). The resulting freedom of our hands to create and fashion, and of our faces and bodies to communicate feelings and intents, created a selective pressure resulting an a developed neocortex and language as an almost unforeseen consequence. Although this theory has its weaknesses, it is interesting to note that cognitivists like Gärdenfors and Merlin Donald have come to support models that place less emphasis on language as a cause for mental development. Chomsky’s theory of innate grammatical structure has been challenged by those who instead point to the way in which body movements and imitation are intimately linked with learning a language among children. Neurological studies have shown that language is governed by several areas of the brain, areas that are often initially developed for the planning and execution of *sequences of actions*. For instance, damages to certain parts of the left lobe does not only cause people to loose the ability to
speaks, it can also cause deaf people to lose the ability to do sign language (Gärdenfors 2000:156, 178-189; Zlatev et al. 2005).

Leroi-Gourhan suggested that a detailed study of technology and techniques in prehistoric societies could reveal social systems within which the knowledge and habits were transmitted. His approach was very influenced by the view of society as an organic system, with material culture as an artificial membrane between the human group and the exterior environment. In the last few decades, archaeologists have made an effort to appropriate his insight that technology is a result of both conscious choices and subconscious habits, more or less embodied as a sequence of events. As Pierre Lemonnier points out, archaeology which should be deeply concerned with the study of material culture, tends to focus disproportionately on a small selection of visual traits.

Even when embedded and developed within a behavioural theory of style ... the scope of reflection on material culture remains restricted to a few formal aspects of a few kinds of objects.

(Lemonnier 1986:148, orig. emphasis)

When technology is studied, it has too often been with a preformed notion of functional efficiency or adaptation. Naturally most tools are made with a function in mind, but there are a great number of alternative choices that are virtually interchangeable in the operational sequence. There are variations in techniques that cannot be fully understood as purely functional, informational or overtly symbolic (Sackett 1986; 1990). There is now a dynamic field of research into the embodied and socially structured technologies/techniques. Issues such as gendered identities and social stratification has been examined through detailed study of the creation of material culture (e.g. Lemonnier 1993; Dobres 1999; Hoffman & Dobres 1999; Apel 2001; Lidström Holmberg 2004; 2008). It is my intent to apply this approach to the pottery technologies of the Middle Neolithic, in order to investigate the relationship between the Pitted Ware and Battle Axe cultures. In order to do so I will focus especially on the socialisation process involved in learning a craft and integrating the techniques and motor skills involved (see chapter 6).
II

The Middle Neolithic B
This chapter presents a very short overview of the Pitted Ware culture and Battle Axe culture in Sweden, as a background for further discussions on pottery and burial traditions in the following chapters. Several factors have contributed to the fact that both cultures are an ongoing subject of controversy among archaeologists. For one, the two cultures have partially overlapping chronology and geographical distribution. How much of an overlap is one issue that is being debated.

Pitted Ware culture represents an apparent de-neolithisation some 600-800 years after agriculture and livestock were introduced into South Sweden. Evidence of farming and hunting subsistence respectively on Pitted Ware sites is discussed in chapter 3.1. Battle Axe culture is a distinctly regional version of the Corded Ware complex which is found over large parts of Northern and Central Europe. There are considerable differences between the Battle Axe and Corded Ware cultures, especially concerning the burials. But there are also undeniable similarities in material culture, settlement patterns and mortuary practices.

The breadth of interpretations relating to the third millennium BC reflect the fact that archaeologists approach material culture with very different ideas about society, cultural change and what it means to be human in the first place. Concerning the Middle Neolithic in Sweden, there is an additional problem of lack of consistency in the way terms themselves are used and understood, resulting in some confusion between archaeologists of what is actually being studied.

The end of the period is defined by the ‘disappearance’ of both the cultures in question, though not necessarily at precisely the same time in all regions. Disappear is a truth with modification of course, as aspects of both cultures in terms of built structures and material culture, continue into the next period. This apparent ‘blending’ in the Late Neolithic, of what was up until then two diverse archaeological cultures, is another reason why the Middle Neolithic B has generated so much dispute. If there were two different ethnic groups/societies in that period, how and why did they become a single society at the end of the third millennium BC?
3.1 Pitted Ware Culture

In terms of sheer quantity of artefacts no other Swedish Neolithic culture can compete with Pitted Ware culture. Despite this its very existence is called into question, with titles such as "The Pitted Ware people – did they exist?" and *A Tale of a Strange People* being used in publications (Edenmo et al. 1997; Larsson 2006). Controversy surrounding the Pitted Ware culture concerns mainly three aspects: earliest appearance, geographical distribution and economy.

Chronology and history of research will be discussed primarily in chapter 4, as they are both tied up with the question of what is or is not pitted-ware pottery. The most visually striking and ubiquitous feature of the pottery are the large round pit impressions which were applied in horizontal rows. This is of course the reason for the name archaeologists first gave to the pottery (*gropkeramik* = pitted-ware), and later the whole phenomenon (Lidén 1920). The sites with pitted-ware pottery often have earlier settlement phases with Funnel Beaker culture assemblages, which means that sorting out which artefacts belong to which chronological phase has been problematic in itself.

An added difficulty lies in determining the geographical distribution of Pitted Ware culture, as some researchers have maintained that it also appears along the West Coast of Sweden and in parts of northern Denmark. The underlying reason for this is the peculiar fact that Pitted Ware culture seems to represent a ‘de-neolithisation’ in South Sweden, with a return to marine hunting as primary subsistence at least 600 years after agriculture and animal husbandry were introduced with the Funnel Beaker culture. In the course of the Middle Neolithic more and more coastal and island sites appear with evidence of fishing and hunting of sea and land mammals in South Sweden and Denmark, which were until then dominated by Funnel Beaker culture. Material culture on these sites both resemble the contemporary Middle Neolithic Funnel Beaker culture and notably differs from it. Whether the entire coastal region represents a coherent cultural complex is just one of the issues being hotly debated.

### East Coast Pitted Ware Culture

Although we are not in a position to ascertain exactly what material culture represents in terms of social identities, I still believe that there is validity in the approach that we are shaped in part through practice and our life-world. Material culture is part of that life-world, and practice includes making and using material culture. So even if archaeological remains are incomplete and fragmented they are still important clues to the lives of peoples in prehistory. I will therefore present a short overview of the Pitted Ware culture of Eastern Sweden, including the islands of Gotland, Öland and Åland. In the light of this I will also briefly discuss why I believe the roughly contemporary coastal sites of West
Sweden and northern Denmark are part of a different social unit than the ones on the East coast, and why they should not all be grouped under a common name.

BACKGROUND

At around 4000 BC Funnel Beaker culture artefacts appear all over South Sweden, from Skåne to Halland to Uppland. It is not just material culture that is affected with the introduction of pottery, new flint technology and new types of tools. Agriculture and animal husbandry (cattle, sheep/goat, pig) also takes hold as shown by palynological, macrofossil, osteological and dietary evidence (Lidén 1995; Welinder 1998; Hallgren 2008). In Eastern Central Sweden settlement sites are found both along the coast and in locations further inland on the large glacial eskers. While the osteological material at the coastal sites reveals evidence of seal hunting and fishing, there are also finds of domesticated animal bones and carbonized cereals. The material culture does not differ at all from that found at the inland settlements, and these places probably represent seasonal hunting/fishing sites (Segerberg 1999; Hallgren 2008).

At the end of the Early Neolithic, c. 3500/3400 BC, the practice of building megalithic dolmens is introduced into the Funnel Beaker tradition, and around 3350-3250 BC passage graves were being built as well (Olausson 2004; Sjögren 2004). In connection with this, there are some important changes in material culture and possibly in economic behaviour. The megalithic tradition does not spread throughout all of the Funnel Beaker sphere, however. Only very few tombs were built in Eastern Sweden, the northernmost confirmed megalith being the Alvastra dolmen in western Östergötland, and the northernmost passage grave is found on Öland (Malmer 2002; Larsson et al. 2005). The distinctive megalithic pottery is also mostly absent from Eastern Central Sweden. Instead there seems to be a locally distinct development of the funnel-beakers with some decorative traits adopted from the megalithic tradition, but also from Comb Ware culture (see chapter 4).

MATERIAL CULTURE

The most characteristic and distinguishing artefact of Pitted Ware culture is the pitted-ware vessel. While I will go into greater detail about the pottery tradition in the next chapter, I will give a short description of the vessels here. The most common shape is that of a short to medium-high neck which ends in a sharply carinated shoulder, and the main body is conical with a pointed base (Fig. 3.1). Variation occurs mainly in the details: some vessels have concave necks whereas others are quite straight, some bodies are more rounded, and occasionally bases are flat. Rather than a set of different types of vessels the same general shape is made into every size, from very small to quite large. A peculiar type is the ‘mini vessel’ which is less than 10 cm in height and can either be a true decorated miniature or a simple conical undecorated cup. Clay was also used to fashion small figurines, primarily of animals, and these are sometimes detailed, but are more often rather indistinct. Anthropomorphic figurines occur mostly on the Åland islands, but
fragments of such are found on the mainland as well (Fig. 3.1e-f). There are a few cases of figures made out of bone as well. Animals possibly depicted include elk, pig, bear, birds and seal, although several of the figurines cannot be identified (Almgren 1907; Cederhvarf 1912; Wyszomirska 1984; Olsson et al. 1994; Björck et al. 2008a; Larsson 2009b).

Fig. 3.1. Examples of pottery and clay figurines of the Pitted Ware culture. a: Complete vessel (Bagge & Kjellmark 1939:pl 30); b: Examples of vessel shape (ibid:fig 44); c: Pitted-ware decoration (Almgren 1906c:figs 8, 15; Edenmo et al. 1997:fig 5:30); d: Miniature vessels/cups (Bagge & Kjellmark 1939: pl 33); e: Anthropomorphic clay figurines, Jettböle, Åland (Cederhvarf 1912:figs 1, 3-4); f: Zoomorphic clay figurines Åloppe, Uppland (Almgren 1906c:figs 43, 44).
Work axes are usually made out of local groundstone, though flint axes are also found in Pitted Ware contexts, especially in Southern Sweden where flint was a natural resource. Both flint and groundstone axes are usually thick-butted, with or without a hollowed edge (adze) (Fig. 3.2). Some groundstone axes are pecked rather than polished and their shape is very similar to Mesolithic round-butted axes. Whereas Mesolithic round-butted axes are found over large parts of Sweden, in the Middle Neolithic they seem to be confined to Eastern Sweden (Uppland, Södermanland, Östergötland, Småland and Gotland). There are also cases of axes being made out of slate. The work axes are comparatively small, and they are not as common at the settlements as they are at the earlier Funnel Beaker sites. In fact knapped stone (groundstone, quartz, flint, quartzite etc.) is much rarer on Pitted Ware sites than Funnel Beaker sites (Bagge 1941; Olausson 1983; Hermansson & Welinder 1997; Segerberg 1999; Malmer 2002:81f; Kihlstedt et al. 2007).

Flint in general is much rarer on Pitted Ware sites in Eastern Sweden than the material is on Early Neolithic Funnel Beaker sites in the same region. North of Siretorp in Blekinge tanged arrowheads made from flint blades are extremely rare, with a few notable exceptions: Humlekärshult in Småland (11) and Körartorpet in Närke (8). Interestingly, the tanged arrows at Siretorp were mainly made from blades struck from flint axes, not from the cylindrical blade core usually used to make them (Meinander 1964). Other stone artefacts include tanged slate arrowheads, which are fairly common on Pitted Ware sites in Eastern Central Sweden but occur as far south as Siretorp (Fig. 3.2). Unlike the Early Neolithic slate artefacts found in Eastern Central Sweden that were imported from
Norrland, the Pitted Ware arrows and axes were manufactured from locally available slate (Taffinder 1998; 2002). On sites where bone is preserved there are similarly shaped tanged bone arrows (Fig. 3.2) (Stenberger 1943:fig 18; Janzon 1974:61; Olsson et al. 1994:fig 14:1-2). Regardless of the material, tanged arrows are rarely abundant or even common on Pitted Ware sites. The exception is Siretorp, where there is also a Funnel Beaker phase and tanged flint arrows (type A) are not solely restricted to Pitted Ware culture (see below).

Other bone and antler tools include harpoons, fish-spears and fish-hooks (Janzon 1974; Malmer 2002:89f; Olson 2008). On Gotland, where organic materials are well preserved in the calcareous soil, pendants and beads made from teeth and bones are also common. Tooth pendants are often canines taken from seal which were perforated at the root. Canines and front teeth of dog, fox, pig and other species also occur. Tubular bone beads were often made from bird bones. The Gotlandic graves also include boar tusks fashioned into neck ornaments (Stenberger 1943; Janzon 1974; Malmer 2002:83f).

The double-edged battle axe, which succeeds the polygonal battle axe as a prestige item in South Scandinavia at the beginning of the Middle Neolithic, appears in both Funnel Beaker and Pitted Ware contexts, though mostly they are stray finds. There is one confirmed case of a battle axe as a burial gift, and it was found at the Funnel Beaker/Pitted Ware settlement at Fagervik in Östergötland. The crouched individual had no other burial gifts, but the filling of the grave contained pitted-ware sherds, indicating the burial is connected with this phase (Kaelas 1957:figs 11-13). Those that are found in Pitted Ware contexts are of a slightly different shape compared to those from the Middle Neolithic Funnel Beaker regions of Southern and Western Sweden. Double-edged battle axes ceased to be used in the Middle Neolithic B (Kaelas 1957; Malmer 2002:82).

SETTLEMENTS AND DISTRIBUTION

In Eastern Central Sweden the Pitted Ware sites are usually found on slopes with sandy soil, sometimes moraine. Extremely abundant deposits of pottery sherds and occasionally complete vessels are found on these slopes in a gradual distribution that suggests they are connected with a receding shoreline. Shore displacement due to land elevation after the Ice Age is a complex affair as it is locally and regionally varied, and fluctuated over time. Some periods may have seen rapid elevation whereas others experienced transgression when the shoreline remained stable or even rose. During the almost 1000 year long Middle Neolithic period the landscape of Eastern Central Sweden experienced both (Åkerlund 1996; Åkerlund & Nordqvist 1997). While the geological investigations yield useful general information, for detailed knowledge of the events in a sub-region it is necessary to investigate and date archaeological materials (Åkerlund et al. 1995). In northern Uppland the earliest Pitted Ware settlements are found at c. 45 m.a.s.l. (e.g. Postboda 2, Högmossen) and the latest at c. 35 m.a.s.l. (e.g. Torslund) (Segerberg 1995; Sundström et al. 2006; Björek & Hjärtner-Holdar 2008). At Södertörn in Södermanland...
the same period is represented at elevations between c. 30-23 m.a.s.l., as the rate of land elevation decreases further south (Olsson 1996a; b; Åkerlund 1996; Kihlstedt et al. 2007).

Virtually every Pitted Ware site excavated in Eastern Sweden is found in direct proximity to the contemporary shoreline, whether on the coast or on islands, or alternatively next to large watercourses such as the Dala River (Dalälven) (Bagge 1941; Welinder 1976; 1978; Lannerbro 1984; Österholm 1989; Åkerlund 1994; Segerberg 1999; Nordin 2002; Papmehl-Dufay 2006). Exceptions include the area surrounding Lake Täkern in Östergötland near the Alvastra Pile Dwelling (Malmer 2002; Browall 2003). There are a number of stray finds found at inland locations that may belong to the Pitted Ware culture. Since these artefacts are generally stone tools that are both manufactured over an extended period of time, as well as not unique to the Pitted Ware culture, they are difficult to date or interpret. It would hardly be surprising to find that Pitted Ware people had more or less temporary dwellings in the inland as well as at the coast, in connection with seasonal hunting and gathering. If pottery was not used or deposited at these sites they would be difficult to identify, however, unless they could be 14C-dated. Interpreting quartz technology is complicated as there is little to distinguish different Mesolithic and Neolithic technologies, though techniques involving large bipolar cores seem to be more common in Pitted Ware contexts (Ahlbeck 1996). Small sites with knapped quartz and other local stones are occasionally found, sometimes with no pottery and sometimes with very few indistinguishable sherds. Jenny Holm has made a compelling argument based on the technology that some of these might have belonged to Pitted Ware groups (Holm 2004). It is hoped that future investigations of such places will yield 14C-dates that can shed some light on the issue.

Early Pitted Ware sites, based on pottery (Fagervik II-type) and 14C-dates, are found primarily in Eastern Central Sweden (Västmanland, Uppland, Södermanland, Östergötland), but also in southern Gästrikland and along the Dala River in Dalarna. These latter regions have some Funnel Beaker remains, but only sporadic evidence of actual settlements as most Early Neolithic sites in this region belong to the Slate culture complex (Hallgren 2008:255-260). Early pitted-ware has also been found on Åland which up until then had been characterised by Finnish Comb Ware settlements (Stenbäck 2003:83-86; Hallgren 2008:58-63). ‘Typical’ pitted-ware pottery (Fagervik III-type) has an even greater distribution. Apart from the regions already mentioned it has been found in abundance on Gotland and Öland, in Närke, Småland, Blekinge and north-eastern Skåne (Forssander 1930; Bagge & Kjellmark 1939; Forssander 1941; Wyszomirska 1986; Nyberg 1987; Österholm 1989; Larsson 2006; Papmehl-Dufay 2006; Petersson 2007). Pitted-ware vessels have also been found at Jonstorp in north-western Skåne (Lidén 1940; Malmer 1969; Carlie 1986). Arguments that Pitted Ware culture is also established on the Swedish West coast and in northern Denmark are based more on flint craft than pottery, and will be discussed below.

The most noteworthy fact about Pitted Ware sites is the remarkable abundance of pottery sherds that are often present: several hundred kilos is quite common. Even
though the abundance reflects the fact that the sites were often in use for long periods of time, though probably not continuously, that cannot wholly explain why there is so much more Fagervik III-pottery (‘typical’ pitted-ware) than just about any other type of prehistoric pottery. There was surely a change in practice and activities at this time that resulted in pottery being deposited in huge quantities in such a way that it would often survive millennia in the ground. The sherds occur in large concentrations, and less commonly in smaller assemblages and pits. At several sites complete bases have been intentionally deposited upside-down, a practice that will be discussed further in chapter 11.1.

ECONOMY AND DIET

As previously mentioned, there is evidence of a shift in economy and diet at the start of the Middle Neolithic in Eastern Central Sweden which becomes more pronounced over time. The early Pitted Ware sites still have some limited evidence of agriculture in terms of impressions of cereal grains in pottery sherds and quern stones that could have been used for grinding (Ahlfönt et al. 1995; Sundström et al. 2006). There are also bones from possibly domesticated pigs. Missing from the settlements are bones from cattle and sheep/goat. Identification of species from the heavily fragmented and usually cremated bones is problematic. It cannot be ruled out that cattle bones may exist among the ones determined only as belonging to large herbivores, or that some of the small herbivore bones came from sheep. However, as elk, red deer and roe deer are often positively identified in these materials it seems more likely that the absence of domesticated animals reflects real circumstances (Aaris-Sørensen 1978; Formisto 1996; Hårding 1996; Storå 2001a; Storå et al. 2007). Pig bones are a difficult category as they may belong to wild boars, half-domesticated pigs or feral pigs from previously domesticated stock (Jonsson 1976). The dog is the only clearly domesticated animal that regularly occurs on Pitted Ware sites.

In Eastern Central Sweden there are indications that the early Pitted Ware sites were situated mainly along the coast and on islands in the inner archipelago. Later Pitted Ware sites are increasingly found on islands, including the outer archipelago (Welinder 1976; 1978). On the early Pitted Ware settlements the osteological material indicates an economy geared towards fishing and marine hunting of seals, as well as other water wildlife such as fowl, otter, beaver etc. But there is also a notable presence of wild land animals such as elk, red deer, roe deer and marten, as well as boar if the pig bones belong to wild herds. The later Pitted Ware sites do not as a rule contain any significant amounts of land animals as seal bones now dominate completely with fish, fowl, beaver and otter making up most of the rest (Ahlfönt et al. 1995; Guinard 1995; Bäckström 1996; Edenmo et al. 1997; Welinder 1998:97-99; Segerberg 1999; Storå 2001a; Sundström et al. 2006; Olson 2008).

The two seal species most common on Pitted Ware sites in Eastern Sweden are harp seal (Phoca groenlandica) and ringed seal (Pusa hispida botnica), whereas grey seal (Halichoerus
**PART 2**

grypus) is quite rare. Bones of harbour porpoise (*Phocoena phocoena*) have also been found at some sites (Storå 2001a:25; Storå et al. 2007). The harp seal is no longer indigenous to the Baltic Sea, but was apparently very common during the Middle Neolithic. The populations of the North Sea today will congregate on the ice for courtship, and the females give birth in late February. Pups are abandoned by their mothers after barely two weeks, and it takes another fortnight for them to be able to swim off, making the period of birthing optimal for hunting. A grown animal weighs c. 120-140 kg. The slightly smaller ringed seal (c. 110 kg) does not gather in packs in the same way. The female gives birth in February-March in caves and hollows which she digs into the ice, and she nurses the pup for four to six weeks until it can swim on its own. Settlements usually contain bones from both species, though one tends to be more common than the other (Storå 2001a:tab 6; Wallin & Sten 2007; Olson 2008:tab 2, fig 4). The fish species most commonly found are perch (*Perca fluviatilis*), pike (*Esox lucius*), various carp fish (*Cyprinidae*) and salmon (*Salmonidae*). On Gotland and Åland cod (*Gadus morhua*) and herring (*Clupea harengus*) are also very common (Segerberg 1999:185f; Olson 2008:tab 4).

Of course, osteological remains need not accurately reflect diet, and it has been suggested that marine hunting/fishing only made up a part of the subsistence (Gill 2003:115f, 192-198). A way to study what people actually ate is by analysing stable isotopes in bone tissue, which have been shown to reflect the general diet of an individual. The isotope $^{13}$C reflects amount of marine diet such as fish, water fowl and seal whereas $^{15}$N reflects where in the food chain (trophic level) most of the sustenance come from. Plant based diet or herbivores give low $^{15}$N values, while marine food tends to give very elevated levels of this isotope as the food chain in the sea involves more steps. Combining these two isotopes can therefore give a close approximation of the diet of an individual. If the sample is taken from bone tissue, it presents a general diet over the last 7-10 years, which is the period of time for regeneration of bone cells. Our teeth, however, are formed during a few months in childhood (or in uterus in case of milk teeth) and the isotope values in the dentine does not change after this. Dietary analysis on bone and different teeth can therefore present a comprehensive picture of an individual’s dietary habits in life (Lidén 1995; G. Eriksson 2003a).

The Archaeological Research Laboratory at Stockholm University has undertaken several analyses on Pitted Ware bones and teeth. Gunilla Eriksson has analysed 26 individuals from the cemetery of Västerbjer (Gotland), all of whom had almost exclusively marine diets with seals being the main source of food (G. Eriksson 2003a; Eriksson 2004). Remains from Ire and Visby on Gotland produced the same result, as well as those from Köpingsvik on Öland and Jettböle on Åland (M. Larsson et al. 2005; Lidén & Eriksson 2007; Eriksson et al. 2008). Unfortunately, unburnt human bones are rarely preserved on the mainland. The settlement Korsnäs (Södermanland) is an exception and it was possible to analyse bones from eight humans for $^{13}$C and $^{15}$N values. These were also compared to the isotopic values of various animals found at the same site, including otter, herring and harp seal. The result was that all of the humans had an almost
exclusively marine diet, probably consisting mostly of seal meat. One individual deviated somewhat and overlapped more with the herring bones, suggesting a greater intake of fish than the others (Fornander 2006; Fornander et al. 2008:fig 6, 292f). Human bones from Jettbőle on Åland also have δ¹³C-values that reflect a thoroughly marine diet (Götherström et al. 2002).

Due to lack of preservation, no human bones from the earliest Pitted Ware sites (Fagervik II) have been analysed, so it is not possible to delineate how dietary practices changed between 3400 BC to 3000 BC. It is clear that the osteological remains on most Pitted Ware sites accurately reflect the diet of the inhabitants.

**BURIAL PRACTICE**

The standard view of Pitted Ware mortuary practice is they buried their dead in flat-earth inhumation graves, and the dead were laid out on their backs accompanied by an assortment of tools, weapons and jewellery made of stone, bone, antler and teeth (Fig. 3.3). Orientation is roughly north-south, but east-west graves are also common. The burials are often gathered in cemeteries which include not just men and women, but also children from a few years of age and up (Janzon 1974; Burenhult 1997; Malmer 2002:91-97). The main problem with this model is that graves and cemeteries of this kind have only really been found on Gotland and at Köpingsvik on Öland (Papmehl-Dufay 2006). This may reflect the fact that the soil here is calcareous and offers excellent preservation, whereas most of the mainland sites are found on light acidic soils where only burnt bones survive.

There are a number of places on the mainland that do have fairly good preservation, but where cemeteries of this kind are still mostly missing, Siretorp and Korsnäs for instance. Also, more or less well preserved skeletons or parts of skeletons have been found at Pitted Ware settlements on both the islands and the mainland that suggest that the burial practice was more complex. In some cases people seem to have been buried on settlements either in crouched positions or laid out on their back, some of them possibly beneath the floor of (abandoned?) huts (Bagge 1938:fig 3; Bagge & Kjellmark 1939:29-31; Welinder 1970:21; Berglund & Welinder 1972; Wyszomirska 1984; Bjöck 1998; Bjöck et al. 2004; Larsson 2006; Bjöck et al. 2008b:325f).

Pitted Ware burial practice is not as straightforward as it is often portrayed, and even the large cemeteries contain several features that suggest a complex secondary treatment of dead bodies. This will be discussed in depth in chapter 9.1.
Fig. 3.3. Gotlandic Pitted Ware flat-earth burial. Grave 67:1 at Västerbjerje contained the body of an adult woman and a small child c. 3 years old. A fringe of perforated tooth pearls from seal and pig were found by the legs of the woman, probably part of her clothing originally (Stenberger 1943:59f).
EAST VS. WEST

Pitted Ware culture was initially referred to as ‘Eastern Settlement culture’. As the name implies the sites in question were found along the eastern part of South Sweden, from Skåne to Uppland and including the islands of Öland, Gotland and Åland (Wibling 1899; Almgren 1906a; b; Nerman 1911; Cederhvarf 1912; Lithberg 1914). As excavations and professional archaeology developed further, sites with similar looking pottery were also found farther north (Gästrikland and Dalarna) and west (Västmanland and Närke). Even though the pottery was quite different from other Neolithic vessels, the stone tools (work axes especially) were often similar to both Mesolithic and Funnel Beaker types. This complicated the attempts to define the typical assemblage for Pitted Ware culture, in the culture-historical tradition.

In the 1920s and ‘30s a number of settlement layers were excavated at Jonstorp in north-western Skåne. Some of these contained pottery similar to pitted-ware found in eastern Skåne. Another type of artefact common in these layers were tanged flint arrowheads with varying degrees of retouching, as well as the cylindrical flint cores used to make them (Fig. 3.4) (Nordqvist 1997; 2000). Oskar Lidén (1940) argued that three of the phases at Jonstorp (MH, M2 and M3) were Pitted Ware culture. This stance meant that tanged arrows made from flint blades now became a lead artefact of the Pitted Ware culture, together with other flint artefacts occurring in the culture layers of Jonstorp and to a lesser degree Siretorp. However, flint blade arrows are very rare north of Siretorp and cylindrical cores are rare even in eastern Skåne. The tanged arrows at Siretorp are mainly made from blades struck from thick-butted flint axes, which suggests the people who made them were not familiar with cylindrical core technology (Meinander 1964). Flint is a rare raw material north of Skåne, so the rarity of the tanged flint arrows is perhaps
understandable. On Gotland there are also a modest number of tanged arrowheads found in Pitted Ware contexts – mainly graves – and a few flint blades. There are no finds of cylindrical flint cores, however, and Kalle Thorsberg (1997) has shown that the arrows and blades were not made of local raw materials but of south Scandinavian flint. The flint knapping technique on Gotland is different from that used in Southern and Western Sweden. The arrows in questions are in all likelihood imported to Gotland, just as a wide variety of other objects found in the burials were.

That objects such as arrows could have been traded and exchanged over a wide area is hardly surprising, but it is interesting that flint in general is far rarer at Pitted Ware sites in Eastern Sweden than at the earlier Funnel Beaker sites in the same region. Another problem with designating flint blade arrows as Pitted Ware is the fact that cylindrical core blade technology and tanged arrows are actually introduced at the beginning of the Early Neolithic in southern Norway (Bergsvik 2002:292f; 2003:16). The spread of the blade technology is definitely connected with some type of social and/or cultural change in the Middle Neolithic A on the West coast of Sweden (including Skåne), and in the northern parts of Jutland and the Danish isles (Meinander 1964; Nielsen 1979; Becker 1980; Persson 1997; 2000; Strinnholm 2001). It is doubtful whether this change is actually related to pitted-ware, or whether the two types of artefacts coincide in Southern Sweden for other reasons.

The interpretation of the Jonstorp sites as Pitted Ware culture, and by extension the flint inventory there as well, combined with the appearance of coastal sites in West Sweden and northern Denmark in the Middle Neolithic, led Carl Johan Becker to argue that Pitted Ware culture was a pan-Nordic phenomenon (Becker 1950; 1963). In this model cultural identification rested more on economy than on material culture. Some of the pottery found at the Danish and West Swedish sites can be quite similar to that of Jonstorp (mainly phase MH) (Fig. 3.5). Decoration is similar to eastern pitted-ware only insofar that they both share general patterns that are also found on Middle Neolithic A funnel-beakers: chisel stamps, hanging triangles etc. (Browall 1991; Nordqvist 1997; Persson 1997; 2000; Strinnholm 2001). Most noteworthy are the things that are missing from the ‘western Pitted Ware’: figurines in clay are virtually non-existent, and pottery assemblages at the sites are modest or even poor.
Compared side by side, there is little to recommend the idea that the West coast and East coast phenomena represent the same society, sharing some form of common identity. The whole idea rests upon the presumption that blade arrows belong primarily to Pitted Ware culture, which in turn rests upon the idea that there must be some common cause for the appearance of coastal settlements and marine hunting in south Scandinavia at the end of the Middle Neolithic A. However, the particular blade technology in question was initiated much earlier, possibly in parts of southern Norway, and the arrows are just as likely to appear on sites without any pitted-ware pottery (Becker 1980; Damm 1991a:95f). The presence of some tanged blade arrows on Pitted Ware sites in Eastern and Southern Sweden is probably more due to exchange and trade, and perhaps relocation by a few individuals in connection with marriage. While there may be a few seasonal Pitted Ware sites on the Danish isles, I believe that it is erroneous to call all the Middle Neolithic coastal settlements surrounding the straits of Skagerrak and Kattegat ‘Pitted Ware culture’. It would be better if archaeologists stopped using the term Pitted Ware for this region (see also Meinander 1964; Nielsen 1979; Wyszomirska 1984; Carlie 1986; Papmehl-Dufay 2006:37-40).

**CONCLUDING REMARKS**

In this dissertation Pitted Ware culture is defined as involving the regions where sites with pottery of types Fagervik II, III and/or IV have been found, as well as miniature vessels and clay figurines. This includes the eastern part of Sweden, from Gästrikland-Dalarna to Skåne, as well as the islands of Åland, Gotland and Öland (Fig. 1.1). Just as important as
the type of pottery is the way these vessels and figurines were used and deposited. It is not a question so much of finding a category of artefacts, as it is of finding sites where these artefacts are deposited in ways suggesting a similar approach to settlement structure and practice. With this definition, Pitted Ware culture first appears in Eastern Central Sweden c. 3500/3400 BC, whereas ‘typical’ Pitted Ware culture (Fagervik III) probably appears around 3300/3200 BC at the earliest in the same region, and only slightly later farther south (3200-3000 BC). The Fagervik IV phase seems to disappear around 2400/2300 BC at the latest (Åkerlund 1994; Segerberg 1995; Olsson 1996b:223f; Åkerlund 1996; Edenmo et al. 1997; Segerberg 1999; Stenbäck 2003; Papmehl-Dufay 2006:113f; Sundström et al. 2006:fig 112; Kihlstedt et al. 2007:tab 32-33; Björck & Lindberg 2008:fig 67).

There are other types of artefacts which are typical of Pitted Ware culture as well, e.g. tanged arrowheads of slate and/or bone, pecked round-butted groundstone axes, thick-butted groundstone axes, groundstone adzes, seal tooth pendants, harpoons and fish-hooks of bone etc. However, these are more regionally varied in their distribution and some are dependent on favourable soils for preservation. They are also not always specific only to the Pitted Ware culture, but appear in other periods as well. As there is a gradual shift from Funnel Beaker culture to Pitted Ware culture this is hardly surprising. To expect artefacts to be completely restricted to one culture or region is a relic of the structural-functionalist culture theory, and is not a realistic approach to human culture.

More important than the items themselves are the contexts in which they appear, how they are deposited, which combinations are common, and any other clues we may have of the practices of daily life. I do not claim that the term ‘Pitted Ware culture’ necessarily denotes a single ethnic identity, or even a coherent socio-political organisation. The concept needs to be analysed from many different angles. My project focuses on pottery craft and mortuary tradition, but there are other aspects as well that are just as important to study critically. For now, Pitted Ware culture is a useful category defining my source material. In the last chapter I will return to the question of what Pitted Ware culture may represent based on the material analysed in the dissertation.
Chapter 3

3.2 Battle Axe Culture

At around 2800 BC, the Funnel Beaker culture mostly disappears from the archaeological record in Southern and Western Sweden and more or less novel types of artefacts appear. There are two alternative names for this new set of objects: Battle Axe culture (Äyräpää 1933; Malmer 1962) or Boat Axe culture (Forssander 1933; Oldeberg 1952). The full name given by Malmer is actually the ‘Swedish-Norwegian Battle Axe culture’, as the material culture found in southern Norway is very similar to the Swedish – initially at least. Since the aim of my thesis is mainly to study the relationship between Battle Axe culture and Pitted Ware culture, I will limit myself completely to the Swedish material. When I refer to Battle Axe culture, unless otherwise specified, I will only mean the Swedish material.

The Battle Axe culture is a regional version of the Corded Ware culture complex, and in order to clarify the extent to which the Swedish material conforms to and deviates from the continental versions, a very short overview will be presented.

Corded Ware Complex

In the third millennium BC a similar form of burial tradition and material culture appears in large areas of Northern and Eastern Europe (Fig. 3.6). The characteristic single graves contain crouched individuals seemingly buried according to a strict set of rules regarding orientation, position and gifts. There are new types of battle axes and new types of pottery – cord-decorated beakers. Ever since this culture was publicised by Sophus Müller (1899), almost every aspect of it has been the subject of intense debate. Explanations have ranged from involving large-scale or small-scale migrations (Äyräpää (Europaeus) 1915; Buchvaldek 1967; Edgren 1970; Kempisty 1978; Girininkas 1988; Gimbutas 1991; Kristiansen 1991), or diffusion of ideas, ideologies and/or religion into the local population (Neustupný 1969; Larsson 1989; Damm 1991a; b; Larsson 1991; Ebbesen 1997; Lang 1998; Włodarczak 2000; Hübner 2005a; Ebbesen 2006). Others have tried to find a middle road, explaining the change as resulting from a combination of both processes (Kosko 1997; 2000; Czebreszuk 2001:256, 261f). A centre of origin for the Corded Ware culture, whether in terms of people or ideas, has been traced to Jutland, Germany and the steppes of Russia respectively (e.g. Åberg 1916; Tallgren 1924; Äyräpää 1933; Forssander 1934; Šturms 1957; Kempisty 1978; Gimbutas 1991).
Fig. 3.6. Corded Ware culture complex in Europe. In southern Russia and the Ukraine the contemporary Fatjanovo and Ochre grave cultures display similar traits in material culture and burial practices (after Milisauskas & Kruk 2002:fig 8.2).

No less controversial is the entire idea that these burials actually represent some form of emic identity. The ‘A-horizon’ which theoretically denotes a common initial phase across most of the Corded Ware area has been supported by some researchers (Glob 1945:202-240; Struve 1955:98f; Buchvaldek 1986; 1997), but it has also been strongly opposed by others who have pointed out that the artefacts supposedly making up the A-group rarely occur together across the whole region (Malmer 1962; Neustupný 1969; Behrens 1997; Ebbesen 2006:213). Most archaeologists interested in the phenomenon are stuck between accepting that there is too much variation within the Corded Ware cultures to suggest a single common origin for all of the material culture, but too much similarity to be explained simply as a superficial trend with little substance. The vast geographical area involved also means that there is no guarantee that interpretations of events in one region are relevant for another. It is at least theoretically possible that some parts experienced large-scale immigration, others saw only partial migrations of small groups or individuals, and yet others had an almost completely local adoption of the culture traits.

As mentioned above, the Corded Ware culture was mainly known and defined through the burials, where individuals were placed in crouched positions. Orientation of the graves, as well as the position of the deceased and where he or she was facing, seem to have been strictly regulated and also dependent upon gender. The burial gifts are likewise very rigidly prescribed and placed in relation to the body (Fig. 3.7). The groundstone battle axes (Fig. 3.8a) are often seen as evidence for a patriarchal and individualistic social order, in contrast to the collective megalithic tombs of the preceding Funnel Beaker culture. It should be noted, however, that the frequency of battle axes varies considerably across the Corded Ware region, being far more common in some parts of Germany and especially Scandinavia than in Poland, the Czech Republic or Switzerland. The common denominator, which has also given the name to the phenomenon, is the cord decorated beaker (Fig. 3.8b) The shape and to a lesser degree the decorative patterns on these beakers also vary, from slim, long-necked Protruding Foot beakers of Holland and parts of Germany to the far more globular, wide-mouthed beakers of Sweden and Finland.
Other types of pottery are also considered indicative of Corded Ware culture, especially the amphorae and the short-wave moulded pottery (Fig. 3.9). The amphorae are mainly common in regions where the somewhat earlier Globular Amphora culture has been found, and they are extremely rare in Scandinavia, including Finland. The role of the beakers and pottery in Corded Ware culture has been debated by many, especially Andrew Sherratt (e.g. 1997 [1987]), and this is discussed further in chapter 8.1.

Apart from the beakers and battle axes, the burials may include work axes of flint or groundstone, flint blade knives, bone awls, rings made from bone or amber, bone pins, tooth-shaped bone pendants and occasionally small copper ornaments. Less common, or more regionally specific, are hammer stones, arrowheads, wristguards, antler weapons, grindstones and quern stones. The typical grave is often described as being oriented east-west, with men placed on their right side and women on their left, both facing south (Glob 1945; Machnik 1970; Buchvaldek 1986; Jacobs 1991; Butrimas 1992; Loze 1992; Furholt 2003b; Kovárová 2004:21f; Fokkens 2005; Hübner 2005a; b; c; Włodarczak 2006). As with all such generalisations, there are plenty of exceptions. A problem is that bones are often not preserved enough for an osteological sex determination. In fact, often not enough remains of the body to even ascertain the position in which the dead was placed. Sex is therefore often determined solely based on the burial gifts, with the risk of a circular line of reasoning. The assumption that battle axes denote male burials seems to hold up on the occasions when actual skeletal remains are analysed, however, the other types of objects are generally not as easy to ascribe to only one gender. In fact, several of the other tools and artefacts seem to appear in both 'male' and 'female' burials, though possibly with different frequency or position. This is also something that is subject to regional as well as chronological variation.

The graves are often covered by a small barrow, and they are sometimes surrounded by a ring ditch and/or a circular ring of posts. It should be pointed out that this type of burial is not common in the whole Corded Ware area, it seems to be practiced mainly in an area stretching from the Ukraine through southern Poland, Central Germany and into Jutland and Holland. Northern and central Poland, Finland and the Baltic States diverge from this tradition in that the barrows and ring ditches/posts are rare or absent. Instead the single graves are oriented north-south, with the dead facing east. In parts of Poland (Kujawia and the Kraków-Sandomierz group), men still appear to be placed on their right side, though now with the head towards the south, and women on their left side. The Baltic graves are often oriented north-south, though other orientations are also known, and there is less consistency in the position of men and women. The well preserved graves are too few to afford a clear picture. Burials in Finland are both rare and completely devoid of skeletal remains, but seem to be flat-earth graves oriented both north-south and east-west. (Machnik 1970; Sirriüinen 1974; Klunder 1988; Purhonen & Ruonavaara 1994; Edgren & Törmblom 1998; Kriiska 2000; Włodarczak 2000; Tunia & Włodarczak 2002; Żukauskaitė 2004; Larsson & Zagorska 2006; Grasis 2007; Żukauskaitė 2007).
Fig. 3.7. Corded Ware burials. a, d: Germany; b: Denmark; c: Czech Republic; e, f: Poland (Machnik 1970:fig 137; Ebbesen 1997:abb 3; Dresely & Müller 2001:abb 22; Turek 2001:fig 1; Włodarczak 2001:fig 17)

Fig. 3.8. a: battle axe of type A, this one is from Jutland but similar versions are found across northern Europe. b: cord-decorated beakers from Denmark, Germany, Poland, Czech Republic and Lithuania. There are beakers with similar patterns occurring across central and northern Europe at the start of the third millennium BC, but the shapes can vary somewhat.
Fig. 3.9. In regions where Globular Amphorae culture had become established at the end of the fourth millennium BC, amphora continue to be a fairly common burial gift. Coarse beakers with short-ware moulding occur on Corded Ware settlements across Europe. (Becker 1955:pl 3; Milisauskas & Kruk 2002:fig 8.1)

Settlements of the Corded Ware cultures have always been a source of consternation to archaeologists. The late Funnel Beaker culture had large and abundant sites, but Corded Ware settlements seemed at times almost impossible to find. The realisation that there existed a kind of coarse domestic pottery with moulded decoration helped to pinpoint the sites more accurately, but they were still few and far between (Becker 1955). As I have written elsewhere (Larsson 2009c), the lack of Corded Ware settlements is due to an unfortunate combination of circumstances: preferred locations are often on light sandy soils, the settlement consists mainly of just a single long house, there is a tendency not to use and deposit large quantities non-organic materials close to the dwelling, and many have continued occupation into later periods causing even more destruction of the remains. This is evident if we look at one of the few exceptions: Finland. Here settlement sites are in fact more numerous than burials, and they often contain fairly large amounts of pottery. Just as in Sweden and other parts of the continent light sandy soils were preferred. However, there was little or no settlement continuity into the Late Neolithic and Bronze Age. Many of these places were not used again until the Iron Age, if at all. That fact has caused the pottery to be far better preserved (Edgren 1970; 1984). With the help of better excavation methods and an understanding of the challenges involved in identifying these types of settlements, archaeologists have now started to find more Beaker settlements with longhouses on the continent and in Scandinavia. (Damm 1991a:83; Hogestijn 1992; Sartes 1994; Turek 1997:236; Edgren & Törnblom 1998:87; Kadrow et al. 2000; Kriiska 2000; Wlodarczak 2000:503; Saltsman 2004; Witkowska 2006; Møbjerg et al. 2007)

The economy of the Corded Ware culture is likewise a difficult subject. There are occasionally preserved animal bones in the graves, often in the form of tools. Sheep and/or goat, red deer and occasionally pig/boar have been identified, but cattle bones are extremely rare. Determining subsistence based on the bones used to make tools or what
was chosen as a burial gift is hazardous, of course. Pollen analyses, as well as finds of carbonized grains and grain impressions in pottery seem to suggest some form of agriculture in many of the Corded Ware regions during this time. Barley (*Hordeum*) is the cereal most commonly found in northern Europe at least, though different kinds of wheat (*Triticum*) are also common (Edgren 1984:10; Damm 1991a:87; Lang 1999:366; Kriiska 2001:11; Milisauskas & Kruk 2002:255-257; Klassen 2005b).

**Battle Axe Culture in Sweden**

As already mentioned, Corded Ware culture in Sweden is both similar to and distinctly different from what is known in Denmark and on the continent. Since there are already several substantial publications on Swedish Battle Axe culture in English and German, the following presentation is very rudimentary.

**Material Culture**

The history of research of pottery will be discussed in depth in chapter 5. The typology defined by Mats P. Malmer (1962) is still substantially correct and eminently useful. Unlike the huge, fragmented and problematic pitted-ware assemblages, battle-axe beakers are not only often found more or less complete in burials, but they are also subject to much stricter rules about decoration. The basic shape is a small rounded beaker with little or no neck (Fig. 3.10). The earliest types are only partially decorated, at the top and occasionally at the base, whereas the later ones are often covered in patterns. There are also larger, coarser vessels that do not appear in the graves but are found at the settlements.

Fig. 3.10. Swedish battle-axe beakers, both early and late types. (Malmer 2002:fig 54)
Malmer’s dissertation is still the definitive word on Swedish Battle Axe culture, and almost every artefact associated with it was defined and categorised by him. He did build on the works of his predecessors Forssander and Oldeberg, but introduced measurements and definitions that were useful to the average archaeologist. The battle axes are no exception, and there are over 2400 known in Sweden, which can be compared to c. 350 polygonal battle axes of the Early Neolithic and c. 325 double-edge battle axes of the Middle Neolithic A (Malmer 2002:154). They are virtually as numerous in Southern, Western or Eastern Sweden. The earliest types (A and B) are relatively few, and it is the later types (D:1, C:2, E:1 and especially E:2) that were manufactured in greater quantities.

Except for type A which conforms to the general A-battle axe of the continental Corded Ware, the Swedish battle axes are notably different from the Danish ones, but strikingly similar to the Finnish (Fig. 3.11). Even the best typology rests upon choosing certain traits and discarding others. Although Malmer’s definitions are clear and useful, they are constructed in such a way as to mostly ignore interregional variation. Aspects such as a moulded seam or ridge along the upper part of the axe, as well as presence/absence of shaft-socket and butt-knob, are termed non-metric. They appear on many types of battle axes they are not considered to define any type, with the exception of the earliest ones. Roger Edenmo (2008) has shown that these traits reveal distinct regional and sub-regional traditions, as well as a gradual change over time. For instance, the presence of butt-knob and shaft-socket has a distinctly eastern distribution in Eastern Central Sweden (ibid: fig. 5:17). There are also indications that the type of groundstone preferred for battle axes varies regionally and chronologically, as can be seen in the colours (brown, grey, green, black, yellow) of the stone used (von Hackwitz & Lindström 2004). Malmer’s aim was to show the coherent nature of the Swedish-Norwegian Battle Axe culture, and he succeeded. While there is no doubt that this basic tenet still holds true, it should not be forgotten that there are more sub-regional and local aspects of Battle Axe culture as well. It is possible that these sub-regional styles represent social networks that occasionally traded and exchanged with others (Olausson 1998; 2000; Edenmo 2008).
Fig. 3.11. Some Swedish battle axes of the Middle Neolithic B, also called boat axes because of their shape. Both early and late types. (a) is a type B battle axe, an early Swedish version of the type A Corded Ware battle Axe, only with shaft hole socket and butt knob. It is especially common in Eastern Central Sweden. Not to scale. (Forssander 1933:taf 1-2)

Fig. 3.12. Stone tools of the Battle Axe culture. The thick-butted hollow-edged flint axe (i.e. adze) and flint blade knife are common burial gifts. The multi-faceted grinding stone is usually made from quartzite and is only rarely found in the graves. (Montelius 1994 [1917]:17; Knutsson 1995:fig 30)

Flint axes and chisels are often found in the burials and to a lesser degree on settlements. The most common type of flint axe is polished with a hollowed edge — and adze (Fig. 3.12). As with the adzes, axes without hollow edge are usually shafted
transverse and straight-edged axes are fairly rare. Malmer divides the transverse axes and adzes into thick-bladed (or thick-butted) and thin-bladed (max 2 cm thick) (Malmer 1962:400-426; 2002:151-154). Although not as numerous, transverse-edged groundstone axes and adzes have also been found in Battle Axe burials, most of them in Eastern Central Sweden, though none at all in Southern Sweden. Not surprisingly flint axes are not as common in Eastern Sweden, and the groundstone adzes are clearly the same general idea made in a local raw material. Tools of flint are still more common in Battle Axe contexts than in Pitted Ware in Eastern Sweden. A survey of stray finds of different kinds of thick-butted stone and flint axes in Västmanland shows that unlike the groundstone axes the hollow-edged flint axes have a distribution limited to inland sites (Hallgren 1996:fig 9). In Southern Sweden a modest number of straight-edged groundstone axes have been found in early Battle Axe burials (Malmer 1962:543-548; 2002:154).

A peculiar type of artefact is the faceted grindstone made from quartzite, sometimes referred to as ‘thighbone shaped’ (Fig. 3.12). Type A has four longitudinal concave facets, whereas type B has more than that. Both types appear in all regions, though they are generally more common in Southern Sweden. They were probably used to shape the battle axes. Most are found as stray finds, but nineteen are found in graves and fourteen of these are accompanied by battle axes. Interestingly, type A is usually accompanied by early types of battle axes (C:1b and D:1a), whereas type B is more commonly found with later types (C:2, D:2 and E). Burials with type A grindstones have been found in Eastern Central Sweden, Western Sweden and Southern Norway, but not in Southern Sweden (Malmer 1962:564-571; 2002:162).

The flint blade knife is a common find in the graves (Fig. 3.12). Although they are not common in Eastern Central Sweden most burials were found by non-professionals who only gathered the most visible artefacts. Helena Knutsson and Errett Callahan have analysed the blades and shown that they were made using a technique that was very different from the cylindrical blade technology of Western Sweden. Unlike the latter where the core was worked from both platforms, the former must have had just one, faceted, platform and therefore been more conical in shape (Callahan 1995; Knutsson 1995:122-127). Interestingly, no flint cores have been identified as belonging to the Battle Axe culture, and they are not found in the graves and apparently not at settlements either. Callahan and Knutsson have pointed out that there are stray finds of cores that could fit the type in museum collections (Callahan 1995:fig 17; Knutsson 1995:fig 61c). Apparently the cores were considered destined for other disposal than as burial gifts. Wear analysis on several flint blades from burials show that the ones found in Eastern Central Sweden have been used to cut plant fibres, probably cereals. The blades found in graves in Southern Sweden are often unused, suggesting that the living included newly made blades since these were easily available (Knutsson 1995:107, 131, 190).

Other objects that have been found in the burials are chopping weapons and daggers of elk or deer antler. Bone awls have been preserved in a few burials. The small number
of bone arrowheads found are tanged, but unlike the Pitted Ware arrows they are conical with a round cross section. Flint blade arrows of type D (completely retouched) have been found in a few late graves in Halland and Skåne. Ornaments include bone rings similar to the Danish amber rings and Estonian slate rings, bone pendants shaped like animal teeth, and a few bone pins. Amber beads of various shapes (cylindrical, irregular, pendants, discoid and tooth-shaped) are also common. Small copper spirals have been found in a few graves, and one fragmentary basket-shaped copper earring (Malmer 2002:158-160).

Settlements and Distribution

Battle Axe settlements are usually found as a result of excavating other periods, and even then they are usually identified only by a small amount of pottery and a few stone artefacts. This has generated some debate as to whether there actually are any Battle Axe settlements, or if it is only a particular type of burial custom of a social segment of the other Neolithic cultures (Carlsson 1987; Nordqvist 1997; Carlsson 1998; Gill 1998; 2003; von Hackwitz 2009). There is a small but significant number of houses dated to the Battle Axe period at these sites, however, most of which have been found through careful and methodical excavation (Larsson 1990; Hallgren 2000b; Artursson et al. 2003; M. Andersson 2004; Larsson 2009c). They are two-aisled longhouses, c. 13-15 x 4-6 m, some of which seem to have a sunken floor in one half of the house (Fig. 3.13). Unfortunately, longhouses like this are not limited to the Battle Axe culture, and similar ones are recorded with Funnel Beaker and Late Neolithic materials. Dating of these houses is often difficult, as they contain little material remains (partly due to the excavation technique), and settlement sites tend to have several phases rendering radiocarbon dating problematic (Larsson 2009c).

Settlement remains of the Battle Axe culture are often found on light sandy soils, but over time the sites seem to move to heavier soils. The settlements are usually situated in the vicinity of running water and sometimes the coastal area as well, but they are not placed directly at the contemporary shoreline (Malmer 1962; Strömberg 1978; Larsson 1989; Strömberg 1989; Larsson 1991; 1992; Malmer 2002; von Hackwitz 2009). In Eastern Central Sweden the early settlement materials are often found on sites that also contain an Early Neolithic Funnel Beaker phase (Tab. 3.1). While this may be due in part to the fact that Funnel Beaker sites are easier to find in surveys, and partly to the shared preference for the light sandy soils of the glacial eskers, it probably reflects something more profound as well. Despite the hiatus of c. 500 years, there is a strong sense of early Battle Axe culture consciously connecting with a by then almost mythical past in terms of material culture, settlements and lifestyle. This question will be addressed again in the final chapter.
Fig. 3.13. Two houses of the Battle Axe culture. a. Fågelbacken, Västmanland; b: Dagstorp, Skåne. The house at Fågelbacken had a concentration of fragmented battle-axe pottery sherds in the southern half. It was interpreted as the sunken floor of the house, where the artefacts had survived the ploughing. The house at Dagstorp is actually one house superimposed on another identical house, only shifted c. 2 m. They have been radiocarbon dated to both the beginning and the end of the third millennium BC. Close to the house a line cemetery with nine Battle Axe burials was found. (Hallgren 2000b; Artursson et al. 2003:fig 20)

Table 3.1. Battle Axe sites in Eastern Central Sweden with only early types of pottery (group A mainly) and battle axes. Remains of Early Neolithic Funnel Beaker culture (TRB) has been identified at or near all of them. * = Early Neolithic stray finds found in the same general location.

<table>
<thead>
<tr>
<th>Site/Burial</th>
<th>Parish (Räa no.)</th>
<th>County</th>
<th>Other period</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astorp</td>
<td>Arla 67:1</td>
<td>Södermanland</td>
<td>TRB*</td>
</tr>
<tr>
<td>O. Hedemora (Eka)</td>
<td>Arla 57:1</td>
<td>Södermanland</td>
<td>TRB</td>
</tr>
<tr>
<td>Barrsjö</td>
<td>Dunker 50:1</td>
<td>Södermanland</td>
<td>TRB</td>
</tr>
<tr>
<td>O. Vrå</td>
<td>St Malm 43:1</td>
<td>Södermanland</td>
<td>TRB</td>
</tr>
<tr>
<td>Hagtorp</td>
<td>L Malma 47:1</td>
<td>Södermanland</td>
<td>TRB</td>
</tr>
<tr>
<td>Domarhagen</td>
<td>L Malma 166:1</td>
<td>Södermanland</td>
<td>TRB</td>
</tr>
<tr>
<td>Vallby</td>
<td>Kil 20:1</td>
<td>Närke</td>
<td>TRB</td>
</tr>
<tr>
<td>Sannahed</td>
<td>Kumla 103:1</td>
<td>Närke</td>
<td>TRB*</td>
</tr>
</tbody>
</table>
Battle Axe culture artefacts and the distinctive graves are found all over South Sweden, from Uppland to Bohuslän to Skåne. There are some changes in distribution during the course of the Middle Neolithic B. Early Battle Axe graves and artefacts are not really found in Uppland-Västmanland, nor in western Skåne. In these parts Battle Axe culture becomes established only a bit later in the Middle Neolithic B. It should also be pointed out that Battle Axe culture is probably not present on Gotland either. There are finds of battle axes and a few other Battle Axe artefacts in the burials at Pitted Ware cemeteries, but these should probably be considered items acquired through exchange, as the burial custom is otherwise distinctly different. There are also Jutish battle axes and exotic items from other parts of the Baltic Sea region in these burials. What is most striking is the complete lack of battle-axe pottery in burials on Gotland. It has been suggested that cord decorated battle-axe pottery exists on a few settlements (Ahlén 1972; Rundkvist et al. 2004). However, after studying the photographs and illustrations I am convinced that these are actually cord decorated funnel-beakers. It is unfortunately quite common for archaeologists to mistake one for the other, but the shape of the vessels, the coarseness of the cord and the decorations differ between them. This leaves only a few late beakers found at the peculiar cave site of Stora Förvar on the island Stora Karlsö off Gotland’s west coast, which contained large assemblages from the other Neolithic cultures as well (Schnittger & Rydh 1940).

Battle axes are also found dispersed through Norrland, and this highlights the fact that the spatial distribution of a supposed social unit cannot be determined on the basis of a single artefact. The battle axes found in Norrland are not found in burials as far as we can tell and are not, with some rare exceptions, accompanied by any other Battle Axe artefacts. The site Mjåla in Ångermanland had battle-axe pottery (Hulthén 1991), though whether these beakers are more similar to Swedish or Finnish battle-axe pottery is still an open question. There are also deposits of South Scandinavian flint axes in Norrland, suggesting long distance trade (Christiansson 1975; Knutsson 1986; Becker 1988; Baudou 1989). That battle axes were exchanged over considerable regions is evident, as there are Swedish battle axes found in Finland and Denmark, as well as Danish and Finnish battle axes found in Sweden (Lindström 1996; 2003). These are usually not found in the graves, but as stray finds and deposits. The only Jutish battle axes found in burial contexts were the ones discovered at Västerbjerds and Visby on Gotland, graves that did not conform to Corded Ware traditions in general. There is little to no evidence that Battle Axe culture was ever an established presence on Gotland, although the population there must have actively met, travelled to and traded with people from many different parts of the Baltic Sea region.

**ECONOMY AND DIET**

Most of what we know about the economy derives from burial finds with preserved bones. Red deer is the most common animal, mainly through antler tools and weapons, but sheep/goat is a close second. Pig and roe deer has also been found in a few graves, as
well as bones from elk, dog, eagle and crane. Cattle bone has not been found in any of the graves, but one was identified at the house at Fågelbacken, where there were also finds of sheep/goat, elk/deer and roe deer (Malmer 1962:884; Boije 2000; Hallgren 2000b:23f; Malmer 2002:150). Grain impressions are rare in the thin-walled beakers, but barley (Hordeum) has been identified in eight and wheat (Triticum) in one. A few carbonised cereal grains of wheat and barley have also been found in Skåne (Welinder 1998:100; Hallgren 2000b:23; Malmer 2002:151).

So far only one analysis of stable isotopes has been done on human remains in a Swedish Battle Axe burial, at Kastanjegården in Skåne (Lidén et al. 2004; Lidén & Eriksson 2007). The result was a completely terrestrial diet (third molar, $\delta^{13}$C: -20.3, $\delta^{15}$N: 9.8). The evidence therefore seems to suggest a subsistence of small-scale farming, some animal husbandry (mainly sheep), and inland hunting.

**BURIAL PRACTICE**

To date, over 250 Battle Axe burials have been identified in Sweden, though many of these were never excavated professionally and most lack skeletal remains. The Swedish single graves differ in many respects from most other Corded Ware burial practices. As far as we can tell no barrows were constructed, and the dead were placed in flat-earth graves that occasionally form a sort of line cemetery (Malmer 1962; During 1989; Edenmo 2000; M. Andersson 2004). It is likely that the graves were placed at or near settlements. The Swedish graves are usually oriented north-south, with the dead facing east, and unlike the north-south oriented graves in Poland, it seems as if men were placed on their left side and women on their right. The dead are still laid in a crouched position, the standard burial gifts include work axes and beakers, and their placement is strictly regulated (Fig. 3.14). Work axes of flint or groundstone are by far the most common type of burial gift, and occur in both male and female graves. Battle axes are also common and are consistently placed by the head in the northern part of the grave. It should be pointed out that not all ‘male’ graves have battle axes. Pottery is very common, too, with one or two beakers placed by the head and/or feet. Considering how many graves were discovered in the course of mining for gravel and during ploughing, the small fragile vessels are probably underrepresented.

![Fig. 3.14. Grave XI (Malmer’s no 51), Lilla Bedinge, Skåne. In addition to two beakers of type G:2 (of different sizes), the grave included a flint adze, two flint blade knives, a bone awl and a number of amber pearls. It has been interpreted as a woman’s grave, based on the position of the body and the burial gifts (after Malmer 1962:abb 47).](image-url)
Early graves seem to be only a wooden coffin or log placed in a pit. Stone packing around the graves becomes common in Skåne later in the period, which helps in protecting the graves and makes them easier to find during excavations. Although there is no denying that Battle Axe culture is well established in Skåne, the combination of stonepackings and calcareous soils have probably contributed to the fact that so many graves are found here. There are a number of stray finds of battle axes and thick-butted flint axes in Eastern Sweden, and many of these are probably originally from burials (Lekberg 2002:52-65). A more detailed discussion of the single and double burials is part of chapter 12.2, which focuses on the ritual construction of the ideal body in the Battle Axe culture.
Pitted Ware Culture Pottery Traditions

The following chapter contains an overview of writings on pitted-ware pottery from 1899 until the present. I have chosen publications that either were the first to present typologies used by consecutive generations of archaeologists, or those that introduced new ways of analysing and defining pitted-ware. The reason is twofold: firstly, while certain styles and phases often are referred to in archaeological texts about Pitted Ware culture, few people have a clear grasp of the analytical foundation of these definitions, or even what the definitions themselves originally were. This is hardly surprising, but so much of the debate about Pitted Ware culture hinges upon how the pottery is defined. For this reason different archaeologists have reached wildly diverse conclusions about the definition, distribution and chronology of Pitted Ware culture.

The second reason is to present examples of how different stylistic analyses of pottery are structured, and to discuss some of their strengths and weaknesses. Style is so often the basis of typology, cultural identification and chronology in archaeology, but it is fruitless if not combined with an understanding of craft traditions and the social context of the material. Arguing over whether the presence of pit impressions on a pot proves that it is pitted-ware or not is to treat style and decoration as biological sub-species, rather than as the result of human action (conscious or sub-conscious). Yet style is important, it is the expression and visualisation of something in the potter’s experience, from bodily situated repetition of tradition to conscious creativity.

Chapter 4.1 covers the period from the first publications on pitted-ware pottery to the definitive work by Axel Bagge on the pottery at Fagervik in 1951. Chapter 4.2 presents some of the more extensive attempts in the latter half of the twentieth century to test and criticise Bagge’s types. It ends with presenting some of the newer works that have tried to take both style and technology into consideration.
4.1 Styles and Chronologies: A History of Research

The basic concepts and definitions of pitted-ware were sketched out in the first two decades of the twentieth century. Subsequent works in many ways expanded, tested, commented upon and criticised these early definitions. The main issues of defining traits, vertical and horizontal patterns, dense or poriferous ware, southern or eastern origins, geographic distribution etc., were mainly articulated in this first phase of research. This would then be the basis of later controversies, debates, misrepresentations and misunderstandings. It is therefore valuable to take a closer look at the instigation of the discourse.

Laying the Foundation

The earliest professional archaeological text dealing with what we now refer to as pitted-ware is Carl Wibling’s article (1899) discussing his excavations at the Stone Age site of PYSSLINGEBACKEN (Torhamn parish, Blekinge). The site had been known to residents for ages, since the ground was rich in large pottery sherds locally referred to as ‘pixie bread’ (pysslingebrodd). Wibling compared the pottery retrieved at his excavation with similar looking pottery from Ringsjön (Skåne) and sites on Gotland (see below), but he does not specifically name the pottery type in question. However, it is noteworthy that Wibling immediately draws notice to the fact that the pottery from these sites have their closest parallels with pottery from areas east of the Baltic Sea – Finland and Russia. Questions about an eastern or western origin of the Pitted Ware people were often discussed in the early twentieth century (e.g. Brøgger 1909; Almgren 1911; 1912; Nordman 1922; Äyräpää 1937).

At the very beginning of the twentieth century, a number of sites in Eastern Central Sweden were not only identified, but also excavated in a fairly professional manner. In the area surrounding ÅLOPPE, Nysätta parish, Uppland, several sites were the subject of both survey and excavation. The focus was on the important contemporary issue of land elevation and shoreline displacement during prehistory. The publication of the Åloppe complex by Oscar Almgren (1906b; c) became central to the intense debate about chronology, migration, culture contacts and change in the Swedish Stone Age. The initial excavations mainly took place on two sites, Ålopp-Norriskog (Nysätta parish) and Mjölkbo (Österunda parish), of which the former is generally known as the eponymous Åloppe-site. In the second part of his two-part article in Fornvännen (1906c), Almgren discusses the pottery of Ålopp-Norriskog. He mentions the large quantity of pottery found at the site, as well as the apparent lack of complete vessels, although the sherds were quite big. From rim fragments it is surmised that most of the pots were fairly large,
but the presence of small simple cups is also noted. The bases of the vessels are rounded, while the necks, which may be straight or slightly concave, are often marked by a carinated shoulder. The edges of the rims are often thick, and occasionally decorated. The ware itself contains notable inclusions of finely crushed stone (Almgren 1906c:101f).

The decoration is generally concentrated to the upper part, with large pit impressions forming one or more horizontal lines being almost ubiquitous. Other decorations mentioned by Almgren (1906c:101f) are various types of stamps: circular, semi-circular, irregular, etc. Also common are short oblique strokes in bands of alternating left and right – so called herringbone pattern – as well as angular lines, cross hatching etc. (Fig. 4.1).

Almgren made one important distinction in his material – between horizontal and vertical patterns. His stated view is that the vertical patterns represent progress in pottery decoration, and that it is probably due to influences from the pottery made by the megalith-builders of Southern Sweden (Almgren 1906c:102). He illustrates this point by showing drawings of a funnel-beaker vessel decorated with vertical lines, found in a passage grave in Skåne, and comparing this to vertical lines found on some of the pottery sherds at Åløppe-Norrskog (1906c:104f). There is by no means an absolute similarity in pattern and execution, although as we shall see, future finds from both regions will keep the discussion going regarding the potential relationship between the two traditions.

Oscar Almgren uses the pottery as an example of how cultural influences from more ‘advanced’ groups only slowly penetrated the local hunter-gatherer communities of Eastern Central Sweden, who were in time driven off by the immigrants (1906c:116). The first thorough publication of pitted-ware therefore establishes two main points: vertical decoration should be noted as deviating from the ‘normal’ horizontal patterning, and these vertically decorated pots were considered chronologically later.

At the time of the excavations of the Åløppe sites, similar Stone Age sites were discovered in Östergötland at Säter (Kvarsebo parish). Almgren himself visited and took part in the initial excavations here and published a quick report of the finds (Almgren 1906a). There were in fact two sites some 100 m apart on a sloping terrace, and Almgren noted that although both contained bones mainly from seal, the pottery seemed to differ. The eastern (lower) site contained a large amount of pottery. The sherds were quite big, but only a few could be reassembled into more complete vessels. The ware was reddish-yellow and well burnt. The photos show vessels with fairly straight necks, carinated shoulders, rows of large pit impressions, crosshatching, herringbone pattern made by incision or comb stamps, and various other impressions forming mainly horizontal patterns (Fig. 4.2:c-d).
Fig. 4.1. Illustrations of pitted-ware pottery found at Åloppe-Norrskog, Uppland. Almgren theorized that those with vertical patterns (i-n) were a later development than the horizontal composition. This was later reversed by other researchers in the light of excavations on more Neolithic sites (Almgren 1906c:103f).
In comparison, Almgren refers to the pottery found at the western (higher) site as being characterised by a dark coarse ware, heavily tempered with crushed stones. The ornamentation is made by coarse lines and dots, occasionally forming complicated patterns (Fig. 4.2:a-b). The photos show vessels with whipped cord, large pits and irregular impressions, and parts of vertical bands and patterns (Almgren 1906a:fig 12-16). He also notes that this site, though less excavated, yielded over four times the amount of flint than the lower eastern site (1906a:29).

Almgren interprets the differences as chronological, and compares the eastern site pottery with that found on Hemmor and Gullrum on Gotland (1906a:30). Since the western site had vertical decoration, he considers this to be roughly contemporary with Ålopp. He reiterates the opinion that the site with vertical patterns on the pottery should be later, and under the influence of megalithic styles, despite the fact that both the ware and execution of decoration seems to him less well made (ibid). As further evidence of the older date of the eastern site he draws upon information from Julius Ailio that the herringbone pattern made by comb impression is indicative of an early phase of Stone Age pottery in Finland. At this point it was not realised that the early comb-ware of Finland in fact predates the earliest pottery in South Scandinavia by several centuries, and pitted-ware by over a millennium (Nuñez 1990; Skandfer 2003; Hallgren 2008).
Almgren’s typology and chronology is completely based on the presumption that vertical patterns are more advanced, and that change can only go in one direction – from lower to higher. It is interesting that he finds the ornamentation more indicative of age than the ware, which he considers cruder on the more ‘developed’ pottery. This might reflect the fact that he formed his opinion based on the Åloppe material, where there was no noted difference in ceramic texture. He also finds his own chronology problematic considering that at Säter the western site (with seal bones, suggesting it was shorebound) has a lower limit of c. 27 m.a.s.l, whereas the supposedly earlier eastern site has a lower limit of 25 m.a.s.l. According to the newly developed knowledge of sea level changes after the Ice Age, this should mean that the eastern site is more recent. In this instance Almgren chooses to trust his evolutionary model of pottery decoration, rather than the geological indications. He states that the differences in elevation between them is small enough to mean that both sites should have been close to the shore at the time of settlement.

Oscar Almgren’s texts on Åloppe and Säter were the starting point of focused archaeological discussions on pottery-yielding Stone Age sites in Eastern Sweden. It is therefore interesting to note that at this time he suggests no name for either the pottery in question, or the people who made it. In 1909 Gunnar Ekholm published his study of Stone Age artefacts in Uppland, but the major focus in that work was on stone tools and settlement patterns. His uses Almgren’s pictures of pitted-ware at Åloppe to illustrate the Stone Age pottery, and accepts the division of vertical and horizontal patterns. In a short paragraph he simply mentions that the pottery shows some examples of primitive art, and that it is similar to vessels found at Ringsjön (Skåne), Säter (Östergötland) and on Gotland. He also notes the decorative similarities with Finnish and Russian Stone Age pottery, but assumes the influences went from west to east (Ekholm 1909:61).

Knut Stjerna (1911), in his chapter on the ‘settlement civilisation’, starts by discussing the sherds found around the lake Ringsjön in central Skåne. He describes the ceramics as coarse with simple decorations, and the early types are in his opinion developed directly out of the local Mesolithic Ertebölle pottery. Later on the style was to have been influenced by megalithic pottery (1911:77). His illustrations show sherds with horizontal rows of pits combined with patterns made with comb stamp or incision, forming horizontal straight or angular lines, as well as in one case a vertical band. When he discusses the ‘settlement civilisation’ in Eastern Central Sweden he states that these are connected with the Ringsjön group as shown by similar pottery traditions, but that the decorations have developed along somewhat different lines. He also believes that these vessels are modelled on woven baskets, explaining their visual appearance and large dimensions. However, a few pages further on he also states that the decoration was surely influenced by megalithic styles (1911:83, 86).

It is important to take note of the fact that it was not until well into the 1930s that archaeologists realized that there is an older pottery-using Stone Age phase in Eastern Sweden as well – the Early Neolithic Funnel Beaker culture (Hallgren 2008:71f). Without this crucial piece of the puzzle, it appeared to them that the Eastern Settlement culture
represented the first people in the area who were brought into contact with farmers and their culture. Ironically, the huge quantities of pottery at the Pitted Ware sites, making them relatively easy to discover, probably contributed to Funnel Beaker sites being overlooked. There was little perceived need to look for anything else. Indeed, the archaeologists often took little notice of nearby sites with ‘small quantities’ of pottery (e.g. 0.5-1.5 kg/m²), when a few hundred metres further away there was a rich and potentially more prestigious site to concentrate their efforts on (e.g. Erixon 1913:169; Schnell 1930:33f). The abundance of pottery was a problem in another way, as it meant that a lot of effort went into excavating the parts of the site most rich in that material, and little time was spent trying to determine the spatial organization of the settlement or what the areas with lesser find frequency represented.

It is not until Birger Nerman’s publication on the Stone Age of Östergötland (1911), and on the SÄTER material specifically, that Almgren’s chronology is challenged. Nerman who had taken part in further excavations at Säter notes the marked differences between the pottery from the east and west sites respectively. The eastern site pottery is described as relatively thin, well burnt, and with finely grained temper. The decoration is simple and regular, characterized by horizontal rows of pits, herringbone (zigzag), and crosshatching lines. The pottery from the western site is described as more ‘primitive’, with coarse ware and simpler decoration (Nerman 1911:7). Interestingly, exactly the same photos are shown as were used by Almgren (1906a:29), but where he saw influence by a more advanced megalithic style – although the ware itself was less refined – Nerman sees a more primitive and simple type of decoration.

Where Almgren saw differences between the eastern site and Åloppe, Nerman claims to see similarities, as well as many shared traits with the material from Gotland. Nerman had also found one more site another 500 metres to the west on a higher elevation, with what he describes as even more primitive ceramics. The elevation of the settlements, which he postulates should have been shore bound, is further proof that the chronological sequence of sites should be from west to east (1911:9). He does not discuss Almgren’s differentiation between horizontal and vertical patterns. It appears that vertical decoration did not prove to be very common on the western (now middle) site, after further excavations. While Almgren and Nerman had opposing views of the chronological sequence, both interpret the material in evolutionary terms of lower to higher. However, they choose to highlight different aspects of the material that they believe to support their model – or indeed the same aspects, but valued differently. One archaeologist’s advanced megalithic style is another archaeologist’s simple and primitive pattern.

As far as I can determine it is in Almgren’s next article, dealing with the “Swedish-Finnish Stone Age problems”, that the term ‘pitted-ware’ (gropkeramik) occurs in print for the first time (Almgren 1912:14). Almgren uses this term to define the pottery belonging to the Settlement culture (1912:23). He reiterates his interpretation that some of the pottery from Åloppe shows considerable decorative influence from the megalithic pottery in the south, such as vertical patterns and rhombic design (1912:20). For Almgren,
decoration is the most important aspect of pottery to focus on, and his interpretations are completely guided by what can be referred to as evolutionary diffusionism – change is seen as occurring when more primitive peoples actively absorb aspects of higher cultures. He uses this as an argument against viewing Settlement culture and Boat Axe culture (Battle Axe culture) as contemporaneous. In his opinion the angular and horizontal bands of neat comb impressions found on Finnish comb-ware show that it developed under the influence of the Boat Axe culture. The absence of those specific patterns therefore show that pitted-ware must have disappeared from Uppland at the time of the Boat Axe culture (1912:23, 26). He continues to believe in essential typological differences in pottery from Åloppe/Säter West on the one hand, and Säter East/Hemmor/Gullrum on the other, but he openly admits that the chronological sequence is still uncertain (1912:38f). While he would continue to show interest in the earliest settlers of Sweden, he would not take any more specific interest in the material from Åloppe, nor in the typology of Stone Age pottery as such.

Expanding Borders and Competing Typologies

The year 1912 was also when Björn Cederhvarf published a report on the excavations in 1905-1911 on JETTBÖLE (Jomala parish), Åland. In his article for the journal of the Finnish Antiquarian Society, Cederhvarf is mainly interested in the many clay figurines of humans and animals that were unearthed at the site (see chapter 3.1). He describes the pottery as being tempered with combinations of crushed feldspar, mica, seashells and sand (Cederhvarf 1912:309). Jettböle was interpreted as having been occupied several times, and Cederhvarf sees many direct similarities between this material and that from the Swedish Settlement culture. On the upper (earlier) part of the site, there were vessels with 'simple' decoration, and oval egg-shaped lower bodies. These pots sometimes had vertical patterns, which Cederhvarf agreed with Almgren must be due to megalithic stylistic influences. The lower (later) part of the site had flat bottom vessels, and decoration that Cederhvarf described as 'more developed and complex' (1912:320). The illustrations show pottery from the older phase as being decorated with pits, herringbone, nail impressions, short vertical and horizontal incisions, crosshatching and circular impressions. Designs are mainly applied by incision, but comb stamp does appear. The later phase is apparently dominated by comb stamp decoration, and other impressions of toothed or patterned appearance, and the design known as 'wolf-tooth' also appears, whereas pits seem to be rarer (Fig. 4.3). In his opinion, the pottery material from Jettbölle is virtually identical with that from Åloppe, Säter and Gotland, whereas he sees only few and superficial similarities with Finnish comb-ware (Cederhvarf 1912:320).
In Blekinge, the site virtually synonymous with Pitted Ware culture is SIRETORP (Mjällby parish). It had been subjected to a number of more or less organized surveys and excavations under the supervision of the counts Fritz and Christian Reventlow (who had also been involved with the Ringsjö-surveys). Christian Reventlow donated the material to the Museum of National Antiquities (Stockholm) after his death in 1908. Knut Kjellmark continued the excavations in the 1910s, later on aided by Axel Bagge, and the bulk was not published until 1939. However, in 1913 Sigurd Erixon presented an overview of the Stone Age of Blekinge, where some of the finds from Siretorp were shown. The huge quantity of pottery was of course remarked upon, and with hindsight the reader can discover a potential Early Neolithic Funnel Beaker phase a short distance away, which was (in comparison) 'rather poor on pottery sherds’, but with greenstone axes and transverse arrowheads in flint (Erixon 1913:169).

What was rather unique about Siretorp were the many almost complete vessels found in the culture layer, as well as a significant amount of small ‘cups’. The vessel shapes are described mainly as a slightly convex body, and concave neck with an outwardly curved
thickened rim, at times almost ‘mould-like’. Erixon describes the decoration as rich, ranging from simple to complex patterns, some vessels having no ornament other than horizontal rows of large, deep pit impressions. He notes that although some pots have small dot impressions covering parts of the neck and/or body, true comb stamp is a technique used only rarely on Stone Age pottery from Siretorp, and in Blekinge generally (1913:175). The photos show examples of pottery with carinated shoulders, rows of large pit impressions, horizontal bands of short vertical strokes, crosshatching, assorted stamps of triangular, circular and irregular shapes, and small incisions creating triangular shapes. There are also a few sherds with comb stamp, cord and whipped cord that may be either Funnel Beaker culture or Battle Axe culture/Late Neolithic pottery, as well as a couple of vessels with a very ‘megalithic’ appearance (1913:fig 45-60). It is clear that the complex stratigraphy and deep time depth of Siretorp, which has been repeatedly occupied from the Mesolithic to the Late Neolithic at least, was poorly understood at the time. Erixon notes the many clear similarities between the Siretorp and Ringsjön pottery on the one hand, and with Säter, Åloppe, Gullrum and Hemmor pottery on the other. But, he also notes differences between Siretorp and the sites of Eastern Sweden, such as the scarcity of comb stamp at Siretorp, as well as the rare examples of vertically decorated pottery influenced by megalithic styles (1913:178).

On Gotland, Stone Age studies formally kicked off with the extensive but initially unpublished excavations in 1889 at the cave Stora Förvar, on the island Stora Karlsö just off the west coast. In connection with this activity and sparked interest, the site Gullrum on southern Gotland was also discovered and partly excavated by the teacher Hans Hansson (Lithberg 1914:61f). A report and pictures of the pottery were published in the journal of the Swedish Antiquarian Society in 1897, where Wibling, Almgren and other archaeologists read about it. Hemmor on eastern Gotland was excavated in 1902, and in 1909-1910 excavations in connection with ditch digging inside Visby produced even more pottery and finds. A more comprehensive publication of all this had to wait for the dissertation of Nils Lithberg on the Stone Age of Gotland in 1914. He notes that the sites of Gullrum, Hemmor and Visby were especially marked by large quantities of pottery, but that few sherds could be pieced together into substantial parts of vessels.

At GULLRUM (Näs parish), most sherds that could be at least partially reconstructed belonged to the rim and neck part, whereas not a single certain base sherd was found. Of course only part of the site was excavated (Lithberg 1914:64). The decoration at Gullrum covers most of the vessels: pits, crosshatching and herringbone pattern made by incision, comb stamp, and short vertical strokes forming horizontal bands dominate, in addition to a few with vertical design (Fig. 4.4). The neck profile is concave, the shape of the body seems to have been conical, and the ware is described as coarse with colours varying from dark-brown to light /yellow-red (Lithberg 1914:64, fig 117-134).
At HEMMOR (När parish), the pottery is similar to that from Gullrum, especially the shape of the vessels. However, comb decoration is more uncommon, and drawn lines or incisions are the dominating methods of application (Fig. 4.5). Pits, crosshatching, and herringbone are common patterns (1914:66, fig 96-116). The material from VISBY is slightly different, in that more of the sherds seem to be undecorated, but there were several finds of pointed bases, which were always decorated (Fig. 4.6). The style is varied, with many pits combined with irregular patterns made by comb stamp and dots, angular lines, incisions and drawn lines. The vessels still have carinated shoulders (Lithberg 1914: 72, fig 135-163). What is interesting however, is that at Visby a fairly large number of complete bases were found, all of them of conical shape.

Fig. 4.4. Pitted-ware pottery from Gullrum on Gotland. Drawn lines and strokes dominate, but there are several sherds with comb stamp also (after Lithberg 1914).

Fig. 4.5. Pitted-ware pottery from Hemmor, Gotland. Comb stamp is more common, but drawn lines and patterns similar to those on the Gullrum-pottery also occur here. The difference between the two sites is not striking (after Lithberg 1914).
Fig. 4.6. The pottery from St. Drotten in Visby is mostly decorated with sparse comb stamp and large pits, the shoulders are sharp but diminutive (after Lithberg 1914).

Almgren had based his typology partly on the Gotlandic material, as it was known to him from reports and in the collections of the Museum of National Antiquities in Stockholm. Lithberg, who presented his dissertation in Uppsala the very year Almgren was named Sweden’s first Professor of archaeology (i.e. Nordic and comparative prehistory) at this University, finds no fault with this model. He reiterates the similarities between Hemmor, Gullrum and the East Swedish Settlement pottery from Alöppe and Säter, and he makes no further remarks apart from repeating Almgren’s thesis that they were influenced by southern megalithic pottery styles (Lithberg 1914:81). He does present the Visby ceramics as a missing link between the Swedish Battle Axe culture pottery (called bandkeramik, see chapter 5) and the Finnish comb-ware influenced by that group (1914:81). Since any similarities between the Visby pottery and either of those two pottery traditions is in my opinion extremely superficial, this theory seems rather contrived. His contemporary colleagues must have felt the same since, to my knowledge, no one followed up on that specific interpretation.

Lithberg’s contribution to the continued discussion of pitted-ware lies mostly in that he notes that there is a difference in relative amount of comb stamp decoration, as compared to incised lines, on pottery from Hemmor and Gullrum. He uses this as one criterion for separating them chronologically. This is later expanded upon by other researchers, and becomes established with the work of Bagge at Fagervik a few decades
later. Lithberg places Hemmor with incised decoration first, followed by Gullrum with comb decoration, and finishes his sequence with Visby. He also states that Hemmor most closely resembles Åloppe, partly due to the presence of decoration on the edge of the rim. The later site of Gullrum resembles Säter East, in his opinion (Lithberg 1914:82-85). Without explicitly stating it, he is therefore reversing Almgren’s chronological sequence where Åloppe is seen as later than Säter East, and siding with Nerman.

**CONSTRUCTING TYPOLOGY: ÅLOPPE AND SÄTER**

In the meantime, sites around Åloppe had continued to be excavated, and these were published by Sune Lindqvist. At Åloppe-Norrskog, next to a large stone in a black and sooty feature, sherds of several vessels had been found in such compact condition, including parts that could be pieced together, that they were interpreted by Lindqvist as having been crushed in situ (1916:170f). A photo of an almost complete vessel from Norrskog shows the typical carinated shoulder and short almost straight neck, with several horizontal rows of pits, crosshatching, and drawn lines rather than stamped oblique strokes.

During surveys Lindqvist had discovered yet another site to the south of the valley: Rusthällsskogen. The pottery here is described as having a dense texture, some being richly decorated and others only partially by coarse stick impressions. The decoration is often vertical, and similar to that seen on megalithic vessels, with straight and angular bands made by parallel lines, as well as fir twig patterns, crosshatching, large pits in horizontal rows (cf. Fig. 4.1i-n). The pots are ‘bell-shaped’: a rounded base and curved necks without marked or carinated shoulders. Lindqvist goes on to say that the pottery from Rusthällsskogen is similar to the earlier of Almgrens’s two types from Åloppe, whereas the later type from Åloppe is defined by simpler horizontal patterns of short lines, herringbone and large pits. This is in fact the opposite of the chronological sequence Almgren suggested, where simpler patterns preceded more advanced megalithic styles. It is not easy to know whether Lindqvist has completely misunderstood his Professor, or if Almgren had at that time been swayed by Nerman’s and Lithberg’s arguments, and changed his position. Lindqvist also makes note of the fact that the later group more often displays ware of a markedly poriferous texture. The combination of this highly visible porosity with the new shapes with carinated shoulders is what definitively separates this group from the other/older one, as typified by Rusthällsskogen and vertically decorated vessels at Åloppe-Norrskog (1916:178). The importance of noting porosity, presence of carinated shoulders and frequency of comb stamps on pitted-ware will be a recurring theme from now on.

New surveys and excavations north of Uppsala yielded more sites, some of which apparently older than Åloppe. In his article from 1918 Gunnar Ekholm reported on these discoveries, and attempted to make a summary and evaluation of the chronology and typology to date. The new site SOTMYRA (Skuttunge parish), had fairly large quantities of pottery, with decoration made by incisions and drawn lines forming horizontal bands of
crosshatching and vertical straight and angular bands made of parallel lines, as well as impressions of various circular and irregular kinds. Large pit impressions are common. The shoulders are not carinated, making the profile slightly s-shaped, and the rims are occasionally decorated (Ekholm 1918:8, fig 9-10). Sotmyra is not many kilometres north of Åloppe, but is situated at 40 m.a.s.l. compared to Åloppe’s 38 m.a.s.l. Ekholm considers this a strong indication that Sotmyra actually represents an earlier stage. In his continued discussion of chronology, Ekholm emphasises the importance of the Åloppe excavations. Almgren’s thesis that the vertically decorated pottery should represent a later phase is repeated, but Ekholm goes on to present Nerman’s analysis of the Säter material. In combination with further investigations into the stone axes of Eastern Sweden, he considers Nerman’s sequence proven and established, that vertically decorated pottery is actually one of the first and oldest types of pottery in the region. He then combines this insight with Lithberg’s separation of the later, horizontally decorated, phase into another two subsets: The Hemnor-group, characterised mainly by incisions, represents the earlier and the Gullrum-group with mainly comb stamp decoration represents the later. As a final phase, Ekholm cites the newly discovered Torslunda site, in northern Uppland, and compares it with Jettböle II (Ekholm 1918:13).

Ekholm makes note of changes in vessel shape and ware, as well as decoration. The earliest phase has ‘bell-shaped’ pots with rounded bases, and are made with dense ware. The later phases comprise more profiled vessels, with carinated shoulders, and the bases eventually become flat. The ware also becomes increasingly poriferous over time. Ekholm constructs the first comprehensive chronological typology of Stone Age pottery in Eastern Sweden (Ekholm 1918:14):

Åloppe I: Bell-shaped vessels, dense ware, vertical decoration influenced by megalithic pottery styles.

Åloppe II: More marked profile (slightly carinated shoulder), mainly dense ware, horizontal decoration, drawn lines.

Åloppe III: Accentuated profile (carinated shoulder), mainly poriferous ware, comb stamp decoration dominates.

Torslunda: Less accentuated profile (rudimentary carinated shoulder), flat base, poriferous ware, horizontally ordered lines, dots and pits. (On Gotland Visby-pottery instead of Torslunda-phase)

Ekholm considers pit impressions to be so ubiquitous in all phases that he does not bother to mention them. While decoration does play a part in his types, especially for Åloppe I, the most important criteria are combinations of vessel shape, ware and application technique. He does follow Almgren’s lead in separating vertical and horizontal decoration into different phases. Both Sotmyra and Åloppe have vertically decorated pottery, but the chief part is horizontally decorated pottery. There are no stratigraphical or contextual facts presented from either site to suggest a separation in time.
Ekholm later revised his position on Åloppe I and II in the light of further surveys and excavations around Bälinge in northern Uppland (Ekholm 1929). In that article he presents results from further excavations in the Bälinge area, where the sites Vadbron and Ytterby on a higher elevation seemed to lack the vertically decorated pottery found at the slightly lower sites of Sotmyra and Persbo. He therefore states that the earliest phase did not necessarily include megalithic influenced pottery, and that Åloppe I and II probably co-existed at certain slightly later sites (1929:14). Further excavations at Vadbron and Ytterby have yielded sherds of Åloppe I type, however, but it is now also established that there is an early Funnel Beaker phase present in the area, predating the Pitted Ware culture (Segerberg 1999:91-99, see below). In retrospect, we can say that Ekholm’s revision where he acknowledged a pre-megalithic pottery phase was correct (Funnel Beaker culture, though he did not know it by that name), and that the chronological and spatial relationship of Åloppe I and II is still in need of further study.

Ekholm’s ordering of pottery is only partly a question of chronological phases. It is also a question of stylistic elements and of typology, including the important aspects of shape and ware. The Åloppe-types became a common standard for describing pitted-ware in Eastern Central Sweden up until Bagge’s Fagervik-sequence in the 1950s, and continues to be used occasionally (e.g. Löfstrand 1974). However, as some archaeologists used it purely as a stylistic order, some as a chronology, and others included temper as well, the results have at times been confused, contradictory and counter-productive. As we shall see with the use and abuse of Bagge’s Fagervik phases, the problems lie only partly with the original typology, and perhaps mainly with how they are understood and used by subsequent archaeologists.

The Säter-sequence was put forward as a contender with the Åloppe typology (e.g. Meinander 1965:77; Welinder 1970). Additional excavations in the area had revealed another site situated at an earlier level than the eastern one. Nerman made only a cursory presentation (1927), and left it to Nihlén to give a more extensive description and photographs of the sherds in his dissertation (Nihlén 1927:143-150, fig. 115). The Säter sites are now numbered I-IV, from west to east, but according to a footnote, this was actually instigated by Ekholm at the National Archaeology-meeting in Stockholm in 1922 (Nihlén 1927:143, note 3). The photos from Säter IV, the lowest site, show pottery covered in sparsely toothed comb stamp, no large pits, and the shoulders are only marginally carinated. Most sherds appear to have been very porous ware. The Säter sequence is therefore actually first presented as such in Nihlén’s dissertation on Stone Age settlement on Gotland. However, Nihlén does little more than repeat what Nerman has written previously, and no attempt is made to evaluate the similarities and differences of decoration, shape and ware. He bases his interpretations solely on what others have written before him on pitted-ware, his contribution being a systematic compilation of it.

The Säter-sequence had the additional problem that Säter I was actually only known through a few test pits, no one seems to have been able to find the place again, and no picture has ever been shown of the pottery (Segerberg 1999:71). Therefore, to the
ultimate confusion of successive archaeologists, only Säter II-IV has been in use as types. To further the confusion, Säter II is often equated with Åloppel I (vertical patterns), and it is unclear whether Säter III is more closely matched with Åloppel II or III.

The Next Generation: from intuition to definition

While the 1920s-30s would see the publication of an extensive quantity of texts on Stone Age cultures, chronologies and interpretations, there was little focused analysis of pitted-ware. Torsten Engström published results from continued surveys and excavations at Bräviken, Östergötland, establishing the Säter style typology further in the minds of archaeologists (1936). Some much needed new methods and thinking were brought to pottery analysis by Ivar Schnell’s publication of the site BRUNN (Ösmo parish), on Södertörn, south of Stockholm (1930). A one metre broad trench was excavated down a slope, and almost 150 kg of pottery was retrieved. The area poorest in terms of finds was at the top of the slope, which Schnell interpreted as the cleaned living space of the actual settlement. That the large amount of pitted-ware could be the result of garbage disposal was a fairly novel idea, since most archaeologists previously had interpreted large heaps of sherd as potential hut floors (e.g. Ekholm 1929).

Schnell noted that style analysis of the 150 kg of pottery would be cumbersome and near useless, since very little could be reconstructed into reasonably complete vessels. His novel approach was to concentrate almost exclusively on application technique. He noted that the same patterns tended to occur both made by comb stamp (group a) and with drawn lines (group b). These groups were then divided into five similar subgroups based on pattern: 1. vertical lines, 2. horizontal lines, 3. vertical zigzag, 4. horizontal zigzag, and 4. crosshatching (’net-pattern’). Six additional main categories included c) circular stamp, d) cord stamp, e) shallow blunt stamps, f) large pits, g) half-circle/crescent stamp, and h) fringe of short vertical lines below the rim (Schnell 1930:21-23).

There are 4,547 registered sherds and Schnell calculated the percentage of the elements in each square metre pit, excluding those units with less than 50 decorated sherds. He presented his results in a diagram, which in itself was quite unique in Swedish archaeology at that time. The study showed, not surprisingly, that pit impressions were the absolutely most common element of decoration. However, it also showed that comb stamp decoration was rare, and that drawn vertical lines (mainly parallel lines forming bands) were the second most frequent type of decoration. Crosshatching and single blunt incisions made up the majority of the rest (Schnell 1930:24, fig. 14). He made another important point when he showed that there were no major statistical differences in the decoration of sherds in the lower black layer, or the upper brown layer (ibid:25). Schnell went even further by stipulating that since previous researchers had established the homogenous appearance of settlement-pottery in Eastern Sweden, any difference between sites in frequency of decoration categories should indicate either chronological or cultural differences between them (ibid:26). He therefore expanded his analysis to include the
pottery from several well known sites in Eastern Sweden, such as Säter II and III, Åluppe-Norrskog, Mjölkbo, Ingarö, Björkkulla, St Vika and Vikaberg. He shows that based on shore-level displacement the frequency of comb stamp pottery increases over time on the settlements, from Brunn (5%) and Säter III (22%) to Björkkulla (51%).

The method Schnell employed at Brunn was a valuable contribution to Swedish archaeology, which too often preferred to talk in terms of subjective values and impressions made by the researcher, but which were seldom open for re-evaluation. He did make some unusual choices in his method, for instance, his focus on application technique means that he makes no distinction between oblique parallel strokes forming vertical bands on the one hand and fields of alternating oblique strokes forming a horizontal herringbone pattern on the other. In effect, he sees vertical elements and not horizontal patterns. While the style analysis of pitted-ware may be constructed according to defined and objective criteria, it is invariably a problem for the researcher to prioritize between patterns or techniques, as well as whether to concentrate on single elements, or single patterns, or combinations of patterns. There is no single definitive way of approaching pitted-ware pottery when attempting stylistic analysis. As we shall see, each has its benefits, and each its pitfalls.

In his approach, Schnell had also removed vessel shape as a variable, possibly because it seemed to be fairly homogenous at Brunn. He mentions that the Brunn pots are mainly ‘bell-shaped’ with rounded bases and slightly concave necks. The rims were decorated in 75% of the cases (1930:29). However there is at least one example of a carinated shoulder, and two examples of flat bases. The ware is dense and tempered with crushed stone or sand. One could say that Schnell was not interested in pottery as material objects, only as stylistic objects. His interpretations are somewhat undermined by the fact that, at the time, it was not realized that there existed a preceding pottery-phase in Eastern Central Sweden. That the early Funnel Beaker culture had included all of South Sweden did not really become apparent until later in the 1930s, when the two husband-and-wife teams of Sten and Maj-Britt Florin, and Ivar and Karin Schnell, identified the first Funnel Beaker sites of the region in 1935 (Florin & Schnell 1950).

The archaeologist who was to become profoundly and enduringly associated with pitted-ware is Axel Bagge. In the early 1930s, he was approached by Knut Kjellmark whose excavations of SIRETORP in the 1910s had yet to be fully analysed and published. Bagge spent a few additional summers excavating trenches with Kjellmark, trying to make sense of the very complex stratigraphy of the sandy dunes in southern Blekinge. However, here I will only deal with Bagge’s work on the pottery. The large monograph written by Bagge & Kjellmark (1939) was outstanding in that this was the first extensive, well illustrated and systematically presented work on pitted-ware. It included tables, photographs, drawings, reconstructions and descriptions. Bagge also presented drawings of necks and bases of many different types, for a better comparison of the variations and similarities. At Siretorp, a number of pits and trenches on the site had yielded over 26,000 sherds of pottery (not counting the smaller fragments). Of these, no less than 22,000

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(85%) were considered by Bagge to be pitted-ware, 9,000 (41%) of which were decorated (1939:108). Other types of ceramics identified were Mesolithic ertebölle pottery, funnel-beakers (referred to as corded-pottery), and battle-axe pottery. The latter was represented by only 26 sherds from six to seven vessels (1939:116, 130).

Bagge considers pitted-ware to have one basic shape, the cone shaped body with a more or less pointed base, a carinated shoulder and relatively short neck (compared to funnel-beakers). He illustrates ten examples of neck profiles, and divides them into two groups based on whether they are mainly straight/oblique (A), or curved/concave (B), the latter being more common (60%) (Bagge & Kjellmark 1939:108). The illustrations show a number of vessel profiles from short to long necks, thin or thick rim, straight or convex body, and more or less strongly carinated shoulders (Fig. 4.7). While it is easy to agree with Bagge that the basic shapes are fairly similar, his rather arbitrary division into only two groups severely diminishes the variation obviously present in the material. Most vessels, excluding miniatures and cups, were fairly large with upper diameters of 30-45 cm, and bases were almost exclusively pointed. The walls are between 8-15 mm thick, 10 mm being average. Bagge notes that they must have been shaped through coiling, and identifies the temper visually as mainly feldspar, with grains of quartz and sand. The ware is dense and well burnt, yellow-brown-red, with a rough (not smoothed) surface (Bagge & Kjellmark 1939:109).

![Fig. 4.7. Examples of rim and neck profiles on vessels found at Siretorp, Blekinge. Bagge divided them into two groups based on the shape of the neck. A: straight/non-curved necks; B: concave necks. Rims can thickened or narrow, flat or rounded (after Bagge & Kjellmark 1939:fig 44).](image)

Only two sherds were visibly poriferous, both of which were decorated with comb stamps. Bagge notes that poriferous ware is representative of the Säter III and IV styles, but also that this is very rare in Southern Sweden. However, unlike previous researchers he discusses possible reasons for the marked porosity. This was not originally visible in the pottery, but the result of centuries of decomposition in acidic soils. As proof of this, he mentions two sherds found at Åloppe that could be reattached, where one was quite
poriferous and the other not at all. Bagge emphasizes that there are two factors involved in creating poriferous pottery, one is the use of temper of decomposable matter such as limestone, organic substances etc, the other is acidic soils. He points out that the lime rich soil of Gotland has protected the apparently calcareous temper in pottery from disintegrating, far more than comparable sherds in Eastern Central Sweden (Bagge & Kjellmark 1939:109f). Whether the pottery of Siretorp was protected by the soil is not discussed. Phosphate values are occasionally quite high, suggesting a large amount of decomposing organic material that could have protected the sherds from corrosion. Unburnt bones were preserved at the site as well. However, Bagge’s macroscopic examination seems to suggest mainly the use of crushed non-calcereous stone as temper.

Fig. 4.8. Pitted-ware found at Siretorp, Blekinge. The pit impressions were quite often of oval or irregular shape (b, c, g, h). It’s a small difference, the result of using slightly different movements when applying the pits, or differently shaped tools. (after: Bagge & Kjellmark 1939)
In discussing ornamentation, Bagge notes that pit impressions, rounded or angular, appear on virtually every vessel. Apart from that, decorations are made by chisel stamp, and sparsely toothed comb stamps (Fig. 4.8). He specifically mentions that the comb stamps of pitted-ware are dissimilar from the tight, square tooth stamp of Danish megalithic pottery as well as that of Finnish comb-ware. Cord and whipped cord is completely absent on pitted-ware vessels. The patterns are almost uniformly horizontal, creating zones primarily around the rim and below/above the shoulder, only occasionally covering most of the vessel. The few instances of vertical patterns are explained as a ‘reflex’ considering the close proximity of megalithic culture. Of the 9,000 decorated pitted-ware sherds, Bagge determines that 20% were decorated by comb stamp, 27% by incisions (by chisel stamp or similar), and 49% only with pit impressions (Bagge & Kjellmark 1939:111f).

Bagge presents basic statistics of decoration techniques and patterns, as well as vessel shapes. He also makes specific note of where on the vessel the pattern appears: rim, neck, shoulder, body or base. Most descriptions are matched with photographs at the back of the book, which significantly diminishes the risk of misunderstandings. The most common pattern at Siretorp, excluding pits, are horizontal bands made up by short vertical incisions (18%). The same pattern, made by short vertical comb stamps, is almost as common (17%). Sherds of both types were found in practically all excavated units. Nor is there any marked difference in vessel types that display these patterns, both A type necks (straight) and B type necks (concave) are frequent, though in both cases the B type is somewhat more common (Bagge & Kjellmark 1939:112, pl 31-34).

Herringbone, made by incision, is fairly common (6.5%), and also occurs over the whole of the excavated area. Here type B necks are more than twice as common as type A. However, herringbone made by comb stamp appears on only 0.7% of the sherds. Crosshatching appears on 3% of the sherds, only a few of which were made with comb stamp. Another pattern worth noting are horizontal bands of hook-shaped incisions, like upside-down letters ‘U’ and ‘V’ (Bagge & Kjellmark 1939:112f). All these patterns appear on sherds found in excavated units from all over the site. However, a few uncommon patterns, such as horizontal bands created by short horizontal incisions, and shallow angular impressions creating fields of decoration, were found only in the western part. As for vessel shapes, type B necks (concave) are the most common irrespective of decoration. As stated above, deep pit impressions completely dominate the material, and several vessels seem to have been solely decorated in this fashion. The pits are spaced out horizontally around the vessel, often in at least two rows, one by the rim and one just below the shoulder. Occasionally they appear in three or four rows. However, while half the pits are rounded, half are somewhat rectangular and applied from underneath, through pressing upwards. As we shall see, this is a regional peculiarity for Southern Sweden.

Lastly, there are a number of rare and more infrequent patterns and decorations as shown on the many photographs. Combinations of dots, comb stamps, circular, semicircular, irregular and nail incisions. Some vessels with a classic pitted-ware shape
have decorations that are more commonly found on megalithic pottery (Bagge & Kjellmark 1939:pl. 48). Some vessels with vertical and triangular patterns, are themselves of a fairly atypical pitted-ware shape, with significantly long necks and curved, rather than carinated, shoulders (1939: Pl 45, 49-50).

It is important to take notice of the fact that Bagge very specifically takes three factors into consideration: decoration, shape and ceramic ware. The latter included colour of both exterior and interior surfaces, temper, and surface treatment. Siretorp offered one of the first sites with clear stratigraphical and spatial separation of pitted-ware from early funnel-beakers – commonly known as corded-pottery at the time – something Bagge emphasized. He especially mentions that the types of ware in the two traditions differed from each other. The funnel-beaker ware was dense, but not as compact as that of pitted-ware. It was also tempered with crushed stone (feldspar according to Bagge), perhaps to a greater degree, but often not fired completely through. The most apparent difference to Bagge was the smoothed brown-grey/grey-black surfaces of the funnel-beakers that separated them from the rougher surface, red-brown pitted-ware (Bagge & Kjellmark 1939:117). So when he discusses vessels with megalithic patterns and shapes atypical of both traditions, he lets the ceramic ware be decisive if he should categorise it as pitted-ware or not (e.g. 1939:114). This is the same criteria he would use when analysing the pottery of Fagervik (see below).

In his concluding discussion on pitted-ware, Bagge is of the opinion that the pottery type is generally spread along Eastern Sweden, from Skåne to Gästrikland, but with apparent sub-regional groups of greater internal homogeneity. One such is the Eastern Central Swedish group, including the landscapes from Östergötland to Gästrikland/Dalarna, defined by the three Säter styles (II-IV). This region differs from other regions with pitted-ware, partly through the existence of Säter II-type (s-shaped 'degenerated' funnel-beakers with vertical decoration), partly through the common occurrence of poriferous ware in Säter III-IV (Bagge & Kjellmark 1939:174). Säter III is in Bagge’s opinion the commonly shared type of pitted-ware in all of Eastern Sweden, divided into two regional groups based on the nature of the ceramic ware: the northern with poriferous ware, and the southern (from Oskarshamn in Småland to Skåne) with dense ware. In the following phase, Bagge sees pitted-ware being diversified into several local styles (1939:175).

As for the Säter II type, Bagge admits that there are indications of a similar phase at Siretorp, with vertically decorated pottery. However, since the vessels are differently shaped with more marked shoulders, he is inclined to see this as an analogous development. The neighbouring megalithic groups should have influenced the local makers of Säter III-pottery directly, rather than through northern pitted-ware groups, resulting in a specific regional type of Southern Sweden (Bagge & Kjellmark 1939:175). Bagge has no qualms in referring to the major part of the Siretorp pitted-ware as Säter III. He notes the many similarities in designs on pottery from Siretorp and Säter. Although some general patterns are present on sherds from Siretorp, and both Säter II and III, the
fact that the vessels at Siretorp display the typical Säter III-profile determines that this is
the type in question in his material (1939:176).

When discussing decoration on Säter III-pottery, Bagge states that at Siretorp
horizontal bands of vertical strokes are five times as frequent as herringbone (oblique
strokes). Interestingly, at Säter the reverse is true. He considers it likely, if not probable,
that the herringbone pattern is the result of influences on pitted-ware by early Finnish
comb-ware, which would explain its greater popularity in Eastern Central Sweden. By
contrast, he considers the other pattern to be adopted from the megalithic pottery style.
In Bagge’s model, Säter II with its ‘degenerated’ funnel-beaker shape, was the result of
local Vrå-pottery (early funnel-beakers from Södermanland) merging with megalithic
styles from West Sweden. However, he considers it unlikely that the Säter III type actually
evolved from this pottery. The reason for this opinion is not some drastic change in
decoration, he admits some designs are commonly shared between them, nor the
occurrence of poriferous ware, since in his view new techniques of tempering need not
designate great cultural changes. Rather, Bagge believes it is the shape that is too
profoundly different (Bagge & Kjellmark 1939:179f).

Bagge’s final interpretation, which he freely admits is a working hypothesis, is that
Säter III pottery originated in Skåne/Blekinge under the influence of megalithic groups,
and spread along the coast northwards where it displaced the Säter II types. The further
spread to the Åland archipelago, with its proximity to the Finnish mainland, meant
additional influences from comb-ware, creating a regional version of Säter III. To
strengthen his argument, Bagge notes that Finnish comb-ware of south-western Finland
has quite poriferous ware, and that there is a possible regional border approximately at
Oskarshamn in Småland. Here, at the pitted-ware site of Humlekärrshult, the sherds are
of dense ware, while slightly farther north at Vivastemåla, part of the pottery was
poriferous.

To sum up, in order to ascertain the correct type of pottery, Bagge insists on
considering 1) ware, 2) shape and 3) decoration – in that order of importance.

BAGGE AND THE FAGERVIK PHASES

The Bråviken bay cuts deep into Östergötland, and on its shores several Stone Age sites
have been discovered, Säter being one of the most well known. During surveys in 1927
additional sites were registered, and in 1935-36 FAGERVIK (Krokek parish) was excavated
by the National Heritage Board in a project led by Axel Bagge. A short preliminary
presentation was published in 1938, and it is clear that from the start Bagge wanted the
analysis to result in a better understanding of different Stone Age settlement phases, as
seen in pottery types. The attempt that he initiated at the complex site of Siretorp was to
be brought to conclusion with Fagervik, where he had a greater control over the
evacuation. Here, he excavated in one metre square units and carefully noted elevation of
every second square.
His article presenting the results and interpretations was published in 1951, two years before his untimely demise. It was, and still is, the definitive work on pitted-ware in Sweden. However, it was written in German, which means few Swedish archaeologists of the post-war generations have actually gone to the trouble of reading the original text. This and other factors have resulted in some confusion and controversy regarding Bagge’s phases, what he meant by them, how he defined them, and how they relate to each other in cultural terms etc. It is therefore necessary to take some time recounting what he actually did and wrote about the pottery from Fagervik.

Fagervik is situated on a somewhat steep, sandy slope. The finds were unearthed between 23-31 m.a.s.l., above which the site was partially destroyed by a road. The majority of the pottery was found from 26 m.a.s.l. and further up the slope (Bagge 1938:152; 1951:62f). Bagge’s study contains one important focus: relating type of pottery with elevation, and through shoreline displacement models ascribing each pottery phase to a settlement phase. He is completely focused on the pottery, disregarding most other artefacts. Since the sandy culture layer showed little or no vertical stratigraphy that could have dated individual stone tools, this choice of action is understandable. Bagge’s solution was to study the horizontal stratigraphy of pottery sherds instead. Pottery certainly made up the bulk of the material, with almost 170,000 sherds – over 45,000 of which were decorated (26%) (1951:63, tab I).

Having gained valuable knowledge of pitted-ware through Siretorp, which acted as a kind of general rehearsal during the Fagervik-excavation, Bagge had a clear purpose and ready method at hand during his fieldwork. He focused on the same main criteria: ware, shape and decorations. He identified three main types of ceramic ware. Firstly ‘corded-pottery’ ware (Schnurkeramisches Material = early funnel-beaker ware) which is dense, compact and heavy (“fest, dicht und schwer”), tempered with fairly coarse crushed stone. The surface is smoothed and the colour essentially dark grey. Secondly ‘dense pitted-ware’ (festes grubenkeramisches Material) which is also dense and compact, tempered with crushed stone that is not as coarse as corded-pottery, with a rougher surface finish and colours ranging from grey-brown to red-brown. Thirdly ‘poriferous pitted-ware’ (poröses grubenkeramisches Material) which, as the name implies, has visible porosity, as well as being mainly red-brown in colour. The porosity, he notes, is most likely due to disintegration of what he assumes must have been either crushed calcareous stone or organic material (Bagge 1951:65f).

The existence of two types of dense ceramic ware at Fagervik, interpreted as representing two chronological settlement phases, was later critiqued by Mats Malmer. He was even more committed to empirical and objective analytical methods, and considered these descriptions far too impressionistic (Malmer 1962:723). However, Ann Segerberg who personally examined the Fagervik pottery as part of her dissertation on the Bälinge sites, sides with Bagge. In her opinion the sherds are distinctly different in terms of surface treatment, and the Fagervik I-ware is quite similar to the Early Neolithic funnel-beaker pottery in her own material (Segerberg 1999:63, see below). In my own more
modest perusals through collections of pitted-ware and funnel-beakers, I have also often noted this dissimilar appearance on even quite small sherds, although there are always the less distinct examples as well. This is not a result of decorative style in the ordinary sense, but the result of different operational sequence in the craft. To disregard ceramic ware is to disregard the craft process that resulted in a completed vessel, and to treat potters as artists in a rather modern (and simplified) manner. The fact that Bagge was one of the few archaeologists at that time to take a fairly holistic approach to pottery analysis is one of the lasting strengths of the publication (see also contemporary publications on early funnel-beakers by Sten Florin).

![Fig. 4.9. Types of vessel shape found at Fagervik, Östergötland. Bagge stated that type a dominated in Fagervik I, type b dominated in Fagervik II and type c in Fagervik III and IV, but with certain overlap between the phases as well (after Bagge 1951:fig 8).]

Bagge was nothing if not meticulous. In his documentation he provided drawings of all the ornamentations he could find (c. 230), noted ware of every sherd, calculated the number of sherds with a specific decoration, and the estimated elevation where they were found. He also took pains to ascertain vessel shape when possible, especially the profile of the neck. Unlike at Siretorp, he here settled on three specific types of profiles (Fig 4.9): a) Marked transition between concave neck and rounded body; b) S-shaped profile creating a bell-shaped vessel; c) Carinated shoulder marking transition between neck and body. In his illustration he shows that the neck could be either slightly concave or straight (more or less oblique), but he did not distinguish between these two sub-types in his analysis (1951:67).

The different criteria of ware, profile and decoration were added up and the sherds were designated to a settlement phase (I-IV), as well as a phase V consisting of battle-axe pottery. His definitions and descriptions of each phase are presented in abbreviated form below:
FAGERVIK I: (c. 1,200 sherds) Funnel-beaker pottery. Corded-pottery ware, a-profiles (35%), b-profiles (65%). Decorations of horizontal and vertical cord, whipped cord, *Furchenstich* (‘drag-and-stab’), broad crosshatching, horizontal band of short vertical lines below the rim, body decorated with vertical lines, and sometimes a row of large pit impressions. Bagge considers this group to be the result of a merging of Early Neolithic funnel-beaker pottery from Eastern Central Sweden (Vrå-group) with traits from early megalithic pottery of Western and Southern Sweden (e.g. crosshatching). (1951:67-69, 84-94, fig 1)

FAGERVIK II: (c. 1,900 sherds) Pitted-ware pottery. Dense pitted-ware, a-profiles (17%), b-profiles (83%). Decorations typical of Early Neolithic funnel-beakers are absent or rare, instead ‘megalithic’ ornamentation is common. Angular horizontal lines made of oblique chisel incisions, crosshatching, fir-twig and other vertical patterns, as well as rows of large pit impressions. Correlates with Säter II. (1951:70-72, 95-97, fig 2)

FAGERVIK III: (c. 36,000 sherds) Pitted-ware pottery. Poriferous pitted-ware (some dense pitted-ware), b-profiles (9%), c-profiles (91%). Pointed base and carinated shoulder are the two most important criteria for this group, poriferous ware completely dominating. However, after consideration Bagge did ascribe a number of sherds with c-profile, typical decoration and dense pitted-ware to this group also (1951:74). Aside from the rows of deep pit impressions, the most common decorations are: herringbone; vertical/horizontal patterns created by oblique short lines; straight vertical/horizontal incisions forming horizontal bands; crosshatching (though relatively less frequent); triangular and rhombic shapes; and circular, semi-circular and hook-shaped stamps. Lines, herringbone and crosshatching were created by drawn/incised lines or comb stamps, though the former was more frequent. Most patterns are horizontal or surface covering, though some vertical patterns are also found on vessels of this type (mostly on dense ware). Correlates only partly with Säter III. (1951:73-78, 97-102, figs 4-5)

FAGERVIK IV: (465 sherds) Pitted-ware pottery. Very poriferous pitted-ware, b-profile (2%), c-profile (98%). Large pit impressions are for the first time rare, instead decoration is almost exclusively applied by comb/tooth stamp, and covers most of the vessel surface. Horizontal or oblique orientation is common, with additional examples of vertical elements, as well as rhombic patterns. However, the most common pattern (c. 240 sherds) is ‘wolf-tooth’ created by a slightly curved tooth stamp moved in such a manner to create fang-like patterns. Correlates with Säter IV. (1951:78-80, 102f, fig 6)

FAGERVIK V: (46 sherds) Battle-axe pottery. The presence of a small amount of typically late battle-axe pottery represented the final phase of settlement, according to Bagge. Most of them were found between 22-24 m.a.s.l. Decoration was almost exclusively done with tooth stamps (densely spaced square pegs), mainly angular bands and lines. (Types G, J, K according to Malmer’s typology). (1951:80-84, 103f, fig 7)
Based on the most common forms of decoration on sherds of respective type, Bagge noted the lowest elevation above present sea level where the majority of these types of sherds stopped appearing. In Bagge’s opinion, this designated the level of the contemporary shoreline of each settlement phase. A few sherds could always be found lower due to disturbances of later settlements, he reasoned. Of course, this meant that his phases overlapped, Fagervik I-III quite significantly so. The point for Bagge, was that the amount of Fagervik I sherds dropped considerably from 8.1/m² to 0.8/m² at 28.5 m.a.s.l., Fagervik II had a similar drop in frequency at 27.5 m.a.s.l., and Fagervik III at 26.0 m.a.s.l. Of course, a vertical drop of one metre in elevation covered a slightly larger area horizontally – though all in all the excavated area was only some 100 m in length (484 m²) (1951:tab I; see Segerberg 1999:80f).

Fig. 4.10. Fagervik II pottery, as defined by Bagge. Dense ware, un-smoothed surfaces, drawn or stamped decorations, vertical as well as horizontal patterns, vessels with predominately s-shaped profile (after Bagge 1951:fig 2).
Fig. 4.11. Fagervik III (a-f) and Fagervik IV (g-i) pottery. Many patterns appear in more than one type, as Bagge prioritized ware (dense/poriferous) and shape (profile a, b or c) over type of decoration. Fagervik IV is very poriferous, has diminutive or no shoulder, pit impressions are rare and comb stamp decoration covers most of the vessel. Wolf-tooth pattern (i) belong to this phase (after Bagge 1951:figs 4-6).

This considerable overlap has been cited as proof that Bagge’s phases are invalid. Malmer, for instance, found the chronology based on supposed shore-levels far too weak, while he still accepted that Bagge had managed to identify different pottery styles at Fagervik. While there is a lot to debate in his method, it is important not to misunderstand Bagge’s analysis and interpretation. It is not based upon single factors, such as elevation, or vessel shape, or decoration, or ceramic ware. It is contingent upon all these factors acting together. Still, ascertaining the true number of settlement phases at Fagervik is probably a hopeless cause. For instance, Fagervik III makes up no less than 80% of the decorated pottery, but is this due to a longer continuous settlement, several
phases of settlements with few material changes, or a marked increase in pottery use and
deposition during a comparable amount of time?

It is also important to note that Bagge structured his registration very much with
previous results and sequences of pitted-ware in mind: Almgren’s division of vertical and
horizontal patterns, Lithberg pointing out the change in frequency of comb stamps over
time, Ekholm’s Åloppe-typology listing poriferous ware as a criterion, as well as the better
understanding of the Early Neolithic pottery types at the time of his own analysis. His
determination to look for different phases at Fagervik is of course contingent on the fact
that there had been previous sites excavated, containing only one or two equivalent
versions of the phases he defined at Fagervik.

However, Bagge was not as stringent in his analysis as he perhaps thought he was.
Without specifically discussing why, he sometimes gave priority to ceramic ware
(Fagervik I or II), sometimes to vessel shape (Fagervik II, or III), and sometimes to
decoration (Fagervik III or IV). This does not mean that he did not make valid choices.
Change in ware is an indication of change in craft techniques (tempering, processing clay,
shaping, surface treatment, firing), changes in vessel shape may indicate new social and
functional use of pottery, and new types of ornament can be a symptom of changes in
influence, trends and preferences. All these aspects are worth noting in ceramic materials,
as is apparent absence of change. Bagge would not have been able to make these claims of
different phases without corroboration from other sites such as Åloppe, Säter, Gullrum,
Hemnor, Torslund, Jettböle and Östra Vrå.

While Bagge’s analysis has some weak points, the main problems have not really
resulted from his own definitions, but rather from the way subsequent generations of
archaeologists would use and interpret them. For instance, Bagge is only analysing one
site, Fagervik, attempting to use statistical means and shoreline displacement to identify
different settlement phases at that site. While he pointed out the many similarities in his
material with pitted-ware from other sites, thereby reinforcing the idea of a common
pottery-tradition, his aim was not specifically to present a general typology of all pitted-
ware everywhere. After all, there was no evidence that all the different stages of pitted-
ware pottery had to be represented at Fagervik. In fact, the Säter III type pottery – typical
pitted-ware vessels with dense ware rather than poriferous – was poorly represented.
Bagge did have a Fagervik II-III phase that seems similar to Säter III. This group included
1,200 sherds with mainly dense ware, curved and carinated profiles, vertical and horizontal
patterns made by incision, rhombic designs, and pit impressions (1951:73, fig. 3).
4.2 After Fagervik: Empiricism and Criticism

Pitted Ware culture continued to be debated and discussed during the 1950s and 60s, but ceramic typology was no longer at the forefront. Many archaeologists would use Bagge’s Fagervik classification while some preferred the Säter sequence (e.g. Wyszomirska 1984). By the 1970s however, processual archaeology with a strong emphasis on scientific methods and water-tight definitions, as well as much needed re-evaluation of old categories, had established a hold in Scandinavian archaeology. One of the first researchers to attempt to make use of this new methodology when analyzing pitted-ware was Stig Welinder. In 1969 he led a rescue excavation at ÖVERÅDA (Trosa-Vagnhärad parish), Södermanland, where gravel extraction was rapidly taking a large chunk out of the esker. Remains of a Pitted Ware settlement were mainly found to the east and south of the gravel pit, and in total some 300 kg of pottery was retrieved from 125 m² of hand dug squares. The majority of sherds came in the southern trench, which was dug in a line transverse to the elevation of the slope. Based on the drop in pottery sherds and phosphate levels, Welinder estimated the contemporary shoreline to have been at the modern day elevation of 29.5 m.a.s.l (1970:26). Apart from at least 150 identified vessels, an additional 30-50 cups and miniature vessels were also found.

In his article, Welinder attempted a rigorous scientific analysis of the ceramic material, devoid of subjective terms and descriptions. He defined five main criteria for classification: form (shape), ornamentation, rim-ornamentation, technique (temper), and spatial position at the site. In the case of shape he defined three main parts of the vessel: M = rim; S = shoulder (including parts of the neck and body); B = base. Rim-sherds were further categorised according to their shape: rounded, angled (asymmetrical), or flat. Shoulder-sherds were divided into either ‘concave-convex roundness’ or ‘angle and concave roundness’. These two rather cumbersome descriptions are in fact identical to Bagge’s b- and c-profiles – bell-shape vs. carinated shoulder. Bases could be rounded, pointed or flat (Welinder 1970:27f).

Welinder also identified a number of vessels at Överåda without any shoulder, interpreting their shape as close to comb-ware pottery. As he himself notes (1970:89), this type of vessel has not really been identified in any number at other Pitted Ware sites with the exception of those on Åland. However, he points out that the type might be wrongly identified due to the fact that it was often difficult to ascertain the presence of a shoulder on sherds from vessels with a curved profile. In other words, these sherds could actually have come from the common pitted-ware types found at Överåda. All these different categories were coded by letters, so that Msr+Srr = sherd with rounded rim and curved shoulder and Msv+Srv = sherd with flat rim and carinated shoulder etc. Rim-decoration was coded O1-O3 (straight/oblique lines; crossing lines; impressions). Surface-covering
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ornaments were divided into eight groups, as well as one for undecorated sherds. These were also coded:

- **u** = undecorated
- **g** = pits (grop)
- **o1** = straight lines >3 cm
- **o2** = straight lines <3 cm
- **o3** = crossing lines
- **o4** = half-circle/crescent shaped impressions
- **o5** = other type of impression than o4, o6, o7
- **o6** = comb impressions
- **o7** = cord- or cord-like impression

Welinder also measured the density of sherds (g/cm³) and divided them into seven groups designated by t1-7. Finally he divided the excavated units into 28 different positions based mainly on horizontal location, and in a few cases also upper and lower layers in some units from the main (eastern) trench. His end result was the ability to code each sherd in a manner reminiscent of an equation: $M_{sr}/O_{1}/(g+o1)+S_{rr}+Br(t2)$. Or, in plain English: vessel with round symmetric rim decorated with lines, convex-concave rounded shoulder, convex base, and decorated with pits and long straight lines, density 1.2-1.4 g/cm³.

Interestingly, like Schnell had done previously, Welinder focused on basic segments of decoration rather than on composition. He implemented that analytical method even more rigorously, ignoring orientation of patterns and elements. One could say that the pendulum had swung completely in the opposite direction from Almgren’s very subjective descriptions of primitive, degenerate and advanced ornamentation, some 65 years earlier. It is debatable however, whether this ‘scientific’ method achieved its goal of objectivity – or more to the point, if objective registration of geometric criteria broken down into the smallest constituent parts actually results in a better understanding of the pottery compared to, for instance, Bagge’s more descriptive definitions. For the reader, the Överåda report is extremely difficult to penetrate, the multitude of tables especially, and if illustrations had not been included it would probably have been impossible to understand what the author meant by such definitions as a convex-concave-convex base.

Welinder chose the shape of the rim (rounded, angled or flat) as his most important category without really explaining why. Probably it was because rims were the most common type of sherd that was also decorated. The shape of the vessel, i.e. whether there was a curved or carinated shoulder, takes second place. From table 20 it is possible to ascertain that carinated shoulders were twice as common as rounded shoulders, and that they were mainly decorated with comb stamp (36%) or short strokes (27%) – herringbone pattern, etc. Pits were common on both types of vessels, but on those with carinated shoulders, the pit impressions were placed close to the rim, rather than on the shoulder or body, and were more often combined with other decorations. It is also clear that rounded and angled rims were more common on the vessels with curved profiles, and that flat rims dominated on those with carinated shoulders (Welinder 1970:table 12).
The Överåda analysis is ambitious in its scope, presenting a multitude of variables in different combinations with each other: rim decoration, shoulder shape, density and position on the site etc. Unfortunately, the presentation is almost overflowing with tables and codes, with little explanation or argument as to why specific variables are chosen for comparison. Welinder shows that comb decoration as well as carinated shoulders are more common in the upper layer. He also notes that the density of sherds with carinated shoulders is lower, or in other words tempered with lighter or decomposed material (1970:51, 58). He himself notes that the study he has performed simply confirms the general types of the Säter typology (1970:80). Perhaps more importantly, Welinder’s excavation method succeeds in showing that the horizontal distribution of pottery types across the site is often more marked than the vertical. He points out that depending on which part of a Pitted Ware site is excavated, the resulting ceramic material may vary significantly (1970:51-53).

The Överåda study was an attempt to register and analyse a ceramic material according to scientific principles of tightly defined criteria, the criticism being that older literature had failed to do so and that knowledge and methods were “…dependent on word-of-mouth cooperation among researchers, personal conceptions and non-verbal experience.” (Welinder 1970:82). These were valid concerns, but the focus on the smallest possible denominators of pottery decoration, with no discussion of why certain traits were to be given priority over others, hardly led to more usable definitions. Nor did Welinder himself seem content with this method, since he neither continued with, nor expanded on it in later works.

In the end, what is perhaps most interesting about the study is that, despite the rather different approach to the material compared to earlier researchers, Welinder still reaches very similar conclusions. Vessels in the lower level have curved profiles, mainly line or incised decoration, and are tempered with sand and crushed stone. Vessels from the upper layer have carinated shoulders, are often decorated with herringbone pattern and/or comb stamp, and are more often tempered with some material that has disintegrated over time. An interesting new result was the fact that the shape of the edge of the rim might be another aspect that changes over time.

Another major publication on Pitted Ware culture and pottery with a pronounced scientific aim was Lars Löfstrand’s dissertation on the settlement Äs (Romfartuna parish), Västmanland. Situated on the south-eastern side of the north-south oriented Badelunda esker, under immediate threat from gravel extraction, the site was excavated in the 1960s by the archaeology department at Uppsala, since the land owner responsible for the destruction was Uppsala University itself. An area of 3400 m² had the topsoil removed by an excavator machine, and 626 m² where finds were made were dug in 1 m² units. The main area (I) covered c. 75x20 m, and area II was 30 m to the north, covering c. 20x10 m. Löfstrand noted the homogenous appearance of the culture layer on the sandy slope, and chose to excavate these units in fixed 10 cm sections in order to retrieve a material that could be statistically comparable (Löfstrand 1974:39). No less than 460 kg of pottery was retrieved from Äs.
What makes Löfstrand’s dissertation stand out was mainly his early attempt to use computerized analysis of registered aspects on the pottery sherds – which in those days meant the difficult and cumbersome use of punch cards for the 3350 decorated sherds. A list of codes was created, with 57 columns listing 25 potential aspects of each sherd. These included coordinates, depth, size, thickness, part of vessel, pattern, temper, surface treatment etc. (though not weight). A metric template was used for measuring size and thickness of each sherd (Löfstrand 1974:40f). Five main parts of a vessel were defined: rim, neck, shoulder, body and base, and an additional four codes were used for those sherds large enough to include several of the vessel’s parts. Each part could have additional discrete traits. For instance, the rim could be flat, rounded or both (32:1-3), it could be angled in or out, or horizontal (33:1-3), and it could be thickened inside, outside, both or neither (34:1-5), etc (Löfstrand 1974:43).

On the tricky question of decoration, Löfstrand chose to disregard application technique, composition and even elements. Instead, he defines 78 different patterns (1974:44-49). Unfortunately his illustrations show only half of the patterns (the most common ones), and there is no explanation of what defines them and separates them from each other. This means that the use of his tables in figure 24b, where he lists the percentage of each pattern as it occurs on sherds tempered with sand/crushed stone or limestone, or figure 24a which lists the occurrence of each pattern at different depths, is of only very limited use. He also mentions that there are 40 different rim decorations, yet shows only the 18 most common in his illustrations. Löfstrand’s critique of previous researchers for their poor record of usable comparisons of the pottery materials, and of presenting quantitative information in general, is therefore suffering from his own lack of definitions and illustrations (1974:51).

Quite frustrating for the reader is the fact that figure 26 presents a potentially interesting diagram of frequency of the different decorations on dense and poriferous sherds respectively. However, the fact that pattern 58 is apparently more common on poriferous ware is of little use, as this pattern is not shown in any of the illustrations. The same goes for several others. This is unfortunately a rather typical example of the analytical and statistical method taking over to such a degree that the material itself is almost forgotten. Pits are not registered as a pattern as such, but the presence or absence of pits on a sherd was registered in a separate column and used to study changes in frequency in different depths of the layer. There was a small, barely significant drop in amount of pit decorated sherds in the upper layers (from c. 65% to 47%) based on the study of 812 sherds found in area II (Löfstrand 1974:65).

On a more positive note, Löfstrand was making thorough use of excavation methodology in analysing the spatial distribution pattern of the site, both horizontally and vertically. He shows that poriferous pottery seems to appear later than stone tempered pottery (1974:72). He also makes a note of the frequency of the size of the vessels in area II, estimated through rim diameter, on different levels. The largest vessels seem to dominate in the lower levels, and medium sized in the upper. Löfstrand criticises previous
researchers for stating that comb stamp is more common on later vessels (1974:82). He claims that they have failed to prove that there is any real chronological difference, and also that Bagge himself saw no reason for such a division. The latter claim is partly a poor reading of the Fagervik study, in my opinion. Bagge does note a marked increase in the use of comb stamp in phase III compared to phase II, although he sees no reason to subdivide Fagervik III into comb stamp and incised decoration respectively. Nor has any other researcher claimed that comb stamp completely replaces drawn patterns, except possibly for the very last phase (Fagervik IV, Torslunda etc).

More problematic for Löfstrand, he makes a completely erroneous recalculation of Welinder’s table 24 from Överåda. In that table, Welinder showed that despite there being differences in the spatial distribution of types of decoration across the site, there was a modest but clear increase of comb stamp in the upper layers. Löfstrand not only recalculates these values by adding the sherds from the two different areas, which Welinder had clearly argued against, but also mistakenly adds the percentage numbers Welinder lists in the lower table, confusing them for actual numbers of sherds. In some cases he even seems to have miscalculated this sum (cf. Welinder 1970:tab 24; Löfstrand 1974:fig 67). Both Bagge and Welinder had been careful to point out that on Pitted Ware sites, the spatial distribution must be taken into consideration. This is not something Löfstrand seems to have taken much notice of at Äs.

Löfstrand was one of the first to include technological analysis of the pitted-ware pottery, discussing choice of clay, temper and temperature of burning. The 1970s were the starting point of this new method of dealing with pottery materials in Sweden, and really took off with the dissertation by Birgitta Hulthén On Ceramic Technology during the Scanian Neolithic and Bronze Age (1977) (see chapter 5.1). The 1970s and ’80s were in many respects heavily focused on technology and statistical analyses of various aspects of pottery. Especially in the case of pitted-ware, which seemed difficult to subject to the type of typological and symbolic theorising popular with battle-axe beakers and megalithic funnel-beakers. This was partly due to the fact that pitted-ware was mostly only found in a very fragmented and dispersed condition, and partly due to the fact that there was simply too much of it. Analysing 300 kg of sherds, much of it decorated, is not an easy task.

One researcher who did try was Inger Österholm in her dissertation on the settlement patterns of Stone Age Gotland (1989). She selected AJVIDE (Eksta parish) for a focused study of pitted-ware pottery, and the intent was to create a reference material with which to compare other Gotlandic pottery. It was an ambitious choice, the Ajvide site consists of a dark and find-rich culture layer that covers some 200,000 m², including both settlement remains and an extensive cemetery. The initial excavations between 1983-87 yielded 58,000 sherds weighing over 280 kg. To date, the continuous excavations have yielded c. 3000 kg of pottery (Österholm 1989:53f; Burenhult 1997:18; Norderäng 2001; 2002; 2003; 2004; 2006a; b). The registration method used by Österholm was initially developed by Birgitta Hulthén (1974), and a version of it had already been applied to some of the Ajvide pottery as part of an exam paper (Scharp 1985). Österholm’s
dissertation is still the only published large scale analysis of pitted-ware on Gotland, though some exam papers have dealt with other sites using the same method. It is significant that the later publication on Ajvide and scientific analysis (Burenhult 1997), discussing digitalisation, osteology, DNA, burial patterns, diet, language and boat technology, all but completely bypassed the by now almost unmanageable pottery material.

Calculations of rim diameter show that there are a number of small vessels in the range between 10-20 cm in diameter, but that the majority are far larger, around 30 cm and up to 45 cm in diameter. There are also some miniatures found, mainly in the grave material. All vessels that could be partly reconstructed had a marked, carinated shoulder. However, in the lower layers there seems to have been a greater quantity of vessels with an oblique neck profile, whereas most vessels in the upper layers had short, straight necks. All vessels larger than cup size have rounded or pointed bases (Österholm 1989:97). Decoration was divided into 78 different types coded by number, and although Österholm presents all of these with illustrations (1989:fig 48-49), she does not explain the method or the priorities made when defining these types. Her types are very detailed, including both orientation, application technique, patterns and combinations, occasionally including decoration of both rim and neck. However, there is no apparent order to the system that can help the reader decipher the code number of a given decoration. For instance, curved or crescent shaped incisions are found in nos. 22, 27, 45, and 59 (see Fig 4.12).

Fig. 4.12. Österholm’s coding of decorations found on pitted-ware pottery at Ajvide, Gotland (after Österholm 1989:fig 49).

If it is to be understood as simply an objective enumeration, it could be argued that this is not really feasible, as some of her types need a large part of the sherd to be preserved, while others do not. The rejection of categories and subcategories of decoration by both Löfstrand and Österholm (i.e. comb stamp or drawn lines, vertical vs. horizontal patterns, application techniques etc.), was probably due to an understandable scepticism of the possibility for the archaeologist to choose those categories that had an actual cultural meaning. However, in my opinion, the result is only superficially objective. By treating pottery decoration as individual parts, disconnected from the logic of the
whole visual display, the material is detached from the craft tradition from which it originated.

A positive aspect of Österholm’s display of such a large number of decorations is that it truly highlights the great variation present in the pitted-ware material. While the diagrams showing the amount of each type of decoration are difficult to analyse and extract meaning from, they do present the reader with a thorough publication of the material. There are some interesting results, presented by Österholm: certain decorations seem to have had a more continuous popularity, especially herringbone and horizontal rows of straight or oblique short lines. Many others were rare, occurring only sparingly in one or two layers, or in one area but not the other. It is also clear from the diagrams that comb stamp, either in patterns or as a surface covering decoration, is more common in the upper layers and at lower elevations: in other words during later phases. Another aspect only common in the upper layers is surface covering cord-decoration, reminiscent of textile ceramics found in the Baltic states and Finland at this period (Österholm 1989:98f). That this type of pottery appears in the later Neolithic layers of Gotland had been remarked upon earlier by Hanna Rydh (1937).

It should also be noted that Österholm did discuss the importance of the visual impact of decoration of the viewer, especially regarding the pit impressions, where she also made some important novel observations. Few researchers had done more than to mention the ubiquitous occurrence of pit impressions on the pottery (cf. Bagge & Kjellmark 1939). Österholm actually made note of the fact that there were mainly two types of instruments used in creating the pits at Ajvide: a pointed one resulting in conical pits, and a blunt one resulting in cylindrical pits. Österholm rejects the theory that the pits should be considered a technical feature, meant to create sturdy vessels. This was in part because the practice was discontinued in the Late Neolithic although the same coiling technique was used, and partly because the sherds were often found fractured through the very pits that were supposed to have helped keep the vessel more durable. Instead, Österholm emphasized the visual aspect of the large pits, especially the cylindrical ones which she describes as creating a striking shadow effect (1989:98). While subjective impressions like this are difficult to use as proof, I do believe that she is valid in pointing out the immediate impression the pits make on the observer, even today.

From Österholm’s diagrams it is clear that whereas both conical and cylindrical pits are almost equally common in the lower layers of the older part of the settlement, the cylindrical pits dominate with almost 9:1 in the upper layers (1989:fig 51-52). This is only counting those sherds that were solely decorated with pits, since if the pits were combined with another decoration only the latter was registered. Most sherds large enough to include part of the area above the shoulder had pit decoration.

Österholm combined her style analysis with some scientific analyses. Not microscopy, but TCT (thermal colour test), investigating differences in quality of clay (1989:53, 99, 117). The results are interpreted as three different types of ware in use over time, with the earliest described as the finest, and the youngest as the most coarse. Temper was
registered by visual examination, and crushed stone and sand was more common in the lower layers/upper area, whereas clay tempered with calcareous materials, mainly calcite, was especially common in the later lower area and in the burials (1989:99). The lime rich soil on Gotland made sure that this temper did not disintegrate over time, as occurred on the Swedish mainland.

Combining all the results of the different analyses of pitted-ware, Österholm was able to show that the pottery sherds found in the graves mostly belonged to the youngest phase of the site, in other words that the upper area closest to the cemetery had been mainly abandoned by the time people were buried there (Österholm 1989:99).

**Fagervik Debated**

As rescue archaeology took off on a grand scale in Sweden in the 1970s-80s, Bagge’s Fagervik-typology was commonly in use among archaeologists dealing with pitted-ware. However, few seem to have noted the importance of ware and shape in Bagge’s definitions. Therefore, the uses became mainly concerned with decoration and designs, somewhat less with vessel shape, and only presence or absence of porosity was noted regarding the ceramic ware. It became more of a stylistic typology, rather than the comprehensive understanding of pottery that Bagge had advocated. At the same time as Bagge had analysed and published his research on pitted-ware, additional discoveries, research and excavations by Bagge, Florin and others had led to the realisation that there was an Early Neolithic Funnel Beaker culture phase in Eastern Sweden, not just in Southern and Western Sweden. This resolved some chronological problems, while at the same time creating a whole new set of challenges in understanding the changes taking place in the Neolithic. The relationship between hunter-gatherer Pitted Ware culture and the Funnel Beaker and Battle Axe cultures, was far from resolved. In fact, it would become one of the most heated and controversial archaeological debates of the late twentieth century, and the definitions of the Fagervik sequence played an important part.

In the second half of the 1980s the Neolithic site of Häggsta (Botkyrka parish), Södermanland, situated on a south-western slope, was excavated by the National Heritage Board with what was for Sweden the fairly new method of employing excavation machines. With these large surfaces could be stripped and surveyed for features in order to get a better understanding of the spatial distribution of the whole settlement. Since only some areas were hand dug, a ‘modest’ 121 kg of pottery belonging to both the Early Neolithic Funnel Beaker culture and the Pitted Ware culture was retrieved from the different areas covering approximately 100 x 80 m (Olsson 1996b:19). A large and comprehensive report was published in 1996, which covered several interesting aspects of Neolithic settlements, culture layers and shoreline displacement.

Eva Olsson noted that area II contained c. 4 kg of sparsely decorated pottery with clear funnel-beaker characteristics, similar to that found at Vrå: the site where Early Neolithic Funnel Beaker culture was first recognized in Eastern Central Sweden (Florin 1938). From area III at a slightly lower elevation to the south-west, c. 20 kg of pottery was
retrieved. These vessels had a curved profile, rounded bases, smoothed surface and were decorated with cord, whipped cord and drawn vertical lines on the body. Olsson noted that this pottery is basically identical with Fagervik I as defined by Bagge, which seems to be a correct observation. However, in several parts of the report it is then stated that Fagervik I is *pitted-ware* (Olsson 1996b:6, 25, 61). Olsson claims that Bagge divided pitted-ware into four stages: Fagervik I-IV. This statement is without any support from Bagge’s original Fagervik article. As presented above, Bagge explicitly calls Fagervik I ‘*schnukeramische*’ and openly compares it with the Vrå pottery – funnel-beaker pottery. While he was prepared to see Pitted Ware culture partly as a local development from the regional version on the Funnel Beaker culture, he does not in any part of his analysis consider the first settlement phase at Fagervik to be anything other than Funnel Beaker culture, and the fragmented vessels funnel-beaker pottery. From the photographs included in the publication it is easy to see why.

Olsson writes several other texts stating without explanation that pitted-ware is defined as Fagervik I to IV (Olsson 1996a:46; 1997; Olsson & Edenmo 1997). While she does admit that Fagervik I is very similar to funnel-beaker pottery, she does not in any of the texts explain what she considers to set Fagervik I apart from ‘ordinary’ funnel-beakers. From what I can ascertain, it seems that the justification for a separation are, in the case of Fagervik I: the fairly large amount of decoration and the presence of large pits on some vessels. However, this is only my understanding, in the absence of a published definition. The Fagervik styles are described as basically different types of decoration (Olsson & Edenmo 1997:177f), and only in a subsequent paragraph are some of the differences in vessel shape and ceramic ware discussed. Olsson also states that Fagervik II is often tempered with calcite and bones (ibid: 178). Again, this is something that is in direct contradiction with what Bagge wrote – or anyone else for that matter. Calcareous materials were regularly used only in Fagervik III and IV, whereas Fagervik II is almost exclusively rock tempered ware.

In contrast, Early Neolithic funnel-beaker pottery which Olsson usually refers to as Vrå-pottery to emphasize the Central Eastern Swedish regionality, is understood by her to be sparsely decorated and without large round pits. However, funnel-beaker pottery in Eastern Central Sweden is not always sparsely decorated, and pits do appear even on very early vessels of unmistakeably funnel-beaker shape (Hallgren 2008:chp 8.2). Florin had omitted to mention this in his original texts, but Hulthén & Welinder (1981:127, 130) highlight this fact. Lately, Hallgren (2008) has shown that pit decoration is common from an early stage in Eastern Central Sweden, and also that there is considerable variation in the funnel-beaker pottery craft that seems to be due to kinship based craft traditions, rather than chronological changes. It is highly doubtful that the presence of a pit impression, and the choice of decorating a somewhat larger part of the vessel, should be given priority over shape (funnel-shaped neck, rounded base), surface treatment (smoothed), and application technique (cord and whipped cord), when ascribing pottery to
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a craft tradition. In any case, such a profound change in definition should be systematically presented and argued by the researcher suggesting it.

The biggest problem with Olsson’s decision to define Fagervik I as pitted-ware is that she claims support by other researchers, who have in fact not written anything that can be construed as such, Bagge being just one of them. For instance, she argues that Florin defined Fagervik I as separate from his Vrå-pottery in an article from 1944 (Olsson & Edenmo 1997:169). In this popular text on the prehistory of Södertörn, written seven years before Bagge’s main Fagervik publication, there is little or no specific mention of pottery or styles of any kind. Instead there is only a general mention of finds of different types of pottery-producing settlements and stone tools, at different elevations. In his later key text on the Early Neolithic Funnel Beaker culture of Eastern Central Sweden, Florin in no way suggested that Fagervik I should be considered pitted-ware – quite the opposite (Florin 1958). Olsson also claims that Lili Kaelas in her 1957 article on double-edged battle-axes defines Fagervik I as pitted-ware (Olsson & Edenmo 1997:170). However, in no part of the text does Kaelas refer to anything but Fagervik II-IV as pitted-ware. Her one and only mention of Fagervik I simply states that vertical lines appear on both this type and on Fagervik II (Kaelas 1957:129).

While Olsson has contributed much valuable and important research on Neolithic settlements, her writing on pitted-ware pottery is very problematic – not least because as an experienced excavator and researcher people tend to accept her statements at face value. In particular the large publication on Stone Age remains excavated by the National Heritage Board Regionalt & Interregionalt (Larsson & Olsson 1997) is very much in use due to the valuable presentations of excavations, materials and 14C-datings. In it, Olsson presents 14C-datings that ‘prove’ that Pitted Ware culture existed side by side with Funnel Beaker culture all through the Early Neolithic. This proof is almost completely dependent on the definition of Fagervik I as pitted-ware. If, on the other hand, we accept Bagge’s original definition – supported by Florin and almost everybody else (e.g. Timofeev 2000:216) – then the Early Neolithic dates from area III on Häggsta which contained mostly Fagervik I pottery (a.k.a. funnel-beakers), is nothing to be surprised by.

The fact that pitted-ware pottery is still a poorly understood category of finds, especially among those who have neither the time nor the interest to make a specialised study of it, has contributed to the continued confusion regarding the definition of Pitted Ware culture, its chronology, and especially its relation to other Neolithic cultures. This is one of the reasons why I have chosen to present this extensive history of research of pitted-ware. So much in the study of the Neolithic of Eastern Sweden hinges upon how Pitted Ware culture is defined, not least by field archaeologists who excavate, analyse and publish results, which in turn inform and influence research.

Another archaeologist who has extensive knowledge of both excavations and research is Ann Segerberg. In her dissertation on the Neolithic settlements around Bálinge, Uppland, including the previously mentioned Vadbron, Sotmyra, Persbo and Ytterby, Segerberg (1999) made a special study of Bagge’s method and results. Unlike most who
wrote about pitted-ware previously, she took the time to thoroughly scrutinise Bagge’s notes and tables, as well as reading his text on Fagervik carefully. She drew attention to the fact that for Bagge ware and shape were just as important, or more so, than decoration (1999:chp 5-6). Her dissertation is arguably the most extensive and systematic presentation of the history of research on pitted-ware published in Swedish. As for Bagge’s analysis of Fagervik, she has both praise and criticism. Having studied the pottery herself, she agrees that there are indeed differences in ware between Fagervik I (funnel-beakers) and Fagervik II (early pitted-ware), and that this is probably due to more careful surface treatment on the former (1999:80).

From her own studies of spatial distribution of pottery on Neolithic sites in Uppland, including those around Bälinge bogs, and at Torslunda and Tibble, Segerberg is of the opinion that although there are still important issues relating to Fagervik I and IV that need to be clarified, Fagervik III/IV are repeatedly found to be later than Fagervik I/II (1999:80-82). Segerberg analysed old and newly excavated pottery material from Persbo, Sotmyra, Vadbron I-II, and Ytterby in the Bälinge area. All these sites have pottery of a type most closely resembling Fagervik II, with bell-shaped/curved profiles, dense ware (98.5-100%), and decoration dominated by drawn lines, vertical patterns, large crosshatching and various types of single stamp incisions creating horizontal fields, as well as some cases of comb stamp (Segerberg 1999:89-97, fig 55). Close to Persbo lies the Skinnarbacken settlement, which is only excavated to a small degree, but is interesting as a comparison since its lowest elevation is almost three metres below that of Persbo. At Skinnarbacken the pottery is 71% poriferous, the decoration is dominated by comb stamp and herringbone pattern, and vertical patterns are absent (1999:91,98).

In her analysis of the pottery, Segerberg spent less time on complex typologies and particulars. Instead, her fairly simple but straightforward tables presented number of sherds with different types of decoration. They were first sorted according to technique: A) drawn lines, B) single stamps, C) toothed stamps, D) cord stamp; then according to patterns: horizontal, vertical, fir-twig, herringbone etc. The method was chosen based on the questions Segerberg asked as part of her project in relation to the history of research and the specific problems she had chosen to focus on, as well as having a usable method for the often bulky quantities she had at her disposal. Her method is not as detailed as those of Löfstrand, Welinder and Österholm, but it has the undoubted advantage of being both lucid and practical, and in my opinion quite suitable for the material at hand. Segerberg’s dissertation also included additional technological analysis of the pottery through thin section microscopy, which will be further discussed in chapter 7.1.

Few foreign archaeologists have made a study of the Swedish Pitted Ware culture. A prominent exception is Vladimir Timofeev, who has visited many museum collections in Sweden, and studied the pottery in relation to his own extended knowledge of Neolithic traditions in Finland, Russia and the Baltic states. Timofeev argues that rims with thickened edges angled inwards, are a typical Finnish/Baltic trait signifying an eastern influence on pitted-ware in Eastern Central Sweden (Fig 4.13:a-b) (Timofeev 2000). He
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has noted the appearance of this type of rim on pitted-ware pottery in Sweden, though almost exclusively in the northern part of the Pitted Ware culture area in Eastern Sweden, being virtually non-existent in southern Sweden (e.g. Siretorp), or on the West coast Middle Neolithic sites (2000:212f). This trait appears to some extent on Early Neolithic funnel-beakers in Eastern Central Sweden as well. Initially it was only as a very small percentage of the material, though at the latter part of the Early Neolithic it becomes more common. At the Funnel Beaker sites of Malmahed, Hjulberga, Mogetorp, Östra Vrå, Brokvarn and Nyskottet only a few rim sherds belonged to this type. At Fagervik, the rim type is mostly absent from the uppermost area with Fagervik I phase pottery (funnel-beakers). However by 29.5 m.a.s.l. they do appear in c. 20% of the Fagervik I rim sherds. Timofeev also found the rim type on between 20-27% of the Fagervik II sherds, increasing at the lower elevations. At Säter II, with some funnel-beakers and mostly Fagervik II type pottery, c. 21% of the rims are of this ‘eastern’ type (2000:214f). On the northern Pitted Ware sites of Östra Mårtsbo and Västra Mårtsbo in Gästrikland, with Fagervik II pottery, over 50% of the rims are variations of this type (2000:212). From Welinder’s presentation of Överåda, it is clear that this type of rim is fairly common at that site as well. The rims grouped under the code ‘Mas’ (asymmetric profile), constitutes 48% of the rims, and most of the types included in this group are thick rims angled inwards (Welinder 1970:fig 14, tab 8). From the illustrations it is clear that the same type of rim appears on the Fagervik II type pottery at Postboda 1 in Uppland (Sundström et al. 2006:fig 171).

Another peculiarity found on pitted-ware in Eastern Central Sweden that Timofeev remarked on, are pit impressions arranged in a ‘chess manner’ (Fig 4.13) (2000:212). On most vessels pits are placed straight below each other. Shifting the rows of pits in relation to each other to form a kind of angular pattern is not found on funnel-beakers, and only occasionally on pitted ware. However, actively using pits to form more geometrical patterns is fairly common on Neolithic comb-ware and pit-and-comb-ware in the East Baltic. Timofeev found several sherds with the at Mårtsbo (Gästrikland) and Fagervik (Östergötland). From what I have seen, it also appears on pottery from Vadbron II, Sotmyra, Postboda 1 and 2, Högmosen (Uppland), and Lötvreten (Gästrikland). It seems to be rare or non-existent in Southern Sweden, however (see discussion about Jonstorp MH below). Timofeev stipulated that these traits taken together – the rim shape and pit pattern – show that pottery traditions in Eastern Central Sweden were directly influenced by the Comb Ware culture, and that pitted-ware should be understood as a form of hybrid between funnel-beakers and comb-ware (2000:218f).
Pitted-ware Pottery in the 21st Century: style and technology

A substantial work on Pitted Ware culture published in later years is Ludvig Papmehl-Dufay’s dissertation, which focuses on pitted-ware pottery on Öland. The thesis combines a multitude of methods, from registration of decoration, wall thickness, and rim diameter, to lipid analysis and thin section microscopy with the aid of Sven Isaksson and Ole Stilborg. Another positive aspect is that Papmehl-Dufay also includes an appendix of illustrated vessel reconstructions, presenting a visual overview of the similarities and variations in the material from the two sites: KÖPINGSVIK (Köping parish) and OTTENBY (Ås parish). All in all, 220 kg of pottery has been retrieved at Köpingsvik, a large Pitted Ware settlement/cemetery, and 24.5 kg at Ottenby, which has been subjected only to a small-scale research excavation (Papmehl-Dufay 2006:166, 178). In an attempt to deal effectively with the multitude of patterns and decorative elements present in the material at his disposal, Papmehl-Dufay chose to analyse c. 18 kg from Köpingsvik and c. 23 kg from Ottenby more meticulously. He registered each sherd according to which part of the vessel it belongs to: rim, neck, shoulder, body or base. He notes mean weight, mean wall
thickness, and percentage of the sherds which had decoration and pits. He also notes percentage of comb stamp and line stamp respectively, and type of base, shoulder, body and neck. He separates line decoration into drawn lines and line stamps, differentiating between them with the help of magnification (2006:159). While this might seem excessively thorough, he does show that in his assemblages line stamp is the rule, and that drawing a line is practically absent. It could be rewarding to make comparative studies of pottery from other periods or regions.

As Papmehl-Dufay himself writes, he started his project with the hypothesis that Öland as a comparatively large island might have functioned as a separate social unit during the Middle Neolithic, not unlike Gotland. However, in an excellent example of a researcher allowing results from his own analysis to contradict his stated objective, he found quite the opposite. As noted above, Bagge had previously pointed out the apparent differences between pitted-ware in south-eastern Sweden and Eastern Central Sweden respectively, with a change taking place somewhere around the area of Oskarshamn in Småland, which is situated on the mainland east of northern Öland (Bagge & Kjellmark 1939:175). Papmehl-Dufay’s results not only confirm this impression, but also significantly strengthen the model.

Since Papmehl-Dufay’s analysis is so extensive, and being written in English is also generally accessible to non-Scandinavians, I will only present a selection of his results that are especially noteworthy with regard to my own discussion. The Köpingsvik site has been radiocarbon dated through human bones found in several different burials. The results indicate that there are older Mesolithic burials present, partly destroyed, in addition to the Middle Neolithic ones (see also Eriksson et al. 2008). In the latter case there are a few graves dated to the start of the Middle Neolithic A but most of them are dated to the end of the period, around 3100-2800 BC, corrected for a reservoir effect of 70±40 years (Papmehl-Dufay 2006:112f). Ottenby has been radiocarbon dated using organic remains on a sherd and a carbonised hazel nut shell, and the result for both was c. 3000-2900 BC. Thus, in an archaeological sense the sites are basically contemporary. It could be argued that Köpingsvik may be older than Ottenby since the pottery assemblage can belong to a phase before the burials were constructed. Based on the radiocarbon dates it is at least unlikely that Ottenby is older than Köpingsvik. This is important to keep in mind when comparing the results from the two sites.

The most common type of vessel is the ‘classic’ pitted-ware vessel with carinated shoulder, slightly concave neck and pointed base. The edges of the rims are most often rounded, though broader flat rims are also common. The similarities in types of vessel shapes present in the assemblages at Köpingsvik and Ottenby are notable. The average occurrence of rim shape, neck shape and shoulder shape are virtually identical at the two sites. One small difference is that flattened rims angled inwards are present (5%) at Köpingsvik, but completely absent at Ottenby. The other difference is that the lower body of the vessels at Köpingsvik are more prone to being slightly rounded, whereas the Ottenby vessels are almost always cone-shaped.
There are similarities in the extent of decoration also, and at both sites c. 85% of sherds from the upper part of the vessels are decorated, whereas slightly less than half of the body sherds beneath the shoulder have decoration. All in all, some 50% of the sherds from both sites have evidence of decoration, and a third of the total sherds found at both Köpingsvik and Ottenby have pit decoration. However, it is in the area of decoration that the differences also become especially apparent. Firstly, it is far more common for rims to be decorated at Köpingsvik than at Ottenby. It is usually the flat rims have decoration and twice as many of these are decorated at Köpingsvik compared to Ottenby, despite the fact that the average number of flat rims in the assemblages is virtually the same. Of the rounded rims, only 9% are decorated at Ottenby, compared to 24% at Köpingsvik. As a side note, in the Early Neolithic decorated rims are more common on funnel-beakers from Eastern Central Sweden than on the same types of vessels in Southern Sweden (Hallgren 2008:chp 8). I would argue that the high frequency of rim decoration at Ottenby is due to the increased influence of northern and eastern pottery traditions in the coastal regions of Southern Sweden at this time.

In Papmehl-Dufay’s published material, I have seen no instances of Timofeev’s ‘chess mannered pits’, with the possible exception of one vessel from Ottenby. However, on this vessel, both the pits and the rows of pits are very close together, forming a band pattern of pit impressions. This pattern is also found on some sherds from Siretorp in Blekinge (Bagge & Kjellmark 1939:Pl. 31:4, 38:4), and it is quite common at Jonstorp in northwestern Skåne (Lidén 1940:fig 63; Malmer 1969:60ff). Most are made with fairly shallow pit impressions, others with a pointed sea shell impression. Pottery from the Pitted Ware site of Kainsbakke, Jutland have this type of pattern as well (Wincenz Rasmussen 1993:114). Another vessel with band pattern was found at the Alvastra pile-dwelling in Östergötland, dated to the beginning of the Middle Neolithic A. The timber structure which was built in the bog contains mainly pitted-ware pottery, but also some sherds from megalithic funnel-beaker vessels found by the foot-bridge leading up to the pile-dwelling (Hulthén 1998; Malmer 2002:fig 24:1; Hulthén 2008a:31). These decorations are often referred to as ‘complex pit-patterns’, and similar ones are found on megalithic funnel-beakers as well. The Ottenby vessel should be considered part of this general southern decorative tradition of the Middle Neolithic A, rather than as an example of an eastern influence, as is probably the case with the Mårtsbo and Fagervik vessels.

One of the biggest differences between the southern site of Ottenby and the northern site of Köpingsvik, is that at the former 61% of the decorations were made with line stamp, as compared to only 38% at the latter site. The reverse is true of comb stamp decoration: At Köpingsvik, 47% of the decorations were made with comb stamp, compared to half that (23%) at Ottenby. The pit decorations are another interesting difference. At Köpingsvik, 99% were so-called cylindrical pits, applied with a circular tool. However, at Ottenby only half the pits were made in this way. The rest had a more irregular oval/angular shape. As Papmehl-Dufay points out this is a fairly common trait of
pitted-ware in Skåne and Blekinge in Southern Sweden, as initially noted by Bagge (Bagge & Kjellmark 1939; Papmehl-Dufay 2006:190).

The pottery from the southern site of Ottenby more closely resembles contemporary assemblages found at Siretorp and Björkärr, west of Öland, rather than the pottery from Köpingsvik on northern Öland. The Ottenby pottery is dominated by line stamp decoration, has irregular pits, and several patterns found primarily in Skåne-Blekinge. Köpingsvik does not diverge significantly from what is considered typical pitted-ware in Eastern Central Sweden: it is dominated by comb stamp decoration, and has almost exclusively rounded pits. The frequency of comb stamp on vessels may be partly a chronological issue, but if the two sites are not contemporary it is more likely that Ottenby is actually the later one, in which case this cannot explain the discrepancy. This confirms Bagge’s old hypothesis that there is a sub-regional division in the pitted-ware material between a northern and southern group (Bagge 1941:42f). He noted that despite clear similarities in the pottery material at Humlekärinhult and Vivastemåla some 40 km to the north, comb stamp (55%) and poriferous ware (23%) were far more common at the latter site than at the former. He also noted that Humlekärnhult pottery was very similar to that of Siretorp. A loose border between the pottery networks seems to exist around the region of Oskarshamn. While the potters to the south are very influenced by Pitted Ware culture visually, and as we shall see also in social practices connected with pottery, they retain some specific preferences based on their own previously established craft traditions.

As we shall see in chapter 7, there is much more to be learnt about pitted-ware from the choices of clay and temper, in terms of regional, sub-regional, and local similarities and differences in the craft traditions. Depending on choice of focus, there are several different levels of the social structure of pottery craft in the Pitted Ware culture, indicating that the potters were controlled more by a general idea of how a vessel should look, and less by a formalized chaîne opératoire.
If the history of research on pitted-ware is a mass of confusing terms and competing typologies, the research on Swedish battle-axe pottery seems quite straightforward by contrast. A few major publications have defined the types and their general sequence, and there has been little need to revisit or challenge the basic premises presented in these. However, there are occasionally still misunderstandings among archaeologists today, especially regarding the question of whether battle-axe beakers occur solely in mortuary contexts. They are in fact just as common on settlements, and there are additional types of household vessels that are not used as burial gifts.

Although battle-axe pottery lends itself to a very strict typology, researchers must still make priorities based on preconceptions about what style is and how it relates to culture. Chapter 5.1 presents the defining works of Swedish battle-axe pottery, noting the often repeated desire for objectivity among the authors. Most attention is of course given to Mats P Malmer’s groups. They are still in use today, having withstood the test of time like few other typologies of prehistoric artefacts. There are several interesting aspects about his construction of the pottery groups that need to be reviewed, not least his insistence on a strict centre to periphery spread of innovations in design. I will try to show how there are other potentially informative aspects of the battle-axe pottery, concealed behind the ones he chose to give priority to. This is hardly surprising, as any categorisation of traits must give preference to some at the expense of others. However, it is valuable to remind ourselves of the fact that even the best typology hides almost as much as it reveals.

Chapter 5.2 presents a discussion on the battle-axe pottery groups, especially the early types, the chronological sequence and some types of household pottery that are far too often overlooked by archaeologists.
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5.1 Styles, Types and Chronology: A History of Research

The research on the Scandinavian versions of the Corded Ware culture is often split between battle axes and pottery respectively. Whereas pottery is the most common and defining artefact category on the continent, in South Scandinavia battle axes have historically had the more dominant position in research. This is partly because they were manufactured in great quantities in the region, and apparently play a much more central role in these communities, and partly due to purely taphonomic reasons: they are better preserved and more easily found than the fragile ceramics. That prestige weapons by their very nature often seem to attract much interest among archaeologists in general is perhaps another contributing factor.

Whereas battle axes were identified as a prehistoric category as early as 1836 by C. J. Thomsen, it took until 1860 for a battle-axe vessel to be described in print for the first time, by Nils Bruzelius (Malmer 1962:3; 1975:11). This was a pot from Vellinge (Skåne), with vertical fields of oblique lines applied by tooth stamp (Frödin 1916; Montelius 1994 [1917]:fig. 773). It would later be determined to be almost Late Neolithic in date, and not particularly similar to either continental corded-ware beakers or Swedish battle-axe beakers. Sophus Müller’s groundbreaking monograph in 1899, which defined the Single Grave culture on Jutland, identified a change over time from cord decorated beakers to vessels decorated with comb stamp (Müller 1899; Malmer 1975:11). In Sweden, however, this cord decorated phase would not be recognised until 1920.

Little research focused on the pottery until John-Elof Forssander’s dissertation in 1933, and then not again until Malmer’s dissertation in 1962. To be fair, only small quantities of pottery had been found in Sweden before the 1930s, compared to the multitude of well preserved battle axes. Even so, these vessels which were discovered at an early date were quickly associated with boat-shaped battle axes and with single burials (Arne 1909), but they were also erroneously connected with the continental Linear Band pottery. This is not surprising, as the LBK pottery has similar spherical shapes, with little or no visible temper. Therefore, up until the early 1920s the battle-axe pottery was often referred to as Swedish band-pottery (bandkeramik).

Another reason for this confusion was the fact that the vessels which were found during this period mainly belonged to the later types, with patterns of angular bands and lines executed with tooth stamp and whipped cord. The cord patterns of corded-ware beakers found in Finland, on Jutland, and on the continent were absent from the Swedish material. However, these angular band decorated vessels were still seen early on as a regional version of the later Corded Ware pottery occurring in Denmark, Germany, Poland etc. (Almgren 1912; 1914; Frödin 1916; Åberg 1916; 1918; Ekholm 1920; 1921). Nils Åberg was among the first to dispute a direct relationship between band pottery and battle-axe pottery, although he did feel there might be an indirect one. Instead he argued...
for an association with the bowls of the Schönfelder pottery, as suggested by the base design found on those types (1916; 1918). He postulated that the vessels representing the earliest types of battle-axe pottery had broad, flat bases and an only slightly convex body, as represented by a vessel from Augerum, Blekinge. These bowl-like pots were to have developed into more curved shapes over time, resulting in the typically spherical shape of the Swedish battle-axe beakers.

By the start of the 1920s it had become clear to archaeologists that the LBK constituted an earlier separate phase, and that there might not be any connection at all between this and battle-axe pottery. Just as importantly, by now the first cord decorated battle-axe beakers had been found in Sweden. The first of these finds was the burial remains retrieved at Sösdala (N. Mellby parish), Skåne. These included an early type of battle axe (which Malmer later designated as type C:1a), and a spherical beaker with a diminutive base and sparse ornamentation on the upper part comprising horizontal cord lines with a slightly wavy cord line beneath (Ekholm 1920; 1921) (Fig 5.1). Ekholm immediately drew attention to the similarity of this vessel with the one previously found at Piirtola (Ilmola parish), Pohjanmaa in Finland (Fig 5.2). He then suggested a three phase typology of the Swedish Battle Axe culture comparable to the three phase Danish Single Grave chronology developed by Müller (1899).

Fig. 5.1. Cord decorated beaker from Sösdala in northern Skåne. Probably from a burial, found with a battle axe (Malmer’s type C:1a) and a thick-butted groundstone axe (Forssander 1933:taf 7).
The Sösdala find showed that there was a clear link between the continental Corded Ware culture and the Swedish Battle Axe culture – and also between corded-ware in Finland and that of Sweden - in terms of vessel shape. However, researchers were to differ widely in their interpretation of this link.

**Forssander: style and stratigraphy**

John-Elof Forssander's dissertation published in 1933 was to be the most comprehensive presentation of the Swedish Battle Axe culture material for almost two decades. His aim was not solely to arrive at a better understanding of the 'Boat Axe culture', but also to criticize the way typology was used to order and date objects according to a basically intuitive and subjective method. Initially, Montelius had used stratigraphic evidence as a starting point for his chronological models, and typology as a means of studying the gradual changes taking place over time, in order to arrive at a more detailed picture. As the method of typology gained prominence in the archaeological community, evolving into an almost biological theory of development, stratigraphic evidence was often dispensed with (Althin 1944; Gräslund 1974).

Forssander, however, felt that objects could not be ordered according to typological development without first taking stratigraphy into consideration, which he felt was a more scientific approach. His stratigraphic analysis still relied to a considerable degree on visual similarities with burial finds from Jutland, Germany and Poland. On the basis of his reinterpretation of the objects found together in Battle Axe culture burials, he criticised both Åberg’s and Ekholm’s chronologies (e.g. Forssander 1933:35f, 64f). Indeed, the theoretical divide between Forssander and Åberg is clear in the latter's review of the dissertation: Åberg notes that Forssander primarily uses the continental archaeological
material for chronological purposes, without reflecting too much on similarities or dissimilarities of decorations and patterns (Åberg 1933:382). In Åberg’s view this is a weakness. For Forssander, this was the main point of the analysis.

Forssander formulated three main styles based on vessel shape and decoration (1933:18-20, 35f, 44-49, 74-80):

I: Spherical/rounded vessel, with marked diminutive base. Sparsely decorated.
   • Ia: The upper part is decorated with horizontal rows of cord impression, often ending with a wavy cord line. Some with base decorations in radial pattern or concentric circles.
   • Ib: Cord/Tooth stamp. Same general patterns as style Ia, except that the wavy line has now changed into a broad angular band, as has the base decoration.

II: Vessels with rounded bases, completely decorated with broad angular bands in tooth stamp.

III: Vessels with round or large flat bases. Covered in angular lines or oblique short lines, occasionally separated by vertical lines.

Forssander believed that the Corded Ware culture originally evolved in the German region of Sachsen-Thüringen, from which impulses (ideas as much as people) spread westwards to Jutland, and eastwards to Poland respectively. Based to a great degree on the visual appearance and shape of the early pottery, Forssander then traced the origin of the Swedish Battle Axe culture (style Ia) to the Preussian region in northern Poland, more specifically to the area by the lower Wisła (1933:184-189). However, style Ib, II and III were in his opinion basically an autonomous internal development, the angular bands having evolved out of the wavy cord line by the rim and the radial base decoration (1933:76-83).

The three styles of Forssander continued to be used by Swedish archaeologists for three decades, until the publication of Malmer’s dissertation.

**Malmer: empiricism and objectivity**

In 1962, Mats Malmer published his dissertation on the Swedish-Norwegian Battle Axe culture. To this day, the 959 page tome is still the definitive work on the culture and the material objects associated with it, although its sheer size and the fact that it is written in German has meant that few have taken the time to read the full text. The publication in 1975 of a shorter Swedish version of the main conclusions has proven to be a sufficient overview in most cases. An even more condensed English version has also been in print since 2002. However, these later publications lack most of the discussions, arguments and background. While Malmer’s aim in the dissertation was to present a comprehensive analysis of this late Neolithic period, the larger goal was to set out a new and more
scientific archaeology. Vague definitions and intuitive types were to be abolished, while only that which could be described and measured should be taken into account when defining types. This would not only have the effect of elevating archaeology as a discipline, but could also facilitate communication and information exchange between researchers.

While almost every aspect of Battle Axe culture is analysed and described by Malmer - from chronology, to tools, weapons, and jewellery in stone/flint/bone, to burial constructions and practices, to settlement remains and economy - the very first chapter is devoted to pottery. Indeed, the definitions of types, styles and chronology of the ceramics form the foundation for most of the succeeding discussion about general chronology, distribution, settlement patterns and cultural change. The groups and sub-groups of pottery that Malmer identified are still in use among archaeologists today, although there are occasionally misconceptions both about the definitions and whether or not he divided the vessels into burial and settlement pottery respectively. It is therefore important to quickly run through the groups in order to discuss the criteria Malmer chose as the most important, what he chose not to take into consideration, and which issues arise from his definitions.

One important thing to note is that Malmer did not consider the shape of vessel, rim or neck, or the overall size of the vessel, to be of particular importance when defining groups, or even sub-groups. The only exception to this was the shape of the base. He especially noted if the beaker had a diminutive base, which he defined as having a marked edge and a diameter less than 25% of the vessel's greatest width (1962:8; 1975:17). He did measure the ratio between height and largest body diameter, but this did not factor in when defining the groups: it only acted as a comparison of vessel index within and between each group (Malmer 1962:57ff; 1975:16f). See below for further discussion.

Malmer felt that Forssander’s pottery types were too broadly and arbitrarily defined, though he was certainly influenced by the earlier work in viewing the shape and decoration of the base as an important defining principle. P. V. Glob's meticulous publication of the Danish Single Grave culture in 1945 probably influenced Malmer as well. Still, Glob had some fairly vaguely defined criteria for his many pottery types, and Malmer therefore developed his own, which are not comparable with the Danish ones. All in all, Malmer defined 14 pottery groups (A-H, J-O), with various sub-groups. Sherds that were difficult to assign to a sub-group, or even to just one group, were referred to as adF, or adFG, as suggested by Glob (Glob 1945:269; Malmer 1962:11). One of the groups defined by Malmer (C), turned out on closer contextual study to be Late Neolithic (1962:138f; 1975:26). Since Malmer kept including this type in his publications (1975; 2002), even though he himself stated it really belonged to the succeeding period, he helped fuel some confusion on this matter among archaeologists who did not take the time to read the full text. I will try to avoid this by not including any description of group C here, which will instead be discussed in chapter 11.2 in relation to other cord decorated vessels from the transition between the Middle and Late Neolithic.
MALMER’S POTTERY GROUPS (Malmer 1962; 1975; 2002)

GROUP A: Cord decorated, no tooth stamp. Diminutive base, which may be decorated or undecorated. (Fig 5.3:a-c)

A:1 – Horizontal cord lines below the rim, below which there can be a wavy line applied by cord (not necessary).

A:2 – Horizontal cord lines below the rim, beneath which there is either a fringe of vertical nail impressions, or a row of small dot impressions.

COMMENT: The main difference between A:1 and A:2 is that the former is only decorated with cord, whereas the latter has cord combined with other incisions, though not comb or tooth stamp. For instance, a vessel from Traryd parish in Småland with wavy cord line crossed by vertical nail impressions is designated as belonging to subgroup A:2 (1962:fig 1:2). This vessel is in fact chosen to represent group A:2 in Jungneolithische Studien, and since it is also larger and slimmer than the one representing group A:1, it is easy to be misled into thinking that shape is a factor – which it is not. Since neither has any base decoration, it is also important to note that some vessels belonging to group A do have base decoration (Fig 5.3:c). A:1 and A:2 can also be divided into three ‘variants’ (1962:10). Variant 1: Wavy line beneath the horizontal rows of cord lines, no base decoration; Variant 2: No wavy line, no base decoration; Variant 3: Decorated base. Few archaeologists, if any, use these variants today.

GROUP B: Cord and stamp decoration. Diminutive base, which is usually decorated, at least on the ones preserved enough to tell. (Fig 5.3:d-e)

B:1 – Horizontal cord lines below the rim, beneath which there is a garland, a wavy band, applied with some type of stamp.

B:2 – Horizontal bands below the rim, made by short vertical incisions or stamps. Beneath which there is a garland made with stamp impressions.

COMMENT: The difference between the subgroups lies in the fact that B:1 has cord decoration combined with stamp decoration, whereas B:2 has no cord decoration. In terms of patterns, there is very little difference between group A and B, and the difference between group A:2 and B:1 can seem rather arbitrary. It should also be noted that in 1962, only two examples of type B:2 were known, one from Ringsjön (Skåne) and one from Østfold, Norway.
GROUP C: A group of cord-decorated vessels which were originally included in Malmer’s analysis. However, as the study was completed, Malmer realized there were many differences between this group and group A/B, and also that there was no apparent chronological continuity between them. Rather, these vessels mostly occur in Late Neolithic contexts and subsequent studies have confirmed that this is in fact Late Neolithic pottery — not battle-axe pottery. See chapter 11.2 for further discussion.

GROUP D: Decorated with horizontal rows of short vertical incisions. Mostly with diminutive base. (Fig 5.4:a-c)

D:1 – Area beneath rim decorated only with horizontal rows of short vertical incisions.

D:2 – Beneath the horizontal rows of vertical incisions there are also rectangular zones created by the same vertical incisions separated by non-decorated areas. On some there might also be a garland beneath the rectangular area.

COMMENT: This group is not represented by many finds. However, it seems to be more common on settlement sites than in burials, which means it is mostly found in fragments where the shape of the base is not always easy to determine. Most seem to have diminutive bases, but there are exceptions (e.g. Vallby, Närke). Also, it might be difficult to distinguish between small fragments of type B and D (and M).

GROUP E: Parallel horizontal rows of small dot incisions. Mostly with diminutive base. (Fig 5.4:d-e)

E:1 – One or more horizontal moulded cordons, with parallel rows of dots above and below each cordon (‘double-dotted cordons’).

E:2 – Horizontal rows of dot incisions, often in parallel rows, but no cordons.

COMMENT: The decoration is only found on the upper half of the vessels, and there does not seem to be any base decoration. Some of these vessels do have a diminutive base, but no base decoration is attested. Malmer specifically mentions that this group deviates in terms of surface treatment from other battle-axe beakers in that the surface is not as smooth and often seems to have been brushed with a bundle of grass when the clay was
still wet (1962:17). Again, the illustrations chosen by Malmer can give the impression that
the difference between sub-groups is also one of size. This is not the case, but it is
important to note that group E vessels are occasionally decidedly larger than the small
spherical beakers normally associated with Battle Axe culture.

Fig 5.4. Group D and E, note that the size and shape of the vessels play no part in the
definition. Both types, but especially group E, occur more often in settlement layers than as

**GROUP F**: Vessels decorated with large angular bands both on the upper part, and on the
lower above the base. There is an undecorated horizontal zone found between these
upper and lower angular bands. (Fig 5.5:a-c)
- F:1 – Diminutive base
- F:2 – Flat, non-diminutive base
- F:3 – Rounded base

COMMENT: Application technique plays no part in the definitions, but most within the
F group are decorated with cord stamp, and some with tooth stamp (1962:24). The
defining aspect of the sub-groups is the shape of the base.

**GROUP G**: Completely decorated vessels. Angular horizontal bands, no loose chevrons.
(Fig 5.5:d-f)
- G:1 – Diminutive base.
- G:2 – Flat, non-diminutive base
- G:3 – Round base, with clearly separate base decoration
- G:4 – Round base, no separate base decoration

COMMENT: There are also some small bowls belonging to this group. Group G is very
similar to group F, with the exception that within group G there is no empty undecorated
zone. Some are decorated with cord stamp, but most are decorated with tooth stamp.
Sub-group G:1 with diminutive base is rare, and sub-group G:3 with rounded base is the
one most commonly found. This is the last group that includes vessels with diminutive
bases.
Fig. 5.5. Group F and G are decorated with cord stamp or tooth stamp, the former being very common on the F-beakers. The groups are divided into sub-groups based on the shape of the base (diminutive, flat, round). a-b: F:1, c: F:3, d: G:1, e: G:2, f: G:3 (Malmer 1962:figs 11-12).

**GROUP H**: Angular bands combined with loose chevrons, or just chevrons, covering the whole vessel body. (Fig 5.6a-b)
- H:1 – Flat, non-diminutive base
- H:2 – Round base, with clearly separate base decoration
- H:3 – Round base, no separate base decoration

COMMENT: Cord stamp is very rare, almost all are decorated with tooth stamp. When Malmer wrote his dissertation, no examples of group H had been found north of Östergötland. However, there are now finds of group H in Eastern Central Sweden (e.g. Artursson 1996b; Hallgren 2000b). In fragmented settlement materials it is often difficult to distinguish between G and H, and these are referred to as adGH in reports, or as adFGH.

There is no group I. To avoid confusion, Malmer chose not to use this letter since Forssander used roman numerals to designate his groups (I, II, III).

**GROUP J**: Completely decorated with angular/oblique lines. (Fig 5.6c-f)
- J:1 – Flat, non-diminutive base
- J:2 – Round base, with clearly separate base decoration
- J:3 – Round base, no separate base decoration
COMMENT: This is a rather heterogeneous group, and Malmer may have lost a bit of the zeal he had displayed in the definitions of the earlier types. Some vessels assigned to this group have long angular lines running between base to neck (variant 2). Others have shorter oblique lines creating horizontal angular lines around the vessel (variant 1). Malmer also included a number of vessels where the decoration was delineated into vertical zones (variant 3) (1962:32). Few archaeologists make use of the variants when identifying pottery group today, indeed Malmer barely mentions these in his publications after the thesis. It is noteworthy that cord stamp is as common as tooth stamp in this group, and some have horizontal cord lines beneath the rim as well.

Fig. 5.6. Group H and J which are sub-grouped based on the shape of the base and whether or not the base pattern is clearly separate from the body decoration. a: H:2, b: H:3, c: J:2, d-e: J:3, f: J:1 (Malmer 1962:figs 14-15).

GROUP K: Horizontal rows of short oblique lines. (Fig 5.7:a-b)
K:1 – Flat, non-diminutive base
K:2 – Round base, with clearly separate base decoration
COMMENT: A common trait within this group is decoration on the inside of the rim. This occurs in some other groups also, but not as often. On a few the pattern is zonal, with the oblique strokes separated by horizontal lines. Cord stamp is the most common technique, but both tooth stamp and incisions are used as well.

GROUP L: Horizontal lines, incised or by stamp. (Fig 5.7:e-d)
L:1 – Flat, non-diminutive base
L:2 – Round base, with or without clearly separate base decoration
COMMENT: Some have zones of three or more lines grouped together, separated by non-decorated zones. Others are completely covered in horizontal lines. This group is not particularly common, only four were identified by Malmer in 1962: one was decorated with cord stamp, two with tooth stamp, and one with incised lines (1962:34).

GROUP M: Horizontal rows of vertical nail incisions, ordered in pairs (Fig. 5.7:e).
GROUP N: Undecorated vessels

GROUP O: Not really a group, but the category for the small number of vessels with decorations that did not quite fit into any other group. Within this group is a vessel from a burial in Täby, Öja parish, Södermanland, decorated with a row of large pit impressions. This vessel is discussed in chapter 11.2.

In single and double burials, A and B are combined with each other or with D, but no other types. Groups G, H and J are combined with each other, or with L or N. Group F is almost always only combined with other vessels of group F – the only exception known to me is a multiple burial at Järrestad, Skåne (Brorsson 2003, see chapter 8.1). Groups E and M are only rarely found in burials, and in those cases mostly as sherds in the filling above a single grave, or in a passage tomb.

Malmer did not suggest that his groups represented one single uniform line of development from A to N. Some were definitely in production simultaneously, and some seem to have been quite rare. Also, a new type did not automatically mean that the old type was taken out of production. Instead, they could both be in use for a generation or more. The major groups that did form a sequence of events in Malmer’s opinion, albeit slightly overlapping, are A, B, G, H, J (Fig 5.8). Apart from the fact that one group did not go out of production upon the appearance of another, Malmer also felt he had identified regional differences. This was particularly apparent in group F, which has a decorative composition similar to that on group A and B, but with large angular bands made in cord and tooth stamp instead, similar to that found on group G. Forssander had
designated this as type Ib, the link between I and II, but Malmer felt that F should not be understood as the link between B and G.

Fig. 5.8. Pottery chronology according to Malmer, including an hypothetical assessment of amount of production for each region over time. 1: Eastern Central Sweden; 2: Götaland = Östergötland, Småland and Western Sweden; 3: Southern Sweden. Malmer suggested that the greater amount of A- and F-pottery in regions north of Skåne-Blekinge was the result of more conservative attitudes in peripheral communities (after Malmer 1962:fig 33).

Malmer’s reasoning for this lies solely in its distribution: Group F is rare in Southern Sweden (Skåne-Blekinge), but not in the other regions. By comparison, group G is well represented in Southern Sweden. Since Malmer explicitly stated that his cultural model called for the introduction and spread of Battle Axe culture in Sweden to have been initiated in Skåne, and that all succeeding innovations must also originate in Skåne, this scarcity of group F in the region was a problem. His solution was to stipulate that group G was the first fully autonomously developed pottery style of Sweden, following directly after group B. This innovation was so radical, Malmer felt, that it was not immediately accepted in more ‘provincial’ parts of the Battle Axe society. Instead, a compromise was reached where the old composition of the AB-vessels was blended with the new angular bands made with cord stamp and tooth stamp, to form group F. Malmer’s reasoning is interesting because he uses a very subjective argument to make his case: artistically evolved types were not created through a mechanical process of gradual change. Rather, they are the result of innovation by remarkable and extraordinary (Scanian) artists, who created freely based on their own experience (1975:24). This is the only instance where Malmer argues for a sudden radical change in the pottery craft. Other aspects, such as the
shape of the base, are very clearly described as a gradual change proven by statistics. I will return to the ‘problem’ with group F in chapter 8.

It is very important to realize that Malmer did not suggest that battle-axe beakers are solely, or even primarily, burial pottery. There are two main reasons why many later archaeologists have mistakenly believed Malmer suggested that there was a dichotomy. Firstly, Malmer had noted that group E did not normally occur in the burials, but mainly as sherds in the filling of burials, and in settlement layers. He also noted that this group often had coarser ware and a rougher surface treatment (1962:19; 1975:27, 31f). Therefore, he did suggest that there was one or more groups of pottery that represented a wholly domestic ware. The second reason is purely a result of his method of constructing a chronological sequence. To this end he devoted a lot of his attention to the vessels found in burials since these pots were often particularly well preserved and therefore possible to reconstruct completely. Also, it is not uncommon for a burial to contain two vessels belonging to different groups which meant that a seriation of both vessels, and through them battle axes, could be undertaken. Seriation of the beakers and the battle axes formed the basis for Malmer’s internal chronology of the Battle Axe culture (1962:42). It should be noted that Malmer also demonstrated that most of his pottery groups occurred as regularly in settlement layers as in burials (1962:38, tab. 4).

Malmer used two other measurement criteria when discussing battle-axe pottery. The first was vessel index: Greatest diameter/Height X 100 = Index (1962:7f, 58; 1975:16f). A vessel with an index of 70 is quite slim, whereas an index of 120 means that the pot is quite broad. The vessel index played no part in the definitions of groups or sub-groups, but Malmer did compare the variations of index within the groups with each other. Groups A-B had an index varying between 95-120, whereas F-G-H were decidedly broader (120-180, not counting the bowls). Within group J, vessel index varies between 80-180, perhaps reflecting its rather eclectic definition. Malmer drew upon the changes in the vessel index, the shape of bases, and the greater variation in decoration, as arguments supporting a development of pottery from A to B to G to H to J. In other words, from tightly controlled and defined vessel types, to increasingly more room for personal and regional variations over time.

The other important measurement was the fineness of cord and tooth stamp. He counted the number of impressions per three cm (e.g. 20/3) as a way of describing the gracefulness of the decoration in a quantitative manner (1962:8; 1975:17). Through these calculations, he showed that group J had decidedly coarser stamp decorations than the earlier groups G and H (1975:24). He also showed that in the case of tooth stamp at least, the vessels of Southern Sweden were decorated with fine instruments more often than in the rest of the country (1962:tab 11). He took this as support for his thesis that tooth stamp and angular patterns were the result of influence on the Battle Axe culture from the continental Bell Beaker culture, and also as support for his model which called for innovation to have originated in Skåne. According to this cultural model, the peripheral regions should have been making less refined copies of the G and H vessels. Based on his
own table 11, one might agree that the finest tooth stamps are missing from Eastern Central Sweden, although there is also a distinct difference in amount of GH-pottery here: 3 as compared to 61 in Southern Sweden. There is not much of a significant difference between Southern Sweden and Götaland however, a region defined by Malmer as comprising both Western Sweden and Småland-Östergötland in Eastern Sweden. His choice to combine these regions into a single large one is partly due to the fact that Götaland was a political reality in the Early Middle Ages. More importantly, with his model of cultural innovation emanating from Skåne, the regions Götaland, Eastern Central Sweden and Norrland also form increasingly peripheral areas away from the ‘centre of innovation’. This division is never really argued for or proven, only assumed to be valid based on the model of a single centre of cultural dominance. With this choice, Malmer obscured the differences between Eastern and Western Sweden, something which has also been discussed and questioned lately with regard to the battle axes (Edenmo 2008:165-171).

It should be noted that there is often a visual difference between the comb stamp on pitted-ware and that on battle-axe pottery. The former have generally been made by tools with rounded/pointed pegs, not infrequently widely spaced. The latter are most often made with closely spaced, square-shaped pegs. To highlight this difference, many archaeologists have chosen to refer to the pegged stamp on battle-axe pottery as ‘tooth stamp’, which I have also chosen to do. However, it is not always easy to distinguish between them on individual sherds, and the difference will occasionally be rather arbitrary. Some archaeologists have therefore chosen to only use the term ‘comb stamp’, without placing any specific meaning into it.

Malmer’s analysis of the pottery and definition of different groups was a methodological success. Even today, his main groups are in use among field archaeologists and researchers working with battle-axe pottery. The sub-groups are less viable since they often demand that the base be preserved, and are therefore only rarely referred to. The variants seem mostly forgotten, or are mainly a cause for confusion. It is interesting to compare Malmer’s definitions of battle-axe pottery, with the many various pitted-ware typologies. Malmer did not care about vessel shape, rim shape, rim decoration, ware, temper, application technique, or orientation of decoration, except in exceptional circumstances and mostly only as an afterthought. In retrospect, it is easy to point out some troubling inconsistencies in his method. Why is application technique decisive when deciding between group A or B, but not in any other group or sub-group? Why such specific groupings, and sub-groupings, based on decoration patterns in A to H, but not in group J? Why are decoration patterns more important than vessel shape (= base) on the one hand, but less important than vessel shape on the other hand (absence/presence of base decoration, vertical/horizontal decoration etc)? Even though Almgren, Schnell, Åberg and Bagge used very subjective and emotionally-charged reasoning for their pitted-ware typologies, at least each made an effort to explain why the criteria chosen were important. Malmer’s method is based on the admirable notion that
the groups should be clearly defined, and usable to other archaeologists, and in this he mostly succeeded. But objective definitions of certain physical characteristics are not synonymous with objective types relevant to the people who made and used these objects.

Malmer tackles the challenge of the pottery as an archaeologist, more specifically as one who was interested in chronology first, regional variation second, and everything else third. He certainly did not approach the material as one interested in the craft of pottery making, or the makers of the pottery. Nor was he really interested in the position of pottery and potters within the cultural setting. The aim of his dissertation was partly to create and evaluate methods usable to archaeology, and partly to solve problems regarding the introduction of Battle Axe culture in Sweden (diffusion or migration) and its internal chronology. He was actually quite successful in doing both. But, as Edenmo (2008) showed in the case of battle axes, we must not forget that the priorities he made highlight certain aspects, while downplaying others. I strongly suspect that a new survey, defining sub-groups based on craft aspects such as vessel shape and application technique, might reveal very interesting and different patterns. In chapter 5.2 I will discuss some further interesting aspects of the battle-axe pottery groups in Sweden. After presenting the technological analysis in chapter 8.1 I will return in chapter 8.2 to the question of the region where Battle Axe culture was first introduced, the process of its spread across Scandinavia, and possible areas of influence outside of Sweden.

From a typological viewpoint, Malmer’s styles have proven to be very useful to archaeologists over the decades, and the seriation seems to hold up well in the light of new finds. More exact dating of the vessels in relation to each other has unfortunately not been possible so far. This is partly because charred crusts are absent from virtually all sherds, and also because the radiocarbon calibration curve for the Middle Neolithic B is problematic, leaving calibrated dates stretching over centuries in most cases. The scarcity of organic remains in burials, and of ‘pure’ settlement layers in general, does not help to resolve this issue. However, no burials excavated after 1975, nor Edenmo’s newly published review of the battle-axe typology, have in any way contradicted the general chronological sequence that Malmer suggested. It just remains unclear which pottery groups co-existed with each other, and if so, for how long.

Chapter 5.1 on the research history of battle-axe pottery is structured chronologically, as is chapter 4.1 on pitted-ware, to highlight how publications over time both build upon and challenge previous research. If I followed this logic properly, there should now be a sub-chapter devoted to the ceramological analyses by Birgitta Hulthén in the 1970s. However, I will use my prerogative as author to postpone this section until later in this chapter. I have made a choice to contrast the stylistic and stratigraphical approach of ‘traditional’ archaeology with the technological research of laboratory archaeology – both of which contribute different insights into the material. The latter has become a standard feature of Swedish archaeology only in the last few decades, and it is still used far too seldom in my opinion. In fact, the next author whose analysis we shall consider,
Christopher Tilley, made virtually no use of the results from Hulthén’s dissertation, as he was completely focused on style.

**Tilley: style and statistics**

Malmer’s typology of battle-axe pottery, indeed of most of the material culture associated with the Battle Axe culture, was so influential that hardly anyone has attempted to challenge it. One of the exceptions is Christopher Tilley in his 1982 publication *An Assessment of the Scanian Battle-Axe Tradition*. This is a strongly processual study, quite typical for the time, though certainly not for Tilley’s later work. As the title states, it is completely focused on Skåne and not much else outside this region. Tilley used statistical computer analyses to test and reassess some of Malmer’s conclusions regarding burial practice, battle axes, work axes and especially pottery.

On the basis of 45 complete or restorable vessels from burial sites, Tilley took measurements on the height, rim diameter, belly diameter, and height between belly and rim. Base diameter was excluded from the initial analysis, as only eleven vessels had a flat base. These measurements were then analysed by principal component calculations. He found a restricted range of shape variability, and little evidence of regionalisation (Tilley 1982a:26). Considering the rather basic components included (height and diameter), this restricted shape variability is visually obvious to anyone familiar with battle-axe pottery. Also, since the region in question consists solely of Skåne, which is only about 100 km across, lack of obvious regionalisation of the vessel shape is perhaps not that surprising either.

There are some interesting differences between types, but it is difficult for the reader to evaluate these. Tilley may take new measurements, but he accepts Malmer’s pottery groups as valid categories without discussion. Group J, as can be expected, is widely dispersed across the principal component plots, again calling into question how well it is defined. A- and B-vessels seem more grouped together, as do most vessels belonging to group G, and there is a difference between these two clusters (no F-vessel was part of the study) (1982a:26f). Unfortunately, there is no discussion by Tilley as to what individual diverging vessels of each group might represent in relation to inter- and intra-site variation. For instance, the analysed A-vessel from a burial at Rötved (Fjälkinge parish), appears to have vessel proportions different from those of two B-vessels from the same line cemetery, but it is strikingly similar to the A-vessel from nearby Sösdala (N. Mellby parish) (1982a:fig 9). These are actually very interesting results, but unfortunately not picked up by Tilley for further discussion.

Tilley does state that everything about the Battle Axe pottery tradition suggests that rigid conventions were followed, and that there were specialists involved in the craft (1982a:28). He also shows that there is a strong element of localised similarities as far as shape is concerned. The problem here is that most line cemeteries contain graves from a fairly restricted time period. For instance, the A, B and D-vessels included in the analysis
come from two cemeteries that have no well preserved vessels of any later group. So whether the similarities are the result of local or chronological circumstances, or both, is not easy to ascertain.

Tilley criticises Malmer’s groups for being “based on partly quantitative, but largely intuitive, criteria” (1982a:22). In other words, he continues the trend where each new researcher into Battle Axe culture tries to surpass the previous ones in objectivity and scientific ardour. This is especially attempted in his new classification system of pottery decoration: “The following is an attempt to devise a rigorous and standardized procedure for classifying Battle-Axe ceramic design.” (Tilley 1982a:29). The new system, which draws upon the influential work of Stephen Plog, is based on an hierarchical approach in three levels, where the most important criteria are ‘open’ and ‘closed’ patterns respectively (Fig 5.9). By this, Tilley means whether or not the decoration is delimited by horizontal or vertical border lines. The logic behind this division, is that bounded designs require more steps in their execution, and are therefore a sign of increased complexity (1982a:32). Application technique (i.e. cord or comb) is not taken into consideration at all (1982a:31). At the second level designs are divided according to whether they are horizontal or vertical. Here again, is the usual difficulty in deciding what is, and is not, a vertical pattern in some cases (see chapter 4.1). The third and most detailed division is based on ‘infill technique’ in the case of bounded designs, and ‘line interrelationship’ in cases of unbounded ones. At the most, there are 33 different attributes, which is quite a small number. Tilley cites an analogous scheme being employed on megalithic funnel-beakers, which has resulted in no less than 350 different attributes at the most detailed level (Tilley 1982a:32).

Tilley identifies 231 classifiable design elements found on 78 vessels which are part of this expanded study, 87.5% of which were unbounded. Most vessels that have bounded designs also have unbounded designs (1982a:32). When bounded designs occur, they are most commonly placed on the body/belly of the vessel, and only in exceptional cases on the rim or base (1982a:36). These meticulously defined elements are not used to formulate a rival typology of battle-axe pottery. Instead they are used to determine similarities and differences between individual vessels within the groups defined by Malmer. Combining various aspects of composition, presence/absence of all-over decoration, base decoration, mirror symmetry between zones, bounded designs and twofold division of surface, Tilley runs these through an average link cluster analysis presented in dendrograms. The only clusters that appear fairly consistently in all these diagrams are the ones containing groups A, B and D (Tilley 1982a:39ff). This is based on the presence/absence of certain design elements and their positioning on the various zones of the vessel. In short, through this statistical analysis Tilley has shown that A, B and D are similar due to the fact that they are only partially decorated and have only unbounded designs. Since these criteria were in fact part of Malmer’s original definitions, the method simply shows that after Malmer had defined his groups, he had consistently followed his own criteria when assigning individual vessels to a certain group.
Tilley makes no attempt to formulate new and different pottery groups based on the results from his diagrams and plots. In the end, he isolates four clusters containing various vessels. Most of these are dominated by a few vessel groups. Cluster 1: G, H (J); Cluster 2: J (H); Cluster 3: G, I (J, K), Cluster 4: A, B, D. Only cluster 4 deviate distinctly from the other clusters in the plot (1982a:40).

In his conclusion, Tilley makes a note of the fact that “…there is considerable overlap between most of Malmer’s vessel groups and it is difficult to draw firm divisions between them.” (1982a:41). This is meant as criticism, but why should the groups be distinct? Are pottery types analogous to biological species? If there is a continuous craft tradition, perhaps some changes were introduced first, and others later on. While it would certainly be valuable and interesting to note if changes occur suddenly or gradually, a gradual change between pottery types may inform us of the structuring of the craft, but does not in itself cast doubt on the validity of the archaeologically defined groups. Tilley states that the only clear division can be drawn between on the one hand AB, and on the other GH. While this is certainly what his analysis shows, it is important to again make note of the fact that he has not included any vessels belonging to group F in his material, despite the fact that one at least partially complete F-vessel is known from a burial in Skåne (Ugglarp, Anderslöv parish). Group F is defined as partially decorated vessels, with angular bands. The Ugglarp-vessel has patterns that Tilley would define as both bounded and unbounded. If this beaker had been included in the analysis, it would certainly have occupied a position between AB and GH on the plots and diagrams, but Tilley cites the rarity of the type in Skåne as a reason for exclusion (1982a:42). So while the difference between ABD pottery and GHJ pottery illustrated by Tilley’s statistical analyses is probably correct, it is deficient by omission.

In the end, Tilley proposes a 3-period division of Battle Axe culture instead of Malmer’s 5 (6 if you count Late Neolithic C-vessels) (1982a:42):
Why E-vessels are included in period 2 is not clear, they have not been part of any of the previous analyses, either for shape or decoration. One would think that their partial decoration makes them more similar to A, B and D, according to Tilley’s own methodology. No attempt is made by Tilley to include contextual or stratigraphical evidence when dating the types. In a way, his extreme stylistic focus mirrors the attitude of early twentieth-century archaeologists like Åberg, whom Forssander had criticised so severely. This quite narrow attitude towards pottery is repeated when Tilley later compares pitted-ware to battle-axe pottery: “In the early period characterised by A, B and D vessels there is a basic similarity between Battle-Axe and Pitted Ware ceramic design.” (1982a:57). This ‘similarity’ is based on the use of unbounded designs and empty zones. It ignores completely the visually very striking differences between the two traditions in terms of designs, patterns, elements, application techniques, and lack of separate base decoration on pitted-ware. Not to mention vessel shape, base shape, rim shape, building technique, and surface treatment. Tilley’s argument is that the two traditions increasingly diverge over time, and that battle-axe pottery becomes more and more complex. It is easy to suspect that a pre-formed opinion informs this interpretation. After all, the all-over decorated battle-axe vessels of groups GHJK, with patterns made up of oblique lines and rounded bases, might just as well be described as more similar to comb decorated pitted-ware pots than the early vessels with cord decorations, wavy lines and diminutive flat bases.

In my opinion, we have to approach the vessels as objects created both through a craft tradition upheld by individual potters and through social pressure applied by the community of practice and society at large. Focusing on style as an entity in itself, almost as a result of genetic processes, is both unfruitful and misleading. I should add that Tilley himself abandoned this method shortly after the publication, and turned to more contextual research in other areas.

Hulthén: craft and technology

Birgitta Hulthén’s dissertation was the first major archaeological publication to focus specifically on the technical aspects of Neolithic pottery craft. However, the first microscopic analysis of thin sections of battle-axe pottery was undertaken by the geologist Nils Sundius at the initiative of Andreas Oldeberg, and published as an appendix to the latter’s monograph *Studien über die Schwedische Bootaxtkultur* (1952). 36 sherds of Swedish Neolithic and Bronze Age pottery were selected, fourteen of which were battle-axe pottery (Sundius 1952:214). The vessels chosen came from Western, Eastern and Southern Sweden, and included both early types and late types according to Forssander’s typology. Unfortunately, the selected sherds are not shown in any illustrations, a
regrettable habit far too common even in later publications of microscopic analyses. Interestingly, Oldeberg and Sundius also included four sherds of Finnish battle-axe pottery in the study. The result of the analysis was that Sundius identified a combination of sand and grog temper in twelve of the Swedish battle-axe vessels, eight of which with significant amounts of grog added. The Finnish sherds all had considerable quantities of grog in addition to fine grained sand (1952:220f). He also identified grog in some Late Neolithic vessels, as well as small amounts in Bronze Age pottery.

Sundius noted that battle-axe pottery did not form a completely homogenous group in regard to temper and clay, although most did contain grog, which made them stand out in comparison with the pitted-ware and megalithic funnel-beaker pottery he analysed (1952:221f). He remarked on the similarity between Swedish and Finnish battle-axe pottery and called for more extended studies including pottery from Denmark and the continent. Sundius was not an archaeologist, however, and did not continue with this research, nor did anyone else immediately following the publication: Malmer discussed Oldeberg’s typology of the battle axes and his cultural model, but did not consider the petrographic analysis in any way. In fact, the results generated no interest at all among archaeologists, and even Oldeberg seems not to have been interested in pursuing this method. The reason for the study had mainly been to see if they could determine place of origin of clay and temper in order to ascertain if the pottery had been manufactured in another country or region. From this point of view the study was not a success, since the results showed a use of clays with ordinary moraine and sand composition from post-glacial sedimentation very common in Sweden, and technology for detailed clay analysis was not yet very refined. This is a possible reason why the extended analysis suggested by Sundius was never initiated and the results lapsed into oblivion.

It should be noted that it is in fact very difficult to determine presence of grog in pottery, as it is easy to confuse it with iron deposits, which are very common in the glacial clays of Sweden (Lindahl 1990:50; Birgitta Hulthén pers. communication). Considering the limited technology Sundius had at hand, and the lack of scientific research into this method at the time (and it is unclear how much Sundius had actually undertaken to read of what did exist), his results can hardly be accepted without serious caution. It is also doubtful whether he was equipped to distinguish between naturally occurring sand particles in the clay and sand purposely added as a temper. However, Sundius’ analysis still raises many important questions, and even though it was not really given much attention by previous archaeologists, it did play an important part in my own critical rethinking of the origin of the Swedish battle-axe pottery craft. However, the real starting point for this was not Sundius, but the first Swedish archaeologist to actively turn to thin section analysis as a means to study prehistoric craft: Birgitta Hulthén.

In 1977, Birgitta Hulthén published her dissertation On ceramic technology during the Scanian Neolithic and Bronze Age. The publication was in many ways a new approach to the study of prehistoric pottery in Scandinavian archaeology. This was in part because the focus was on continuity and change in craft, taking choice of raw materials into
consideration, and not just a stylistic and artistic analysis. Also unusual was its focus on a specific region over an extended time period, not just on one type of pottery belonging to one archaeological culture. This awarded Hulthén a long term perspective, and an opportunity to contrast and compare various forms of pottery, similar as well as dissimilar. She was the first Swedish archaeologist to specialize in microscopy of thin sections, and to use this method as the very basis for her analysis and discussion concerning a period from the first ceramic objects of the Mesolithic to the Bronze Age.

The material chosen for the dissertation was part of the large scale Hagestad project, supervised by Märta Strömberg, which included systematic excavations and paleobotanical surveys carried out in Löderup parish in south-eastern Skåne, between 1961 and 1976 (Strömberg 1980; 1989). Although additional Neolithic/Bronze Age pottery from sites along the eastern coast of Skåne was included in the comparative analysis, the battle-axe pottery stemmed from seven sites exclusively within the Hagestad area. Five of these were found along the stream Tykeå, one was from the megalithic tomb Carlshögen a couple of kilometres to the west, and the final one was the line cemetery at Löderup, some 4-5 km south-west of the Tykeå sites. Altogether 25 vessels were investigated by thin section and microscopy. Most of the vessels were identified as belonging to group G, H and J, none belonged to group A, B or D. There were also a few that strongly resembled brim vessels and straight walled vessels, more commonly found on the continent (Hulthén 1977:144ff).

The petrographic analyses resulted in a deeper understanding of the special and unique nature of battle-axe pottery: in particular, grog temper was now conclusively shown to be commonly, and in certain types almost exclusively, used as temper. Malmer had written that the pottery was tempered with sand and grog, but had produced no evidence of his own to back up this statement. Hulthén also showed that grog was not used as temper in the funnel-beaker or pitted-ware pottery from the same region, nor in the Late Neolithic vessels. The clay chosen for the vessels were often coarse, glacial clay. Just as interesting was the fact that Hulthén was able to argue that the dark colour of many beakers, especially the dark core, was the result of them being fired in a REDUCED ATMOSPHERE. Neither funnel-beakers, nor vessels belonging to the Pitted Ware culture, had been fired in anything other than open fires, in an oxidizing atmosphere. Also, the smaller beakers at least seem to have been shaped through pinching the shape from a ball of clay, rather than through coiling. This, then, suggested that the battle-axe pottery represented a completely different technology as compared to both the preceding Funnel Beaker culture in the region, and the contemporary Pitted Ware culture (Hulthén 1976; 1977:144ff).

The technological aspects of battle-axe pottery will be discussed in depth in chapter 8.1, and Hulthén has contributed a re-evaluation of her classical study in the Appendix.
5.2 Battle Axe Pottery: A Discussion

The profound lack of interest in pottery craft traditions among many archaeologists studying the Battle Axe culture is quite remarkable, especially since both Sundius’ and Hultén’s analyses make it clear that some quite significant changes are taking place at its introduction. It strikes me as decidedly odd that the many intense debates about the nature of Battle Axe culture, its introduction and spread, not just in Sweden but over large parts of Europe in the form of Corded Ware culture, have not turned to analysis of craft and technology as a source of information more often. Instead, lengthy texts on the more superficial issues of style and shape have dominated the archaeological debate on whether there is such a thing as a Corded Ware culture, or if it is just a dispersed fashion trend. Determining whether we are seeing mere imitation or shared craft traditions should be the starting point of any discussion, not an afterthought.

EARLY BATTLE-AXE POTTERY

The pottery types defining the first phase of Battle Axe culture in Sweden are A, B, D and E. As noted above, A- and B-type pottery is very similar in appearance and decorative pattern, comprising: a band of horizontal lines made with cord, vertical incisions or a stamp tool, below which there might be a wavy line/garland made of cord, stamp or incisions, or a fringe of short vertical incisions. The base is diminutive and around it there is often, but not always, decoration. The only type that does not have any form of cord decoration is group B:2, and these beakers are very rare: Malmer identified only two such vessels, one by Lake Ringsjön in Skåne and one in Norway. Only a few have been found after this, for instance at Domarhagen in Södermanland where there was also examples of group A and B:1 (Hallgren & Larsson ms.). I am hesitant about the validity of Malmer’s argument that there is an important difference between so-called group A and group B vessels, based solely on the frequency of cord decoration.

As an example of the problem that might arise from distinguishing between A:2 and B:1 pottery, we can take the beaker found at Åstorp (Årla parish), Sördermanland. Beneath the horizontal lines of fine cord was a wavy line made up of very small dot impressions (Fig. 5.10). Malmer stated that A:2 might have a line of dot impressions, but that if there was a garland made with a stamp tool it should be defined as B:1 (Malmer 1962:8; 1975:18). So deciding between calling it A:2 or B:1 comes down to close scrutiny of the dots to ascertain whether they were applied by a row of single incisions, or by a multi-toothed tool. From what I can make out from photographs, by the curve and irregularity of the wave line, the designer had not used a stamp, so it should be defined as A:2. Others might disagree. It still leaves us with the question of whether this is a truly valid distinction. Reassigning all the B-vessels to sub-groups within group A defined by application technique would seem to me a more consistent approach, especially since...
B:2 beakers are so rare. However, as Malmer’s definitions are well established it is easier just to continue with a group B.

Fig. 5.10. Close-up of an early battle-axe beaker found at Åstorp, Ärla parish in Södermanland. Multiple horizontal lines of left-angled cord lines followed by a wavy dot line. Malmer’s group A:2 (after photo by Fredrik Hallgren).

With very few exceptions, B-pottery appears on sites that also have A-pottery. Three out of the four Swedish graves that contained B-type pottery also contained group A pottery. Group B-pottery might indeed have been developed out of the A-style as Malmer suggests, with the same general pattern only with slightly different application techniques. However, there is no evidence that it replaced A-pottery, that there was a considerable time gap between A and B, or that it is a strictly regional style. B-pottery is found on the same sites as A-pottery in both Central and Southern Sweden, and the burials of Rötved and Törneryd show that they were both in use at the same time. While archaeologists might keep using the category of B-pottery as a convenient way to define the type of decoration found in a ceramic assemblage, it is important to remember that this distinction might not have been at all relevant to the potters themselves. Malmer could just as well have chosen as defining traits for his types the presence/absence of base decoration, or wavy line, or fringe, but he did not. The choice he made does not seem to be based on a clearly conceived notion of what aspects of a vessel’s appearance should be considered culturally/socially significant, only what he himself considered significant: the use of stamps instead of cord or single incisions. Since this aspect seems to have no real correlation with either a geographical region or with a chronological sequence, it is not very informative (see Tab. 5.1).
Table 5.1: Settlements and/or graves (not megaliths) with early battle-axe pottery (A/B).
Other = other types of battle-axe pottery at the same site. Note that only a few of the
settlements are fully excavated. * = The settlement Ö. Hedemora is also known by the
name Eka. Information from Malmer 1962 and 1975, as well as personal studies of
collections.

<table>
<thead>
<tr>
<th>Sites</th>
<th>County</th>
<th>A</th>
<th>B</th>
<th>D</th>
<th>E</th>
<th>Other</th>
<th>Battle axe</th>
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<td>Närke</td>
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<td></td>
<td></td>
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<td></td>
<td></td>
<td>G, H</td>
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<td>Sandvik</td>
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<td>X</td>
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<td>G, J</td>
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<td>X</td>
<td>X</td>
<td></td>
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<tr>
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<td>X</td>
<td></td>
<td>B</td>
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<tr>
<td>S Lindved</td>
<td>Skåne</td>
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<td>X</td>
<td>F</td>
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<tr>
<td>Häslöv</td>
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<td>Ringsjön</td>
<td>Skåne</td>
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<td>X</td>
<td>G</td>
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<td>Lersten</td>
<td>Bohuslän</td>
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<td>Falkenberg</td>
<td>Halland</td>
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<td></td>
<td></td>
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<td>Hallehög</td>
<td>Halland</td>
<td>X</td>
<td></td>
<td></td>
<td>G</td>
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</tbody>
</table>
The difference between A/B-pottery on the one hand, and groups D and E on the other, are more perceptible. Group D has short vertical incisions forming horizontal bands at the upper part of the vessel, sometimes followed by rectangular zones formed by the same incisions but separated by non-decorated areas. That there is a D:2-vessel where this pattern is also followed by a garland similar to that found on B-vessels highlights the fact that only a few select patterns were used on these early battle-axe beakers. Still, on small sherds it might be difficult to distinguish between B and D pottery, since both may have short vertical incisions forming the pattern.

From Table 5.1 it is clear that A, B, D and E are pottery groups that very often occur in combination with each other, sometimes without any other battle-axe pottery groups present at the site. A-beakers appear both on settlements and in burials, D-beakers are less common and are mostly found in settlement layers, but occasionally in burials combined with A-beakers, and E-vessels are mainly found on settlements and occasionally as sherds in the fillings of graves. The combination of A, B and D vessels in the Rötved graves is proof this is not a coincidence. It does seem, then, that the first battle-axe pottery to appear in Sweden is not just a single type of vessel, but rather a set comprised of A/B, D and E-vessels. This set included the A-beaker common on settlements, but which was also the preferred burial vessel. B-beakers are really just a variety of A-beakers, with the same general pattern, but with other forms of application technique. The D-beaker sports another type of pattern, and is more commonly found in settlement layers, but is occasionally included in the graves. Finally, the E-vessels vary in size more than the others, differ more from the other types in terms of design and surface treatment, and do not really occur as whole pots in the burials. With the risk of propagating the myth that there is a divide between burial pottery and settlement pottery, I will at times refer to this and some other groups as 'household pottery'. It should be stressed, however, that the difference lies in the fact that one type (E) has a more restricted sphere of use, which the other types do not have.

The types of pottery mentioned here as belonging to the original set all have counterparts in other regions of the Corded Ware complex. In chapter 8.2 I will return to this idea that we are dealing with a full set of Corded Ware ceramics from the start of the period. However, it is important that we now look a little closer at the various forms of household pottery of the Battle Axe culture.

**HOUSEHOLD POTTERY**

The E-group is the most commonly found household pottery of Battle Axe culture: vessels with 1-2 parallel lines of small dot impressions running horizontally around the upper part of the pot, either with or without moulded cordons between them. The rest of the vessel is undecorated, but often has a surface that appears to have been brushed over with a bundle of grass when still wet – though not always. The beaker version of E-vessels in particular can have a surface similar to that of other beakers. Versions of this type of dwelling site pottery appear in most regions of the Corded Ware complex, the difference
being that the parallel lines of dots marking the cordon is a pattern peculiar to Sweden and one other region – south-western Finland. In all other countries where corded-ware beakers appear the cordons are almost exclusively decorated by incisions into the cordon or across it (Fig 5.11). This is a small difference, but a significant one that I will return to in chapter 8.2.

![Fig. 5.11. Cordon decorated corded-ware pottery, generally found in settlement contexts. a-c: Single Grave culture of Mecklenburg-Vorpommern in northern Germany, d-e: Rzucewo (alt. Haffküsten-kultur) in north-eastern Poland, e: Perkiö, Finland. Execution can vary, but unlike the continental ones the Finnish often have two parallel rows of dots lining the cordon. (Kilian 1955; Edgren 1970; Jacobs 1991)](image-url)

For how much of the period this type of pottery was in production is not easy to determine. Group E:1, with cordons, occurs on a few sites that have later types of pottery, but only where the early types A, B and/or D also appear. The only exception is Krokås in Blekinge, which is mainly a Pitted Ware site, where J-pottery also appears (Tab. 5.2). Group E:2, without cordons, also exists mainly in connection with the early groups A, B and D, though on the settlement of Vanneberga only later groups of pottery have been found together with the dot-decorated sherds (Forssander 1934:fig 20). The site has not been professionally excavated, and the material has been collected by a local resident. There are indications that E-pottery was still in use at the time when F- and G-pottery is being made, but so far the evidence mostly suggests that the type was discontinued around that time. For instance, no E-pottery was found in connection with the Battle Axe houses of Fågelbacken and Kabusa, where primarily later forms of pottery appeared (e.g. GH, J, K) (Larsson 1990; Hallgren 1997; 2000b).

Are there other types of primarily dwelling ceramics? One possibility is that there are, in addition to the E-pottery, larger vessels in use that have simple cord lines on the upper part and no other decoration. Pottery found at settlements is generally heavily fragmented, and such cord decorated sherds are usually referred to simply as adA. If most of the vessel is undecorated, the sherds will be difficult to classify as battle-axe pottery unless a close study of the ware is undertaken, especially in mixed culture layers. Still, cord decorated
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pottery becomes less common over time, with the possible exception of Eastern Central Sweden where cord line and tooth stamp are both used until the end of the period.

Table 5.2: Sites where group E pottery has been found in combination with other types of battle-axe pottery. * Ö. Hedemora is also known as Eka. (Malmer 1962:941; Hallgren & Larsson ms.)

<table>
<thead>
<tr>
<th>Settlement</th>
<th>BAC groups</th>
<th>E:1</th>
<th>E:2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kolshult</td>
<td>Östergötland</td>
<td>X</td>
<td>D:2</td>
</tr>
<tr>
<td>Barrsjö</td>
<td>Södermanland</td>
<td>X</td>
<td>A:2</td>
</tr>
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<td>Ö. Hedemora*</td>
<td>Södermanland</td>
<td>X</td>
<td>A:1, B</td>
</tr>
<tr>
<td>Domarhagen</td>
<td>Södermanland</td>
<td>X</td>
<td>A, B, D</td>
</tr>
<tr>
<td>Mjällby</td>
<td>Blekinge</td>
<td>X</td>
<td>A:1, G, J</td>
</tr>
<tr>
<td>Krokås</td>
<td>Blekinge</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>S. Lindved</td>
<td>Skåne</td>
<td>X</td>
<td>B, F</td>
</tr>
<tr>
<td>Vanneberga</td>
<td>Skåne</td>
<td>X</td>
<td>G, H, J, K</td>
</tr>
<tr>
<td>Hallehög</td>
<td>Halland</td>
<td>X</td>
<td>A, G</td>
</tr>
</tbody>
</table>

Group M, which Malmer stated could also be seen as domestic ware, is still quite a rare type. However, if one widens the definition to include not just paired nail impressions, but also pottery decorated with nail-like impressions across the surface, there are some more find-spots, such as the settlement site of Fägelbacken (Hubbo parish), Västmanland (Hallgren 2000b). Group J is also well represented on settlements and do appear as somewhat larger vessels at times.

There is one final type of pottery that needs to be addressed in connection with this issue, one which was never discussed by Malmer and has therefore escaped notice by Swedish archaeologists. Outside Sweden, this is the type most commonly known as the household pottery of the Corded Ware cultures: coarse vessels with short-wave mould (Fig 5.12). The group was first fully identified as such by C. J. Becker in a paper from 1955. Criticising the lack of interest among archaeologists in the coarser and less decorated types of pottery, Becker showed that there were large, coarse vessels occurring on mainly Corded Ware settlements across Europe, from Finland to Jutland, and from Switzerland to North Poland. The pots were undecorated save for one or two mouldings applied on and close to the rim that were distinctly 'short waved': “It is clearly to be seen that they were actually modelled by firm finger pressure, here from one side, there from both sides.” (Becker 1955:66). Another interesting distinguishing feature of the vessels that struck Becker was that “…the surface presents a curious striaion, as if the wet clay prior to kilning had been smoothed off with a whisk of straw or something else that was rough.” (1955:65). This brushed surface is clearly visible on the short-wave mould vessels from all different regions of the Corded Ware...
culture complex. The type is only rarely found in burial contexts, but appears in settlement layers repeatedly. The exact shape of the vessels can vary somewhat, but what is striking is the similar way in which the decoration was executed and the finishing off of the surface.

Becker’s conclusion that this particular kind of wavy moulding is connected with Corded Ware culture settlements has been confirmed over time by many archaeologists and excavations, and they have been found in Holland and Estonia also. The only region of the Corded Ware complex where they seem to have been absent is the Swedish-Norwegian Battle Axe culture. E-pottery is the closest parallel of course, not just because of the use of moulded cordons on these vessels, but also because of the fact that these too were often brushed across the undecorated wet surface with a bundle of grass or something similar (Malmer 1962:17). The short-wave mould can be seen as another variant of the cordon decorated household ware of the Corded Ware complex. This is important to highlight, as it shows that the Corded Ware pottery tradition was not restricted only to the beakers, which are arguably prestige goods connected with drinking ceremonies and mortuary rituals. When the beakers appear in Sweden they are joined from the start by cordon decorated vessels with brushed surfaces that are not deposited in the single graves, but do occur on settlements.

The question remains: why is short-wave mould pottery absent from the Swedish settlement materials? It might be partly due to a lack of correct identification as Malmer never listed the type in his dissertation, since his focus was mostly on the burials. Although settlement materials were dealt with, they were still quite rare at that time. Another complication is the fact that similar looking decorations appear on Bronze Age and Iron Age settlement pottery, something Becker himself pointed out (1955:67). As discussed in chapter 3.2, Battle Axe settlements are often found on locations that were used in later times as well, occupation that further fragmented and mixed the sparse
pottery remains. Swedish archaeologists do not look for wavy moulding on battle-axe pottery, since Malmer did not include the type in his publications, nor do most archaeologist take into consideration that not all battle-axe pottery is thin-walled with fine ware and smoothed surface. Therefore, the risk of simply overlooking these sherds in the field, or misclassifying them, is great. From published illustrations and study of museum collections, I have managed to identify a few examples of short-wave moulding battle-axe pottery in Sweden. These include sherds from Jonstorp M3 and Hagestad 98:1A in Skåne (see Fig. 5.12:e).

In 2006, the county museum of Södermanland excavated a Neolithic site called Domarhagen (Lilla Malma parish). The remains were first thought to be only Early Neolithic Funnel Beaker culture, but on closer inspection Fredrik Hallgren, who was in charge of the registration of the pottery, realized that it also contained a substantial amount of early battle-axe pottery. I collaborated with Hallgren in the analysis of the battle-axe pottery, and in writing that part of the report. These sherds belong as far as we could tell almost exclusively to groups A, B, D and E (Fig 5.13). They have the ceramic ware peculiar to the battle-axe tradition, mainly pale yellow-gray exterior with an often very dark interior, and very thin walls. Minute grains of mineral such as sand or very finely crushed stones occur, but mostly there are no visible grains. This contrasts clearly with the funnel-beaker pottery at the site. However, some sherds with typical battle-axe ware quality have a striated surface, as if brushed by grass (Fig 5.13:a) (Hallgren & Larsson ms).

There were also some sherds of battle-axe pottery with a different kind of decoration: nails had been impressed in the clay from alternate directions (Fig 5.13:d). This was done sometimes only a little, sometimes more deeply, creating a design that was at times almost moulded, as the clay was elevated by the pressure. I would suggest that this is in fact a version of short-wave moulded pottery created by the same logic – the same motion – but with the difference that the impressions were made directly in the vessel wall and not on a moulded cordon. A similar relationship can be seen to exist between E:1-pottery with parallel lines of dots arranged by a cordon, and E:2-pottery, which has simply dispensed with the cordon. Most of the technique and craft practice is the same. In fact, the E-pottery of Domarhagen in general mostly belong to the cordon free group E:2. I will return to this version of short-wave moulding in chapter 8.2, when I discuss possible areas of influence on the early Swedish Battle Axe culture.

While there might be more such examples waiting to be discovered in our collections, the overwhelming impression is still that vessels with short-wave moulding only rarely occur in Sweden, and then mostly in Skåne. It is the E-vessel with double-dotted moulding that most commonly defines the Battle Axe settlements. The importance of this fact, and what it might tell us of the introduction of Corded Ware culture in Sweden, will be further discussed in chapter 8.2.
INNOVATION OR LACK THEREOF: THE TROUBLE WITH GROUP F

The Domarhagen type is important in another respect, because in a way it is also a precursor to Malmer’s M group, which is decorated with paired vertical nail imprints. On these later vessels the impression is not as deep, and as a result the clay of the vessel wall is not moulded. This is another example of how conservative the Battle Axe pottery tradition is – existing traditions are built upon and developed, but very little in the way of brand new designs appear. Malmer suggested that the G group should be seen as an innovation, a stark break with the continental tradition. This is problematic for two reasons, firstly because angular bands occur on the continent as well – especially Poland and Denmark. The Polish band patterns are mostly applied by cord, whereas the Danish can be made by both cord and tooth stamp (Glob 1945; Machnik 1970; Wlodarczak 2006). Secondly, and most importantly, it is problematic because the abrupt break with tradition depends on Malmer’s insistence of taking the F group out of the discussion. In
strictly typological terms, F-pottery is the perfect ‘missing link’ between A/B-pottery and G-pottery (Fig 5.14).

Fig. 5.14. Although Swedish battle-axe pottery changes over time, the alterations all follow a basic set of principles where old patterns are built upon, making them bigger and more angular. Other conservative traits are application methods, with cord stamp being used alongside tooth stamp, and shape with only a gradual change from diminutive to fully rounded bases.

F beakers are:

- Partially decorated with an empty zone around the belly, in the same tradition as the early beakers.
- The angular band appearing on the upper part is strictly speaking just a larger, more extreme version of the wavy cord line of the AB-beakers.
- Most have the decoration applied with cord stamp, not tooth stamp.
- Most have a diminutive base, just like the early beakers. In contrast, G-beakers have mainly round bases, Malmer noted only two with diminutive base.
- The main difference is that the old established patterns from the AB-beakers are now broader, larger and more angular – both on the upper and lower part.

The reason Malmer did not accept F-beakers as a precursor to the G-beakers is not because there is any evidence that F-vessels occur later than group G. In burials F-beakers occur almost exclusively with other F-beakers, the only exception being a multiple burial at Järrestad in Skåne (Söderberg 2002). In addition to a typical F-beaker this contained some very atypically and carelessly decorated vessels. The only one which might conform to one of Malmer’s groups was decorated with nail impressions in what might possibly be referred to as a D-type pattern. This pot had a diminutive base, but the F-vessel in question probably had a round base. The odd technological aspects of this grave pottery are discussed in chapter 8.1. At the settlement of Södra Lindved in Skåne, F-pottery was found with B- and E-vessels, but no other types (Malmer 1962:937). G-beakers, however, are just as likely to be found together with later types in burials and on settlements.

The reason for Malmer’s decision to jump directly from B to G in his pottery sequence is the fact that F-beakers are quite rare in Southern Sweden. At the time Malmer wrote his
Chapter 5

Malmer has this to say about F-pottery in relation to AB and G-vessels:

...F is a remarkable combination of features of the two, namely, the partial decoration of the former and the angular bands of the latter. It would therefore seem to be a reasonable hypothesis that F is also a chronological intermediary between B and G, and this was also the view in earlier research (Forssander 1933a, pp 74ff.). Yet this hypothesis is not so plausible since group F is most strongly represented in Götaland, which has two-thirds (62.5%) of the find-spots, whereas Skåne-Blekinge (according to the calculations for 1975) have only 12.5%. (Malmer 2002: 135)

Malmer goes on to state: “Ceramic development cannot possibly have started in Skåne-Blekinge with A-B and then continued in Götaland with F” (Malmer 2002:135). There are several problems with this statement. Firstly, of course an innovation in decoration can happen in a region other than that where the pottery was first introduced. Secondly, what if we do accept Malmer’s thesis that the rigid structure of the Battle Axe culture meant that innovation was driven mainly from the region where it was first established? What makes us so sure that region was Southern Sweden? I will discuss this problem in more depth in chapter 8.2, but there are some circumstances that should be clarified from the outset: Malmer’s own compilation of early Battle Axe pottery and early battle axes (A and B) show that these types are far more common in Eastern Central Sweden than in Southern Sweden (Malmer 2002:170). When tracing the exact sub-region of introduction in Skåne through his pleion method, Malmer notes that the early types are more common in north-eastern and south-eastern Skåne and draws the conclusion that this is where Battle Axe culture was first established (Malmer 2002:168f). He does not apply the same logic on the super-regional scale of the whole of South Sweden though. His reason for this is that the ratio of early Battle Axe culture objects to later types is largest in Norrland (11 out of 18 vessels found here have cord decoration). The notion that the continental Corded Ware culture bypassed all of South Sweden to be introduced first in the North is contrary to all reason according to Malmer. The same prevalence of early battle axes and cord decorated pottery is also true for Finland. Therefore, the reason for the early types being more common the further north you go must be a conservative trend for the populations of the periphery that do not have the same access to innovations (2002:170).

As persuasive as this may seem, there is a major difference between stray finds in atypical contexts scattered across a vast region, and assemblages of artefacts associated with each other in familiar contexts, such as graves and settlements. My problem with Malmer’s argument is that it does not take into consideration that Battle Axe culture objects in Northern Sweden and Northern Finland mostly appear together with other contemporary culture materials, and proper burials are absent. Battle axes are the most common, pottery is very rare, and there are large deposits of flint axes which we do not normally find in South Sweden (Knutsson 1986; Becker 1988; Baudou 1989). Another explanation might be that these few artefacts represent either trade and exchange between populations, or a failed attempt to introduce Corded Ware culture and ideology in these
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regions, which is why we hardly see any later types. It is also potentially misleading to assume that the simple cord decorated beakers found along the northern coast of Sweden should necessarily be connected with South Sweden, rather than the Corded Ware sites along the Finnish coast just across the Baltic Sea – strictly speaking a shorter distance.

Malmer’s map which shows the distribution of the early pottery types A, B, D and E also includes group C (Malmer 1962:43; 1975:147; 2002:265). While this type of pottery has cord decoration, it is not dated to the early Middle Neolithic B, but rather quite the opposite – it belongs to the very end of the period and primarily to the Late Neolithic. Malmer of course makes no statement that this map represents a chronological phase, but it does distort the visual impression and favours Southern Sweden. The map also includes adA pottery. This is usually fragmented pottery found in mixed layers, and identified only through the presence of some cord lines. But cord decoration on household ware probably continues long after A- and B-beakers have stopped being produced (see above). There is a clear concentration of early battle-axe pottery south of the lake Mälaren, and south and west of lake Hjälmaren (Fig. 5.15). The stray finds of the early battle axes (A and B) also conform to this distribution (Edenmo 2008:fig 5:17). The occurrence of early pottery and battle axes continues in a south-western direction between the lakes Vänern and Vättern to the West Coast. Another concentration exists in north-eastern Skåne and Blekinge, with a sprinkling of sites in the parts between the main regions.
Seen in terms of total quantity of artefacts, Battle Axe culture is indeed more common in Skåne than the rest of Sweden. However, this is partly due to the fact that in the late period a much greater amount of battle axes were made, which distorts the general picture. Also, from the middle of the period onwards it became increasingly common for the graves in this part of Sweden to have stone packing. This of course helps in both protecting them and identifying them before they are destroyed. The calcareous soils in Skåne means that bones are more commonly preserved. In contrast, stone packing is very rare north of Southern Sweden, and bones are never preserved due to the acidic sandy soil (the double burial of Linköping being the exception). As I myself experienced at an excavation near Växjö in Småland, finding these graves before the pottery is crushed and the stone tools dispersed takes a combination of careful field method, sharp eyes and a
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great deal of luck (Åstrand 2004). In the early phase, when few burials at all had any stone packing and circumstances therefore being more equal, there is no dominance of Skåne over the rest of Sweden – rather, quite the opposite as we have just seen. I will return to the question of the introduction of Battle Axe culture in Sweden in chapter 8.2.

CONCLUDING REMARKS

The research history presented in chapter 4 and 5 has shown that the typologisation of pottery often rests upon subjective priorities in stylistic analysis, despite an evident desire to appear objective. What is striking is that archaeologists have selected criteria without actually investigating how craft is organised and transmitted across generations. Personal opinions and theoretical ideals are never cross-checked with actual real-life examples of potters. Instead, modern Western notions about Art, evolution and cost-efficiency informs the undertakings. In chapter 2.2 I argued that archaeologists need to direct more attention to practice and embodied experience, not only because these are potentially revealed in material culture but also because they are intimately linked to the construction of identities. Trying to order and group material culture such as pottery without an understanding of which aspects of the craft are prone to change, conservative behaviour, sub-conscious reproduction or conscious manipulation is meaningless. Is application technique more or less important than pattern? Is rim shape more or less revealing than vessel shape? Is surface treatment a qualitative characteristic? Before any social or cultural meaning can be elucidated from material culture we need to address these issues. In the next chapter I will show how a better knowledge about craft traditions and transmission of learning, physically as well as intellectually, offers enormous potential for archaeology.
III

Living Bodies
MAKING MATERIAL CULTURE

All archaeological inference about past societies (including, potentially, the identification of social groups and boundaries) hinges critically upon an understanding of the relationship between material and non-material aspects of culture and society. (Dietler & Herbich 1998:233)

Humans are not content to just be in the world, we have a need to create and shape the world around us, from handy tools to monumental buildings. Even more remarkably, we make things which are in no way essential for our survival. Every human society on the planet spend time and energy on decorating and embellishing both objects and bodies. What does it all mean? Anything, everything, nothing? These are questions that concern not just archaeologists, but all who study human beings.

Material culture has always been a prime focus for archaeology, yet we still understand precious little about how patterns appear, are perpetuated and how they change in the course of history. In this chapter I will present anthropological and ethnoarchaeological research into craft traditions and transmission of knowledge within and between generations. These studies give us invaluable insights into the daily practices that shape material culture in both the short term and the long term. Chapter 6.1 presents a short background to archaeological research into pottery, and a more extensive account of the pottery studies focused on contemporary craft traditions that have taken off in the last few decades. Chapter 6.2 discusses research into situated learning and embodied motor habits, as well as the chaîne opératoire of pottery craft.

Manual labour has become increasingly devalued in the West for the past centuries, and therefore dealing with prehistoric material culture is sometimes portrayed as having to make do with less: the sorry remains that act as a poor substitute for thoughts put on paper. It is true that a pot cannot speak to us, yet it is odd that we who study human society, past and present, would place such a primary importance on written statements, as compared to the material reality we have made, and in which we live and act. Both thought and practice make up our daily experience, neither can present the whole picture in itself.
6.1 Craft, Tradition and Potters

Pottery studies has virtually become a discipline of its own within ethnoarchaeology, with an abundance of studies, projects, analyses and texts. A number of bibliographies have also been published over the years and provide a convenient synopsis and guide to the current texts and themes (Nicklin 1971; Kramer 1985; P. J. Arnold 2000; Costin 2000; Hegmon 2000; Stark 2003). Ethnoarchaeological pottery studies of varying focus and intensity have been undertaken in different parts of the world. Africa has an especially strong presence in this area of research thanks to the French influence on research traditions. In Asia, especially East Asia, projects have been more geared towards art history for historical as well as political reasons (Adams 1977; Stark 2003). As the bibliographies make clear, there are several sub-disciplines within pottery ethnoarchaeology that only rarely overlap or inform each other. Mostly, there is a persistent division between technology and style. The former tends to focus primarily on functionality, adaptation and efficiency and the other on symbols, communication and identity (Gosselain 1998; Stark 2003).

The notion that technology and shaping is a craft, and that decoration is art – and that there is an inherent difference between them – is based to a large extent on the way the Western world has come to develop these concepts through history (Ingold 1999). The term ‘art’ originally denoted skill, initially in crafts and later in learning (e.g. ‘Bachelor of Arts’). It did not achieve the meaning we think of today until the seventeenth century, when certain categories of skilled makers were termed ‘artists’ (Ingold 1999:viii). The dichotomy between art and technology in turn owes a lot to the eighteenth-century Enlightenment and the Cartesian separation of body and mind, where the body is seen as restrictive, something to be overcome and conquered by the educated mind. It also owes much to the colonial and industrial era, where manual labour of the working class, and the arts and crafts of indigenous peoples, needed to be defined as less valuable than the Great Art of the painters and sculptors of contemporary and ancient Europe. These artisans and craftspeople in rural areas or in foreign countries might achieve a certain level of mastery with their chosen material, it was argued, but they lacked the elevated spiritual aspirations of ‘real’ artists.

Up until the late nineteenth century it was still expected that most artists would achieve a certain level of mastery, specifically with oil, copper or marble which enjoyed higher cultural esteem than for instance textile, ceramics or wood. Industrialisation also brought with it alienation between people and products, since the production process was fragmented, non-specialised and controlled by decision-makers far removed from the labourers. Manufacture of usable objects was associated with the lower classes, whereas the upper classes of society were to be distinguished by their intellectual and superior minds, and the creation of purely decorative art. With the advent of the twentieth century,
the idea that artists should be judged primarily by their ideas and concepts evolved even further, as can be witnessed most clearly in the *objet trouvé* art of Marcel Duchamp, utilizing industrially produced objects. In the post-modern society a skilled craftsperson is generally not considered an artist unless adding an element of novelty to the end product, and in contrast an artist does not necessarily need to exhibit any great level of technical skill in the art object created. One may compare this to the mindset in many other cultures, and old Europe as well, where a great master was someone who managed perfection within a rigidly prescribed set of rules regarding symmetry and design.

This devaluation of technical skill compared to mental agility permeates many aspects of Western society today, not just the arts. It may at times lead to conflicts at universities between the ‘classic’ Humanities (history, art, literature, language and philosophy), and newer disciplines with a potential focus on material culture such as archaeology, anthropology and textile history. These latter disciplines might themselves become internally conflicted by this culturally inherited value system that places mind over matter (cf. Trigger 1998; A. Holmberg 2009). As a result, technology is mostly discussed in terms of optimisation, adaptation, and functionality – concepts borrowed from the Sciences.

**Technology**

Interest in the functional and technical aspects of pottery has been especially pursued by Michael Schiffer and James Skibo in a number of works, but also by many other researchers over the years, with interesting results regarding thermal properties and shock resistance, for instance (e.g. Hulthén 1985; Schiffer & Skibo 1987; Sassaman 1995; Feathers 2003; Schiffer 2003; Tite *et al.* 2003). However, these empirical analyses are seldom combined with studies of actual use and production in living communities. Change in technological characteristics is assumed to be initiated by functional requirements or discovery of a more optimal way of making a vessel (e.g. Feathers 2003).

There is no single, ultimate way of making a cooking vessel, storage pot or water jar. Both the raw materials and the methods can vary considerably, and still result in a good product. While there are some cases of decidedly specialised selection of materials for the manufacture of a specific kind of vessel, such as the Fennoscandian asbestos ware for bronze smelting (Hulthén 1991), and the kaolin clay used to make fine porcelain, most types of pots can be made with many kinds of clays or temper materials. The functionalistic approach has been criticised by Olivier Gosselain:

> With respect to the supposed relationship between vessel performance characteristics and contexts of use, for example, it is striking to see that most arguments do not proceed from an examination of archaeological or ethnographic evidence. Instead, arguments rely blindly on concepts and theories from ceramic engineering and experiments made under completely artificial conditions.

(Gosselain 1998:81)
The idea that the intended use of a vessel can be detected from the technical characteristics of its raw materials finds very little support in ethnographic sources. The relationship between ware, form and function is not simply a question of efficiency. In the Andean Highlands, several communities belonging to different ethnic groups use pastes that are standardised within each community (Sillar 1997). These range from very coarse clay with large natural inclusions to fine with laminar talc temper. Certainly, some of these pastes are, technically speaking, better suited for some of the vessel types produced, e.g. large beer jars, eating bowls and cooking pots. There is even a widespread understanding in the region that some pastes are better suited for certain types of vessels, a notion generally acknowledged by the potters themselves. Despite this, each community makes the whole range of vessels from the same basic paste. They neither change the paste composition for different kinds of pots, nor restrict themselves to making only those vessels deemed suitable. There is a widespread trade of pottery in the region, so theoretically speaking most people can acquire any kind of pot they want.

The choice of raw materials and techniques may be better understood as ‘cultural choices’ that are as dependent on local ‘representations’ as any ultimate scientific measure of functionality. The concept of ‘cultural choice’ is intended to highlight the fact that while there are frequently a wide range of alternative techniques that could be used to overcome a particular problem, within the vision of a particular culture’s understanding, they will only consider a very much more restricted number of alternatives.

(Sillar 1997:12)

Even when functional explanations are evoked by potters, their opinions and empirical facts do not always coincide. The Raqchi potters of Peru use a paste made up of coarse clay tempered with volcanic rock, and are regionally renowned for their excellent beer jars. They are also one of the few groups in the Highlands who do not manufacture their own cooking pots, and they say this is because they do not have access to the talc temper used for making the preferred cooking vessels. However, the archaeological record from the same area shows that similar volcanic temper used locally today were used in cooking pots in the past. Explanations by potters themselves as to why they cannot make certain types of vessels often seem artificial and prompted by being asked the question by an anthropologist (Sillar 1997:11).

Reliance upon ceramic engineering to supply the answers about changes in prehistoric pottery draws upon modern Western notions about technology, not actual study of contemporary traditional societies (Gosselain 2008b:67). That cultural and social factors often play a far more decisive part in the constitution of the technology of pottery making has been highlighted by researchers on many occasions in the past (e.g. Foster 1966; Nicklin 1971; Arnold 1985; 1989). However, although Dean Arnold notes that one cannot understand the choices made by pottery manufacturers without taking social, political and religious factors into consideration, he still consider ecological factors to play a decisive part in the process. Ceramic petrography has also increasingly become a part of the study of pottery technology. Often it is used as way of determining whether a pot was locally
made or imported (Shepard 1966; Arnold 1985:58f; Bogucki 1995; Specht et al. 2006), or as a basis for discussing the emergence of specialization (cf. D. E. Arnold 2000). In the last decade many archaeologists have tried to understand pottery making from a socially situated and learning oriented perspective, along the lines of the French research tradition (Stark 2003). In chapters 7.1 and 8.1 I try to show how thin section analysis can be a valuable method when studying these aspects of prehistoric pottery technology.

**Style**

By viewing technological aspects as the result of adapting to natural and environmental circumstances, archaeologists have been left with style as the only wholly culturally constituted aspect of material culture. This stance, that decorative aspects of material culture denotes cultural affiliation, has long been a tradition of archaeology (Stark 1998:2). The archaeological traditions of early twentieth century often viewed changes in pottery design as evidence for changes in populations, either directly through migrations or indirectly through acculturation by a superior neighbouring culture. In 1965 James Deetz published an influential study on Arikara pottery where he came to the conclusion that the changes seen in pottery decorations were directly related to changes in social organization taking place within the society at the time (1965:96). The American processual school of archaeology, drawing upon anthropological models, also informed the work of William Longacre who analysed Pueblo pottery decoration in order to ascertain whether they practiced matrilocality (Longacre 1970).

Continuing the line of reasoning that style and decoration should be understood as a form of communication, the ‘information exchange’ model was put forward in the works of Martin Wobst and Stephen Plog. Based on the premise that efficiency and rationality drive human choice, Wobst and Plog both stipulated that the expenditure of energy and time in decorating an object must serve a purpose. The most likely purpose is the display and communication of social and cultural identity to members of other groups. Therefore, the most decorated vessels should be those that were the most visible to outsiders (Wobst 1977; Plog 1980; 1990). The more decoration, and the more complex it was, the more likely that the pot had an important social position in society as a marker against outsiders. To spend time on stylistic communication with people with whom one is in almost daily contact would be “a dysfunctional waste of energy and matter” (Wobst 1977:325). The ‘information exchange’ model of Plog and Wobst was based on assumptions of ‘rationality’, rather than on an actual understanding of how craft is constituted and transmitted in human societies (Herbich & Dietler 2008:224).

While Wobst later modified his position (Sterner 1989:451), many others continued to view style in this narrow way, as a rational investment of time and energy to present information between different groups. However, there are numerous examples from anthropology that contradict this model. For instance, among the Sirak Bulahay of northern Cameroon, the vessels most embellished with decoration are actually those that are the least visible to outsiders. These pots do have great social and religious meaning.
within the community as they are the family’s eating bowls and also spirit vessels. They are part of events that communicate unity, tradition and fellowship within the group and especially the household. This is another example of how Bourdieu’s notion of habitus can help us understand the necessity of intra-group communication. Social identity, whether family or ethnic group or social class, is not something we are born with, nor is it something we are presented with at a specific time and put on as a new set of clothes. Rather, it is gradually embedded in us through interaction with those around us. Sterner also warns against making an easy distinction between sacred and secular pottery, as some vessels have a very complex lifespan. They might begin as everyday domestic ware, later be used in rituals, and then end life as common ware again (Kopytoff 1986; Sterner 1989:453, 458). Also, decoration in itself need not take any significant amount of time, even when the pots are quite richly decorated. As Dietler and Herbich note for the Luo, decoration consumes far less time and vastly less energy than actually forming and shaping the pots – the importance of which will be discussed below. The only exception being burnishing of the surface, which the potters themselves note is physically exhausting (Dietler & Herbich 1989:155; cf. Eriksson 2008).

Sackett (1977; 1982; 1986; 1990) made valuable contributions to the style debate by highlighting the fact that not all variation in material culture can be explained by either functional or consciously decorative causes. Isochrestic variation is another option: when there are similar ways of doing something, people’s choices tend to be based upon cultural traditions that are partly subconscious. These variations might at times be connected to social units, such as ethnic groups, but they are not a deliberate communication of that social identity. Polly Wiessner contributed to the growing awareness of agency within archaeology by distinguishing between emblemic style, which denotes group identity, and assertive style, which is the individual’s personal interpretation and rendering within a stylistic tradition (Wiessner 1983; 1985).

Another valuable contribution to the study of pottery was made by Daniel Miller who conducted ethnoarchaeological work among the potter castes of India (Miller 1985). He noted that it was the shaping techniques rather than the decoration or the shapes themselves that reflected the social units. Indeed, assuming that decoration is more culturally significant than any other aspect of a vessel is a fallacy. For instance, among the Luo of East Africa it is the overall impression of a vessel, including its general shape, the colour of the fired clay, and the microstyle of the rim and profile, that signal information about group identity and individual style more than the at times quite complex decoration. One of the most important vessels is the one used for beer drinking, a social event that is organised in a similar manner among all Luo groups. However, the shape of this vessel varies between the different regions depending on which community has made it – some are rim-less, others have a flared rim, etc. The Luo recognize this and seem to consider it a part of regional traditions, much like Sackett’s isochrestic variation (Dietler & Herbich 1989:157, fig 3). In fact, although beer-drinking pots are the most socially visible vessels, the amount of decoration they receive and the complexity of the patterns vary
significantly between potting communities. Indeed, in some areas the domestic cooking pots are more decorated than the beer jars (Dietler & Herbich 1989:159).

Style must be more than absence of apparent function. Functional aspects are also stylistic because there are many different ways of making pottery that will lead to a functional end result (Hegmon 1992; 1998:265). One might say that both the functionalistic and the stylistic approaches to pottery have suffered from a lack of interest in the potters themselves and the social reality of the pottery craft, especially in the dynamic relationship between them. This is in part the result of the alienation between people and the production of material objects that has developed in modern times. It is also due to the Anglo-Saxon academic tradition of viewing technology and material culture as an external result of social structure, rather than as an integral part of the social structuring of human identity. Understanding material culture, both changes and resistance to change, demands an understanding of the context in which the knowledge about making something is transmitted from person to person.

To comprehend why pots look the way they do, and why they are made the way they are, we need to know more about those who make them. Only by understanding the personal, social and cultural complexities that surround the making of an object can we hope to even begin to understand the basics of material culture patterning in prehistory.

Artifacts and chaînes opératoires, like individuals and social groups, are not clearly bounded and monolithic units, but complex, dynamic, and profoundly mixed constructions. As such, they have the ability to tell multiple stories about social groups and their historical trajectories…

(Gosselain 2000:208)

What Potters Think and Do, and Think They Do

This lack of detailed primary research on learning is particularly glaring in the domain that is most crucial for archaeological interpretation: the realm of material culture production. (Herbich & Dietler 2008:223)

It is frequently observed that potters, despite living in close proximity in the same environment, and having similar functional aims, use different raw materials, processing methods and shaping techniques (Gosselain 1998:100; Gelbert 1999:213). There are also many examples of remarkably conservative technology within crafts. Some ethnoarchaeological studies have documented ceramic traditions that go back over 2000 years, such as the Ifupiat pottery in the Arctic, and the pottery of the Guizhou province in China (Stark 2003:206). In the Cuzco region of the Andean Highlands in South America, the Chanapata and Pacalomoco pottery traditions display remarkable consistency in ceramic ware for a thousand years (Sillar 1997:1). Four aspects seem to play a major role in the conservative behaviour of artisans: tradition, techno-functional constraints, relationships with other realms of activity, and symbolic conceptions (Gosselain & Livingstone Smith 2005:41).
Old traditions need not necessarily disappear with the introduction of novel methods either. In Colombia, rural women potters make utilitarian pots with pre-hispanic techniques, whereas their husbands who are mainly producing commodities for the urban market use the wheel and moulding introduced with the conquest (Stark 2003:204f). Although the wheel is an effective and efficient way of making pottery, it has not displaced the hand-made pottery. Similar phenomena can be seen both historically and pre-historically (cf. Roux 2003; Degoy 2008; Roux 2008b). The realisation that different techniques used on the same material may denote gendered practices is certainly interesting from an archaeological viewpoint (cf. Dobres 1995; Lädström Holmberg 2004).

Potters are often aware of differences in techniques within other traditions, even when their contact with these is fairly restricted, but this awareness does not mean that they change the way they make pottery (Dietler & Herbach 1989:154; Gelbert 1999). Resistance to change is a common theme when reading about crafts, and it may affect many levels of the production process, though the aspects most commonly mentioned are involved with raw materials and motor habits, such as shaping. Gosselain (2000:191f) has noted in his own ethnographic research among contemporary potters in sub-Saharan Africa that shaping tends to be more conservative than decoration/surface treatment. Although he modifies these views somewhat in later publications (Gosselain 2008a:170), he still notes that the potters themselves tend to view shaping as a part of their heritage and a material correlate of social identity in many cases. Any change of this is therefore under strong pressure to be interpreted as socially meaningful and historically rooted. What are the reasons for this resistance to change, considering that clay is such a plastic and changeable material?

**THE WAY OF OUR ANCESTORS**

When a woman is close to the age of her death, she gives her pottery-making tools ceremoniously to a daughter or another woman. This act transfers her sabiduría, the ancestral spiritual knowledge of pottery making that is embodied in each woman’s calabash scrapers and polishing stones…

(Bowser & Patton 2008:113)

When questioned about the reason for various technological and technical choices, most traditional potters will simply reply that this is the way to do pottery handed down by their predecessors and ancestors (Miller 1985:165; Gosselain 1998:91; 1999:206; Gosselain & Livingstone Smith 2005; Bowser & Patton 2008; Degoy 2008:216). The potters openly stress the relationship of their current practices and tools to that of their parents and ancestors. This is more than just ad hoc explanation, since it signifies the person’s social ties and basic identity (Gosselain & Livingstone Smith 2005:41). Even the prohibitions and superstitions around the pottery process which follow general cultural guidelines have details that tend to vary with the tradition as handed down in the family. The important thing in those circumstances is to do as your ancestors did – as you were taught – and not necessarily adjust to others (Gosselain 1992; 1999). It should be pointed out that most
potters do not tend to think of their craft in terms of a number of ‘choices’, rather it is simply ‘the way to make pottery’ (Gosselain & Livingstone Smith 2005:41). This is especially apparent when pottery making is mainly an intermittent task, with little or no economic incentive. The Maghreb woman who makes her domestic pottery once a year does not spend a lot of time considering how to reinvent the process. Rather, she mobilizes all her attention in an effort to “reconstitute the chain of traditional steps” (Balfet 1966:169). Change invariably occurs over generations of course, but it is not actively pursued – quite the opposite.

Abandoning a technique associated with one’s ancestors can be a painful process, even if the new technique is considered better or more efficient. In some of the Songhay communities of Mali, a few potters have borrowed the moulding technique from itinerant Tamasheq potters. The latter are considered ‘Bella’: low status groups on a par with (former) slaves. However, they are held in high esteem as skilled artisans, which is the reason the Songhay potters occasionally use their technique. The Songhay are not wholly comfortable with this borrowing from a lower class group, however, and when visited by anthropologists studying their craft they only used the traditional pounding method. Only when questioned about the presence of pots that looked like they had been made otherwise did they acknowledge that they usually make vessels with the borrowed technique. One of them explained about pounding that it “is the true Songhay technique”, and went on to say “This is the technique that I will teach to my daughters, as I learned it from my parents” (Gosselain 2008a:169; 2008b:74). Some also went so far as to make the first stage of the vessel with moulding, but the final with pounding, since it produced the mat impressions on the surface typical for Songhay vessels. It should be noted in this case that the demands of a market economy and customers were to a large degree responsible for the pressure to change shaping technique to one that was considered more efficient.

As we shall see below, consumerism is very often a powerful external pressure to change raw materials and manufacturing techniques. However, even market demand is not always an effective way of making people change their craft. Polychrome painted patterns on large water jars made by certain Bella potters of Niger are very popular, and potters in other groups are urged by their clients to make similarly decorated vessels. When they oblige the result is often lacking in detail and composition, their patterns being bolder and more carelessly executed (overflowing, paint running etc). Despite being accomplished artisans with direct access to the original vessels, and under social/economic pressure to duplicate them, this is not easy since it is done only by imitation. Also, the Zarmaganda potters, who do not have the same social stigma attached to imitating the Bella pottery, adopt the craft as a purely economic side activity, and are therefore completely geared towards customer expectation. In contrast, the Songhay potters of the same region do not accept the idea of changing their decorative style, despite the fact that they are more familiar with the Bella patterns and craft than the Zarmaganda. They still value the Bella pots, and indeed often buy them – especially as marriage gifts.
But, they refuse to change their own decoration tradition since it was instigated by the ancestors (Gosselain 2008a:172).

The notion of ancestral ties to both craft and the actual raw materials, clay and temper, can be so strong that relocated potters in a new community will be forced to abandon the craft. This is the case with potters in the Andean Highlands where the local community and especially the household is the locus for passing on technological knowledge. In Bolivia, a male potter moving to his wife's village will continue to make pots identical to the ones from his original village, and will even go through the trouble of trying to acquire the clay from his old source. Here the craft and the use of clay are both strongly associated with local identity, since the earth is a physical symbol of the community. The right to acquire clay and temper materials is tightly bound up with belief in nature spirits and ancestors being physically connected to the earth. As a result, people who move to another village will often cease to make pottery, so there is little opportunity for new techniques being transmitted to the next generation (Sillar 1997:8, 12).

**OUR WAY IS BETTER**

Other techniques are often considered foreign and consciously associated with people of another cultural or social identity. For instance, when questioning potters in his survey area, Gosselain learnt that they had noted that neighbouring potters had different ways of making pottery. It could mean using historic and prehistoric sherds rather than modern ones to make grog temper, or mixing two or three clays together, or shaping by moulding or pounding respectively. The potters tended to associate these practices with different cultural affiliation, a socially connoted tradition, and rejected them for that very reason (Gosselain 2008a:163, 167). It is also common for potters to express a sense of technological superiority compared to other traditions. Gosselain and Livingstone Smith tried to have potters make the same kind of vessels they usually do, but using clay from another source, or processed in another manner. They were initially met with open refusal by their informants, who were sure that the paste offered would not be usable – though in fact later attempts showed that it was (Gosselain & Livingstone Smith 2005:40). The Bafia of Cameroon also felt that there was only one right way of making a pot, regardless of shape or function (Gosselain 1992:572). Most potters argue, when asked pointed questions by an inquisitive anthropologist, that to make a pot in any other way would result in it breaking before or during firing, or turning out inferior in some other way (Gosselain & Livingstone Smith 2005).

Sometimes the foreign craft might in fact be referred to in positive terms, and be described as superior to the local tradition, e.g. the moulding vs. pounding shaping techniques used in South Niger. What is interesting is that both techniques may be described as ‘better and faster’ by potters using the other one. Despite this the potters in question do not change their own craft accordingly. This is because it is associated with a specific population and is therefore considered culturally significant and not simply ‘another way of doing it’ (Gosselain 2008a:167f; 2008b:74).
EMBODIED PRACTICE

When shaping clay into pots, the potters are unable to explain *what they do*, they are only able to show *how they do it*. Among the Bafia this sequence of gestures is absolutely similar from one potter to another. Only during the final shaping of the rim do some slight variations occur (in the orientation of the thumb and middle finger, the force of application, and the regularity of the rotating movement) resulting in slight morphological differences…

(Gosselain 1992:572, orig. emphasis)

As mentioned above, most potters do not really ponder the whys and hows of every stage of the production sequence, or even any of them (Gosselain 2000:192f). Many are not even able to explain or put words upon what they do, but they could still do it blindfolded. This is a phenomenon noted by Mauss, Leroi-Gourhan and others (see chapter 2.2), and currently receiving much attention in the cognitive and pedagogical sciences. Practices and motor habits become embodied to a degree that blurs the boundaries between nature and culture within the human body. In pottery, the shaping process is a stage that is very much dependent upon motor habit and repetition, with little experience of external constraints from others since it is not really visible in the end product, unlike decorating and painting (though see the use of pounding in a mat mentioned above). Gosselain noted when studying the Bafia of Cameroon that the shaping process was the only stage where there was a uniformity among all the potters of the ethnic group. More generally on the African continent, shaping tended to have a geographical distribution that did not seem arbitrary, but corresponded to linguistic groups to a certain extent (Gosselain 1992:572f). While later studies would complicate this picture (Gosselain 2000; 2006), it is clear that the shaping of a vessel is one of the most conservative aspects of the potter’s craft.

To the Dii of Cameroon shaping is the most conservative aspect of a craft that in itself is very conservative. Even two potters who make vessels and vases in the Toupouri tradition for sale to non-Dii consumers, as a way of increasing their income, make them with the Dii shaping technique. Neither was actively taught the Toupouri craft, one was simply shown the models, and the other lived for a while in their community (Wallaert 2008:186, 196). Tonaltecan potters in Mexico are geared towards the market and open to make any kind of clay object – however, only if the object can be made using the traditional moulding technique and fired in the locally used kilns (Nicklin 1971:23). Louana Lackey, a potter and art teacher turned anthropologist, has studied craft and learning structures among the potters of Acatlán, Mexico. She set out to learn to make pottery the way the local artisans do, which included sitting on the floor when working on the pots:
Chapter 6

It was probably more difficult for me, a potter, to learn these traditional methods since I had to 'unlearn' and relearn almost everything I knew about the craft. These hard-learned lessons have become firmly ingrained. I now find it almost impossible to sit at a table to work with clay.

(Lackey 1993:170)

I have worked on several occasions with Gunlög Graner (Graner & Larsson 2004; Larsson & Graner in prep.), who in addition to being an archaeologist has extensive personal experience in making pottery, especially reconstructions of prehistoric pottery. Considering the matter of motor habits and craft she has made the following observations:

Long before I knew that there were anthropological studies on the matter, I noted for myself the firm opinion of potters as to how shaping and firing should, and must, be carried out to avoid cracking. I have met several Swedish potters holding entirely opposite, but very decided opinions concerning the necessity for instance of scraping the surface of the coils, or to use slip between them, when building the vessel. Firing vessels in an open fire without pre-heating or covering them is also a method that many potters do not believe to be possible until seeing it with their own eyes. As for myself, I have noticed with astonishment how certain parts of the working process have become routine, for example in what direction to build up the coils. Working in another way than my usual one gives me such an awkward feeling that I would rather avoid doing it.

(Gunlög Graner, pers. communication)

Virtually all potters will associate the craft with certain sensory memories, such as the right feel of the paste for instance. Any changes in choice of clay or type of temper will therefore also affect this sensuous experience. A Zarma potter rejected the use of millet husks as extra temper material, which was used by other potters in her village, because “she just doesn’t like the consistency of the clay when it contains millet husks.” (Gosselain & Livingstone Smith 2005:34). Gosselain (2008a:168f) notes that techniques mastered at an early stage of life are more often associated in the minds of the potters with inherited tradition, and are more likely to be considered technical norms. Techniques learned at a slightly later stage in life are more often referred to as a social/cultural demarcation, or as technologically advantageous for various reasons.

GROUP PRESSURE

Among the many reasons for conservative behaviour, we should not forget the pressure supplied by other members of the community, either by other potters or by non-potting users and clients. A potter might want to innovate and experiment, but her products – and she herself – run the risk of being ignored, rejected and even ridiculed by friends, family and neighbours (Sillar 1997). The two Dii potters mentioned above were the only ones who differentiated themselves from their colleagues by selling Toupouri style flower vases to non-Dii customers. Both were viewed by the community as deviating from the cultural norm, and teased in public for their individuality, which is associated with bad morality
and insolence (Wallaert 2008:186f). Among the Dii pottery is a secondary task and aimed at making domestic vessels, not meant for the market or for trade. Dii potters are also very conscious about how other community members and potters view and value their work. Motivation among apprentices is not built upon the goal of achieving mastery, but on meeting social expectations. The appreciation of their peers and superiors is gained by adhering to tradition, not displaying innovative excellence. In fact, when asked by the anthropologist to attempt a new vessel shape not part of their repertoire, they refused since they were convinced they would fail and be the subject of ridicule as a result (Wallaert 2008:191).

**CHANGING THE CRAFT**

Knowledge acquisition has a strong spatial orientation: what is ‘known’ is not simply known from neighbours, but from frequenting (or hearing about) areas with which one has developed various kinds of ties.

(Gosselain 2008b:72)

Changes in a craft can be initiated both internally and externally. As was mentioned above, artisans may have varying awareness of the fact that the things they create can be made in ways other than how they have been taught. They may never have considered that fact, or been brought into contact with any other method, or they may actually have very detailed knowledge about alternative methods, but chose not to be influenced by them. One important fact for archaeologists is of course that in order for any knowledge to be transmitted there must be some kind of connection between the peoples in question, be it deeply rooted ties of kinship, networks of alliance, acts of aggression or accidental meetings. This simple, but monumentally important, fact is not highlighted enough in discussions about cultural change in my opinion. It is far more than a question of geographical proximity.

Clearly, knowledge acquisition is not related to spatial proximity, but, once again, to the space within which people actually travel and develop social interactions. (…) It explains why potters from Zarmaganda are more familiar with the techniques used by potters from the west, rather than from the east, regardless of the distances between communities.

(Gosselain 2008b:75)

Among the Bella of the eastern bank of the river Niger in South Niger, very few seem to have knowledge about other shaping techniques, despite close proximity to other groups. Bella potters are a specific endogenous artisan-caste, whose craft is intimately linked with their social identity within the group (Gosselain 2008a:166). Social organisation and kinship structure influence what kind of information is readily exchanged and transmitted between individuals and groups alike.

The most important thing to realise about pottery craft is that the separate stages in the operational sequence are *interchangeable* to a very large degree. There are many different kinds of clay that can be used to make the same variety of vessels, as well as a very large
number of usable temper materials, the combinations of which vary even more. Nor does it follow that a certain kind of firing technique can only be used on a specific kind of product (e.g. Sillar 2000). This means that various parts of the operational sequence can be changed without necessarily affecting any other part of the manufacturing process. A new type of clay, a new recipe for temper, a new shaping technique, or a novel way of firing the vessels can all be adopted at different times and for very different reasons – from social to functional. The chaîne opératoire within any given moment of time may therefore not necessarily reflect a coherent synchronic method, but the diachronic result of various historical circumstances, from large-scale cultural processes, to small-scale individual life-histories (e.g. Gosselain 2000). To put it plainly: a potter may change part of the craft when under pressure to do so, but may at the same time retain some aspects of the old craft – deliberately or not. Above we have mainly focused on what restricts change; below I will give some examples of circumstances where change occurs more regularly.

AFTER RELOCATION

One of the most commonly noted reasons for change is relocation of the potter, especially after marriage into a new community. Gosselain (1998:95) showed that 80% of the potters he studied in Cameroon learned the craft in the village where they grew up, but only half of them still resided there at the time of the survey. The changes of the craft may be either gradual or abrupt, depending on the circumstances (Maceachern 1998:123; Wallaert 2008:187). Generally it is the stages that are the most observable to others that change first. The subtle differences of how to thin the walls or shape the rim are more resistant, partly because they are not visually apparent to others, partly because they are grounded in embodied habits. They are in fact not always consciously perceived as different by the potters themselves until pointed out by an observer (Gelbert 1999:221f). If certain activities are undertaken collectively, such as retrieving clay or the preparation of pastes, then they have to be changed simply because the individual must conform to the majority rule (Sillar 1997; 2000).

Change can happen as a result of potters being brought into close contact with other techniques, and thereby being forced to think about their own practices in a new light. There is the distinct possibility of being openly questioned and challenged by the local potters (Bowser & Patton 2008:112). As a new resident, peer pressure by the resident potters may be too much to cope with. For instance, a Mossi potter married to a Bobo blacksmith (Burkina Faso) had changed her clay preparation and decoration to fit with the local norms (Gosselain & Livingstone Smith 2005:42). Sometimes the newly-wed is given no choice in the matter, among the patrilineal and patrilocal Luo of East Africa pottery making is only practiced by a select number of communities. Any woman who marries into such a community, and who has been taught pottery craft previously, is expected to be re-trained by her mother-in-law or one of her senior co-wives. Since the compound will potentially contain women from many different communities, who will now live and
work together for the patrilineage, keeping a common craft tradition and a common style of pottery is a way of establishing an ideology of unity both internally and externally. To change ones ways according to the senior women’s wishes is a concrete act of submission to their authority (Herbich 1987; Dietler & Herbich 1989).

Occasionally relocation occurs even if there is no marriage involved, and being brought into contact with other potters may bring about significant changes. Even so, it is far from certain that these changes will be permanent or transmitted to new generations of potters. A Lame potter settling in a Fulani village first tried to conform to the local practices, unwittingly creating ‘hybrid’ forms of pottery that were in little demand. After others from her region also settled in the village, she returned to her traditional ways of making pottery and actually then achieved much greater success in selling them to the Fulani (David & Hennig 1972). In Zarmaganda east of the River Niger, most potters use moulding to form pottery, whereas pounding is the technique used by Bella potters in the same area.

In a village, a woman explained that her maternal aunt, already an experienced potter, settled for three years in a Bella village near the river, where she learned the pounding techniques. When she came back, in the early 1970s, she continued to shape vessels in that technique, but was unable to transmit her knowledge to other women in the village ‘despite all their efforts’.

(Gosselain 2008b:75)

The Bella potters have a good reputation as artisans, and learning their way of making pottery was socially beneficial to the aunt. Living with the Bella potters and interacting with them gave her an opportunity to adopt a new method. It is interesting, however, that it did not prove to be easy to transmit that knowledge back to her own community, even when there seems to have been at least some inclination to learn. This may have been because the aunt was not a very good or diligent teacher, or it may have been because there was still some deeply rooted resistance among the local potters to ‘change their ways’.

INFLUENTIAL INDIVIDUALS

Certain individuals who have great social standing or charisma can also initiate and guide change. Practices considered ‘new’ by Zarma, Songhay and Hausa potters in Niger are usually attributed to a single new settler. The individuals who have managed to introduce a novelty in the process are often said to have come from, or lived in, particularly renowned pottery centres. There is a social gain in adopting these novelties and in being associated with the distinguished artisans and centres (Nicklin 1971; Gosselain & Livingstone Smith 2005:43). Processes of homogenization can also be found around pottery villages of great repute, which seem to act as ‘reference centres’ for their neighbours (Gosselain 2008b:72). Among the Acatlán potters a few have become renowned as innovative artists and their products sell in the large urban markets. Other
potters in the region tend to copy these popular pieces, not because of any artistic urge, but rather for pure economic reasons to keep up with market demand (Lackey 1993:177).

Among the Conambo potters of Ecuador creativity and originality in pottery making is valued – within certain established norms. Young women therefore actively set out to learn new design styles from other women, preferably very senior women of their matrilineage, and sometimes their mother-in-law. On the other hand, middle-aged women change their pottery design to show influences from women of their own generation because they are concerned with creating alliances with each other to further their political influence in the village (Bowser & Patton 2008:112, 119ff). Skilled potters among the Luo may experiment with design and decorations. An innovator with skills and a charismatic personality can achieve a widespread reputation, especially if her wares sell well on the market, and other potters within her network will try to emulate her (Dietler & Herbich 1989:161).

**Influential Groups**

Sometimes pressure to change may come from an influential ethnic group or social class. This is the case of the blacksmith Nyamakalaw caste in West Africa, whose women formed a separate potter class with important ritual responsibilities and knowledge of their own. Due to some very complex historical events, many neighbouring peoples were pressured either to abandon pottery craft altogether to the newcomers, or to assimilate with the caste (Gosselain 2000:204). In some parts of Nigeria, local potters have begun to produce imitations of European pottery in addition to the more traditional types. These copies are made with the same traditional craft methods, and the imitation is only superficial (Nicklin 1971:20).

In south-central Niger some areas are currently undergoing a form of acculturation, as the local Tuareg groups are voluntarily adopting the Hausa language and identity since it carries greater social status – in part because it is associated with Islam. In many potting communities the potters have therefore deliberately changed their shaping technique from pounding in a depression to moulding on a convex mould, since the latter is considered ‘the Hausa way’. They are also very self-conscious about this fact, and far from prepared to acknowledge to outsiders that a change has taken place, since they like to present themselves as ‘100% Hausa’ (Gosselain 2008b:75). Interestingly, the objects which most clearly testify to their previous ethnic identity is the simple wooden paddle, as well as rounded stones used as hammers to shape vessels. These are used by the Tamasheq-speaking potters in other regions as well, and their names are of Tamasheq origin. The fact that they are still in use among the Hausa-acculturated Tamasheq is probably due partly to embodied habits, and to the fact that they are not consciously associated with ethnic/social identity by either group (Gosselain 2008b:76).
**IMPROVED EFFICIENCY**

The introduction of wheel throwing in many areas is definitely associated with a desire for faster production and more consistency in the final product. It should be noted that it sometimes temporarily disappeared from regions where it had previously been established, such as the Neolithic Levant and Iron Age Europe (Roux 2003; 2008a; b). The main reason for this is that wheel-throwing is complicated and difficult to master, demanding access to teachers (Johnston 1977). Lacking a local or regional demand for large quantities of pottery, and some kind of market economy compensating for the time spent making the vessels, most potters will find it difficult to achieve and maintain the skills needed. Also, the introduction of the wheel-throwing technique does not necessarily mean that the old hand-making techniques are abandoned (Nicklin 1971:35ff; Sillar 1997; Chernela 2008; Degoy 2008). Some Songhay potters in West Africa have started using moulding more often, since they consider it both easier and faster. However, they are not comfortable with this change, and do not bring it up willingly since it is not considered the ‘true Songhay way’ (Gosselain 2008a:169). Apart from this, there are few ethnographic examples of potters changing or altering their technique and technology for the stated purpose of efficiency. Whenever this occurs the underlying reason seems to be directly linked to economic incentives.

**MARKET ECONOMY AND CONSUMERISM**

While there are many cases of traditional societies with prestige technologies encouraging gifted artisans to achieve a level of mastery, market economy is a very common factor for changes in technology and style (cf. Foster 1966:52). If there is market or consumer demand, artistically skilled potters will find the time, incentive and social acceptance to innovate and experiment. It is doubtful how much of that they would have done without this external force. There are some interesting examples of the renaissance of pottery making among the inhabitants of San Ildefonso, New Mexico. Archaeological excavations in the area brought them into contact with old types of pottery, and there was increased interest for the local pottery among collectors and museums which were willing to pay for high quality products. Shortly, a few female potters stood out as particularly gifted and innovative, most especially Maria Martinez who also made significant contributions to the making of paint and the art of creating an etched black surface. Very much the same thing occurred in the Hopi towns of Arizona, during and after archaeological excavations. In these cases it is clear that individual ability, talent and charisma play a great part in guiding the changes taking place, as other artisans noted the successful ones and tried to copy and emulate their work (Nicklin 1971:22, 27f). However, the incentive was still mainly commercial, both for the innovators and the imitators.

In two Zarma villages in Niger, potters mixed clays to make vessels for sale at the local market, but used a single local clay when making pots for their own community. The quality of the product was the same in their opinion, but the buyers felt that pots made of mixed clays were better (Gosselain 2008a:163). In India, Andhra Pradesh potters produce
for both local rural and urban markets. To meet consumer demands they are quite prepared to modify their production process, clay processing and shaping especially. However the ceramics made for the rural markets are less prone to alterations (Degoy 2008:205). The inability at first to ascertain the secret behind the fine porcelain ceramics of China inspired European pottery manufacturers to experiment with making similar looking wares, which included mixing large amounts of bone ash with the clay. The result was actually successful, and ‘bone china’ was produced in large quantities for a considerable time.

It is highly doubtful that pure commercial interests ever guided pottery production in the European Stone Age, or even the Bronze Age. It is clear from the examples above that even when market economy forces act upon traditional potters today they tend to be conservative regarding their own socially situated craft. This makes it unlikely that the type of behaviour seen among potters geared towards trade and profit is valid for the Neolithic.

CHANGES IN OTHER MATERIAL CULTURE

Changing technology or the shape of vessels might also be due to otherwise unrelated changes in material culture or social practices. For instance, some Luo potters have started to add a ring-foot on previously round-bottomed bowls, since the use of tables have become more widespread (Dietler & Herbich 1989:161). Introduction of new types of food, drink or ceremonies might demand the manufacture of new types of vessels as well (cf. Hoopes 1995; Meadows 1997; Hamilakis 1999; Gosden 2006; Eriksson 2008). The use of heavily asbestos tempered prehistoric pottery in Northern Fennoscandia is probability related to metallurgy, and shows how a new technology can affect the ones already established (Hulthén 1991).

FAILED INNOVATION

Some examples of innovation that is attempted and aborted are also worth considering. A Raqchi potter in the Andes collected tale temper known to be used by potters in other communities to make a popular kind of cooking pot. She mixed this with the clay normally used by community potters, and the traditional temper of volcanic sand, to make toasting pans. These pans were rejected by almost all community members apart from a few close kin who probably felt obligated to use them (Sillar 1997:11). Considering that we often tend to assume that it is the gifted and skilled who innovate, one should consider the fact that experimentation with temper and compositions among the Luo is rarely attempted by the good potters. It is the poor and less diligent craftswomen that try to cut corners or mask deficiencies by doing this (Dietler & Herbich 1989:161).

Even when a change is strongly pushed by powerful interests with promises of economic rewards the attempt can fail because of strong traditional cultural structures. Trying to change the pottery industry in Tzintzuntzan, Mexico in the mid twentieth century did not succeed initially. Reorganizing the potting on a workshop basis with an
assembly line method failed completely since the local people did not take to co-operative work of this kind – no one felt responsible for the finished product. Introduction of modern equipment such as kerosene-fired kilns and electrically powered wheels was an almost total failure as well. Part of the problem was that these changes were mostly pushed by government agencies whose representatives often lacked sensitivity towards the locals. There were also no trade networks in place to handle this new industry, which resulted in the participants being cheated by the shop owners who bought their wares.

The increase in market demand for pottery, and the appearance of middlemen who could guarantee the transactions between potters and sellers, have nonetheless created a booming pottery manufacturing industry in the region after these initial problems. However, the potting units are organized around the nuclear family, which is the traditional unit for all social and religious activities. There is still a strong cultural opposition to an expansion of the potting industry to involve wage labour. The workshops that do work employ potters in a manner that allows for flexible work hours and for the potters to make complete ceramic objects, rather than pieces to be assembled (Nicklin 1971:22f, 24; see also Lackey 1993).

**CONCLUDING REMARKS**

These examples are not meant to be an exhaustive list of all the various reasons for changes in pottery craft. However, they do demonstrate the importance of taking actual human contact and interaction into consideration when discussing alterations in decoration and technology in prehistoric pottery assemblages. In particular, one must consider the type of interaction that took place, whether marriage, migrations, visits or simply access to the vessels, but not the makers of them. I also hope to highlight how important it is to remember that change is not something that occurs automatically on contact, and that for a potter to change one or more stages in the operational sequence the incentive is only rarely a strive for efficiency, functionality or variation for its own sake. Craft is *tradition* – in every sense of the word – and tradition is transmitted through learning. In order to understand pots, we must understand how their makers once learned how to make them.

**Who Is the Potter?**

Not everyone in every society that has pottery craft learns how to be a potter. The number of pottery makers can vary from a few percent of the total population, to a majority of it. Usually there is some sort of restriction enforced: i.e. gender, social class, lineage, settlement location, inclination and/or innate skill. Among traditional societies where pottery making is a secondary activity taking place only intermittently, and is at the most the source of a very modest income through trade or sales, pottery is usually in the hands of women (Arnold 1985; Sassaman & Rudolphi 2001:420). Of course, we cannot be certain that this was the case in prehistory, and situations may have varied in both time
and space. There are a number of traditional societies today where pottery making is conducted by men. In Africa there are male potters among the Azande, Yamba, Kongo, Kwakongo, Ganda, and Hausa Katsinawa, though some of these might well be described as specialists who derive a large part of their income from their craft (Barley 1994:25, 145; Gosselain 1999:210; Gosselain & Livingstone Smith 2005:42). Within the Goiniri community on the Sepik coast of New Guinea pottery making is an exclusively male occupation. However, Welsch and Terrell who report this note that the jars they produce are bulky and crude, and that in all the neighbouring communities pottery making is in fact a female activity (1998:62). Generally speaking, men tend to be in control of pottery making when it is a specialised craft that generates a notable income.

Sometimes male and female potters co-exist. The community of Pichao, Argentina, has three traditional potters: one man and two women (Sjödin 1998:258). In the Andes, male Raqchi potters make the large brewing jars, whereas the women make smaller jugs and bowls, using the same paste, but slightly different shaping techniques. Since the traditional way of firing pottery requires the large jars to be covered by a protective layer of smaller bowls, cooperation between male and female potters from the same household is practically indispensible. It is an unusually clear example of technology and cultural values becoming thoroughly intertwined (Sillar 1997:7; 2000). In Acatlán, Mexico, both men and women are potters, but the women do not make the vessels that are fashioned on a parador, since the wheel demands assuming a posture considered immodest for women (Lackey 1993). The men in the potter castes of Andhra Pradesh make all the wheel-thrown vessels, but their wives make small handmade pots (Degoy 2008:205). One thing all these groups have in common is that the men’s production is partly, or even mostly, geared towards trade – often within a market economy. In Tzintzuntzan, Mexico, men started participating in the traditionally female occupation of moulding pots in the twentieth century as a result of a growing market demand and economic benefits (Nicklin 1971:23).

Assuming pottery in the Neolithic to have been a female activity certainly has a lot of support in ethnographic and historical literature. Still, it should be remembered that there are several other viable alternatives, including the fact that it may not have been a gender specific craft at all. Even if pottery craft is in the hands of women, it is by no means certain that all women are potters. Among the Luo only about 1% of the total population manufacture all the pottery. These are concentrated in specific communities, which are in turn clustered around clay sources. Even under these circumstances, the craft is only a secondary activity, and there are no full-time specialists (Herbich 1987; Dietler & Herbich 1989). Ceramic vessels for the Kalinga settlements of the Pasil river valley in the Philippines are mostly supplied by potters in only two villages (Stark et al. 2000:301). Among the ethnic groups of the Mandara mountains in Cameroon/Nigeria there are potters in every community, but only between 30-50% of the women become potters. Inclination and opportunity decides who will learn the craft and take up the task of making vessels for the group (Maceachern 1998:118). Some talent or affection for the
craft is at times a necessary prerequisite. Members of a household who do not show proficiency, or who grow to dislike the task, might be allowed to abandon it (Lackey 1993:171f).

By communicating to children who can learn, and who can not, other social norms are ingrained as well. The anthropologist Krause once observed a young boy and girl becoming interested in a woman’s pottery making and they tried to participate. The boy was exhorted to stay away from ‘women’s work’ and chased off. The girl was allowed to stay and even given some instruction. She clearly enjoyed the attention she got, and the status of being allowed to stay with the adults. The boy kept watching from behind a hut for a long while (quoted in Kamp 2001:429). Even in Late Medieval Europe pottery production was mainly a family affair. In West France, women were not actually prohibited from being potters, but it was the sons who inherited the pottery making equipment and who got the formal training, making it difficult in reality for a woman to start up her own business. Widows could continue the trade of their late husband, but were often obliged to marry another potter to make the operation work. The girls did learn to participate in the trade in other respects, such as preparation of raw materials, helping with decoration, and marketing of the products (Musgrave 1997).

An important point here is that pottery, like so many other crafts, is not solely or even mainly, an individual activity. It is a collective endeavour, often demanding the participation and assistance of many members of the community, potters and non-potters alike. Tools as well as labour can be shared both within the household and within the larger community (Nicklin 1971; Lackey 1993; Sillar 1997:8; Sjödin 1998; Gosselain & Livingstone Smith 2005:42; Bowser & Patton 2008:112; Degoy 2008). These practices by themselves create a feeling of unity, for instance Barbara Frank tells of a ‘work dance’ several women performed as they were mixing clay together with temper (1994:29f; cf. Lidström Holmberg 2008). Preparing the paste is hard work which is often shared between the potters, sometimes it is done by apprentices or junior potters (Frank 1994:30). Firing the dried vessels usually involves the work of several potters, and even in Medieval Saintogne the kilns were collectively owned (Dietler & Herbich 1989:155; Frank 1994:32; Musgrave 1997:89; Sillar 1997:8). Acquiring clay is also undertaken collectively in most traditional societies, and participants can be of both sexes, young and old (Welsch & Terrell 1998:56; Gosselain 2008a:160). However, sometimes strong taboos prohibit certain categories of people to take part in the activities (children, sexually active men, menstruating women etc.) (Gosselain 1999; Gosselain & Livingstone Smith 2005).

The young potters of Conambo, Ecuador, who learn how to paint chicha (beer) bowls must be prepared for other senior women, not just their mother, to appear and give advice, critique and guidance during the creative process. Young married women might voluntarily ask their mother-in-law for instructions and advice on design. Sisters and sister-in-laws often sit together, talking and joking, during the painting of the bowls (Bowser & Patton 2008:111f). Pottery craft, like almost any other crafts, is wholly integrated in a social structure, and not the individual expression of an artisan. Changes
and alterations in technology and technique affect several people, and may at times be completely impossible without also persuading a whole host of others to follow suit.
6.2 The Chaîne Opératoire of Pottery

The following chapter takes a closer look at the operational sequence of pottery craft in traditional societies, and what this might tell us of the socialisation process in general. The examples are mainly from ethnographic sources, but at the end of the chapter I will present a few archaeological case studies where researchers have attempted to use a craft oriented approach to interpret pottery materials. Before presenting the operational sequence it is important to understand the process of learning, as it affects it in many different ways.

Learning How to Make a Pot

In our modern day society, learning is usually understood to be taking place in a specific place, at a specific time, and under specific circumstances. In many traditional societies where people themselves, or someone close to them, make most of the objects of their daily life this distinction is not really valid. Here learning is a process which is only occasionally demarcated with a beginning and an end (Herbich 1987; Bowser & Patton 2008; Gosselain 2008a:158; Herbich & Dietler 2008:234). Children and adolescents will observe and even participate in adult activities to a certain degree, long before they are expected to actually master them – which can be referred to as ‘legitimate peripheral participation’ (Lave & Wenger 1991). Considering the nature of social organisation in most traditional societies, it is hardly surprising that the majority of crafts, practices and activities are taught by one or several very close family members, e.g. a parent, sibling, uncle, or grandmother (Smith 1989:64; Lackey 1993:171; Sillar 1997:8; Gosselain 1998:94; Gelbert 1999:211; Gosselain 2000:193; Crown 2001:455; Wallaert-Pêtre 2001; Degoy 2008:218). It is the age of learning that partly determines who is the main teacher, and since most learning takes place in childhood and adolescence (6-15 years of age), it follows that the main instructor generally lives in the same household. As a consequence, the period of learning a craft or practice is also the period of socialisation for the individual. In the process of transmitting knowledge and skill, the deep and formal relationship that is established between the pupil and instructor also creates strong emotional bonds.

Receiving instructions from someone outside the immediate family is often connected with learning something as an adolescent or adult. Among both the Gurensi and Luo, pottery craft is taught by female affines (Herbich 1987; Dietler & Herbich 1989; Smith 1989:64; Gosselain 1998:94; Herbich & Dietler 2008). In Gosselain’s survey of potters in Cameroon only five (6.5%) had received training from a non-relative: a neighbour, a friend, or someone with whom relations had already been established beforehand. In these cases the linguistic affiliation of informant and pupil was always the same. Only six potters out of 77 had learned the craft from someone from another linguistic group –
which invariably meant an affine had been relocated after marriage (Gosselain 1998:94). Freeborn Zarma women (Niger) often learn pottery from neighbouring low-class Bella potters, who have a good professional reputation (Gosselain 2008a:158). This is partly because they do not have enough established potters themselves as yet (which of course may change in a generation or two), and partly because pottery production is mainly a subsistence economy for them.

The children of potters will begin familiarising themselves with the material from an early age, from playing around with the malleable clay to aiding in small tasks, like fetching tools and carrying. Of course, sometimes cultural prescriptions and taboos result in children being kept away from certain stages in the operational sequence, i.e. clay extraction or decoration (Gosselain 1999:210). Most knowledge and know-how concerning selection and processing of raw materials, including cultural symbolism and taboos, is acquired informally at an early stage of the learning process (Herbich 1987; Wallaert-Pêtre 1999; Gosselain & Livingstone Smith 2005:42). It is not really perceived as ‘learning’, since it happens automatically as they participate in the domestic chores of the household (Lackey 1993; Frank 1994:29; Gelbert 1999:213; Kamp 2001:429). The important thing is that learning a craft is deeply embedded in the socialisation process where other cultural, normative and religious principles are transmitted as well. The process can often be divided into two rough phases:

**FIRST PHASE**

The first phase encompasses early childhood, from around ages four to six until more formal teaching commences. This phase is mostly centred around legitimate peripheral participation (sensu Lave & Wenger 1991), with little in the way of formal instructions. It includes taking part in some general, non-specialised stages of the operational sequence, like observing parents and older siblings, feeling and playing with the raw material and tools, imitating the adults, and helping out with various tasks (David & Hennig 1972:5; Lackey 1993:171f; Gosselain 1998:94; Stark et al. 2000:305; Crown 2001:455; Bowser & Patton 2008:110f). Most learning is acquired through this physical participation in, or simply observation of, the potting process: from clay prospecting, extraction and processing to temper acquisition, decorating and firing. The child thereby becomes familiar with the materials, the operational sequence, “as well as symbolic and social prescriptions pertaining to the craft” (Gosselain 2008a:160; see also Wallaert 2008:188). There is little or no verbal instructions. Most people do not actually view this as a learning process – they are simply helping.

**SECOND PHASE**

They give the impression that the gestures used in producing a vessel lie at the heart of the transmission process, while other types of knowledge and know-how are ‘easy’ and already mastered when the actual learning begins.

(Gosselain 2008a:160)
For most potters the more formal teaching phase begins in early adolescence, around the age nine to fourteen, depending on the cultural norms. As a result, the length of this teaching phase can vary considerably between cultures, from a few months to several years.

To help the apprentice overcome her difficulties, the teacher now works alongside the apprentice, correcting her errors and movements and, quite often, holding the apprentice’s hands so that the latter can physically sense the correct movements and hand positions. (Gosselain 2008a:161)

This close interaction usually demands that those involved get along and have respect and affection for each other. As a consequence, shaping becomes strongly associated with tradition, heritage, family ties and personal identity. Learning the craft does not necessarily entail following the sequence of activities that lead to the creation of a vessel exactly. Shaping can be taught before paste preparation, post-fire treatment before decoration etc. For some, it is the simpler and more straightforward aspects that first are practiced, repeated and mastered – then those that require finer motor skills (Gosselain 1998:94; 2008a:160). In contrast, Conambo potters of Ecuador first instruct the young women in how to decorate a pot correctly with geometrical patterns. Only after this has been mastered are they instructed in how to actually fashion and shape a bowl, around age fifteen (Bowser & Patton 2008:111). Of course, by then they have been around their mothers for a very long time when they manufacture these vessels. It is not until they are fully grown and with families of their own that they learn how to make the large fermentation jars. Up until that point, when they are in their 30s, these jars were made for them by their mothers (ibid:113).

Acatlán potters start the formal teaching around nine to eleven years of age – the parent decides when the child seems mature enough. “…by the time a potter’s child is ready to sit down and learn to make pottery, he already knows a great deal, but ‘it is in the head, not in the hands.’” (Lackey 1993:173). Learning how to knead the paste properly, to get rid of air bubbles, is one of the first tasks to master, as well as how to keep the paste from sticking to the surface, but not to make it too dry. Then the child learns to make a small bowl, and after that stage has been fully mastered the apprentice learns how to build the bowl with coils to make a spherical jar. Each new step in forming certain basic shapes, and additions such as handles, is only taught after the previous step is mastered. As the apprentice starts participating in the routine work of manufacturing vessels, he also learns how to prepare the paste and finish and fire the wares. The potter Mario, whom Lackey stayed with, was a kind and patient teacher to his children, encouraging rather than criticising, and giving positive feedback. Although he lent a hand at times to prevent failures, he was never more intrusive than that (Lackey 1993:174).

Not all teachers abstain from severe criticism over perceived failures, of course, and for some obedience is the first virtue to be mastered (Frank 1994:30, 33; Wallaert 2008:188). Among the Pueblo and Piman speaking groups of the American southwest,
formal direct instructions were also rare. The adults sometimes corrected the children who were imitating them and gave them brief advice. The learning process mirrored the production sequence to some degree, as the young girls first learned how to shape a vessel, then how to decorate it and finally how to fire it (Crown 2001:455).

Hélène Wallaert has discussed the differences between authoritative and non-authoritative learning in traditional societies (Wallaert-Pêtre 2001; Wallaert 2008). While all teachers are in some effect authorities, the learning process may be geared towards either establishing the importance of social hierarchies in the mind of the apprentice, or supporting the development of independence and self-sufficiency. This will in the long run affect to what extent change and alterations are welcomed in the making of material culture.

**Non-Authoritative Learning**

The Fali of Northern Cameroon encourage their apprentices to learn through trial and error. Verbal instructions are used fairly frequently, rather than direct physical correction. So although the disciple learns by imitating, she is not micro-managed in the details. The Fali potters appreciate innovation, since the products are also sold on the market and popular innovations will result in an increased income, as well as a good reputation. Even so, innovations are mainly in terms of decoration, whereas shaping and technology is more conservative (Wallaert-Pêtre 1999; Wallaert 2008:197).

Similar examples can be found in Conambo, Ecuador: Here, the shape of the eating bowls does not vary very much, but originality and creativity in design is highly valued. At a young age, girls are allowed to play and experiment with the clay without any real supervision. Then the mother/teacher will first teach how to create and paint a design, partially by working jointly on designs and tracing their outlines. There is demonstration, correction, and verbal instructions, but also praise when the apprentice does well. The fact that young potters can sit together laughing and talking when painting highlights the fact that instructions, advice and suggestions given by senior potters are not perceived as a sign of failure or bad character. Potters are allowed and even encouraged to create their own designs and gain inspiration from one another (Bowser & Patton 2008:111f).

**Authoritative Learning**

Among the Dii of Cameroon, formal teaching of the craft starts at around age nine. The apprentice is now expected to focus fully on the task at hand, and play is over. At first she may make miniature models, some of which are given away to friends and family, while others are deemed substandard and thrown away. Questions are never encouraged even from the younger children, and they are still discouraged now. Knowledge and skill is transmitted in part by sitting next to the mother, observing and imitating her. Intervention is usually only to correct or criticise, and very often physical in that the mother adjusts postures and gestures. After about a year, the apprentice is allowed to create formal vessels, and partial design is applied. The mother still prepares the paste from which they
both work, and this makes the apprentice familiar with the ‘correct’ texture. Now the mother devotes time to showing her daughter the whole operational sequence. Trial and error is not allowed, nor is personal initiative. Innovation is frowned upon, as the goal is to adhere to tradition. Every gesture is controlled and corrected, and corporal punishment is used, as well as verbal humiliation (Wallaert 2008:188ff).

Mothers interpret mistakes in technical form as proof of social disorder and defects in morality, and as a challenge to their authority. Good behaviour is rarely noticed, but errors are always pointed out in public. (Wallaert 2008:191)

The conservative nature of pottery craft among the Dii is evident. Wallaert observed three generations of potters who worked with identical techniques, closely reproducing shapes and decorations. New shapes are not attempted even when prompted, because most assume they would fail and be ridiculed (Wallaert-Pêtre 1999:191, 199f). Only when the basic types of vessels have been mastered is the apprentice taught how to make other shapes and types. One of the last things mastered is the shaping of the collar of a bottle, considered the most difficult task. Learning how to fire the vessels is the final stage, although this will still require the aid, advice and assistance of other potters in years to come. The end of the apprenticeship is marked by formal celebration, a rite of passage comparable to the circumcision of young men, and witnessed by all the potters of the village and their families (Wallaert 2008:192). Even this strict regime cannot hinder the occurrence of some variation of course, especially in aspects of the decoration, but also the clay and temper preferred. Shaping the vessel is still extremely conservative (Wallaert 2008:196). By only teaching small parts of the craft at a time to the apprentice, the Dii potter makes sure that each stage is learned in a way that conforms to established conventions before the next is taught. Copying errors are actively and forcibly resisted in this way, as well as by verbal and physical punishment. It is not just the craft that is transmitted by this, but also cultural norms about authority and proper behaviour.

**LEFT-HANDEDNESS**

In all populations, a number of people are born left-handed. The way such individuals are treated by others - ignoring them, fearing them or forcing them to change - says a lot about the way the society in question perceives individual variation. The Dii, who as we have seen are very concerned with proper respect to authority and proper behaviour, do not allow left-handedness at all. Left-handed children are taught early on to change their leading hand, partly by wearing heavy iron bracelets, and sometimes even by cutting the left hand and rubbing salt in the wound to make it uncomfortable to use (Wallaert 2008:196). It is a clear example of how an authority-centred culture equates correct bodily behaviour with correct moral behaviour.

Sassaman and Rudolphi have studied decoration on prehistoric Stallings pottery in south-eastern USA. In their sample, c. 90% had right-oriented drag-and-jab incisions, and
10% had left-oriented. This was interpreted as examples of right- and left-handedness among the potters. Two out of the 598 vessels studied had incisions from both right and left, which was interpreted as ambidextrous potters (Sassaman & Rudolphi 2001:418). Another explanation might be that more than one person contributed to the decoration in these vessels, an apprentice for instance, much as has been described elsewhere (Crown 2001; Kamp 2001; Bowser & Patton 2008). Also, the proportion of left- and right-oriented impressions varied between different contemporary settlement sites, where Middle Savannah sites had c. 20% left-oriented punctuations, but Brier Creek had only 3% (Sassaman & Rudolphi 2001:418). This might be the result of chance, assemblages created under different circumstances, or diverse attitudes towards left-handedness.

**CAUSES FOR PATTERNS IN MATERIAL CULTURE**

The spread of clay processing recipes is not likely to proceed from an “unavoidable contagion” but from socially and culturally mediated relationships between potters; hence the discrepancies in the pattern of distribution.

(Gosselain & Livingstone Smith 2005:43)

In the examples of chapter 6.1, it has become clear that one cannot view ceramic vessels as the result of bounded, coherent technologies. Nor is it clear which aspects of the craft – if any – correlate with ethnicity. Depending on which stage of the production is in focus, different levels of identity and networks can be involved, from personal family ties to large super-regional, inter-linguistic historical networks. In southern Cameroon, learning networks usually involve several villages covering a large area, but it is still smaller than the whole ethno-linguistic territory (Gosselain 1998:103). In cases where pottery is the sole responsibility of members of a caste or social segment who practice endogamy, potting traditions can become spread over an extended region. (Gosselain 2000; Degoy 2008). Technological standardisation across a region is often interpreted as evidence for specialisation of the pottery craft. While this might be the case at times, it is clear that lack of standardisation does not equal lack of specialisation (cf. D. E. Arnold 2000). In the Cuzco region before the Hispanic conquest, the growth of a specialist potter segment actually led to increased differentiation, as the craft traditions become firmly grounded in the local community and its land rights (Sillar 1997; 2000; Sillar & Tite 2000).

It seems almost impossible to establish universal rules about what level of social identity is the underlying cause for specific aspects of pottery craft, such as shaping or decoration. However, this impression of randomness is not really accurate. Patterns of material culture and technology do tend to be caused by social, cognitive and historical factors that make sense to us. Specifically, social and cultural identities, marriage networks and learning structures influence to a great extent how conservative or changeable a craft is. Motor habits also tend to be less prone to alterations than more visible features of the craft. Hand-forming techniques used by the women within the potter castes of Andhra Pradesh correlate less with the sub-caste or linguistic group than with the endogamous
PART 3

marriage network. For the male potters using wheel-throwing techniques, their methods, especially the wheel-rotation modes, correlate with linguistic affiliation. Body postures and morphological attributes of tools are closely related to dialectical groups (Degoy 2008). All these are in some ways related to the structuring of the craft and transmission across generations, from teacher to apprentice.

Luo pottery can come in thirteen general categories of pots, but no single region will have local versions of all thirteen forms (Herbich 1987). Rather, each area produces and uses a distinctive subset of variants, usually seven to nine, which serve “a roughly identical set of functions” (Dietler & Herbich 1989:154). The variation is connected to the patrilineal compounds and extended households within which locally homogenous traditions are upheld through respect for authority and seniority among the women married into the lineage (Herbich 1987; Dietler & Herbich 1989). Also, the Luo pottery set is not associated solely with that ethno-linguistic group, as it overlaps with the neighbouring Luyia. The variations in decoration and shape seen in Luo pottery are a result of the relations between potters in networks of daily personal interaction, both locally and regionally since the potting communities tend to cluster around clay sources. At times, conflict between compounds, or even between co-wives within a compound, may lead to different decorative styles (Dietler & Herbich 1989:155, 158f).

The blacksmith-caste of Senegal is not a single ethnic group, but rather exists as endogamous social classes within many different ethno-linguistic groups. Consequently they have partly different operational sequences for making water and storage jars, from choice of temper, to shaping and painting. However, they all have the same general decorative pattern, identifying their products as part of the same tradition (Gelbert 1999:221). The complex historical background of sub-Saharan Africa can also account for the fact that contemporary groups that ascribe to the same ethnic identity and speak the same language may have quite different technologies and operational sequences when making the same type of vessels.

The spatial coexistence of different traditions also may stem from linguistic and cultural assimilation of previously independent populations, as documented among the Dogon of Mali and particular Mande potting communities. In all these cases, people simply retained parts of their cultural heritage, including fashioning techniques, while borrowing or being pressured to adopt new cultural traits in the process of establishing another identity. (Gosselain 2000:206)

In other words, embodied habits are not changed as easily as ethnic and social identities. South Niger is one of the best examples of how an apparently complex and chaotic spatial distribution of various technological aspects can be understood if teaching relations, migration patterns and marriage networks are taken into consideration. Olivier Gosselain has studied 600 potters in 350 villages belonging to a dozen ethno-linguistic groups in this region, including field research, in-depth interviews, and detailed study of the chaîne opératoire. Historical events have created a region with extensive overlapping of both ethnic groups and linguistic groups in the same areas, some of which are more mobile
than others. Instead of settling for present day settlement patterns and ethnic affiliation, Gosselain registered the potters’ place of birth, migration patterns, and the background of their teachers as well (Gosselain & Livingstone Smith 2005; Gosselain 2006; 2008a; b).

In south-western Niger, clay processing recipes – including tempering – is widely perceived and used as technical expressions of social and/or community identity. However, in south-eastern Niger the temper recipes have a less obvious correspondence with professed cultural identity. Nor does the spatial distribution of technologies bear any relationship to modern day linguistic boundaries. This is partly because the region is undergoing a process of ‘Hausaization’, and the spread of Hausa language and culture obscures older social and ethnic identities. Therefore, technological boundaries are not at present identical to ethnic, linguistic or social boundaries. It should be remembered, however, that before the Hausa became associated with superior social status, religious orthodoxy and economic benefits in the area, the pottery crafts probably correlated fairly well with ethno-linguistic affiliation (Gosselain 2008a).

Technology, especially as seen in paste preparation, still corresponds mainly with kinship networks. These may not comprise straightforward marriage patterns, but rather exist where people and relatives continuously interact with each other (Gosselain 2006; 2008b:72, figs 5-6). Decoration and especially shaping do to some degree correspond with language-families in Cameroon. This is an effect both of conscious cultural identity and of the underlying kinship networks that structure everyday social relations, and through them the transmission of knowledge and practice, that in turn create this perception of cultural identity (Gosselain 2000:198,202f). The importance of following the operational sequence set out by one’s teacher becomes apparent in Niger. In several villages two to three different processing recipes are in use among the potters, despite the fact that they all use the same clay source and produce similar vessels. In each instance, those who use different recipes also belong to different social sub-groups: farmers, blacksmiths and ‘slaves’. “When asked about the situation, they simply answer: ‘it is only normal that we do not process clay in a similar way, since we are different’” (Gosselain 2008b:71f).

While technical knowledge is mainly transmitted within a kin network, especially from parents to offspring, and older members of a household to the younger ones, technological traditions such as those of pottery are not governed solely by inheritance. They are also heavily influenced by “the context within which knowledge is put into practice” (Gosselain 2008b:67), and therefore open to readjustment and renegotiation by the practitioners.

The Operational Sequence of Pottery Craft: a summary

Depending on availability of clay and temper materials, as well as climate, making pottery from scratch can take anything from barely a week to well over a month (Rye 1981; Stark et al. 2000:306; Gosselain & Livingstone Smith 2005). Considering that a capable potter can make a batch of 10-15 vessels at a time for firing, most of the annual demand for new
pots can be met through one or two occasions of manufacture. This is assuming most households have their own potter, and that there are no special events that call for large amounts of ceramic ware. If pottery for a whole community is made by only one or two potters, the time spent procuring raw materials and making the pots is of course more substantial. Most traditional, non-market focused potters around the world concentrate their production period to certain times of the year that are optimal considering seasonal climate and/or other seasonal demands for labour. In Northern Europe, it is fairly evident that most if not all pottery making took place between late spring to early autumn, when the ground was no longer frozen, and drying the vessels was unproblematic. As Sillar has pointed out, the operational sequence of pottery making cannot be viewed in isolation from other aspects of society. Not only is it intimately linked with social prescriptions of roles and personal identities, but also other activities that occur throughout the year (Sillar 2000). No artisan is a completely free agent, but must organise the work in a way that does not clash with everything else that needs to be done.

CLAY SELECTION

Clay is simply a finely grained material that becomes plastic when mixed with moderate amounts of water. There are many factors that control the properties of clay: the mineral composition, presence of non-clay minerals and their abundance, shape and particle-size, organic content, and the texture which is the result of the distribution and orientation of the particles (Hulthén 1977; Rye 1981:29; Lindahl et al. 2002). Birgitta Hulthén presents more extensive technical information about clay and its properties in the Appendix. In South Sweden, both fine and coarse clay is fairly easy to find in most regions, without having to travel large distances. In some parts (e.g. Gotland), however, most of the clay is calcareous which may be difficult to fire without risking fractures.

Several ethnoarchaeological surveys have shown that the distance travelled by a potter to attain clay is usually no more than a 3 km radius of the homestead, and often less than that (Sillar 1997:tab 1; D. E. Arnold 2000:343; Gosselain & Livingstone Smith 2005:35; Gosselain 2008b:70). The outer limit appears to be 7 km in most cases, though potters who travel that far usually make use of roads and at least some form of transportation device. If clay is extracted from a source even farther away, it is usually located next to a village where the potter used to live, and where he or she regularly visits kin. Sillar points out that it is inaccurate to simply describe the distance traversed as the result of calculated energy expenditure, since important social and cultural factors of landscape, natural resources and social organisation always play a decisive part (Sillar 1997). While notions of quality naturally have a role in the potters choice of clay, especially in terms of texture (Frank 1994:29), social factors such as ancestral ties to the place also feature heavily (Smith 1989). Moreover, it is clear that the clay sources used are situated conveniently, close to areas frequented for other reasons as well (Gosselain 1998:91; 2008b:70). The source is hardly ever considered personal property, but shared by many members of the
community, or even members of different communities (Sillar 1997:6f, 12; Livingstone Smith 2000; Wallaert-Pêtre 2001; Gosselain & Livingstone Smith 2005:33).

It is not easy to determine what type of clay was preferred based on the type of vessel produced or its intended use. While there are examples of potters using different types of clay for different kinds of pots, for instance coarse clay in cooking vessels, there is no absolute rule about this. There are plenty of examples of craft traditions that call for fine clay in cooking vessels, or which use coarse clay in vessels intended for other uses (Sillar 1997; D. E. Arnold 2000:345). Moreover, potters may consider that the risk of using a clay known for a tendency to cause cracks is still worth it, as they feel that if successful it will result in stronger and more valuable pots (Herbich & Dietler 2008).

CLAY PROCESSING

There are several potential stages of processing raw clay: drying, crushing, cleaning, soaking, sieving, sorting, mixing, tempering, and kneading (Rye 1981; Livingstone Smith 2000; Lindahl et al. 2002:17f; Gosselain & Livingstone Smith 2005; Wallaert 2008). With the exception of kneading they are all optional, depending on the circumstances and the established craft tradition. Some craft customs call for different processing depending on the type of vessel being produced, but this is not common. For Luo potters, the whole range of local pot forms, for cooking, serving, storing water, brewing etc, are made from the same clay and temper combination. In other communities the combinations vary somewhat depending on the type of vessel being made (Dietler & Herbich 1989:152). In the Andes, potters prepare only one type of paste that they use for all the different pots they make, from large brewing jars, to drinking bowls and cooking pots. Paste preparation is a communal undertaking, and those who have specialised in a certain range of pots for trade seem to have a common idea of what is a suitable type of paste (Sillar 1997:8). In some societies, two or three type of clay are mixed together to make the perfect paste (Gosselain & Livingstone Smith 2005:33f).

TEMPERING

Adding non-plastic inclusions to the clay is the most common and practical way of avoiding fracturing during drying and firing (Rye 1981:31ff; Lindahl et al. 2002:18ff). This is also something that can be studied fairly accurately in prehistoric pottery through thin section microscopy (see Hulthén, this vol.). While crushed rocks and minerals are most commonly associated with tempering, there is a vast array of materials that can be used singly or in combinations with each other: e.g. shells, bone, hair, dung, grog, blood, grass, rice, millet, cereal husks, wool, ash etc. The type of rock/mineral used is also highly variable: granite, quartz, flint, volcanic rock, slate, asbestos, limestone etc. The amount added is usually prescribed in general terms, but the potter who prepares the paste decides when the texture feels right, and adds temper and clay accordingly (Frank 1994:30). While the recipe is very much grounded in tradition, potters sometimes have to alter it in order to avoid failure. Ticul potters add crushed minerals to the clay, but at times these locally
acquired minerals contain large amounts of the plastic clay mineral montmorillonite, which can cause the vessel to sag and crack. Therefore they occasionally add extra amounts of a silicate mineral known to counteract this problem (D. E. Arnold 2000:355). When coarse clay is being used, it is possible at times to add no temper at all (ibid: 354).

EVALUATING BY THE SENSES

One of the most powerful tools a potter uses to decide that the clay selected and the paste produced meets the requirements is touch (Frank 1994:30). The texture should conform to sensory memories of the potter that in themselves are difficult or impossible to verbalise. There is always natural variation in clay and the temper materials, so absolute quantities are not used in the systematic approach of a chemist, for example. Decision making is sensuous, and draws upon memories from childhood and apprenticeship, as well as personal experience that deepens with age. In fact, far more senses than touch are used: “A first requirement is that the clay must have the ‘right’ physical properties; i.e. that its plasticity, texture, colour, and even its taste and scent fit with the personal requirements of the potter.” (Gosselain & Livingstone Smith 2005:40). Luo potters test the clay and temper paste for proper consistency by pressing a small lump of clay between thumb and fingers, pulling it apart to test for stickiness, and by “rubbing a bit of paste on the tongue to check roughness” (Dietler & Herbich 1989:153).

Pumpuri potters of Bolivia, when forced to find new clay sources, classify clay as either strong or weak based on plasticity and amount and coarseness of natural inclusions. ‘Weak’ clay is very plastic, which is necessary to be able to shape the pots, but is also more prone to cracking. The final product is often a mixture of different kinds of weak and strong clay. But a new clay source also means that the proportion of temper might need to be changed so that the end product conforms to the established standards (Sillar 1997:11). Although the potters have specific recipes for amount of temper and clay, since the characteristics of each may vary from time to time, it is the physical property of the final mixture, as determined by the potter from experience, that will decide the ratio (Miller 1985:212; D. E. Arnold 2000:354).

SHAPING

Forming a vessel is often divided roughly into primary and secondary stages, as well as surface modification.

PRIMARY FORMING entails converting a lump of clay into something resembling the final shape. Different parts of a vessel can be made in separate stages, and these may be left to dry into leather-hard texture, which makes it easier to add a new part without deforming the ones already made. Techniques of primary forming are usually versions of coiling, pinching, moulding, pounding, slab-building, drawing and/or wheel-throwing (Johnston 1977; Rye 1981; Hulthén 1982). Sometimes only one method is used, sometimes several. Coiling, which is a very common technique in Neolithic Scandinavia, means that all or
large parts of the vessel is constructed from coils of clay placed on top of each other or added as a spiral. The way in which the coils are then made to form a smooth wall can vary between traditions. Based on the way the ceramic wall would look in a cross-section, these different techniques are called H, U or N (Fig. 6.1:a) (Hulthén 1982:7f; Lindahl et al. 2002:21ff).

Fig. 6.1. Neolithic shaping methods. Coiling (a) is the most common, and the coils are fastened either by pressing down and the smoothing the sides (H), drawing downwards on both interior and exterior surface (U), or drawing one side upwards and the other downwards (N). Pinching (b) is used more rarely. (after Rye 1981:fig 52; Lindahl et al. 2002:figs 8-10)

H-TECHNIQUE: The coil is fastened to the underlying one by pressing a finger down into it. The walls can be smoothed upwards on both sides. This method creates vessels with a distinct tendency to fracture at the joints. In Sweden it was mostly employed during the late Mesolithic, and only occasionally in the Neolithic.

U-TECHNIQUE: The coils are smoothed downwards both on the interior and exterior surface. Used in Sweden in the late Mesolithic and sporadically during the Neolithic.

N-TECHNIQUE: The most commonly used technique in Neolithic Sweden. The coils are smoothed downwards on one side, and upwards on the other, creating sloping joints.

SECONDARY FORMING involves adjusting and completing the vessel, and making sure the vessel walls are not of uneven thickness. Techniques used involve turning, scraping, paddle-and-anvil, beating, trimming, and additional wheel-throwing, coiling and/or joining. The proportions and finer aspects of the shape are set, and features such as rim shapes and handles are added (Rye 1981:84ff).

SURFACE MODIFICATION can take place during either of the previous stages and/or after them. This means changing the texture of the surface to some degree, e.g. by scraping, smoothing, polishing, burnishing, or applying slip etc. (Rye 1981:62ff; Hulthén 1982:13; Gosselain 2000; Lindahl et al. 2002:25f). Separating surface modification from decoration is perhaps arbitrary, but it is too often forgotten by archaeologists, and as it is intimately linked with the forming process it is reasonable to include it here.
Shaping a vessel is deeply embedded in motor habits, mastered through repeated, routinized practice during the learning period and subsequently internalised (Gosselain 1998:92, 102). The differences in traditions might at times be so small as to escape superficial detection. For instance, the potters of Fouta Toro shape the body of the vessel by scraping the inside *horizontally*, whereas the nearby Galam potters thin the walls by scraping both the inside and outside *vertically* (Gelbert 1999:216). This is certainly not grounded in a conscious cultural expression, yet its very existence testifies to teaching networks and actual human interaction that exists in the physical world, and not just in the mind. The fact that shaping is rooted in learning the craft and embodied practice, means that it is often very resistant to change (Gosselain 2000:192, 210). As an example: two sisters who had both been taught the craft by their mother moved to different villages upon their marriages. Both had thereafter modified the way they processed the raw material and fired the pots, stages that are shared with other potters of the community, but had kept the fashioning technique they had been taught by their mother (Gosselain 1998:102). The two Dii potters mentioned above, who make Toupouri pots for sale, but use the traditional method for fashioning them, are another case in point (Wallaert 2008:196). Even the Fali who encourage innovation and trial-and-error have a very conservative shaping technique (ibid: 197). Of course, there is no rule that different ethnic groups must have different shaping techniques. In the Andean highland of Bolivia and southern Peru, the basic principle behind making a vessel is to have a slab of clay for the base and form the walls by drawing the coils upwards. This is the method in most areas, regardless of ethnic affiliation or raw materials being used (Sillar 1997:fig 1-2).

**DECORATING**

Decoration can take almost any form imaginable, from impressions of tools or objects, to painting, to moulding 3-dimensional patterns. Although most archaeological works have tended to focus upon decoration as symbolic text and/or as an identity marker, examples of this in ethnographic research are fairly limited, at least when the decorations are non-pictorial. There are of course cases of decorative patterns being named and ascribed symbolic meaning (Gosselain 1992:574), however there are just as many, or more, cases of patterns being viewed as traditional embellishments and nothing more (Smith 1989:62f; Gosselain 1992:574).

Decoration belongs to a category of manufacturing stages that are both particularly visible and technically malleable, and likely to reflect wider and more superficial categories of social boundaries.

(Gosselain 2000:193)

There are interesting examples of decoration being influenced by other materials, such as basketry, weaving or even bodily ornamentation (Smith 1978; David et al. 1988; Smith 1989; Gosselain 2008a:171). In those cases, the decoration must be understood as being translated from one medium to another. Decorations on the water jar that takes part in a
Dowayo woman’s mortuary rites bears star shaped marks (‘scars’) that are the same shape as the haircut worn by women in mourning, and the scars traditionally cut into a woman’s abdomen (see chapter 12.1). The motif has no name, and it is not said to ‘symbolise’ the sun, or crossroads, or anything else (Barley 1994:121). The Mafa and Bulahay of Cameroon, on the other hand, scar their bodies in such a way as to create patterns made up of multiple bumps. These are also found on the pottery jars and are openly likened to millet grains. There is actually no general term for ‘decoration’ in the Mafa language. The motifs created by these bumps seem to have no apparent meaning today at least, apart from beautification of bodies and pots. While this reveals an interesting cosmological connection between bodies, fertility, earth and pottery, it is quite revealing that when queried about the patterns of their pottery most informants simply state versions of “That is the Mafa way” (David et al. 1988:370).

The tools used to create decorations and patterns are very often simple and non-specific: a sharpened twig, a piece of cloth, a shell, an ear of corn. Some are specifically made, such as pegged comb or tooth stamps, or roulettes. Gosselain studied the widespread use of various types of roulettes in sub-Saharan Africa, made of fibre or carved out of wood. These were not restricted to certain areas, or ethno-linguistic groups. However, their distribution was not completely random either. He came to the conclusion that, in this case at least, type of tool does not reflect cultural affiliation.

This is not to say that roulettes or other kinds of decorative tools are never embedded in local symbolic systems, laden with cultural value…. However, from a strictly typological point of view, rouletting tools allow mostly for the identification of social networks of individuals whose interactions are only occasional and superficial, dependent upon geographic propinquity.

(Gosselain 2000:200, orig. emphasis)

Even the non-descript tools, like sticks and cords, can for the potter herself be closely associated with the period of learning the craft, and the tradition of her teacher. They are non-specialised, but they are also deeply personal.

FIRING

For many potters this is the most hazardous phase of the entire process. All the previous hard work in acquiring clay and temper, processing the paste, forming and decorating the vessels, and drying them may come to nothing if they fracture and crack when fired. Many taboos and ritual prescriptions therefore accompany this phase, and it is not something to be experimented with unduly. It is also in many cases a collective affair, meaning the preferences of the individual must come second to the will of the majority – or the senior potter (Dietler & Herbich 1989:155; Frank 1994:32; Sillar 1997; 2000; Gosselain & Livingstone Smith 2005).

During firing, the clay-mineral crystals are destroyed which makes the clay matrix hard and insoluble. The temperature at which this happens varies somewhat depending on the
type of clay minerals, with minimum temperatures at c. 500°C. At c. 800°C all types of clay generally become ceramic material. Ceramics are usually divided into earthenware, stoneware and porcelain, depending upon the physical characteristics. In Neolithic Scandinavia, where kilns were not in use, earthenware is really the only kind of ceramic found, meaning it is crystallized with quite porous quality (Rye 1981:96; Lindahl et al. 2002:30ff). There are mainly two types of firing that could have been employed: open or covered.

**Fig. 6.2. Methods of firing pottery. a: oxidized, b: reduced (Lindahl et al. 2002:figs 16, 18)**

**OPEN FIRE:** This is the most basic and straightforward method. Dried vessels are placed on and surrounded by wood, dung, grass or other types of fuel (Fig. 6.2:a). While it is deceptively simple, it requires a lot of experience and know-how on the part of the potter in order to avoid too extreme temperature variations causing the vessels to fracture. An open fire can easily reach 800°C, or even above 900°C if it is constructed properly (Rye 1981:102f). Firing too short a time will make the vessels unstable or prone to disintegration, while firing for too long may make them too brittle. Clay containing calcite, or being tempered with calcareous materials, will be weakened by temperatures above 800°C, and should preferably be fired at lower temperatures (Hulthén 1977:157; Rye 1981:98; Hulthén 1982). Fuel can be added or moved around during the firing, or the vessels can be turned over or pulled away if it is deemed necessary. An open fire is generally referred to as an oxidized atmosphere, meaning the clay interacts with the oxygen to create a surface that is usually between light yellow to reddish brown, depending on the minerals (e.g. calcite, iron) present in the clay. If one wishes to avoid black and sooty areas or interior surfaces, the potter must make sure all of the vessel is exposed to air at some time during the firing. Cooling should not be too fast either, to avoid cracks. Wide-mouthed vessels are especially vulnerable to cracking at the rim, since this part cools more quickly than the rest. To prevent this they may be placed upside-down.

**CLOSED FIRE:** An alternative way is to cover the vessels and the fuel with a layer of non-combustible insulating material, e.g. dung, mud, wet grass, stones (Fig. 6.2:b). Either
this is constructed as a mound around the vessels, or they are placed in a pit. Since this creates a reduced atmosphere, the vessels become dark and blackened. However, if the still warm pots are allowed to cool off in open air, the outermost surface will become oxidized (Fig 6.3) (Rye 1981:98, fig 105; Hulthén 1982).

**Fig. 6.3. Cross section of a pot that was burned in a reduced atmosphere and cooled rapidly in air (Rye 1981:fig 105a).**

**SUMMARY REMARKS**

Anthropological and ethnoarchaeological research into pottery production and craft in traditional societies have yielded many cautionary tales about making an arbitrary connection both between cultural identity and material culture on the one hand, and between technology and function on the other. Technology is still embedded, in the truest sense of the word, in social relations and historical contexts. While it is not guided by deterministic principles and rules, it is certainly not randomly constituted either. Personal interactions between parents and children, teacher and apprentice, the potter and the community, as well as between different potters, shape and influence the operational sequence and the material culture produced. Motor habits acquired in youth become embodied over time. Cultural meaning is most prominent not in the display of symbols, but in everyday practice that is both conscious and sub-conscious depending on the circumstances. Change in practice and/or technology in prehistory is therefore something to be studied closely. It should not be seen primarily in terms of optimization, functional necessity, or symbolic communication, but in terms of whether the changes we see are superficial or if they influence the entire operational sequence of production. Before we answer that, we cannot hope to answer the question of what it means, or what the underlying reason may be.

What matters here is that self-awareness about technical procedures has the ability to turn a routinized and mundane activity such as ‘shaping a pot’ into a powerful tool for defining oneself and expressing group identity.

(Gosselain 2008:77)

While marriage networks may be one important method for establishing and upholding contact and cultural exchange of every kind with another group or community, even across language barriers, it is not in itself enough to explain changes in craft and material culture. There are many examples of societies which expect the new spouse to alter his/her ways according to the local norm, and who will reject any attempt to introduce new practices. Also, not all affinal ties are equally strong: it is the steady, continuous and
long-term contacts between individuals and sub-groups, combined with strong culturally structured ties, that have the largest potential for introducing change.

**Pottery as Craft and Chaîne Opératoire in Archaeology**

It is far too common for archaeologists to start with typological classification of various traits to form the basis of interpretation, without first questioning which variations are socially/culturally significant, and if so *why*. It is even rarer to find that they correlate such an understanding with actual anthropological research into craft traditions. Too often the whole discussion starts with a reasoning along the lines of ‘If X then Y…’ or even ‘If Y follows the same basic rules as X, then the reason for the pattern that we see is…’. Seldom is it actually analysed whether X is a valid premise in the first place. Pottery can of course be analysed with the same methods and rules being used in genetics or evolutionary biology (e.g. Neiman 1995; Shennan & Wilkinson 2001; Eerkens & Lipo 2008), or market economy, or molecular chemistry for that matter. While each may result in some interesting theories and models, the big problem for me is that they start with the presumption that the scientific principle of their choice is not just a valid metaphor, but a direct analogy, and that there are identical forces at work.

What tends to be glaringly absent in these attempts is a direct reference to contemporary situations or living informants. Before attempting to infer certain principles in a prehistoric material, researchers should prove their existence in present day traditional societies. The increasing interaction of the fields of practice theory, cognitive science and neuroscience, especially in the study of childhood and learning, show that natural science, social science and the humanities have a lot to contribute to each other. However, it is important not to simply apply evolutionary theory on any kind of human cultural practice. A biological or scientific model applied to human culture must also take the realities of human everyday existence into consideration. We are not always ‘rational’, optimizing, efficiency seeking, adaptive beings. We can and do act in a wholly irrational, counter-productive and even completely destructive manner. We are also rarely free agents with perfect perception, we are grounded in a cultural framework with individual notions about what is the moral, ethical and most rewarding action to take (cf. North 2005). Frequently, we are unable to fully realize or predict the consequences of our decisions a year from now, not to mention a generation from now. For archaeologists who are dealing with a very blunt tool when it comes to temporal matters, individual intent is often drowned in the flood of generations.

Some archaeologists have attempted to interpret pottery assemblages drawing upon insights gained from ethnographic observations and learning research. Valentine Roux has done research on the emergence of the potter’s wheel in southern Levant during the fifth to third millennium BC. She shows that the introduction is dependent upon a complex set of circumstances involving technology, social organisation, networks, political change and environmental factors. The primary factor was the demand for ritual objects from a small
group of specialised craftspeople attached to an elite. During a period of significant political and religious change, the novelty of the hand thrown vessels was an asset to those involved. What is remarkable is that after the technique had first become established it disappeared from large parts of the region at the end of the fourth millennium BC. Roux interprets this as a result of both a change in demand for the ritual vessels, and the fact that knowledge of the technique was controlled by a small group of artisans. The learning system was too restricted to survive the changes taking place. The transmission of a technological innovation depends not just upon the cultural context, but also on the organisation of the craft and the teaching network. (Roux & Matarasso 1999; Roux 2003; 2008a).

Patricia Crown has studied pre-Hispanic pottery in south-west USA where some 5% of displays a distinct lack of skill in applying painted geometric designs (Crown 2001:452). The decoration shows evidence that the painter kept interrupting his/her movements to correct the direction, making short strokes and overlapping lines. This suggests that the painter was not being sloppy or hasty, rather that it was the painstaking attempt by an as yet unskilled painter to create unfamiliar patterns. Crown identifies a number of collaborative pots in the archaeological pottery material, based on comparing the level of skill in shaping the vessel (symmetry, method, wall thickness and evenness) with the skill of the painted design. It is likely that a number of poorly decorated vessels from Mimbres were made by adults, but painted by children. Some vessels had masterfully applied templates of design, which was then filled in with paint by someone who could not keep inside the outlines – very much in the same manner as Shipibo-Conibo children are taught to paint patterns (Crown 2001:462f; Kamp 2001:428). In other words, the children were first taught to master design painting, and only after that how to shape the vessels in question (cf. Bowser & Patton 2008).

In contrast, among the Hohokam potters the apprentices themselves seem to have traced the outline of the design, more or less successfully. This would indicate that only children who had already mastered a certain level of fine motor skills were allowed to learn how to paint. There were also fewer examples of naturalistic designs on the Hohokam pots than on those from Mimbres. Crown takes this to mean that the former accepted fewer deviations from the culturally prescribed design templates than the latter (2001:464). The Hohokam pottery shows slow, consistent changes in design over time, whereas the Mimbres pottery is characterized both by changes in technology and creatively altered designs. This is interpreted as the result of the differences in cultural attitudes as revealed by the social structuring of the craft, and the learning process among the two groups (Crown 2001:465).

Sassaman and Rudolphi studied temper materials used in Classic Stallings pottery at three riverine fishing communities in Georgia, USA. The elaborate decorations vary both within and between settlements. At Middle Savannah virtually all pottery was fibre tempered, with sand added to almost one-fifth. At Ogeechee all the pottery was sand tempered, with fibre added to half. And at Brier Creek two-thirds of the pottery (67%)
was sand tempered, with fibre added to 23% of these, and a quarter of the sherds were untempered. The direction of stab impressions in pottery was also noted, with a greater proportion of left-oriented ones at Middle Savannah sites (c. 20%), less at Ogeechee (c. 10%), and virtually none at Brier Creek (2.7%). The authors interpret the regional coherence in pottery types, the different proportions of supposed left-handedness, and the tempering traditions that are quite locally characteristic, albeit regionally similar, as evidence of a sense of cultural unity combined with matrilocality and infrequent relocation of potters (Sassaman & Rudolphi 2001).

Fredrik Hallgren has studied Early Neolithic Funnel Beaker pottery (c. 4000-3300 BC), the earliest pottery of Eastern Central Sweden, from a craft perspective (Hallgren 2008). He noted the type of decorations at various sites, but also made detailed study of the shapes and profiles of the pots based on the method set out by Eva Koch (1998). Some Early Neolithic funnel-beaker vessels have extensive decorations, whereas others have barely anything. Previously, this has been interpreted as either due to chronological differences (more or less ‘evolved’ pottery), or as a difference between secular and ritual pottery. Through 14C-dating of carbonized crusts on the sherds, Hallgren shows that the differences cannot be chronological, as richly decorated vessels are just as old as the sparsely decorated ones. Next to the settlement Skogsmossen was a fen which contained, in addition to grinding stones and burnt flint axes, large quantities of pottery that had probably been deposited as complete vessels. This ritually deposited pottery was not significantly different in decoration from that found in the domestic area around the house. There were no clear regional differences either, as similar looking pottery could appear on sites across most of Eastern Central Sweden. Instead, specific settlements across South Sweden seem to have pottery that corresponds to certain ‘microstyles’ in the way they are shaped and decorated – a settlement in Södermanland could have pottery more similar to that of a site in Skåne or Uppland, than its closest neighbour. (Hallgren 2008:chp 8)

Thin section analysis was done on sherds from Skogsmossen and three other contemporary sites within the same part of the region (Hulthén 2008b). The results are discussed in more detail in chapter 7.1. The technology was mainly homogenous, but there were some interesting differences between Skogsmossen, where all the pottery was made with fine clay, and Skumparberget and Hjulberga, where several sherds had been made with medium-coarse clay. At the latter there were also two vessels that had been fashioned with U-technique rather than the standard N-technique, and the paste had not been kneaded as meticulously (ibid). The single sherd investigated from Vallby had been tempered with gneiss rather than the granite which was used on all the other sites. Hallgren concludes by noting that the craft was generally speaking very homogenous, with similar types of vessels, technology and techniques used. However, the shapes and decorations on the pottery suggest not only very localized traditions, but also that they were remarkably conservative for generations. This suggests that while pottery technology was introduced along with the ‘agricultural package’, potters developed microstyles over
time as they stayed within their own kin group, rather than move to their spouse’s house. If pottery was in the hands of women, this would mean that the Funnel Beaker communities of South Sweden practiced matrilocality (Hallgren & Possnert 1997; Hallgren 2000a; 2008).

The importance of not viewing one craft in isolation is also discussed by Joanna Sofaer in her analysis of Bronze Age pottery, metalworking and house constructions at Százhalombatta in Hungary. She points out that traditional archaeology too often focuses on the finished products, rather than on the craftspeople themselves. Crafts do not exist in isolation, and especially in pre-state societies there would have been ample give and take between people involved in different craft techniques/disciplines (Sofaer 2006c:127, 137). With this in mind, the use of riveting as a method of attaching handles to clay vessels is interesting. From a ceramic point of view, the method is hardly ideal, but it is the most effective and easy way to attach handles to bronze vessels, as well as in wood working (2006c:136). Rather than fragmenting a society into separate crafts and technologies, Sofaer points out that even if certain technologies were gendered, cooperation between genders might also have been part of the set-up. Technologies often depend upon many different activities, from acquiring raw materials to aiding in certain tasks, and this co-dependence might have been viewed as an asset and an indispensable part of social life. Most importantly, any interpretation of prehistoric material culture must take into consideration that the transfer of know-how is situated within social networks that organize the interaction between actual individuals (Sofaer 2006c:128, 139).

Sandy Budden, who has a background as a potter herself, has performed a detailed analysis of the Bronze Age pottery from Százhalombatta and other sites in the area, including a cemetery (Budden 2008). Drawing upon learning theory and cognitive intelligence studies of daily practice and skill acquirements, she examines the apprenticeship practices of the region. Registering a number of formal aspects on different types of vessels (cups, fine-ware, urns), such as wall thickness, surface treatment, rim symmetry, profile symmetry etc, she gains an insight into the level of skill of makers of the individual vessels. Importantly, she does not assume that each pot was made by a single potter, but notes discrepancy in skill on various parts of some of the vessels, as apprenticeship might entail doing specific tasks in stages, rather than an entire complicated vessel at once. It is clear that cups are made with a lower investment of skill than urns, for instance. Interestingly, although the types themselves are the same, there is a distinct difference between the pottery found in burial contexts compared to that found at the settlements. The fine-ware at the cemetery stands out as being invested with less skill than usual, though the urns are still made with a great investment of skill (2008:5).

As Budden points out, traditional interpretation would probably be that the fine-ware items were made in a hurry for the funeral, and that they are token products for appearances sake, or that the settlement pottery was an investment by the elite in specialist products (2008:10). These interpretations would not explain why cups are low-skill at both settlements and cemetery, and why the urns are high-skill at both as well.
Moreover, as a potter herself, Budden points out that motor skills are deeply embodied and not something that is ‘unlearnt’ when in a hurry. Skill is routinized and not a conscious choice in most cases. Also, having an unskilled potter make a vessel will not save time, as he or she will work more slowly, and it will only increase the chance of failure. Budden’s interpretation is that the fine-ware deposited in burials did not have to meet the same pragmatic requirements as those used by the living. This was therefore an opportunity for junior potters and apprentices to practice making them (Budden 2008:10f). Urns, probably used for storage of goods, are very complex creations and have a prominent position in the burials. They were probably only made by potters that had already mastered making both cups and fine-ware (2008:13). It brings to mind the Conambo potters mentioned above, who were not taught how to make the large fermentation jars until they had established themselves as wives, mothers and community members (Bowser & Patton 2008).

Thomas Eriksson has investigated the Bronze Age pottery of Central Sweden, focusing on the various shapes and sizes of the vessels at settlements and in burials as a way of developing an understanding of the ‘set’ of ceramic vessels used by the people (Eriksson 2008; in press). But he has also noted the various forms of surface treatments present on the pots at different sites: rusticated, polished, burnished, striated, grainy and textile-impressed. Rusticated pottery is by far the most common type overall, but the quantity of sherds with polished or burnished surfaces varies considerably between sites. These belonged to smaller vessels probably used as drinking cups. At the site Ryssgårdet there were not only ten long houses, but also a probable cult house inside of which a large number of the burnished sherds were found. Bronze Age vessels in Sweden are rarely decorated, but as was mentioned earlier, burnishing is actually both more arduous and time consuming than most forms of decoration. The produced sheen is reminiscent of metal surfaces, and it is likely that they were meant to emulate bronze drinking vessels.

One additional interesting result of Eriksson’s analysis was how clearly the Darsgärde site of coastal Upland stood out against the other six settlement sites in Uppland, and also assemblages from Södermanland and Åland. Here most of the sherds had striated surfaces, perhaps from brushing across wet clay with grass. There was also a small but significant number of sherds with textile impression in the Finnish-Baltic tradition. There were hardly any rusticated vessels at the site. This strongly indicates that Darsgärde should be viewed as settled by people belonging to a more East Baltic tradition, whether as a semi-permanent site or a trading outpost is difficult to say (Eriksson 2008; in press).

Mats Roslund has discussed the nature of contacts between Slavic and Scandinavian populations during the Viking Age and Middle Ages by looking especially at the common domestic Slavic pottery and its relationship to Baltic ware in Sweden. As he points out, it is difficult to argue that there were permanent settlers in Sweden from the Slavic areas
without the presence of household vessels integral to everyday activities. Technically excellent Slavic ware has been found at Sigtuna, in Eastern Central Sweden, and it is apparent that this must have been manufactured elsewhere due to the clay and temper used. There are also versions of Baltic ware that show a morphological influence from Slavic ware, but which were made in the materials and with the craft traditions of ordinary Baltic ware. While Slavic ware was held in high esteem, and attempts at imitations were made, there seems to have been no organised learning process or direct contact between potters. The traders and travellers from Rus who undoubtedly visited and stayed at the early towns of Birka and Sigtuna, were not accompanied by people who became settled in the area to a notable degree. Slavic ware is mainly found in the towns and not in rural areas, and the attempts at making ‘Slavic-looking’ ware betray a lack of technological know-how (Roslund 2001:320).

Approaching pottery as an operational sequence, and with a focus upon the transmission of technology, technique and style from one generation to the next can obviously reveal a great deal about issues concerning social organisation, ideology, kinship structures and interactions on both a communal and regional scale. In the following chapters I will attempt to reveal more about the Pitted Ware and Battle Axe cultures by looking beneath the surface of the pottery.
MAKING A Pitted Ware Pot

Trying to reconstruct past lives from dead things and dead bodies is a challenge. However, aspects of those lives are embodied in the craft and through this in the material culture. As discussed in chapter 6, ceramics are more than just surface: in order to make a vessel, a potter has to gather and prepare various raw materials and put them through a whole sequence of actions. Whereas stone technology is pieced together by archaeologists through analysis of debris, as well as the external traces visible in the final product, the ceramic vessel is in itself a container of many of the technological choices and traditions which created it.

On the surface, pitted-ware vessels and battle-axe beakers seem genuinely different. The use of calcareous temper in pitted-ware, and grog in at least some of the battle-axe beakers, also seem to indicate separate craft traditions. But how ‘deep’ are these differences, and are they mainly chronological, regional, functional or cultural? The question cuts to the core of the current controversy surrounding the definition of Pitted Ware culture and Battle Axe culture. The method most commonly used to unravel these clues is microscopy of thin sections, first pioneered for archaeological use by the geologist Anna Sheperd in the 1930s (Rye 1981:2). In Sweden the method was not really used until the 1970s (though see chapter 5.1). Today, thin section microscopy of pottery is a common form of analysis on pottery and the results have been used in a number of research publications.

In chapter 7.1 I have combined the results from a large number of analysed pitted-ware sherds from Eastern Sweden. Based on these I discuss the local and regional variations and similarities of the Pitted Ware pottery craft. I focus mostly on choice of clay and temper, which are apparently technological choices strongly associated with the early learning period, but also with the collective organisation of pottery craft in a community. I also compare the technology of typical pitted-ware (Fagervik III/IV) with early pitted-ware (Fagervik II) and Early Neolithic funnel-beakers. Based on these results I draw some conclusions regarding the organisation of the craft, and in extension attitudes toward potters and individual variation, within in the Pitted Ware culture.
7.1 Beneath the Surface: Craft, Technique, Technology

As discussed in chapter 6, ethnographic studies of craft traditions show that practices often become bodily situated, they become part of the practitioner in ways that are in part thoroughly conscious, partly sub-conscious routine. Even the way of teaching a craft to another person is in itself a situated practice, often revealing deeply held beliefs of the nature of the craft, social position of the practitioner in the wider community, proper relationship between mentor and novice, as well as attitudes towards innovation, creativity and adherence to tradition. With this in mind, I wanted to see if there was anything that could be revealed about the potter networks within which the vessels were produced. Based on the works cited in chapter 6, I believe this can be studied through technological analysis of choice of clay and temper, as well as shaping, surface treatment, and firing. All of which are important stages in the operation sequence making up the pottery craft.

The following questions are posed:

- Are the stages of pottery craft subjected to general rules, or are they varied and changing over time, and across regions?
- Do differences in style and shape disguise underlying similarities in technology?
- Are the greatest differences in Middle Neolithic B pottery craft due to regional or chronologic conditions, rather than between pitted-ware and battle-axe pottery?
- Is there compelling evidence for significant cultural differences in the social structuring of the crafts within the Pitted Ware and Battle Axe cultures?

To conclusively answer these questions we would probably need to do thin sections on thousands of sherds, selected with this very goal in mind, from a multitude of sites all over South Sweden. Unfortunately, this project had neither the time nor the financial means to manage such an undertaking. However, over the decades several other projects have resulted in a number of thin section analyses from many different sites. Lars Löfstrand (1974:120-124) was the first archaeologist to publish a petrographic analysis of pitted-ware. He had selected fifteen poriferous sherds from Ås (Romfartuna parish), Västmanland, and thirteen poriferous sherds from Korsnäs (Grödinge parish), Södermanland, which he studied under a microscope with the aid of geologists. Only a few of the sherds seem to have been cut into thin sections, however, and the rest were studied on the polished break surfaces. His conclusion was that the poriferous pottery had been tempered with calcite, not shells. The possibility of bone temper was not discussed. While Löfstrand’s study is interesting, it is difficult to judge the accuracy of his analysis considering that he had little formal training. I will therefore not include Ås in my compilation of technologically analysed pitted-ware.

In the 1970s Birgitta Hulthén became the first Swedish archaeologist to specialize in thin section microscopy, and her dissertation from 1977 was the first monograph dealing
specifically with what this method might reveal about long-term events and changes, as seen in the pottery craft in Skåne. Hulthén presents a description of the technicalities of thin section and microscopy conducted at the Laboratory for Ceramic Research in the Appendix, so I will not go into detail about the method itself in this chapter. Over the last decade in particular, the amount of thin section analyses has grown considerably in connection with the great rescue excavations in Skåne and Uppland. Additionally, the dissertation by Papmehl-Dufay (2006) has helped to highlight many aspects of the pitted-ware pottery craft on Öland.

Table 7.1. Sites with thin section analysis included in this chapter. TRB = Early Neolithic funnel-beaker pottery, F II = Fagervik II (early pitted-ware), F III/IV = Fagervik III and/or IV (typical and late pitted-ware), TS = thin section (no.).

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<td>TRB</td>
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<td>(Brorsson 2006b)</td>
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<tr>
<td>Skogsmossen</td>
<td>Västmanland</td>
<td>TRB</td>
<td>18</td>
<td>(Hulthén 2008b)</td>
</tr>
<tr>
<td>Skumparberget</td>
<td>Närke</td>
<td>TRB</td>
<td>3</td>
<td>(Hulthén 2008b)</td>
</tr>
<tr>
<td>Hjulberga</td>
<td>Närke</td>
<td>TRB</td>
<td>9</td>
<td>(Hulthén 2008b)</td>
</tr>
<tr>
<td>Vallby</td>
<td>Närke</td>
<td>TRB</td>
<td>1</td>
<td>(Hulthén 2008b)</td>
</tr>
<tr>
<td>Högmossen</td>
<td>Uppland</td>
<td>F II</td>
<td>23</td>
<td>(Brorsson 2008a)</td>
</tr>
<tr>
<td>Postboda I</td>
<td>Uppland</td>
<td>F II</td>
<td>7</td>
<td>(Brorsson 2006a)</td>
</tr>
<tr>
<td>Postboda II</td>
<td>Uppland</td>
<td>F II</td>
<td>7</td>
<td>(Brorsson 2006a)</td>
</tr>
<tr>
<td>Skinnarbacken</td>
<td>Uppland</td>
<td>F II</td>
<td>2</td>
<td>(Segerberg 1999)</td>
</tr>
<tr>
<td>Sotmyra</td>
<td>Uppland</td>
<td>F II</td>
<td>3</td>
<td>(Segerberg 1999)</td>
</tr>
<tr>
<td>Vadbron II</td>
<td>Uppland</td>
<td>F II</td>
<td>2</td>
<td>(Segerberg 1999)</td>
</tr>
<tr>
<td>Brännpussen</td>
<td>Uppland</td>
<td>F III/IV</td>
<td>20</td>
<td>(Nilsson 2006)</td>
</tr>
<tr>
<td>Tibble</td>
<td>Uppland</td>
<td>F III/IV</td>
<td>3</td>
<td>(Hulthén, this vol.)</td>
</tr>
<tr>
<td>Torslunda</td>
<td>Uppland</td>
<td>F III/IV</td>
<td>3</td>
<td>(Brorsson 2006c)</td>
</tr>
<tr>
<td>Bollbacken</td>
<td>Västmanland</td>
<td>F III/IV</td>
<td>26</td>
<td>(Hulthén 1996)</td>
</tr>
<tr>
<td>Rogsta Hage</td>
<td>Södermanland</td>
<td>F III/IV</td>
<td>1</td>
<td>(Hulthén 1997)</td>
</tr>
<tr>
<td>Vårby</td>
<td>Södermanland</td>
<td>F III/IV</td>
<td>1</td>
<td>(Hulthén 1997)</td>
</tr>
<tr>
<td>Fagervik</td>
<td>Östergötland</td>
<td>F III/IV</td>
<td>1</td>
<td>(Hulthén 1997)</td>
</tr>
<tr>
<td>Ire</td>
<td>Gotland</td>
<td>F III/IV</td>
<td>13</td>
<td>(Hulthén 1997)</td>
</tr>
<tr>
<td>Köpingsvik</td>
<td>Öland</td>
<td>F III/IV</td>
<td>18</td>
<td>(Stilborg 2006)</td>
</tr>
<tr>
<td>Ottenby</td>
<td>Öland</td>
<td>F III/IV</td>
<td>21</td>
<td>(Stilborg 2006)</td>
</tr>
<tr>
<td><strong>TS Total</strong></td>
<td></td>
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<td>209</td>
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These projects have given me an opportunity to make a compilation and comparison of the material in order to ascertain what, if any, conclusions can be drawn at this point. All in all, 152 thin sections of pitted-ware pottery of types Fagervik II, III and IV have been
collected from various publications. The compilation is certainly not complete, as some sites have pottery that would in itself demand a lengthy discussion on cultural affiliation, and some sites might have escaped my notice, or are yet to be published in reports. Nor are all regions equally represented: 100 of the thin sections come from Eastern Central Sweden, due in great part to the recent large rescue excavations in this region of Pitted Ware sites, and certainly also reflecting research interest. As we shall see in chapter 8, the situation is reversed in the case of battle-axe pottery. This is of course unfortunate, but additional thin sections on Fagervik III sherds from Öland and Gotland means that there is still an opportunity to study regional similarities and differences. Of the 100 thin sections from Eastern Central Sweden, 44 come from sites with mainly Fagervik II type pottery, and 56 from sites with mainly Fagervik III/IV type pottery (see Tab. 7.1). I believe the results warrant some hypotheses at this point, and that they highlight some issues that future projects might take into consideration. In my opinion, thin section analysis, combined with the theoretical insights gained from practice theory and the school of chaîne opératoire, has the potential to reveal profound and important aspects of prehistoric social organisation, mentality and identity.

In the following subsections, I will start with a chronological comparison of clay and temper selection in Eastern Central Sweden, from Early Neolithic funnel-beakers to Middle Neolithic B pitted-ware. I will then make a regional comparison of Fagervik III/IV pottery in Eastern Central Sweden and on Öland, and also Gotland. Finally, I will discuss local variations as seen on roughly contemporary sites. The results highlight some interesting aspects of Pitted Ware pottery craft, both strong regional traditions and pervasive local variations. I will end by discussing what I believe this tells us about the social structuring of potters within the community.

Technological Change and Continuity in Eastern Central Sweden

I have compiled thin section microscopies from thirteen Pitted Ware sites in Eastern Central Sweden. The total number of thin sections at each site varies considerably, from a single sherd at Vårby and Rogsta Hage, to over 20 at Bollbacken and Högmossen. Those sites with more than five thin sections have generally been part of projects connected to rescue excavations, highlighting the fact that since Hulthén few researchers have had the interest, or means, to analyse substantial quantities of Neolithic pottery as part of their project, and also to include these results in their cultural analysis. The two notable exceptions are Papmehl-Dufay’s (2006) study of pitted-ware on Öland, and Hallgren’s (2008) work on funnel-beakers in Eastern Central Sweden. However, thanks to recent excavation projects there are now several microscopies on Neolithic pottery published from sites in Uppland, Västmanland, Närke and Södermanland in various reports. This enables us to get a glimpse of both regional and chronological aspects of the craft. In addition, microscopies on pitted-ware from Öland and Gotland allow us to conduct an interregional study of pitted-ware craft traditions.
There are several aspects of pottery technology that can be discussed. Based on the material at hand, I have primarily chosen clay coarseness and temper materials for my discussion. The coarseness of a clay is a sensuous thing to a potter, and it is clear from comparing preferences in this department from many periods and cultures across the world that it is often taken seriously (see chapter 6.1). The amount of temper added to the clay, and the grain size of the material, are other important aspects taken into consideration by potters, and I will briefly discuss these aspects also. Generally, potters prepare the paste according to established traditions, working until the feel and texture is deemed familiar and correct. Both habit and experience weigh in heavily at this point. In some cases, coarse clay may be deemed to naturally include large particles in enough quantities that no temper is added. It is just as possible, however, that the potter will automatically add the usual amount of temper out of habit, disregarding the coarse inclusions already present.

In the pitted-ware pottery presented here, there are no less than eight different types of temper present, as well as a few cases of what are probably naturally tempered clay. These tempers are crushed granite, quartz, sandstone/quartzite, slate, calcite, burned bones, natural sand, and in two sherds from Gotland, grog. As we shall see however, their respective frequencies vary considerably both across time and region, and even between local sites.

Figure 7.1 presents a comparison of choice of clay in pitted-ware, from fine to coarse clay. For Eastern Central Sweden there is a marked and continuous preference for fine clay. This is valid for Fagervik II as well as Fagervik III and IV, but also for Early Neolithic funnel-beakers in the same region. There are but a few examples of vessels made with coarser clay. In the case of the funnel-beakers, most of those made with medium-coarse clay are found at the site Malmahed in Södermanland (62%) (Olsson & Hulthén 1986), whereas at other sites fine clay is the rule. The exception and a hypothetical parallel to Malmahed is found at Skumparberget (Närke), where only three sherds were analysed, two of which had been made with medium-coarse clay (Hulthén 2008b). In his dissertation, Hallgren has argued that based on decorative designs, vessel shapes, and choice of clay, the pottery craft of the Funnel Beaker culture was organized through a matrilocal kinship system, with slightly different types of funnel-beakers depending on lineage (2008:chp 8.6). It is possible that use of medium-coarse clay is another aspect separating certain craft groups within the wider Funnel Beaker community, though more microscopy studies need to be undertaken to be certain of this.

The three cases of coarse clay among Fagervik II pottery are all from the Pitted Ware site Högmossen. However, the remaining twenty sherds analysed from that site were all made with fine clay. Out of the 56 thin sections on Fagervik III and IV pottery, from seven sites in Eastern Central Sweden, only four cases of medium-coarse clay, from three different sites, have been identified. The general impression is therefore that there was a continuous practice for almost 1500 years in Eastern Central Sweden of selecting fine clay, disregarding stylistic and cultural changes.
Fig. 7.1. Choice of clay in Eastern Central Sweden. TRB = Early Neolithic funnel-beakers (58), F II = early pitted-ware (44), FIII-IV = typical pitted-ware (56).

Fig. 7.2. Choice of temper materials in Eastern Central Sweden. TRB = Early Neolithic funnel-beakers (58), F II = early pitted-ware (44), FIII-IV = typical pitted-ware (56). Note that a single sherd may contain two or three different temper materials. Sst/Qzite = Sandstone or quartzite.
Turning to TEMPER SELECTION, the diagram in figure 7.2 shows the relative occurrence of different temper materials in pitted-ware and funnel-beakers in Eastern Central Sweden. The Neolithic pottery might contain anything from no added temper (naturally tempered), to two different materials mixed together. Below, I will go into more detail about combinations of temper found in the pottery at different sites.

Both funnel-beakers and Fagervik II pottery are generally tempered with crushed granite, with few exceptions. In some vessels the crushed granite is combined with calcite, or sand. A few seem to have been made without adding temper. Not surprisingly, of the four Fagervik II vessels that have only ‘natural temper’, three are the same as the vessels made with coarse clay found at Högmossen (Brorsson 2008a). These sherds were visibly different in ware from the rest of the pottery assemblage at Högmossen, but since neither the final publication nor the original report (which was not included in it), publishes any illustrations of the sherds selected for thin section, it is difficult to form an opinion about them. One sherd which was found close to the contemporary shoreline at Högmossen had calcite or bone temper. The publication states that it is bone tempered, but the original report from Brorsson notes that it is not possible to differentiate between calcite and bone in this sherd without further chemical analysis (Björck et al. 2008a:223; Brorsson 2008a:5). Still, it is the only one with calcareous temper as yet identified on a Fagervik II site, and there was a small amount of poriferous sherds at Högmossen.

In Eastern Central Sweden temper selection undergoes a striking change in the transition from Fagervik II to Fagervik III. ‘Typical’ pitted-ware, or Fagervik III and IV, is represented by 56 thin sections from seven sites in Uppland, Västmanland and Södermanland. The homogenous appearance of temper choice from previous periods is now gone. Instead, there is a marked increase in the use of calcareous tempers – calcite and burned bones – as well as selection of other types of stone materials, such as quartz and sandstone/quartzite (the latter two are difficult to differentiate when studying finely crushed grains in a thin section). No vessels are without added temper, which is understandable since fine clay is used almost exclusively.

The bones were in all probability burnt before being added to the clay. Unburnt bones splinters into sharp edged pieces when force is applied to them, and it is extremely difficult to crush unburnt bones into small enough pieces (1-3 mm) to make them usable as temper. Completely dry bones might be relatively easy to crush, but drying out organic materials from a bone takes years in a temperate climate, while simply burning them for a while on a fire is an infinitely easier way to get usable temper. The bone fragments are usually thoroughly calcinated, which would suggest they were burnt in temperatures above 800ºC. It is doubtful that normal firing of pitted-ware in an open fire, for little over an hour, would result in those temperatures long enough in the interior of the vessel wall to completely calcinate the bone fragments. The most likely explanation is that the bones were cremated before they were crushed and used as temper.

When we compare the diagrams of clay and temper selection in Eastern Central Sweden, a discrepancy is immediately evident. While there is no change in clay preferences
over time in the region, from the Early Neolithic to the end of the Middle Neolithic, *temper* preferences show a distinct change coinciding with the appearance of the carinated pitted-ware vessels and their primarily horizontally arranged decorations. Apparently the change in shape and style was accompanied by a greater flexibility in tempering, whereas clay selection stayed conservative.

Interregional Comparison of Pitted-ware Craft

In the previous section we saw that almost all pitted-ware vessels in Eastern Central Sweden were made with fine grained clay. While fine clay might be perceived as the ‘obvious’ choice, not truly representing conscious selection at all, an interregional comparison proves that this is not the case. On Öland only 28% of the 39 pitted-ware vessels analysed were made with fine clay (Fig. 7.3) (Stilborg 2006). There is no notable difference in selection between the two sites, Köpingsvik (22%) and Ottenby (33%), which complicates the results of the stylistic analysis. As discussed in chapter 4.2, Papmehl-Dufay (2006) shows that in terms of decoration the Köpingsvik site compares more closely with pitted-ware pottery in Eastern Central Sweden. In contrast, the southern Ottenby site correlates with a more southern pitted-ware decorative tradition. In terms of clay selection, however, they present a distinct *regional* appearance, dissimilar to that found further north.

This use of coarse clay might be part of an already established craft tradition on Öland, just as the use of fine clay seem to have been in Eastern Central Sweden. On Alby (Hulterstad parish), four thin section microscopies of Early Neolithic funnel-beakers showed that three were made with coarse clay, and one with medium-coarse clay. However, at the passage tomb at Mysinge (Resmo parish), the two Middle Neolithic funnel-beaker sherds analysed were made with fine clay (Stilborg 2006). Further study of funnel-beaker pottery on Öland is needed, especially since the position of Middle Neolithic Funnel Beaker culture on the island in relation to the virtually contemporary Pitted Ware culture sites, has yet to be fully resolved (Lidén et al. 2004; Vaara 2004; Alexandersson 2007; Lidén & Eriksson 2007; Papmehl-Dufay 2007). Whether this is connected with a wider regional preference for coarser clay in Southern Sweden is difficult to say, since there is a regrettable lack of analysed pitted-ware from Skåne and Blekinge. However, the two analysed pitted-ware sherds from Siretorp were both made with medium-coarse clay, and two of the five analysed pitted-ware sherds from Hunneberget in north-eastern Skåne were made with medium-coarse and coarse clay (Stilborg 2005; Brorsson 2007). Analyses made on funnel-beaker pottery and battle-axe pottery in Skåne, show that this preference for coarser clay might in fact be a long term craft tradition in Southern Sweden. This is not due to a lack of fine clay in Skåne, as is shown both by the results from clay surveys and the use of fine clay in several Neolithic vessels (Hulthén 1977; Brorsson 2003; Stilborg 2003; Brorsson 2007).
Choice of Clay - Öland & Gotland

Köpingsvik (Öl)
Ire (Go)
Ottenby (Öl)

Fig. 7.3. Pitted-ware clay selection on Öland and Gotland. Ire on Gotland (13), Köpingsvik on northern Öland (18), Ottenby on southern Öland (21).

Temper selection on Öland & Gotland

Ire (Go)
Köpingsvik (Öl)
Ottenby (Öl)

Fig. 7.4. Pitted-ware temper selection on Öland and Gotland. Ire (13), Köpingsvik (18), Ottenby (21). On Ire two sherds contained a small quantity of grog mixed in with other temper materials (granite and calcite respectively).
From Gotland there is as yet only one example of published Pitted Ware material analysed through thin section microscopy: Ire (Hulthén 1997). Here only one out of thirteen pitted-ware vessels had been made with fine clay, two with medium-coarse clay, and ten with coarse clay (Fig 7.3). In all cases except one only calcareous clay was used. That coarse calcareous clay was widely used on Gotland is not particularly surprising, considering the fact that the island has almost exclusively calcareous moraine clay (Nationalencyklopedin). One might therefore argue that the use of coarse clay in pitted-ware on the islands of Gotland and Öland simply reflects local realities. This is certainly part of the explanation, especially for Gotland which is far from the mainland, but it is not the whole truth. Papmehl-Dufay and Stilborg collected eleven clay samples on Öland, and in nine cases these were calcareous; the two non-calcereous clay samples were found a few kilometres south of Köpingsvik. All four clay samples collected from within 10 km of Ottenby were highly calcareous (Papmehl-Dufay 2006:206). However none of the analysed pitted-ware sherds from Öland was made with calcareous clay, although some that used were probably slightly calcareous, though not enough to be significant (clay type 4, see Stilborg 2006: 301f). Also, of the 39 sherds analysed, eleven had been made with fine clay, despite the fact that only one of the clay samples Stilborg and Papmehl-Dufay managed to find was fine grained (Papmehl-Dufay 2006:194ff; Stilborg 2006).

Whether certain potters made the effort to find the few deposits of non-calcareous as well as fine clay on Öland, or if they went across the short distance to the mainland where the potential for finding this raw material was greater, cannot be ascertained at this time. As with the rest of Sweden, clay has been deposited on Öland both in connection with de-glaciation, and later during post-glacial times. This has resulted in a quite complex and varied appearance and distribution, making it virtually impossible to use ceramic petrography to ascertain exact area of origin for the clay. Post-glacial clay is occasionally used, especially on Köpingsvik, but glacial clay is most commonly used in pitted-ware. There is a possibility that the vessels on Öland have actually been made elsewhere and transported by boat to Köpingsvik and Ottenby. Stilborg believes most of the raw material is in fact local in origin, but three sherds from Ottenby were made with a type of sorted fine clay whose quality is so different that he considers it likely that these vessels were made elsewhere (Stilborg 2006:304). The fine clay used in the Köpingsvik vessels was different from the one at Ottenby, and Stilborg does not find compelling evidence that these pots were non-local in origin (ibid.). As Papmehl-Dufay points out, it was possible with determination and planning to find the preferred non-calcareous clay on the island, and many vessels are definitely tempered with local materials (Papmehl-Dufay 2006:209f). The Pitted Ware potters did have a clear agenda and a conscious strategy in their selection of materials. It just did not include a common interregional preference for fine clay; rather, it seems to have been based on local traditions.

In the section on pitted-ware technology in Eastern Central Sweden, we noted that with the appearance of typical pitted-ware, Fagervik III, temper selection changed in that several new materials were now used, most notably calcite and burned bones. Other
materials becoming more common compared to previous periods are sandstone/quartzite and quartz. Natural sand has also been found in a few sherds. So, if pitted-ware on Öland was made with local clay, was at least the temper added to that clay of the same types that are found in the stylistically similar vessels of Eastern Central Sweden? As is evident in figure 7.4, the answer is negative: temper materials used by pitted-ware potters on Öland differ significantly from those of Eastern Central Sweden. Only the greater variety of temper materials compared to earlier periods is similar, but on Öland sandstone/quartzite and natural sand are preferred. Calcite is found in only four out of 53 thin sections, and while there is always the possibility that future studies will reveal larger quantities of pottery with calcareous temper, there is little evidence of this at present, since few sherds are poriferous or seem to be tempered with calcite (Papmehl-Dufay, pers. communication). There are no cases of pottery tempered with burned bones identified as yet.

At present there are too few thin sections of funnel-beakers from Öland to discuss a technological break or continuity with older traditions. However, the four Early Neolithic funnel-beakers analysed from Alby are tempered with crushed granite, as are the two sherds of Middle Neolithic funnel-beakers found in front of the megalithic tomb at Mysinge. While this is too meagre a sample to draw conclusions from, it is interesting that the funnel-beakers on Öland seem to be homogenously tempered with crushed granite, just as is the case with contemporary pottery in Eastern Central Sweden. At the same time, the preference for coarser clay suggested at Alby is continued at the Pitted Ware sites on Öland, just as fine clay continue to be used in Eastern Central Sweden. It might be that we are again faced with changes in craft regarding shape, style and temper – but not clay. There are also quite a few untempered vessels in the material, reflecting the common use of coarse and medium-coarse clay. Apparently the pitted-ware potters on Öland felt free to exclude temper if the clay had a natural inclusion of grains considered to be sufficient.

On Gotland there is only the Pitted Ware site of Ire for comparison with our regionally grouped materials. What is interesting is that the thin sections from this site reveal a tradition that shares similarities with Eastern Central Sweden. Calcite is the most common as temper here, occurring in twelve out of thirteen pitted-ware sherds. Ire stands out in another way from the assemblages of Öland and Eastern Central Sweden. Two of the vessels analysed contained *gng*, one in addition to calcite, the other in addition to granite. From the illustrations in Hulthén’s article (1997:figs 4a, 4e) it is clear that they are not battle-axe beakers. One has conical pit decoration, the other part of a marked (carinated?) neck and oblique comb stamps. Of the 152 thin sections of pitted-ware collected here, these are the only instances of grog temper being used. As we will see in chapter 8, grog temper is a common feature of battle-axe pottery. The fact that the only cases of grog in pitted-ware come from Gotland is in itself noteworthy. As discussed in chapter 3.2, Battle Axe culture objects such as battle axes and multifaceted polishing stones have been found in burials on Gotland that are generally dissimilar to the burial
traditions of the Battle Axe culture. One category that is completely absent from these burials, however, is battle-axe pottery. In cases where these graves contain any pottery at all it is invariably pitted-ware. Battle-axe pottery is in fact almost absent on Gotland (see chapter 3.2). In contrast, at Ottenby a small number of battle-axe sherds were found in addition to the large quantities of pitted-ware, a common enough occurrence. Two of these sherds were analysed through thin section microscopy, and one had indeed been tempered with grog. However, grog was not identified in any of the 21 pitted-ware sherds. Also, four battle-axe pottery sherds at Bollbacken have been analysed and one contained grog, but one of the 26 pitted-ware sherds was tempered with grog. I will return to the issue of grog temper in chapters 8 and 11.

Local Variation of Pitted-ware Craft Technology

We have now covered chronological and regional similarities and differences. While there is interregional coherence in shape and general decorative design of the Fagervik III type pottery, this similarity is only on the surface. Technologically, regional traditions prevail and this regionalisation is in fact more pronounced than in the funnel-beaker pottery of previous periods. But before we attempt to unravel the structuring of pottery craft communities and mentality in the Pitted Ware culture, we must pay attention to yet another level – the local.

As stated earlier, with the appearance of ‘typical’ pitted-ware (Fagervik III), temper selection not only changes, but also expands with a greater selection of materials. The diversification is even greater if one considers the various combinations of tempers in each vessel. Some might be tempered only with calcite, while others might combine calcite and quartz, or granite, calcite and bone. The choice of temper, or combination of tempers, is part of the technological procedure used by potters. This may vary according to planned function of the vessel, or the tradition in which the potter was taught, or the craft tradition in use at the potter’s current place of residence. We noted above that calcareous tempers (calcite and bone), as well as crushed rocks, were used in Eastern Central Sweden, whereas crushed rock and natural sand were used on Öland. But do these regional patterns extend down to the local level – are the same ‘recipes’ for tempering clay used irrespective of settlement site, and is there homogeneity within a settlement’s pottery materials?
Fig. 7.5. The diagram shows which type of temper, or combination of temper materials, each sherd contained at Bollbacken, Västmanland. Single colour means only one type of temper, striped means two types (in one case three types of temper). G = granite, Sq = sandstone/quartzite, C = calcite, B = bone.

Fig. 7.6. Pitted-ware temper combinations from Brännpussen, Uppland. Single colour means only one type of temper, striped means two types. Q = quartz, B = bone, Sq = sandstone/quartzite, S = sand.
Temper combinations: Köpingsvik

Fig. 7.7. Pitted-ware from Köpingsvik on northern Öland. The vessels never combined two types of temper. G = granite, Sq = sandstone/quartzite, S = sand, C = calcite, N = no added temper (natural).

Temper combinations: Ottenby

Fig. 7.8. Pitted-ware from Ottenby on southern Öland. The vessels never combined two types of temper. G = granite, S = sand, Sl = slate, C = calcite, N = no added temper (natural). Most vessels were tempered either with natural sand or had no temper added to the naturally coarse clay.

The number of thin sections available from different sites varies considerably, from a single sherd at Vårby to 26 at Bollbacken. In order to make a valid comparison of the craft traditions found at different settlements, I have selected two sites from Eastern Central Sweden: Bollbacken in Västmanland (TS = 26) and Brännpussen i Uppland (TS = 20). Both settlements are 14C-dated to the Middle Neolithic B: Brännpussen: c. 2800-2600 BC, Bollbacken: c. 2600-2300 BC (Artursson 1996b:99; Nilsson 2006:69ff). The distance between them is not greater than 80 km as the crow flies, and in the Middle Neolithic travelling between the two islands by boat would probably have taken less than two days. On Öland there is Köpingsvik (TS = 18) in the northern part of the west coast,
and Ottenby (TS = 21) at the southern end of the island. Both are dated to the latter half of the Middle Neolithic A, c. 3100-2800 BC, and the pottery is consistently Fagervik III. Ire on Gotland has thirteen thin sections of pitted-ware taken from both burial contexts and the cultural layer adjacent to the cemetery. Four $^{14}$C-datings on human bones span the second half of the Middle Neolithic A and the whole of the Middle Neolithic B, though there has been no correction for reservoir effect due to marine diet. A hazelnut was $^{14}$C-dated to 4019±150 BP, which is c. 2900-2300 cal. BC (Janzon 1974:123ff, fig 35).

Figures 7.5 – 7.8 show diagrams where the combinations of temper in sherds analysed at the sites are presented. They assist in visualising the variation found within a settlement’s material, as well as between settlements. It is immediately clear that the variation of temper materials found in pitted-ware is in fact increased when the many different combinations of temper in the vessels are taken into consideration. Bollbacken and Brännpussen are typical of the Northern craft community in that calcareous tempers are commonly in use. However, at Bollbacken both calcite and burned bones are used, whereas at Brännpussen it was most probably only burned bones, though it cannot be completely ruled out that calcite was present in some sherds (see discussion by Brorsson in Nilsson 2006:34). Brännpussen also had a fairly standard recipe for tempering the clay, with fifteen of the twenty sherds having a combination of two temper materials: bones and some sort of rock. Quartz + bone was most commonly combined (9), followed by bones + sand (3), bones + sandstone/quartzite (2), and bones + granite (1). The use of quartz for temper is unique for Brännpussen among the Pitted Ware settlements with analysed materials. Five vessels had only a single temper added: bones (4), and quartz (1) respectively.

Bollbacken presents a somewhat different and less cohesive picture. Eighteen of the 26 vessels were tempered with only one material. In ten cases with crushed rocks: granite (8), sandstone (2), and in nine cases with calcareous material: calcite (4) and bones (5). In a few vessels a combination of two types of temper has been found: calcite + granite (3), calcite + bone (2), and calcite + sandstone (1). One contained a combination of three materials: calcite + bone + granite. Of the 26 sherds analysed, eight different techniques of tempering the clay have been identified.

As mentioned in chapter 1, Bollbacken contains a mortuary house as well as finds of battle-axe pottery and certain cord-and-pit decorated pottery specific to the end of the Middle Neolithic. Several of these vessels suggest a hybridisation of craft traditions that will be further discussed in chapter 11.2. It might be tempting, therefore, to see the notable variation of temper at Bollbacken as evidence of it being an aggregation site, where potters or vessels of many different local traditions are brought together. This is certainly possible, but as we shall see, with pitted-ware pottery variation of temper is more of a rule than an exception and need not necessarily suggest anything extraordinary.

The Pitted Ware sites of Öland share some technological similarities in their preference for coarser clay, for only using one type of temper, and for keeping some vessels untempered. There are still conspicuous differences between the two virtually
contemporary sites. At Köpingsvik sandstone/quartzite is added to nine of the eighteen vessels analysed, but this stone temper is not identified in any of the vessels from Ottenby. Instead, at the latter site it is natural sand which is the most commonly used mineral (7). Granite is present in four sherds from Ottenby, but in only one sherd from Köpingsvik. Calcite is identified in three sherds from the northern site of Köpingsvik, compared with one sherd at the southern site Ottenby. Whether this reflects a greater influence of the northern Pitted Ware pottery community at Köpingsvik, as the decorations seem to indicate, is too early to tell.

The use of coarse clay also means that some vessels have no added temper, since the natural inclusions were deemed sufficient. However, it is more common for the Ottenby potters to be content with the natural inclusions found in coarser clay: 57% (8) of the sherds with non-fine clay have only natural temper. At Köpingsvik only 14% (2) of the vessels made with coarser clay have no added mineral temper. That the pitted-ware potters could use their own discretion in selecting temper is perhaps shown by the singular example of the Ottenby vessel that had been tempered with locally available slate. Clay selection on the other hand, shows no notable difference between the sites, as can be seen in figure 7.4. At present it is not possible to ascertain whether the variation in clay is due to functional considerations, or different craft traditions within the community. The fact that the same variation occurs at both Köpingsvik and Ottenby, but not in Eastern Central Sweden or on Gotland, might be an indication that clay selection should not be interpreted as pertaining to the planned function of the vessel (see also section on lipid analyses below).

The homogeneity of temper and clay at Ire on Gotland is all the more interesting since the sherds were selected from eight different burials, and the rest from a large trench c. 40-50 m north-east of the cemetery. Despite what appears to be a complex site, both chronologically and contextually, the pottery is remarkably coherent technologically since almost all vessels were tempered solely with calcite. Only TS 9 and TS 15 stood out, not just in terms of having grog temper, but also in terms of clay. The former had been the only vessel made with fine, sorted clay in the material, and the latter had been made with the only example of non-calcareous clay (coarse, unsorted). The latter vessel must have been imported from another region, since there is no non-calcareous clay on the island (Hulthén 1997:136). It is not easy to interpret what the other sherd might represent; imported vessel or an immigrant potter willing to change the physical appearance of the vessels, but not the technique of making them. One additional sherd from a test pit closer to the shore is excluded from this discussion, since its vertical cord decoration is typical of a regionally distinct type of late pitted-ware/early Late Neolithic pottery on Gotland, not Fagervik III-IV (see chapter 4.1). The technology of this sherd was still coarse calcareous clay mixed with calcite. It is also interesting to note that although almost all Ire vessels were made with coarse clay, the potters still continued to add mineral temper to the mix. This contrasts with the practice on Öland, where coarse and even medium-coarse clay was often considered naturally tempered to a sufficient degree.
While these five settlements are the only Pitted Ware sites with enough sherds analysed through thin section microscopy to make a discussion of inter- and intrasite variability feasible, I would also like to draw attention to Torslunda and Tibble. Both of these sites are situated in northern Uppland, no more than 35 km apart, and Tibble is only a few kilometres west of Brännpussen. Both sites have thin sections from three pitted-ware sherds each, probably dated to the late Middle Neolithic. This is too limited a selection to draw any conclusions from, but it is interesting that not one of the six sherds has the same type of temper combinations. At Torslunda the three sherds are tempered with bone, bone + granite and calcite + granite. At Tibble the selected vessels had been tempered with granite, calcite and calcite + bone. Together with Brännpussen there are therefore no less than ten different combinations of temper found in 26 sherds from three roughly contemporary sites, situated only a few kilometres apart. Visually, the pottery found at the three sites belong to the same type of Fagervik III/IV pottery, with carinated shoulders, large pits, herringbone patterns in comb stamp or incisions, and various other patterns. However, beneath the surface of the vessels there is apparently an even greater variation to take into consideration.

Tempering, Shaping, Firing

A few other aspects of the Pitted Ware pottery chaîne opératoire are covered below.

AMOUNT AND COARSENESS OF TEMPER

The amount of temper added to clay by a potter is often determined by tradition and habit, rather than flexibly adjusted after the quality if the clay, except to a small degree (see chapter 6.1). The potter might for instance cut away a set portion (e.g. a quarter) of the raw clay and replace it with temper. Slightly more temper or clay may then be added as the mixing continues, in order to arrive at a texture deemed proper and correct by the potters involved. The temper added might also vary in coarseness between craft traditions, some preferring fewer but larger grains, others using a fine grained temper. Therefore, archaeologists should not discount the visual information present in sherds, and thin section analysis also yields information about the amount of added temper and the size of the inclusions. Naturally, the grain size of temper varies within a thin section, and it is therefore customary to simply note the largest grain, or occasionally the medium size of the grains.

Calculating percentage of temper is a difficult task, especially when organic materials are used, or when parts of the temper has disintegrated. In naturally tempered vessels made out of coarse clay, amount of temper is not calculated. In sherds of Fagervik III and IV pottery, amount of temper ranges from 5-30%. The most common amount is 10-15% (51% of the vessels). Maximum grain size of the temper varies between 0.5-6.0 mm, but the most common maximum size is 2.0-3.5 mm. There is no strong correlation between temper amount and grain size, although at Köpingsvik Pampmehl-Dufay found a tentative connection between small grains and small amount, and vice versa (2006: Fig. 6:25).
Within each site, the maximum grain size varies considerably between sherds, the one exception being Brännpussen with variations mainly between 1.0-2.0 mm. This reflects the homogenous tempering techniques used at this site. The same might be said for Ire, where most sherds had a maximum grain size of either 3.5 mm or 5.0 mm.

At Ire, almost all sherds were tempered with calcite, however the amount of temper in each of these sherds still varies between 7-20%. This variation is present at the other sites with a larger quantity of thin sections (see Tab. 7.2). Comparing maximum grain size with amount of temper at these sites shows that while the largest grains do occur in sherds with more than 11% of temper (though not necessarily in those with the greatest amount of temper), the difference in variation between those and sherds with less than 12% temper is not striking.

Table 7.2. Variation in amount of temper in pitted-ware (Fagervik III-IV) and maximum grain size of temper for sherds with up to 11% temper, and over 11% temper, respectively. (Hulthén 1996; 1997; Nilsson 2006:tab 5; Papmehl-Dufay 2006:194ff; Stilborg 2006).

<table>
<thead>
<tr>
<th>Site</th>
<th>Amount</th>
<th>Max grain size (≤ 11%)</th>
<th>Max grain size (&gt;11%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bollbacken</td>
<td>7-22%</td>
<td>2.0-3.5 mm</td>
<td>2.0-4.0 mm</td>
</tr>
<tr>
<td>Brännpussen</td>
<td>5-27%</td>
<td>0.5-2.0 mm</td>
<td>1.0-3.5 mm</td>
</tr>
<tr>
<td>Köpingsvik</td>
<td>6-21%</td>
<td>1.8-3.0 mm</td>
<td>1.9-3.5 mm</td>
</tr>
<tr>
<td>Ottenby</td>
<td>8-24%</td>
<td>1.6-3.7 mm</td>
<td>1.7-4.0 mm</td>
</tr>
<tr>
<td>Ire</td>
<td>6-20%</td>
<td>2.0-5.0 mm</td>
<td>2.5-6.0 mm</td>
</tr>
</tbody>
</table>

As we shall see below, sizes of the pitted-ware vessels also vary considerably, however it is at present not possible to determine if the disparity in temper amounts are always due to the differences in vessel volume. The clay appears to be well homogenized in most cases, and since thin sections are mainly made on sherds from the same part of the vessels (neck and rim), it is unlikely that the variation is simply a coincidence.

**SHAPING AND FIRING**

Pitted-ware vessels are mainly built through coiling, which is the prevailing technique of Mesolithic and Neolithic pottery in Scandinavia (although see battle-axe beakers in chapter 8.1). From Early Neolithic funnel-beakers onwards, the so-called N-technique is the most commonly used, which means that the coils are smoothed downwards on one side of the vessel wall, and upwards on the other, creating a cross-section slightly resembling the letter N (Hulthén 1977; Lindahl et al. 2002). This technique is often visible on sherds, since they tend to fracture along the lines of the coils. Bertil Almgren (1967) has remarked on an interesting discrepancy between neck sherds of funnel-beakers from Denmark and Sweden. On the former, the coils are mostly smoothed in a ‘falling’ technique, meaning that the exterior surface is drawn down, and the interior up. The opposite applies to most funnel-beakers in Sweden, where a ‘rising’ technique is used. Eva
Koch’s (1998) extensive and comprehensive analysis of Danish funnel-beakers yielded results that confirmed Almgren’s tentative results. But she also noted that on many vessels, though not all, the body and neck are fashioned in opposite techniques: i.e. falling on neck and rising on body (see Hallgren 2008:137 for further discussion).

Almgren also included early pitted-ware from Sotmyra (Fagervik II) in his study, and noted that the same technique was used on these vessels as on the Early Neolithic funnel-beakers in Eastern Central Sweden (i.e. rising). While this is but one site, it is interesting that this seems to confirm the results of clay and temper analyses which suggest strong regional continuity in craft technology. In the light of the insights offered by the school of chaîne opératoire, it is easy to see that it would be a potentially rewarding undertaking to record varying frequencies of these shaping techniques in Neolithic vessels, especially since it is probably closely connected to bodily practices that are mainly sub-conscious routines. N-technique is so common in Neolithic pottery that it rarely warrants a comment from archaeologists (though see Nilsson 2006:26, Hulthén 1997:135). Papmehl-Dufay explicitly points out that this is the general fashioning technique of pitted-ware on Öland (2006:181), but also notes that the base often seems to be modelled. This is not uncommon practice among potters in many different parts of the world, but it is interesting in the light of the fact that the vessel bases are so often singled out for special treatment, and that mini-vessels often mimic the same shape as the modelled base (see chapter 11.1). The fact that the base is modelled makes it more prone to fracture from the main body in a complete piece.

As mentioned above, despite the noticeably homogenous general shape of the typical pitted-ware vessels found on settlements and sites (carinated shoulders and more or less conical body), the actual size of the vessels varied considerably. Even if we exclude the interesting miniature vessels and small cups that often mirror the shape of the larger vessels or their bases. Papmehl-Dufay has calculated the upper rim diameter on 31 rim sherds from Köpingsvik and 56 rim sherds from Ottenby. Torbjörn Brorsson has done the same on 25 sherds from Brännpussen and Birgitta Hulthén on 109 sherds from Bollbacken (see Tab. 7.3).

Table 7.3. Estimated rim diameters on pitted-ware vessels. * = The greater rim diameter of Köpingsvik probably reflects the fact that on these sherds the diameter was estimated on the outer surface (Hulthén 1996:fig. 168b, fig. 169; Nilsson 2006:27, fig. 18; Papmehl-Dufay 2006:167ff, 178ff)

<table>
<thead>
<tr>
<th>Site</th>
<th>Rim diameter</th>
<th>Wall thickness (body sherds)</th>
<th>Most common wall thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bollbacken</td>
<td>4-33 cm</td>
<td>5-15 mm</td>
<td>9-10 mm</td>
</tr>
<tr>
<td>Brännpussen</td>
<td>5-35 cm</td>
<td>4-17 mm</td>
<td>9-12 mm</td>
</tr>
<tr>
<td>Köpingsvik</td>
<td>12-44* cm</td>
<td>4-19 mm</td>
<td>7-10 mm</td>
</tr>
<tr>
<td>Ottenby</td>
<td>10-40 cm</td>
<td>5-20 mm</td>
<td>6-9 mm</td>
</tr>
</tbody>
</table>
Despite the variation in sizes, most vessels at the sites seem to have an upper diameter of 15 cm or more. At Bollbacken and Brännpussen, parts of miniature vessels were found, which is a common occurrence on most Pitted Ware culture settlements with significant quantities of pottery. Ottenby on Öland has as yet only been investigated through a few trenches, and no miniature vessels were retrieved at these initial excavations. At Köpingsvik no miniatures have been identified either, but of the 220 kg retrieved over the decades, only 8% were selected for the concentrated analysis. That no rims of miniature vessels were found among the 18 kg is unfortunate, since sherds of this kind were noticed by Papmehl-Dufay during the initial sorting process of the bulk material (Papmehl-Dufay, pers. communication). Both Hulthén and Papmehl-Dufay identify groupings of vessel sizes in their material that might indicate that there are different sets of vessels being produced, based on volume.

Wall thickness of body sherds is between 4 mm to 20 mm at the most. This probably reflects both variation in vessel sizes, and the fact that the pots are thicker by the shoulder and close to the base. Still, as a comparison between Ottenby and Köpingsvik shows (Papmehl-Dufay 2006:fig 6:22), the vessels at the former site are on average thinner than at the latter, so craft practice might play a part in this aspect of the pottery as well. Body sherd thickness of pitted-ware is generally between 8-10 mm.

As mentioned in chapter 4, a noteworthy difference between similarly decorated sherds of funnel-beakers and pitted-ware, is the surface treatment. Bagge made this one of the more important features in distinguishing between Fagervik I (funnel-beakers) and II (pitted-ware). Whereas funnel-beakers often have an almost glossy surface (though not polished), pitted-ware has a smoothed but slightly less treated exterior surface with more visible temper grains. Ann Segerberg explicitly stated that this conclusion of Bagge’s was difficult to describe, but fairly obvious even in her own material from Uppland (Segerberg 1999:68, 80). This appearance, as we have seen from the ceramological analyses above, has nothing to do with choice of clay or temper, rather it is the result of different surface treatments. Alteration of the final touches made on the vessel before decorating it seems to occur in the transition from Early Neolithic funnel-beakers to early pitted-ware (Fagervik II), and continue through the Middle Neolithic.

As for firing of the vessels, the same technique used on most funnel-beakers applies to pitted-ware: Open fires and an oxidizing atmosphere, which creates reddish to orange hues in the often iron rich clay (Hulthén 1977; 1996:236; Stilborg 2002:71; Nilsson 2006:26). The pots are mostly oxidized completely, but occasionally contain a darker core, especially in the thicker parts of the vessel. This evidence of incomplete firing does not necessarily mean bad craftsmanship - in fact, quite the opposite is true. A vessel intended to be used over an open fire would be better off with an incomplete firing (Hulthén, pers. communication).
Daily Practice with Pitted-ware Vessels: lipid analyses

The pottery vessel contains within it most of the aspects which constituted its ‘birth’: choice of clay, temper, fashioning, surface treatment, decoration and firing. As archaeologists we find the vessel, or sherds thereof, in a situation associated with its ‘death’: the place of final use and deposit. But the life of a pot is something we generally know very little about, and this lifespan can be anything from a day to several human generations. As in a human life, the end can be an unfortunate accident, a carefully planned event, or a slow decline into oblivion. The nature of our study material means that we are often forced to put all our emphasis on the creation and disposal of material culture, whereas its use and part of daily practice is mostly left to our imagination. For a multipurpose object such as a vessel, our imaginations leave us with too many potentially valid suggestions.

A step on the way to understanding more about the use of pottery lies in analysis of the residue of fatty acids, waxes and oils absorbed by the ceramic matrix, usually referred to as lipid analysis. The method has developed considerably for archaeological use in the last decade, and will certainly continue to develop and be refined in the future. In Sweden, the Archaeological Research Laboratory in Stockholm has been in charge of an increasing number of lipid analyses on ceramic materials, and development of the methods involved, mainly by Sven Isaksson. While initially lipid analysis tended to focus on the charred remains on the interior surface (‘food crusts’), the researchers involved have more recently preferred analysing the lipids absorbed into the clay, and extracted from pulverised ceramics. This decreases the risk of contamination by modern lipids, still one of the most pressing problems with the method.

Studies have shown that the lipids extracted from the pottery probably reflect the last use of the vessel, rather than a combination of several uses, though this issue is still not settled (Craig et al. 2004b, Sven Isaksson pers. communication). It should also be remembered that the lipids only relate to the use of pottery, not the actual diet of the people using them. This is very different from dietary analysis of human bones, which presents the general diet of an individual over the past seven years (the pace of bone cell replacement), or during early childhood in the case of teeth. Lipid analysis will not give us a complete picture of the complex life of a pot, but it will at least present us with information about the different types of uses made of pottery at a site, within a culture, or across time.

The analyses of lipids presented here are undertaken with the help of Gas Chromatography combined with Mass Spectrometry (GC/MS). Identifying separate substances can be fairly straightforward, but identifying their organic origin can be very problematic and complex. Organisms, whether plant or animal, contain many similar molecular chains and it is mostly the ratio between different lipids that help the analyst determine whether they originally came from fauna or flora. For instance, land living animals have a higher ratio of stearic acids to palmitic acids compared to plants, marine
animals and fish. Since the pot might have contained a mixture of several different food stuffs, determining the presence or absence of marine or land animals, plants, dairy products etc., can be quite a challenge even when recent contamination is not present, which it often is. It is also important to know that the fatty acids identified generally originate from the ingredient containing the most fatty acids, which does not have to be the same thing as the main ingredient (Isaksson 2006; Isaksson in Nilsson 2006; Papmehl-Dufay 2006:163ff, 214ff).

I will not go into any detail about lipid analysis in this section, since it is better explained by the specialists themselves, and because the points I wish to make concerning the results from the method do not depend upon a detailed discussion. Certain basic facts need to be made clear, however. Unsaturated fatty acids disintegrate faster than saturated ones, therefore presence of marine animals and fish (not low-fat fish) are determined through certain isoprenoid fatty acids. Fatty acids from marine fish are also better preserved if they have been subjected to heating. In fact, it is not always easy to differentiate between low-fat fish and plant materials, but cholesterol in the sample might indicate presence of the former (cholesterol is a by-product of animal fats in general), and waxes are indicative of plants and vegetables. Certain fatty acids denote ruminants, though to separate between the meat and the dairy products of these animals one has to perform additional analyses, e.g. stable carbon isotopes (δ13C), specifically the ratio between different types of fatty acids. (Isaksson 2006; Isaksson in Nilsson 2006; Papmehl-Dufay 2006:163ff)

Heating of the organic material in the vessel, indicating that it served as a cooking vessel, might also be determined through certain chemical markers, such as ω-(o-alkylphenyl)alkanoic and isoprenoid acids. Fermentation of the food stuffs might also influence the appearance of the fatty acids and create branching acids of the kind otherwise found in organic remains from ruminants, since they process plants through fermentation in their stomachs (Isaksson 2006; Craig et al. 2007).

Lipid residue analysis has been conducted on samples taken of pitted-ware sherds from seven sites in Sweden, and one on Åland (Glamilders). The number of sherds included vary from two to eighteen. Papmehl-Dufay undertook the analysis of the samples from Glamilders, Köpingsvik and Ottenby, the latter two sites in collaboration with Sven Isaksson. Isaksson is also responsible for the analyses of materials from Postboda 1 and 2, Högmossen, Brännpussen in Uppland, and Lötvreten in Gästrikland. The results of all these analyses are summed up in table 7.4, where the funnel-beaker pottery analysed from Postboda SKB (Skjutbana) is included for comparison.

Lipid residues from fish or marine animals, land living animals, ruminants and plant materials have been identified in the samples, as well as one case of substantial quantities of bees wax (or honey) from Ottenby. Several vessels were also devoid of lipids, which might indicate that they were used as containers for water or dry goods, or not used at all. However, results from analyses on Bronze Age pottery sherds with ‘food crusts’, but apparently devoid of lipids, show that taphonomic factors might be involved in this empty
appearance (Eriksson in press). Time between last use and deposition, soil chemistry, and ceramic texture might also influence the preservation of lipids. The pitted-ware from Brännpussen contained very small amounts of lipid residues, and it was suggested that the marked porosity of the bone tempered sherds could be a cause of this (Nilsson 2006:39). At most of the sites several vessels show evidence of heating, which meant that pitted-ware vessels were often used for cooking as well as storing. Heating is most easily visible through changes occurring in fatty acids from fish and marine animals, so the rarity or absence of identified cooking vessels at Postboda 1, Brännpussen and Ottenby might be the result of the fact that marine fatty acids are rare/not present in the vessels here.

The most common substances identified in the samples are plants of various kinds. Fish and/or marine animals are also quite common at most sites, with the exception of Postboda I, Brännpussen and Ottenby. Postboda 1, with Fagervik II type pottery and dated to the Middle Neolithic A, is interesting since it deviates from the nearby and virtually contemporary site of Postboda 2. At the former, most vessels were either lacking lipid residue, or contained plant materials, and in one case fatty acids from a ruminant (meat or dairy). The latter site (Pb 2), in addition to plant materials in all the sherds, also had fatty acids from fish/marine animals in 70% of the sherds. There was also one case of ruminant fatty acids at this site. In lipid composition, Postboda 2 is quite similar to the nearby Funnel Beaker site Postboda SKB. Whether the difference between Postboda 1 and 2 reflects different settlement phases, or different economic or ceremonial practices, is not easy to determine.

Ottenby on Öland is fairly contemporary with Köpingsvik to the north, although the pottery at the two sites is admittedly different both decoratively and technologically, in a way that the Postboda materials are not. At Ottenby only 29% of the samples contained marine lipid residues, compared to 94% at Köpingsvik (Papmehl-Dufay 2006: 214ff). The osteological material at Ottenby contained many bones from both seal and fish, however (Reuterdahl 2005). Whereas all but two of the samples from Köpingsvik showed evidence of heating, none at Ottenby had such traces. Several Ottenby sherds do have carbonized crusts, though only half as often as the Köpingsvik material, and one of these residues was analysed and shown to contain a mixture of terrestrial animals and vegetables (Papmehl-Dufay 2006:225). It did not contain any of the acids generally used to detect heating and cooking. As stated above, these appear most commonly when marine animal products are present, and the fact that these food stuffs are uncommon in the Ottenby pottery might distort the picture. However, the four sherds that probably did contain marine residues showed no sign of heating either. The organic crusts might have been formed during processes other than cooking, such as fermentation. The presence of beeswax in one sample from Ottenby is as yet unique in Neolithic pottery in Sweden, though it is not possible at this time to ascertain whether it originated from honey, or if the interior of the pot had been treated with beeswax. Even more interesting is the fact that this sherd comes from one of the vessels made with what is most probably non-local clay (Papmehl-Dufay 2006:225).
Brännpussen (Uppland), dated to the Middle Neolithic B, has a fairly typical range of osteological material for a Pitted Ware site: seal, beaver, marten, and pig/boar in descending order of occurrence, as well as fish (pike, bass, salmon). The poriferous pottery was in many cases very contaminated, and the fatty acid levels were often quite low, which made identification problematic. Of the six samples that were not contaminated, five contained no lipids at all. These vessels might have been used as containers for water or dry goods, or the lack of any fatty acids may indicate an unfavourable preservation environment. The scarcity of fish/marine indicators in the vessels might be due to either the fact that these unsaturated fatty acids decompose more rapidly if not subjected to heating, or simply that pottery was not mainly used for storing or cooking these food stuffs at Brännpussen.

There was one sample at Brännpussen that contained residue of terrestrial animals, with a ratio of C17:0/C18:0 high enough to indicate dairy products. However, as Sven Isaksson points out, this needs to be confirmed by analysis of stable isotopes to make sure (Nilsson 2006:38). This is the only possible case of ruminant fatty acids in Fagervik III type pottery as yet. As table 7.4 makes clear, residue of ruminants occurs sparingly in funnel-beaker pottery and Fagervik II type pottery of the Middle Neolithic. The apparent lack of it in most typical pitted-ware is certainly interesting from a subsistence perspective, and confirms the impression given by the osteological material.

There are lipid analyses made on pottery from one more Pitted Ware site: Jonstorp M3 in north-western Skåne. This study was undertaken by Mikael Isaksson in 1999 as part of his exam in laboratory archaeology (M. Isaksson 2000). Unlike the previously mentioned analyses, at Jonstorp it was the charred crusts on the surface of fourteen sherds from twelve vessels that were examined. The results indicated the presence of plants and terrestrial animals, and nothing from fish or marine animals. The only osteological material analysed from the site belongs to the 1970-72 excavations, where c. 1000 fragments weighing less than 600 g were recovered. Carina Olson later analysed the bones and identified several from seal, but also pig and a number of herbivores, including cattle and sheep (Olson 1998). Only two fish bones were found, but the excavation technique and the poor conditions for preservation might be a contributing factor to this scarcity. The lack of marine lipids at Jonstorp M3 might be due to a practice of preparing and storing seal and fish by means other than pottery vessels, or it might be due to a greater rate of degradation of marine unsaturated fatty acids in carbonized crusts, as compared to that absorbed by the ceramic material. Since the δ13C and δ15N values attained by Mikael Isaksson do not suggest any marine presence in the crusts, the former explanation seems more likely (M. Isaksson 2000:32; Craig et al. 2007).

Lipid analysis on prehistoric ceramics is a fairly new method, still very much under development and experiencing exciting new breakthroughs. It is important to keep in mind that there remain many unsolved aspects of this method. For instance, it is unresolved whether the lipids present in the pottery material represent the final use, or if they are in fact remains of several events (Craig et al. 2004b, Isaksson pers.
There are also variations in the methods used by different laboratories. A blind test on sherds of a pot which had contained camel milk were analysed by seven different laboratories, and yielded results that can only be described as varied (Barnard et al. 2007). The test was unusually difficult, since nothing was known to the laboratories of the context of the vessel, and some lacked comparative material to make an informed interpretation. Only one out of the seven laboratories accurately indentified the presence of meat/milk/blood from an herbivore in the vessel. Some made a general interpretation of egg or milk, and some specified a non-dairy source, either another protein rich food stuff or even pure plant materials. Two were not able to find any residue to be analysed. The results showed the importance of good comparative material and an idea of the archaeological context, but also highlighted that the amount of residue can vary considerably depending on where on the sherd the sample is taken. Camel milk contains many of the same fatty acids as are found in vegetables and other animals, and this blind test highlights the problem of extrapolating original food stuff from a collection of separate molecules. The Stockholm laboratory was not part of this study, but Isaksson generally uses the methods that yielded the best result of the blind test.

It has been suggested that the large quantities of pottery at Pitted Ware sites are the result of economically specialized activities, especially the processing of seal blubber. Train oil from seal, whale and fish has historically been used for multiple purposes: as a vitamin rich sustenance, for curing leather and treating wood, and as a source of light and warmth. Considering the importance of fish and seal on the Pitted Ware sites, it is not a farfetched theory that the multitude of vessels were used for this purpose. Apparently, the lipid analyses do not support that hypothesis. It is still possible that train oil was extracted, but if so, it seems the process did not involve pottery to any notable extent.

Lipid analysis of pitted-ware pottery tells us that the vessels were used for cooking various foods, and possibly also for storing certain dry goods and/or water. Most commonly identified are vegetables, but fish and marine animal products also occur regularly in many of the samples, while land animals are somewhat rarer. The content of the vessels does not contradict the osteological evidence at the sites or the diet analyses on human bones in Pitted Ware burials (see chapter 3.1). However, it is clear that the lipid contents of the vessels can vary quite significantly between settlements in a way that is not immediately evident from other material evidence. This means that lipid analysis can be of great help in revealing more complex aspects of Pitted Ware culture and practices. Products deriving from ruminants are rare, and mainly found in early pitted-ware (Fagervik II) dated to the Middle Neolithic A. This corroborates the osteological material and macrofossils found at settlements dated to the Middle Neolithic A and B respectively, where domesticated species are rare in the former, but virtually absent in the latter (see chapter 3.1). It is hoped that future studies will make an even greater effort to combine lipid analysis with other methods, such as thin section microscopy, vessel reconstruction and stylistic analysis.
LIPID ANALYSES OF PITTED-WARE POTTERY

- Sites where fish/marine products are more common than terrestrial animals in the pottery: Postboda 2 (F II), Högmossen (F II), Lötvreten (F II), Glamilders (F III), Köpingsvik (F III)

- Sites where terrestrial animal lipids are as common, or more common, than marine products: Postboda 1 (F II), Brännpussen (F III), Ottenby (F III).

- Products from ruminants (dairy and/or meat) have been identified in funnel-beakers and early pitted-ware (Fagervik II). Only one possible, yet to be proven, case of ruminant lipids has been found in Fagervik III type pottery.

- The Early Neolithic funnel-beakers of Postboda SKB display a similar usage as the Middle Neolithic A pitted-ware (F II) of Postboda 2: c. 70% fish/marine, c. 20% terrestrial animals, presence of ruminants. In contrast, Postboda 1 (F II) is the one that stands out, with empty vessels or vegetable products.

- Köpingsvik and Ottenby on Öland also display evidence of different usages of the pottery vessels: the former is dominated by fish/marine products and has more evidence of heating.

Table 7.4. Lipid analysis of pitted-ware, and one site with funnel-beakers for comparison. FM = Fish/Marine, V = Vegetabilia, TA = Terrest Animal (non-ruminant), R = Ruminant (meat or dairy), BW = Beeswax, E = Empty (no lipids). Some vessels had evidence of heating and cooking of the food stuffs, though more vessels might have been used as cooking pots than the analyses reveal. The presence of possible dairy products at Brännpussen has not been confirmed by analysis of stable isotopes. (Papmehl-Dufay 2005; Isaksson 2006; Nilsson 2006; Papmehl-Dufay 2006; Isaksson 2008)

<table>
<thead>
<tr>
<th>Site</th>
<th>Type</th>
<th>No</th>
<th>FM +V</th>
<th>FM</th>
<th>TA +V</th>
<th>TA</th>
<th>V</th>
<th>R+V</th>
<th>TA+F+V</th>
<th>TA+V+BW</th>
<th>E</th>
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<th>TA %</th>
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<td>Postboda SKB</td>
<td>TRB</td>
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<td></td>
<td></td>
<td></td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td>67%</td>
<td>22%</td>
</tr>
<tr>
<td>Postboda 2</td>
<td>F II</td>
<td>10</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
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<td></td>
<td>4</td>
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<td>20%</td>
</tr>
<tr>
<td>Postboda 1</td>
<td>F II</td>
<td>10</td>
<td></td>
<td></td>
<td>5</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4</td>
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<td>10%</td>
</tr>
<tr>
<td>Högmossen</td>
<td>F II</td>
<td>16</td>
<td>5</td>
<td>2</td>
<td></td>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>44%</td>
<td>0%</td>
</tr>
<tr>
<td>Lötvreten</td>
<td>F II</td>
<td>2</td>
<td></td>
<td></td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>50%</td>
<td>0%</td>
</tr>
<tr>
<td>Brännpussen</td>
<td>F III</td>
<td>12</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>2</td>
<td>(1)</td>
<td></td>
<td></td>
<td></td>
<td>5</td>
<td>17%</td>
<td>25%</td>
</tr>
<tr>
<td>Glamilders</td>
<td>F III</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>67%</td>
<td>0%</td>
</tr>
<tr>
<td>Köpingsvik</td>
<td>F III</td>
<td>18</td>
<td>13</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>3</td>
<td>94%</td>
<td>22%</td>
</tr>
<tr>
<td>Ottenby</td>
<td>F III</td>
<td>14</td>
<td>3</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td>1</td>
<td>29%</td>
<td>29%</td>
</tr>
<tr>
<td>Sum</td>
<td></td>
<td>94</td>
<td>36</td>
<td>5</td>
<td>1</td>
<td>20</td>
<td>5</td>
<td>4</td>
<td></td>
<td></td>
<td>1</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>
7.2 Pitted Ware Potters: The Craft Community

The technological analysis has both confirmed some aspects of the stylistic analysis and at the same time presented a more complex view of the pottery technology of the Pitted Ware culture. I will now try to combine the results, summing up what we may deduce about the potters and the changes in pottery craft during the Middle Neolithic.

FROM FUNNEL BEAKER TO FAGERVIK II

The first type of ‘pitted-ware’ that appears in Eastern Central Sweden at the end of the Early Neolithic is still in many respects a continuation of local Funnel Beaker traditions. Both the s-shape and the large pit impressions are present to a degree in the funnel-beaker material, but they now become nearly ubiquitous. New traits include vertical patterns reminiscent of the contemporary megalithic funnel-beakers of Western and Southern Sweden. These decorations seem more like emulations rather than fully integrated patterns, and the new types of megalithic vessels and clay objects are not found in this region. In addition to these megalithic influences, an eastern influence can also be traced. The broadly applied cross-hatching, ‘chess-mannered’ pits and thick bevelled rims are all traits that can be found in the pottery of the Comb Ware culture of Finland and Comb-and-Pit Ware culture of the East Baltic region. The zoomorphic clay figurines are another eastern aspect that appears at this time.

Technologically the Fagervik II-pottery is still very similar to funnel-beakers, i.e. the same fine clay and crushed granite temper is used in almost all the vessels. A small number of sherds also contain crushed calcareous materials. Although it is difficult to show in objective terms, the surface treatment often is not smoothed as carefully on the Fagervik II-vessels. This, in addition to the new types of rims that appear on some of the pots, suggests changes in the motor habits of the potters at the time. Perhaps not extreme enough to be part of a conscious choice, but they are significant modifications nonetheless. Fagervik II-pottery also has a different distribution from that of the funnel-beakers, occurring in Gästrikland, Dalarna and on Åland.

FROM FAGERVIK II TO FAGERVIK III

It is difficult to know the length of the production period for Fagervik II-pottery, but around 3300-3100 BC ‘typical’ pitted-ware replaces it. Fagervik III-pottery represents a more definitive break with tradition both in terms of style and technology. Some aspects continue, for instance pit impressions, and in Eastern Central Sweden the potters continue to favour fine clay. The most notable change is the increasing use of calcareous temper (calcite, bone, shells), but also the greater variation in temper materials and combinations of tempers. Although the basic shape of the vessels is quite homogeneous, a carinated shoulder and conical body, the rim shapes and neck shapes hint at a relaxed
attitude towards the finer details of the craft. The decorations seem to support this impression, as there are a few general concepts and patterns that can be combined in many different ways and created through different application techniques.

Typical pitted-ware is firmly established along the Gästrikland coast and is also found on Gotland and Öland, and in Småland, Blekinge and Skåne. Although the general shape and decorative patterns are very similar across Eastern Sweden, there are regional divisions as well.

- **NORTHERN GROUP:** Predominately fine clay, though there is local variation. Calcareous temper and comb decoration becomes increasingly dominant over time. Almost only round pits: Gästrikland, Uppland, Västmanland, Södermanland, Östergötland and northern Småland and Öland.
  - Gotland belongs to this group also, but uses the locally available coarse calcareous clay.

- **SOUTHERN GROUP:** Extensive use of coarse and medium-coarse clay. Comb impressions are less common and calcareous temper and are very rare. Irregular/rectangular pit impressions are common: southern Småland and Öland, Blekinge, Skåne.

I am not suggesting these groups are absolute, and further analysis of the pitted-ware in Östergötland and Småland is still needed. However, I think it is likely that they reveal the existence of certain social networks within the wider cultural community. As was pointed out in chapter 6, similarities in material culture are indicative not just of contact, but of continuous contact between individuals and groups. That is, relationships in the real physical sense, and not just as ideological mental constructs.

The northern/southern group suggested above can of course be divided further into sub-regional and local groups, but it is unlikely that any sequence of division will ever be neatly organised, simply because the Pitted Ware society was not rigidly segmented. Pitted-ware is diverse, varying at the regional, sub-regional and local levels. The impression is of a community of potters that does not actively enforce anything more than the most general concepts of how a pitted-ware pot should look. Considering the variation present in the combination of temper materials locally and regionally, it might suggest the relocation of potters after marriage, for instance, and that there is more than one potter active at the settlements, but that there is no pressure to conform to one particular tradition. The important thing is not how a pot is made, or even how it looks specifically. There are huge quantities of pottery found at the sites, however, so it seems as if the use and depositing of the vessels were important to the Pitted Ware groups. Emphasis is on practice rather than craft, on the consumers rather than the producers. The cultural importance of pottery and clay within the Pitted Ware culture will be discussed further in chapter 11.1.
FROM FAGERVIK III TO FAGERVIK IV

The Fagervik IV-phase is mostly limited to the northern group, more specifically to the regions where Fagervik II-pottery has been found: Uppland, Gästrikland, Södermanland, Östergötland and Aland. It is in many respects very similar to Fagervik III-pottery except that the vessels are now almost exclusively tempered with calcareous material and covered in comb stamp, sometimes in wolf-tooth pattern. The carinated shoulder is diminutive or completely missing. This type of pottery is not found in the same large quantities as Fagervik III, though it is difficult to say whether this is only because it represents a shorter time period or if there is also a change in practice at this time. Fagervik IV is quite common on Aland, indicating it was a result of pottery traditions on these islands (Stenbäck 2003).

Fagervik IV is rare or absent in other parts of Eastern Sweden. Vessels have been found at Stora Förvar on the island Stora Karlsö outside Gotland, but on the island itself it is perhaps more common for late types of pitted-ware vessels to be covered in cord impressions creating a sort of fake textile pottery (Rydh 1937; Schnittger & Rydh 1940).
Making a beaker was very different compared to making a pitted-ware vessel. The new type of temper, grog, means that old vessels were used to fashion new ones. However, the contrast is not just in the choice of raw materials, but in the whole operational sequence, from beginning to end. Even more strikingly is the way in which the craft was apparently organised, and the attitudes toward variation and alteration in even the smallest details. The homogenous appearance in decoration runs deeper than the surface, showing that there was a very definite idea of what a potter within the Battle Axe culture should know and do. It will also become clear that these changes appear in the earliest battle-axe vessels in Sweden.

The use of beakers have been the focus of much speculation, and chapter 8.1 also presents what evidence there exists of what these vessels may have contained. Were they used as drinking cups for beer, or mead, or another type of fermented beverage? This highlights the question of what the role of the potter may have been in the Corded Ware culture complex, and why we should pay special close attention to the first phase of Battle Axe pottery craft.

In chapter 8.2 I will revisit the question of the relationship between the Battle Axe culture of Sweden and the Corded Ware cultures on the continent and around the Baltic Sea. I argue that the current model which states that Battle Axe culture was first established in Southern Sweden, through contacts established with Danish Single Grave culture, is incorrect. To find area of influence we should look east, across the Baltic Sea.
8.1 Beneath the Surface: Craft, Technique, Technology

In the appendix, Birgitta Hulthén presents a re-analysis of the battle-axe material originally investigated in her dissertation (1977). The results of her initial study of the pottery from Skåne have been somewhat modified thanks to better technology in identifying grog, calculating clay properties and determining which minerals have been added as temper materials. Most of the revisions are minor, but there is one area which required a major revision. In the thesis, Hulthén had noted that several thin sections contained crystals of calcite and therefore concluded that the potters had used calcareous clay (Hulthén 1977:144, 157). While this type of clay is quite common in the limestone rich region of Southern Sweden, the use of calcareous clay was not common practice among Neolithic potters, as it tends to fracture more easily during firing. Although few additional ceramological analyses were done on battle-axe pottery in the 1980s, it quickly became an established rule that battle-axe beakers were often made with calcareous clay.

However, in the re-analysis Hulthén noted that the calcite crystals had not gone through the changes connected with heating. In other words, they were secondary deposits in the clay. This has occurred as the sherds were buried in lime rich soil, and water had dissolved the calcite which had then been absorbed into the ceramic matrix. One important result of the re-analysis is therefore the rejection of the previously held view that Battle Axe potters used calcareous clay. As we shall see there are in fact virtually no cases of typical battle-axe vessels made with calcareous clay. The few alleged exceptions are atypical in other respects as well, and will be dealt with in chapter 11.2.

Interregional Comparison of Battle-axe Pottery Craft

A total of 77 thin sections on sherds from vessels belonging to the Swedish Battle Axe culture have been compiled for this study (see Tab. 8.1). Apart from Hulthén’s Hagestad material, she has also conducted more recent analyses of battle-axe pottery from Bollbacken and Turinge, which are included in the tables in the appendix (see also Hulthén 1996; Lindström 2000). The Berit Wallenberg Foundation has financed thin section analysis of battle-axe sherds from Barrsjö, Fägelbacken, Täby, and Vallby in Eastern Central Sweden, and Rötved in Skåne. Torbjörn Brorsson has analysed battle-axe pottery from Östra Vrå in Eastern Central Sweden, and also Hammar, Hunneberget and Järrestad in Skåne (Brorsson 2003; 2006b; 2007). However, it is my firm opinion that one of the sherds from Hunneberget identified as a battle-axe vessel (Brorsson 2007:190 TS 18; Lagergren 2007:fig.16b) in fact belongs to the funnel-beaker pottery material found at the same site. It is cord decorated, but the cord is coarse and applied in a fashion of alternating horizontal and vertical lines consistent with Funnel Beaker patterns. The rim sherd in question is from a vessel with a large concave neck, so the shape is that of a
It is not unusual that cord decorated sherds are identified as battle-axe pottery, when they are in fact funnel-beakers (e.g. Åhlén 1972; Rundkvist et al. 2004). I have not included this particular thin section in my analysis therefore.

Table 8.1. Thin sections of battle-axe pottery, showing which of Malmer’s pottery types were analysed at each site, when possible to determine. Sometimes only approximate identification can be made (e.g. GH). TS = thin sections, swm = short-wave moulding.

<table>
<thead>
<tr>
<th>Site</th>
<th>TS</th>
<th>Groups</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mjäla</td>
<td>1</td>
<td>cord dec</td>
<td>(Hulthén 1977, this vol.)</td>
</tr>
<tr>
<td>Bollbacken</td>
<td>3</td>
<td>G, H, M</td>
<td>(Hulthén 1996, Hulthén this vol.)</td>
</tr>
<tr>
<td>Fägelbacken</td>
<td>2</td>
<td>H, M</td>
<td>(Hulthén this vol.)</td>
</tr>
<tr>
<td>Vallby</td>
<td>1</td>
<td>A</td>
<td>(Hulthén this vol.)</td>
</tr>
<tr>
<td>Barrsjö</td>
<td>1</td>
<td>A</td>
<td>(Hulthén this vol.)</td>
</tr>
<tr>
<td>Turinge</td>
<td>1</td>
<td>J</td>
<td>(Lindström 2000, Hulthén this vol)</td>
</tr>
<tr>
<td>Taby</td>
<td>1</td>
<td>J</td>
<td>(Hulthén this vol.)</td>
</tr>
<tr>
<td>Östra Vrå</td>
<td>3</td>
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<td>(Brorsson 2006b)</td>
</tr>
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<td>Ottenby KG</td>
<td>2</td>
<td>GH, K</td>
<td>(Stilborg 2006)</td>
</tr>
<tr>
<td>Björkärr</td>
<td>5</td>
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<td>Valje</td>
<td>7</td>
<td>Hj, J, M</td>
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<td>Carlshögen</td>
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<td>(Hulthén this vol.)</td>
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<td>5</td>
<td>FGH</td>
<td>(Brorsson 2007)</td>
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<td>Hunneberget</td>
<td>2</td>
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<td>(Brorsson 2007)</td>
</tr>
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<td>Hyllie</td>
<td>12</td>
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<td>(Stilborg 2005)</td>
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<tr>
<td>Jonstorpm M3</td>
<td>1</td>
<td>swm</td>
<td>(Hulthén this vol.)</td>
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<td>Jarrestad SU1</td>
<td>7</td>
<td>F, M, N, O</td>
<td>(Brorsson 2003)</td>
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<td>Kv. Brorshyan</td>
<td>3</td>
<td>J</td>
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<td>A, B</td>
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<td>(Hulthén this vol.)</td>
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</table>

Ole Stilborg has analysed battle-axe pottery from the palisade at Hyllie in Skåne and vessels from another grave at Lilla Bedinge, as well as sherds from the sites at Björkärr and Valje in Blekinge (Stilborg 2003; 2005). These are not illustrated in the report or in the archaeological publication (Brink & Hydén 2006). From photographs in the latter it is clear that several sherds from the site are indeed battle-axe pottery, but precisely which
were chosen for thin section is not made clear. Stilborg has also conducted microscopy on two battle-axe vessels from Ottenby on Öland (Stilborg 2006).

Unfortunately, as far as I can tell no analyses have been made on battle-axe pottery from Western Sweden as yet. There is also a great difference in number of analysed sherds from Southern Sweden (61) and Eastern Central Sweden (13). This is the opposite situation compared to pitted-ware, where very few sherds from Southern Sweden have been analysed. While this discrepancy is partly the result of coincidence, since the Hagestad project had few Pitted Ware sites and the large projects in Eastern Central Sweden intersected with few Battle Axe sites, it also to some extent reflects different research priorities in the respective regions. The comparisons made below between battle-axe pottery from Eastern Central Sweden and Southern Sweden will therefore be hampered by the few samples available from the former region. However, as we shall see, compared with Pitted Ware culture the craft technology is far less varied within the Battle Axe culture. While the results cannot be deemed conclusive, they can at least provide a starting point for further studies which may test the work presented here.

Note: While the analysis of the total number of battle-axe sherds will include the three from Öland and Norrland, Southern Sweden only includes sherds from Blekinge-Skåne, and Eastern Central Sweden only includes sherds from Uppland, Västmanland, Närke and Södermanland.

CLAY SELECTION

As stated at the start of chapter 8, the notion that Battle Axe potters made use of calcareous clay is no longer supported. Not only has Hulthén’s re-analysis shown that there were only secondary deposits of calcite in the sherds, but neither Bronson nor Stilborg has found calcareous clay in any of the materials they have analysed from Skåne, Öland and Södermanland. In fact, only Pitted Ware potters made regular, if sparse, use of calcareous clay. There is another feature that distinguishes battle-axe clay selection: the common use of coarser clay (Fig. 8.1). In Southern Sweden, over 60% of the vessels were made with coarse or medium-coarse clay, and in Eastern Central Sweden almost half the vessels were made with coarse/medium-coarse clay. Since the number of thin sections from the latter area is quite small, there is of course the risk of a non-representative sample. Even so, we have seven sites with pottery types spanning the whole Middle Neolithic B. If we also include the thin sections made on battle-axe pottery from Öland and Angerianland, a total of 58% of the Swedish battle-axe vessels are made with non-fine clay.

There are no strong indications that choice of coarseness is connected to local traditions. At sites where coarse and medium-coarse clay is used, there are almost always also vessels made with fine clay, unless only one or two sherds have been analysed. Although most vessels made with truly coarse clay seem to belong to group H or later, there are some exceptions, such as an A-vessel from Vallby in Närke and an F-vessel from Järrestad in Skåne. Medium-coarse clay is used in several vessels belonging to the earlier types, from A to F and G, but also in later types such as J and K. Fine clay is used in anything from A-beakers to J-vessels. Choice of clay does not seem to have been governed by pottery type either. However, the determination of small sherds is often
very imprecise (e.g. adFGH), and occasionally no identification of specific groups is done at all ('comb decorated'). Sometimes no illustrations are included, so it is difficult to form an opinion based on such general descriptions. This is a question I hope will be studied further in the future.

**Fig. 8.1.** Regional comparison of clay selection in battle-axe pottery. Eastern Central Sweden (13) and Southern Sweden (61).

**Fig. 8.2.** Regional comparison of selection of temper materials in battle-axe pottery. Sst/Qzite = sandstone/quartzite.
**TEMPER SELECTION**

A compilation of temper materials used by Battle Axe potters show that two types dominate completely: crushed granite (present in 66% of all thin sections) and grog (48%) (Fig. 8.2). Other types of rock represented are sandstone/quartzite (8%), natural sand (5%), and only three vessels (4%) have no added temper to the clay. There are also two sherds with burned bones added as temper: both are H-vessels found in Västmanland in Eastern Central Sweden. One came from the Battle Axe house found at Fägelbacken, and in addition to a small amount of bones it was also tempered with grog and granite in common Battle Axe craft practice. The other was apparently tempered only with burnt...
bones, and was found at the nearby Pitted Ware settlement of Bollbacken. Battle-axe pottery made with more traditional tempers was also found at both sites. The significance of these vessels, and some other atypical ones belonging to the end of the Middle Neolithic, will be discussed further in chapter 11.2.

Temper selection divided by region reveals both similarities and differences. Granite and grog are clearly the two most common tempers in both regions. In Southern Sweden granite has been added to 70% of the sherds, whereas grog is added to almost half the vessels (48%). In Eastern Central Sweden granite has been found in 62% of the vessels, and grog in no less than 69%. The reason for grog seemingly being more commonly used in Eastern Central Sweden is probably due to chronological factors – a larger portion of the vessels from Southern Sweden belong to the final stage of the Middle Neolithic when the use of grog temper declined. The role of chronology will be discussed further below. The main difference between the regions is the temper materials other than granite and grog that appear in the vessels. While only a small amount of the sherds contain other types of temper, those that do appear are revealing. In Southern Sweden granite is sometimes exchanged for sandstone/quartzite or natural sand. There are also two sherds without temper, both of which belong to vessels made from coarse clay. In Eastern Central Sweden, the only other type of temper found in the analysed sherds consisted of the abovementioned H-vessels from Västmanland, which contained burnt bones.

The slightly greater variation of tempers found in Southern Sweden might reflect a somewhat more varied craft tradition, possibly influenced by earlier traditions since sand and sandstone have been found in pitted-ware and funnel-beaker vessels in Southern Sweden and on Öland (see chapter 7.1). Another explanation might be that the few sherds analysed from Eastern Central Sweden do not fully represent the true variation. My interpretation is that both explanations are probably valid to some extent. However, the fact that the only temper other than granite or grog appearing in Eastern Central Sweden is burnt bones is certainly interesting, considering the common usage of this temper material within the northern Pitted Ware group. Just as interesting is the fact that there is no evidence of burnt bones in battle-axe vessels elsewhere in Sweden. The regional differences illustrated in the diagrams are therefore probably fairly accurate. However, the proportion of bone tempered battle-axe vessels in Eastern Central Sweden is in all likelihood much lower than the 15% the two out of thirteen sherds would seem to suggest. One of these was intentionally selected because of its deviating appearance from a larger collection of battle-axe sherds (poriferous ware), the other for occurring together with an atypical battle-axe vessel of the so-called third group (see chapter 11.2). Until more thin section microscopies have been made on a representative sample of battle-axe pottery from Eastern Central Sweden, the true extent of variation cannot be known.

Despite these interesting regional differences, the similarities are still striking, especially the common use of grog. If we study the actual combinations of tempers within each sherd, as we did with pitted-ware, some minor regional variations are apparent (Fig 8.3). In Eastern Central Sweden in particular pots are tempered either with grog or granite, or
with a combination of both. The only vessel which contained neither is the one found on
the Pitted Ware site of Bollbacken, whereas the Fågelbacken vessel had a small amount of
bone added to the usual grog+granite temper. In Southern Sweden, where we have more
thin sections, a slightly greater variety appears. Even so, 84% of these vessels contained
either just granite, or just grog, or a combination of both. Another 5% were tempered
with grog combined with sandstone or sand instead of granite. The rest consists of a few
sherds tempered with sandstone, sand or a combination thereof. Only the Fågelbacken
sherd contained a combination of three types of temper.

Two of the sandstone tempered vessels come from the multiple burial at Järrestad,
where the vessels had either clumsily applied decoration (F, D/M?) or remarkably
unorthodox decoration (Fig. 8.4). In fact, six out of the seven battle-axe vessels from
Skåne that contain sandstone come from the eastern parts. However, there are very few
microscopies made on vessels from Western Skåne, so the significance of this is highly
uncertain. There is, however, a strong tendency that the unusual ones are of a later date.
For instance, both vessels tempered with natural sand belonged to J-vessels, one from
Hagestad 22:8, and one from a burial at Bronsyxan. None of the earliest types had
unorthodox tempers.

**HOUSEHOLD POTTERY**

Birgitta Hulthén also analysed some sherds from Jonstorp in north-western Skåne in her
dissertation. At Jonstorp M3, with pitted-ware pottery mostly dated to the late phase of
the Middle Neolithic (Lidén 1940:178; Carlsson & Strandmark 1998:35), sherds with
short-wave moulding were found. These were not initially recognized as battle-axe
pottery, parts of more typical battle-axe beakers also occurring at the site, since this type
was not listed by Malmer (Hulthén 1977:fig 94b, c). I have inspected not just these sherds,
but also others from the Jonstorp M3 layer. The moulding was definitely shaped by finger
pressure applied from two directions, the surface had traces of brushing, and the ware was
course and comparable to what is usually found on the smaller beakers. What really
piqued my interest initially was the fact that Hulthén had identified grog mixed with the
crushed stone in these sherds (1977:fig 87f). Another interesting sherd was found at
Hagestad 98:1A, a site with mostly Middle Neolithic funnel-beaker pottery. One
undecorated sherd stood out as it was the only one with a brushed surface. Hulthén noted
that the clay used in this vessel corresponded closely with that used in battle-axe pottery
found at nearby Hagestad 22:6. Thin section microscopy revealed that the sherd had been
tempered with a combination of crushed stone and grog (Hulthén 1977:61, figs 42-43).

**INTRA-SITE**

The number of thin sections of battle-axe pottery from individual sites is too few to
achieve a valid cross-regional comparison. The localities with the largest numbers of
microscopies are Järrestad (7) and Hyllie (12) in Skåne, and Valje (7) in western Blekinge.

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At Järrestad, the vessels were found in a fairly large grave containing six vessels, four flint axes and a chisel, which means it was most probably a multiple burial. A couple of pots were well preserved and can be identified as belonging to groups F and N (which is undecorated). Some had decoration that was difficult to assign to a specific group, for instance one slightly larger vessel has nail impressions in an indistinct pattern and might either be termed D or M (it does have a diminutive base and a vague semblance of zones, which would suggest a closer affinity with group D). On another, the potter has dragged nails and fingers across the surface creating a haphazard and unique pattern (Fig. 8.4). Five of the thin sections contained either granite or grog, or both combined. The N-vessel was tempered with sandstone and grog, and the D/M-vessel was tempered only with sandstone. Interestingly, with one exception, all the vessels were made with fine clay. The exception is the F:2-vessel which was made with coarse clay and had no discernible temper apart from a small quantity of grog – the only one to have no minerals added to the clay. This might suggest that the F:2-vessel was either made according to a special recipe, or that the vessels in the grave had been made by two or more different potters. Only the F:2 vessel really adheres to the usual visual appearance of a battle-axe beaker – and it is also apparently technologically consistent with the craft. The unorthodox appearance of the other vessels at Järrestad suggests that the potters involved in making these were not truly brought up within the Battle Axe craft tradition. They seem to be self taught, or new at the craft in general. The use of sandstone might be due to this imitative rather than learned craft.

Fig. 8.4. Three of the six vessels found in the multiple burial at Järrestad, Skåne. The beakers were poorly fashioned and decorated, which together with the technological analysis suggests they were made by potters who were imitating battle-axe pottery, rather than having been actively taught by Battle Axe potters. The F-beaker (a) was the only one to contain any grog, and only a small quantity (after Lindahl et al. 2002:figs 106-108).

A selection of battle-axe sherds have been analysed from a complex pit (A656) at the large palisade of Hyllie. Animal bones from the feature have been 14C-dated and show that it probably represents several phases of use, since the bones are dated to both the later half of the Middle Neolithic B and the Late Neolithic, but with no overlap. The thin section microscopies have been published by Stilborg in a report from the Laboratory for Ceramic Research (Stilborg 2005), but it contains no illustrations and only a few of the
sherds are identified by type. The published archaeological report on the other hand contains a photo of some sherds found in the pit and descriptions of the different decorations found in the material in the text, but no information as to which sherds were selected, or any mention of the ceramological analysis (Brink & Hydén 2006:56ff, fig 46). Of the twelve vessels analysed, ten were made with coarse or medium-coarse clay and all were tempered with granite or grog, or both, regardless of what sort of clay was used. The only one that stands out is a vessel with no temper added to the coarse clay. So while Hyllie displays the same general consistency in temper as Järrestad, there is a greater variation in the sort of clay used. Whether this is due to different types of vessels, chronological reasons, or because of the unique context of the palisade is impossible to tell at this time.

VALJE in western Blekinge is a complex settlement site with remains belonging to the Funnel Beaker, Pitted Ware and Battle Axe cultures. According to Stilborg, half of the 2 kg of pottery found at the excavation belong to the Battle Axe culture. However, this also includes C-vessels, which should more properly be ascribed to the Late Neolithic (see chapter 5.1). Most of the battle-axe vessels seem to belong to the late Middle Neolithic B (H, J and M). Five out of seven vessels were made with coarse or medium-coarse clay, and six out of seven were tempered with granite or grog, or both. One vessel (H/J) was made with fine clay and tempered with just granite. Technologically these vessels conform to the Battle Axe craft tradition.

Battle-axe pottery has also been found at the Neolithic sites of HUNNEBERGET and HAMMAR in north-eastern Skåne, situated only a few hundred metres apart (Brorsson 2007; Lagergren 2007). The pottery from the sites was mostly decorated with tooth stamp (one case of cord lines) in angled bands and lines, and probably belong to F, G and/or H types. Hunneberget has yielded rich Neolithic remains, including 104 kg pottery which mostly came from Early and Middle Neolithic funnel-beakers. A few sherds of possible pitted-ware were also identified, as well as two battle-axe sherds (see discussion above). Five battle-axe sherds from nearby Hammar were also analysed.

Brorsson analysed 38 Neolithic sherds from Hunneberget: fifteen (40%) had been made with fine clay, four (10%) with medium-coarse clay and nineteen (50%) with coarse clay. The two battle-axe vessels were both made with coarse clay. Although there are only two battle-axe sherds analysed, they do seem to confirm to the already established craft tradition at Hunneberget. One of the battle-axe sherds contained sandstone, and this was a commonly used mineral temper in the other Neolithic vessels. The other had no added temper, and this was also fairly common in the funnel-beaker and pitted-ware sherds. Interestingly, all of the five battle-axe vessels analysed from Hammar were made with fine clay, all were tempered with granite and two also had sandstone added to the clay. The general impression is therefore of a difference in craft practice between the sites despite their proximity and the similarity in appearance of the beakers. Unfortunately, the number of sherds analysed is not enough to ascertain whether this is coincidental or not.
Chronology

We have already touched upon the subject of chronology as a contributing factor to the variation present in the material. There are no clear indications that coarseness of clay or choice of temper is directly related to specific pottery types, or periods. There was variation among the vessels in the multiple grave at Järrestad, and differences between the similar looking vessels at Hunneberget and Hammar. Still, the few sherds that do have an unorthodox composition do seem to be mostly of later types. The compilation of thin sections presented above have shown that granite and grog are the most common tempers used in battle-axe pottery (66% and 48% respectively). Sandstone occurs in 8% of the sherds, and sand in even less – and not at all in Eastern Central Sweden. Burned bones or no temper at all is exceedingly rare (3-4%).

Before 2005, there were no published thin section microscopies of early Swedish battle-axe pottery, apart from Sundius’ old study which cannot be fully relied upon. Ole Stilborg has analysed a B-vessel from Björkärr in Blekinge (2005), Torbjörn Brorsson has analysed three sherds of A/B beakers from Östra Vrå in Södermanland (Kihlstedt 2006), and within my joint project with Birgitta Hulthén, another four A/B-vessels from Barresjö, Vallby, and Rövved have been analysed. Hulthén has also re-analysed the A-vessel from the Kasin-burial in Southern Norway. While this is only nine vessels, taken together they do suggest some interesting facts about the earliest battle-axe beakers of Sweden and Norway. Firstly, all of the sherds analysed contained grog temper, and quite significant amounts of grog in fact (Fig. 8.5:a). Six of them were almost exclusively tempered with grog, a few grains of minerals were present in a few, but in such small quantities it might as well be accidental inclusions. Three contained grog and a more significant quantity of crushed granite. Even though the number of sherds analysed is few, I feel this is compelling evidence that the new practice of using crushed pottery/clay as temper was an integral aspect of the very first battle-axe beakers manufactured in Sweden-Norway. There is no indication that the practice of tempering clay with crushed pottery and/or burned clay developed gradually over time, or appeared at a later phase of the Middle Neolithic B. Just as clear is the fact that the A/B-vessels are grog tempered regardless of geographical location: Eastern Central Sweden, Southern Sweden and South Norway.
Fig. 8.5a-b. Early battle-axe beakers (group A and B) from Eastern Central Sweden, Southern Sweden and one from Norway (Kasin). All were predominately tempered with grog, three also had moderate amounts of crushed granite mixed into the paste. Coarser clay has been used to make four out of the nine analysed beakers.

What is surprising is the variation in choice of clay among these early vessels (Fig. 8.5b). It is almost as common to use non-fine clay as it is to use fine clay. Even in Eastern Central Sweden, where fine clay is used virtually exclusively by contemporary Pitted Ware potters, the vessel from Barsjö in Södermanland has been made with medium-coarse clay. The beaker from Vallby in Närke was even made with coarse clay, whereas an Early Neolithic funnel-beaker vessel from the same site was made with fine clay (Hulthén 2008b, this volume). The same clay deposit might contain clays of different structures, from quite fine to very coarse. A variation of clay types used in vessels at a single site does not necessarily mean that different clay deposits were in use among the potters, though that may of course have been the case. However, even if all clay was
retrieved from the same deposit, any experienced potter would have noted and felt the different textures and been faced with the choice of discarding the clay or keeping it. Both Funnel Beaker and Pitted Ware potters in the region certainly felt very strongly about using fine clay. The varied choice of the Battle Axe potters could have three potential explanations:

- The potters did not place any significant value on what type of clay was used, but simply made use of what was easily at hand.
- Potters selected different type of clay for different types of vessels.
- Individual potters within the same community preferred different types of clay depending on what they had been taught.

The use of medium-coarse clay in AB-vessels in both Eastern Central and Southern Sweden seem to suggest that the variation in clay is not dependent on beaker type, or on inter-regional traditions, or on chronology (except short-term). Since so few vessels from each site have been analysed, it is not possible to form an opinion on whether the differences might be dependent upon strictly local traditions, or changes within a generation or two. The three sherds from Östra Vrå were all made with fine clay, but the two vessels from the Rötved burial were made with medium-coarse and fine clay respectively. Although the Rötved burial might suggest that there were no strong local traditions, it is interesting that the A-vessel was made with fine clay whereas the B-vessel made with medium-coarse clay. There are indications that the vessels chosen for burials might actually represent the work of different potters, who might even have belonged to different communities. The multiple burial of Järrestad contained six vessels, at least four of which are made with fine clay, and one with coarse clay – the only one which had ‘typical’ decoration. The grave at Täby in Södermanland contained a J-vessel made with fine clay tempered with granite and grog which is included in the tables. However, it also contained an atypical pit-decorated beaker of the so-called third group which will be discussed in chapter 11.2. This was made with coarse clay and tempered with granite.

While this opens up the possibility that the beakers chosen for a burial might have been made by different potters, or were meant for a variety of uses, some burials suggest otherwise. At Lilla Bedinge cemetery, grave 12 contained two beakers, one type G and one type H, which have been analysed. They were both made with fine clay of very similar character, and they were made in different but corresponding sizes, the smaller one found neatly ‘nesting’ inside the larger one (Hulthén 1977). They certainly seem to have been made within the same community, probably by the same potter. The fact that they have patterns that Malmer assigned to separate (although very closely connected) groups is therefore worth noting.

**Battle Axe Pottery Craft – Clay**

- Only non-calcareous clay is used
PART 3

- In terms of coarseness there is great variation in choice of clay, coarse/medium-coarse clay is dominant in the material from Southern Sweden (61%), and in Eastern Central Sweden make up almost half of the analysed sherds.
- Coarseness of clay cannot be credibly linked to (long-term) chronological, regional or typological differences. Although very coarse clay is unusual among the earliest types of pottery, the number of vessels analysed is too small to determine if this is representative of the established practice.
- Clay coarseness can vary among vessels deposited in the same burial, and between vessels decorated similarly.

BATTLE AXE POTTERY CRAFT – TEMPER

- Crushed granite and grog are by far the most commonly used tempers, often combined with each other.
- Other minerals such as sandstone and natural sand make up a very small percentage, and are mainly added to later types of pottery in Southern Sweden.
- Grog temper is especially common in the earliest types of beakers (A and B). All the early vessels that were analysed contained generous amounts of grog, often only grog.
- Grog temper becomes less common in the latest pottery groups from the end of the period, but it is still present in many beakers.
- Grog temper is as common, or more common, in Eastern Central Sweden as it is in Southern Sweden.
- Second generation grog occurs in at least some vessels: the clay has been tempered with crushed grog-tempered pottery.

Tempering, Shaping, Firing

AMOUNT AND COARSENESS OF TEMPER

It is inherently difficult to identify and calculate grog temper in a vessel, and it is quite possible that some of the vessels with seemingly low amounts of temper might in fact have had undetected grog added to the mix. Anders Lindahl has shown in experiments that visibility of grog is dependent upon both the firing temperature of the original vessels and the new vessel. It is difficult to detect crushed pottery temper if both it and the new vessel are made with similar types of clay. It is especially difficult if the new vessel is fired at a higher temperature than the original one has been. During reheating, the colour of pottery is unchanged or darkens until the original firing temperature is exceeded. However, if the new vessel is fired at a higher temperature, the result will be that the grog grains will become virtually indistinguishable unless they are made in a distinctly different type of clay (Lindahl 1990; 2002). Using old vessels as raw material for temper will also
complicate the calculation of temper amount in other ways. Using a granite tempered vessel as the basis for the non-plastic inclusions will result in the small but inevitable presence of crushed granite which then becomes a form of more or less unintentional temper. The final mix might then be dependent upon which sherds are used to make the temper, and whether they belonged to vessels originally made by another potter.

Even considering the difficulties in ascertaining the absolute amount of temper, as we have seen above, battle-axe pottery has a fairly small variation in amount of temper materials added: between 3-23%. Despite the problems of determining amount of grog, it is worth noting that over half of the vessels containing less than 10% temper have no identified grog. It is possible, therefore, that these sherds actually contain grog that cannot be detected. Even so, 40% of all the vessels have between 15-20% temper, and only 6% contain more than 20% of temper. The only vessel which contains more than 23% of temper is an uncharacteristically thick-walled pot (1.1 cm), which had 29% granite temper and no grog (Hulthén, this vol.). It was found in the passage grave Carshöggen in southern Skåne (Hagestad 14:4), and the decoration has been compared to Malmer’s group M, but the vertical lines have been applied by a shell, not by nail impression. Considering the unusual visual appearance of this beaker, its presence in a megalithic burial, and the exceptionally large amount of temper, I suggest it should be considered atypical of the Battle Axe pottery craft tradition.

Coarseness of clay does not appear to have played any significant part in amount of temper added. Both vessels made with fine clay, medium-coarse clay and coarse clay usually have between 15-20% of temper. Maximum grain size of the temper varies between 0.5-5 mm, the most common maximum size is between 2.0-3.0 mm (57%). There is no clear correlation between grain size and amount of temper. In the most extreme cases, those with the smallest and largest amount of temper respectively, there is a tendency that the former has small grained temper and the latter coarse grained temper. In most cases, however, vessels with 10-20% temper were just as likely to have been tempered with fine grains as with coarse ones. In other words, the amount of temper added, and the size of the temper grains, do not seem to be dependent upon each other, on coarseness of clay, or on regional traditions.

Table 8.2. Variation in amount of temper in battle-axe pottery, and maximum grain size of temper for sherds with up to 11% temper and over 11% temper, respectively. (Hulthén 1996, this vol.; Brorsson 2003; Stilborg 2005; Brorsson 2006b; 2007)

<table>
<thead>
<tr>
<th>Region</th>
<th>Temper (%)</th>
<th>Max grain size (≤11%)</th>
<th>Max grain size (&gt;11%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Central Sweden</td>
<td>10-20%</td>
<td>0.8-3.0 mm</td>
<td>1.5-4.0 mm</td>
</tr>
<tr>
<td>Southern Sweden</td>
<td>3-23%</td>
<td>0.5-4.0 mm</td>
<td>1.4-5.0 mm</td>
</tr>
<tr>
<td>Early beakers (A/B)</td>
<td>11-20%</td>
<td>0.8-1.3 mm</td>
<td>1.4-3.0 mm</td>
</tr>
</tbody>
</table>
The early vessels (A/B) are all tempered with between 11-20%, with maximum grain size of 0.8-3.0 mm. In this category of beakers there is a clearer tendency for vessels with smaller amounts of temper to also have fine grained temper, and vice versa. This might be an indication that the early vessels were fashioned according to stricter technological recipes.

THE FINAL STAGES: SHAPING, DECORATING AND FIRING

Three more stages in the manufacture of battle-axe pottery can be highlighted: shaping, surface treatment and firing.

SHAPING. Battle-axe beakers are very often shaped not through the prevailing Neolithic method of coiling, but by pinching a clay ball into shape. This method helps in making vessels that have the distinctive ‘spherical’ shape of Swedish corded-ware, and it is also an effective way of making vessels with very thin walls. Most beakers have vessel walls that are between 4-6 mm thick, though some are only 3 mm and others are more than 10 mm thick. Of course position on the vessel influences the variation, with the base often being thicker. On some vessels it is clear that the rim has been added as a separate coil. It is also evident that coiling is used for making whole vessels as well, at least among the later types of battle-axe pottery. For the somewhat larger pots, mainly household pottery, coiling is the main method and therefore the walls are not as thin as on the small beakers. However, on the earlier types of beakers (A, B, D, F and G), pinching seems to be the general method. On E-vessels it is partly dependent upon the size of the vessel and perhaps chronology, and in both cases pinching and coiling can be identified.

SURFACE. As previously stated, surface treatment of battle-axe vessels often involves careful smoothing of the surface. In some cases the surface seems almost polished, but this is not as common. This appearance of the surface, combined with the thin walls and often lack of visible temper minerals, contributes to the fact that even quite small sherds can be distinguished from other fragments of Neolithic pottery at a site. In Eastern Central Sweden, early Battle Axe culture settlements are often found on sites that were also settled by Early Neolithic Funnel Beaker culture (chapter 3.2). Both cultures commonly decorated their pottery with cord impressions, and could have fairly thin walled vessels with carefully smoothed surfaces. Even so, the difference in ceramic ware between them is often apparent to anyone sorting through the material. The TRB sherds are often thicker, have fractures along coils fashioned according to N-technique, and coarse grains of crushed granite – often with feldspar clearly visible (Segerberg 1999; Hallgren 2008). The vessels are fully oxidized, occasionally with a blurred dark core showing incomplete firing. The battle-axe sherds, at least those from the early types, often have a very dense ‘plastic’ appearance, the fractures only rarely follow along the edge of a coil, and they are thin with little or no visible grains of temper. There is also the category of vessels which instead have a brushed surface, a bundle of grass or something similar having been whisked across the surface of the vessel while it was still wet.
DECORATION. The decoration on battle-axe beakers was applied mostly by impressing cords and/or toothed stamps into the clay. Early pottery, as well as a number of later types, are often decorated with finely spun cords (Fig. 8.6). The earliest spindle whorls date to the Late Neolithic, and there is no evidence in Sweden of spinning wool during this period. Woollen yarns would probably be coarser than the very thin, fine cords used on corded-ware beakers, and it is more probable that they are made from plants fibres. It is not clear what material was used to make these cords. One of the more imaginative and creative suggestions was put forward by Andrew Sherratt, who postulated that the cord was made of hemp fibres, and that this was used to decorate the vessels as a way of highlighting the importance of the use of the plant as a narcotic by the community (Sherratt 1997 [1987]:397f). Herodotus had written about the intriguing ‘steam sauna’ traditions of the Scythians, who threw cannabis seeds on a brazier and enjoyed the resulting vapour “so much that they howl with pleasure” (Herodotus, quoted in Sherratt 1997:398). This is of a much later date of course, but Sherratt felt that the early use of cord decoration on pottery from the Russian steppes indicated that this might be a very old tradition. He bases this theory on the premise that cord decoration spread to Western Europe with the Globular Amphora culture, which certainly has a strong connection with the East. This might be correct in terms of corded-ware, but cord decoration is quite common on Early Neolithic funnel-beakers of the TRB in both South Scandinavia and parts of Germany, so the issue is far more complex (Becker 1948; Koch 1998; Hallgren 2008).

Another possibility is that the fibre is derived from a close relative of the hemp: hop (Humulus lupulus). This plant is strongly associated with beer, a beverage which has often been cited as the possible content of the beakers. The practice of decorating the corded-ware vessels with its fibres would certainly provide a tidy explanation for the symbolism. However, our earliest sources for hop being part of beer-making belong to the eighth century AD (Hornsey 2003:303ff). The practice was apparently established among Slav groups by then, although it is not clear if it actually originated with them. Whether there was a tradition of cultivating hop going as far back as the third millennium BC is pure speculation, and not really supported by any palynological evidence at this point.

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Fig. 8.6. Close-up of cord impression on the rim of a battle-axe beaker. The twists in the cord are left-angled, meaning they were made with an S-twisted cord, which creates a mirror impression in the clay.
There is also a possibly more credible, though less exciting, suggestion that the cords were made out of fibres from the stinging nettle (*Urtica dioica*) (Korkeakoski-Väisänen 1993; Kängä 1993). This plant has been used as a source of textile in Europe well into the twentieth century, and nettle fabric has been identified in Bronze Age burials at Slotshøj and Voldtofte in Denmark (Hald 1980; Kriiska et al. 2005:21f). To obtain usable fibres from nettles, the withered plants can be retted and barked with wooden implements or teeth. The material extracted is then pounded with a pestle and scutched using a knife to produce the fibres (Kriiska et al. 2005:21). Flax (*Linum usitatissimum*) is also a possibility: its cultivation is known from Neolithic pile-dwellings in Switzerland, and from contemporary sites in East and Central Europe. However, pollen evidence from further north is lacking up until the Iron Age (Kriiska et al. 2005:22).

In order to make cordage, individual fibres are twisted into a thread, which is then twisted into a cord (Hald 1980). The way a cord is twisted, clockwise or counter-clockwise, will result in what is referred to as either an S-twist or a Z-twist based on the direction of the slant of the fibres/thread as seen from a vertical position (Hald 1980; Minar 2001:387) (Fig. 8.6). The direction of the initial spin and the final ply is opposite, which causes the fibres to lock together. An S-spun thread makes a Z-twisted cord and vice versa. Both the way the fibres are twisted, and the final twist direction of the cord, speaks about the craft practice, but here I will only concern myself with the latter: final twist direction. This will in turn leave a negative mould in the clay that can be easily recorded by archaeologists.

What is striking is the fact that on every cord decorated battle-axe sherd from Sweden that I have encountered in collections, exhibits and publications, the cord used is always made with an S-twist. Horizontal impressions made with an S-twisted cord on clay will invariably result in 'left-angled cord impressions’ (Fig. 8.6), and that is what I have seen on every Swedish battle-axe sherd that I have been able to study, in person or through photographs and detailed illustrations. We can compare this to the cord decorated funnel-beakers on which mostly coarser types of cord were used. Although left-angled cord impressions do occur, it is more common to find right-angled cord impressions. Not just on vessels found at the same site, but in a few cases even used together on the same vessel (see Hallgren 2008:fig 8.16a). In other words, the making of cords within the Battle Axe culture was a tightly controlled practice where no exceptions were allowed. In contrast, within the Funnel Beaker community, some cord makers twisted the fibres clockwise, while others twisted them counter-clockwise. The cords will be discussed further in chapter 8.2. Although whipped cord decoration (creating a dense row of short vertical impressions) is common on funnel-beakers, this form of application is rare on battle-axe pottery until the J-vessels from the end of the Middle Neolithic (Fig. 5.6:e).

The stamps used on beakers have mostly square/angular pegs very close together. This is unlike the comb stamps used on pitted-ware vessels, which have mainly rounded and sparsely placed pegs. This tool only appears with the F/G-vessels, at which point it
becomes the most common form of application on beakers for the rest of the period. Both cord and stamp impressions often seem to have been added when the surface is more leathery than fresh, resulting in fairly shallow imprints. Both the exterior and the interior surfaces of the beakers are carefully smoothed down, occasionally resulting in erasing small parts of the decoration. The surface treatment is more obvious on the early vessels, since the later ones usually have decoration covering most of the surface. A peculiarity of the Swedish beakers is that from early on many have decorated bases (see chapter 8.2). Initially this is no more elaborate than concentric circles made up of stamps or cords, but with the F and G beakers complex patterns start to appear. Cross-patterns in various forms are customary (Fig. 8.7).

Fig. 8.7. Examples of base decoration found on battle-axe beakers in Sweden. The most elaborate designs are usually found on group G and H, whereas base decoration on early beakers (A and B) was usually designed as concentric circles (after Malmer 1962:fig 10).

FIRING. Despite the fact the vessel walls often are quite thin and the exterior surface usually oxidized to a light yellow-brown or reddish-orange hue, it is not uncommon for the interior to be dark brown or even pitch black. The usual suggestion is that this is because the firing was incomplete (e.g. Korkeakoski-Väisänen 1993:21), which would be remarkable as the beakers are both smaller and thinner than most of the funnel-beakers which are often fired through. On closer inspection it is evident that the transition from light exterior to dark interior occurs almost immediately below the surface (Fig. 8.8). The transition is also quite sharp, not at all like the blurred darker core that occasionally can be found on funnel-beaker or pitted-ware sherds. Hulthén noted in her thesis that some of the G- and H-vessels she analysed had dark surfaces as well, and were fired in a closed reduced atmosphere. This is a profound novelty in the pottery craft of prehistoric Scandinavia, where burning in open fires had been ubiquitous up until this point. In those cases Hulthén mentioned the whole vessel had been fired and left to cool in a covered fire leading to a completely dark vessel. However, it is likely that several vessels with light surfaces have also been fired in a reduced atmosphere, but then uncovered and left to cool in the open. Such a practice will result in an oxidized exterior with a sharp transition to dark, reduced clay immediately below the surface (Rye 1981:98, 116f) – just as we can see in many of the beaker sherds. The light exterior/dark interior is especially common in the early types of vessels (A, B and D). It seems likely that the practice of firing vessels in a reduced atmosphere was something which appeared with the very introduction of battle-axe pottery in Sweden.
Fig. 8.8. Polished cross-section of B-beaker from Rötved II, after thin section had been taken. The interior is very dark, almost black. However, the exterior surface is light brown. Not only is this lighter area very thin, but the transition to the darker part is very sharp. The vessel was probably fired in a reduced atmosphere and then left to cool rapidly in open air (cf. fig 6.3). This sort of cross-section can be seen in many battle-axe vessels, especially the early types. (photo: Å. M. Larsson)

One reason for firing in a reduced environment is purely aesthetic: to create dark and blackened pots. But the early types of beakers were mostly left to cool in open air creating a common oxidized surface. It would not have been obvious to those who were using the vessels that the firing was done in any other way short of breaking them open. The introduction of reduced firing can therefore not be explained as purely for appearances sake. A covered fire will have the advantage of having less extreme variations in temperature, thereby decreasing the risk of the vessels fracturing during the firing. However, it is a complicated method that demands a measure of experience and practical know-how, as there is virtually nothing the potters can do after the pots are covered up, except to hope for the best. Firing is the final and most hazardous stage in the manufacturing of pottery: many weeks of careful work and preparations can now be irrevocably undone. Firing is therefore often surrounded by superstition, taboos and conservative attitudes, as related in chapter 6.2. Far more remarkable than the new habit of tempering with grog is the new way in which pottery is now fired.

With the appearance of the very first battle-axe vessels in Sweden, there is a change in the chaîne opératoire of the pottery craft which should not be understated. Any good potter can imitate a vessel they have been shown. However, to copy shaping, temper and firing you need to be allowed to participate in the process, receive instructions from someone experienced, and most of all have a very strong incentive to change your established habits. When it comes to battle-axe pottery, several stages in the process of making a vessel appear to have been different from the previous Neolithic crafts of Sweden:

- The clay is tempered with crushed burnt clay/pottery
- The vessels are shaped by pinching
The beakers are decorated by cords that were exclusively S-twisted. The firing is now often done in a reduced atmosphere, and the vessels are often left to cool in an oxidizing atmosphere.

Using a Beaker

“The symbolism of the containers is closely connected with the significance of their contents.”

(Sherratt 1997 [1987]:376)

Any discussion of Battle Axe pottery inevitably draws upon research into Corded Ware and Bell Beaker culture – the Beaker cultures, in short. The Beaker phenomena share many interesting aspects: the single graves with the dead placed in crouched positions, the strictly regulated burial practices with an apparent gender differentiation, and the prominent position of the thin-walled, finely crafted, relatively small vessels referred to as beakers. The s-shaped, high-necked corded beakers of Jutland, the Netherlands and parts of Germany are certainly very similar to the early bell beakers in those regions – the difference being mainly the decorative patterns (Harrison 1980; Czebreszuk 2004). Bell Beaker burials occur in many areas across Northern Europe where Corded Ware culture is or has been firmly established. Although much emphasis among researchers is placed upon the weapons – battle axes, arrows or daggers – in some of the burials, it is worth noting that the object which is the defining item is the ceramic beaker. The undisputed variation of the types of beakers notwithstanding, the presence of at least one vessel in so many of the single graves is striking.

One reason that radiocarbon dating of the Battle Axe culture is sadly deficient in Sweden is because battle-axe vessels hardly ever have any organic residue left on the sherds. Even though a site with battle-axe pottery may also yield funnel-beakers that are a thousand years older, the latter often have at least some organic crusts, unlike the former. There is very little evidence that the battle-axe beakers were regularly subjected to heating after the initial firing; vessels with a dark reduced exterior and/or interior would have become oxidized throughout if that had been the case. That the small beakers that fit in the hand have not been used to cook food is perhaps not surprising, but it does seem remarkable that even the larger ‘household’ vessels have not been used in this way as far as we can tell. All indications are that they were used for storage of liquids and/or dry goods. In contrast, contemporary pitted-ware vessels have apparently been used both for cooking and for storage (see chapter 7.1).

Andrew Sherratt is arguably the archaeologist who has most eloquently and comprehensively stressed the importance of the beaker’s inclusion as a burial gift, and the theory that they are a symptom of the spread of alcoholic beverages, and socially significant drinking ceremonies in general, across Europe at this time (e.g. Sherratt 1997 [1987]). Of course, the idea that these vessels represent drinking utensils is quite old: John Thurnam suggested the term ‘drinking cup’ in 1871, and Lord Abercromby established...
the more elegant word ‘beaker’ in 1912, in accordance with existing German and French traditions (becher, gobelet campaniforme). The notion of an association with the knowledge of beer or mead brewing has been discussed by several archaeologists over the last century, even though actual evidence for this has been mainly theoretical (Harrison 1980:9). Sherratt helped elevate this question to the forefront of the debate of cultural change in the third millennium BC, and what the Beaker phenomenon actually represented, by stating that they indicated a new communal ceremony centred around the sharing of alcoholic beverages.

Sherratt discussed whether the beverage in question was wine, beer, mead or koumish/kumis (fermented mare’s milk which is richer in sugar than cow’s milk). Sugar is the decisive factor in the process of supporting fermentation and creating alcohol (ethanol), since yeast will continue the process even in the presence of oxygen as long as enough sugar is present. For early brewers with simple containers this is essential. As Sherratt rightly noted, the one ingredient that the Neolithic peoples of temperate Europe would have been hard pressed to produce enough quantities of is sugar. The sugar-rich fruits and berries at our disposal today, including grapes, are the result of centuries of selective breeding. Wild grapes, berries and apples might have helped the process, but they probably would not have been enough in themselves to create beverages such as wine or cider in Northern Europe at this time. Sherratt felt that the two likely candidates were either cereal based alcohol (beer), or honey based alcohol (mead).

To initialize the fermentation process in cereal grains the enzyme amylase needs to be present. There are two easy ways of assuring this: by chewing them since the enzyme occurs in human saliva, or by letting them germinate in water, since the enzyme is also produced during sprouting (a.k.a. malting). It is easy to imagine that both methods come with heavy symbolic associations, and saliva has been associated with beer and mead making in Scandinavia in later prehistory: The Norse god Kvasir is made out of spit from both Vanir and Aesir gods collected in a pot, and when he is slain his blood is used by his killers to brew the mead of poetry – which is later stolen by Odin in the guise of an eagle who spat it out in new containers. In Kalevala, the beer that the sorceress Louhi brews for her daughter’s wedding feast needs the spittle from a bear as well as honey to start fermenting.

As discussed in chapter 3.2, barley seems to become much more common in Northern Europe during the third millennium BC. Barley is also a cereal very commonly associated with alcohol production. The seeds are germinated in water, then roasted resulting in malt, which is turned into beer. However, one of the reasons barley is so optimal for beer making is because its grains are husked (Hornsey 2003:14), and Neolithic barley in Northern Europe as far as we can tell belong to the naked variety (Hordeum vulgare var. nudum). Sherratt cites this as a reason for not interpreting the beaker contents to have been beer (Sherratt 1997 [1987]:394). However, while naked barley is not optimal, it is hardly disqualified as a viable alternative. Wheat grains are also ‘naked’ but have been used as a basis for beer in many parts of the world from prehistory to modern day; indeed,
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most major cereal crops can be malted, it is just that husked barley is the most user-friendly (Hornsey 2003:14f).

Sherratt’s interpretation is that the Beaker peoples produced mead, and he makes a very compelling case for the elevation of honey as a precious commodity during this time. His primary proof is a beaker included in a Bell Beaker cist-burial with a copper dagger found on Ashgrove Farm in Fife, Scotland. Samples from the vessel wall and the soil adjacent were dominated by large amounts of pollen from small-leaved lime, combined with pollen from meadowsweet and heather – consistent with what we might find in honey. The site lies 100 km north of the boundary of lime (Tilia cordata) at that time, so Sherratt’s interpretation that this is the residue of a honey based content might very well be correct (Sherratt 1997 [1987]:396). Still, making too sharp a distinction between beer and mead might not be constructive when discussing early alcoholic beverages: the Bronze Age oak coffin burial at Egtved in Denmark contained a vessel which had included a brew made of honey (pollen from lime, meadowsweet and clover), cranberries, sweet gale (Myrica gale), as well as wheat grains (Hornsey 2003:219).

There are other finds that seem to conform more to beer than mead as the beverage of choice for the Beaker users. The excavation of an early Single Grave burial at Refshøj on eastern Jutland yielded an s-shaped beaker decorated with parallel grooved lines on the neck (Klassen 2005a:29; 2005b). Uniquely, on the interior surface of the neck a thin brown crust was preserved, representing carbonized residue with no evidence of being the result of heating or cooking. Four separate samples from the vessel were analysed. There was no identifiable presence of pollen in the crust, which indicates that the residue was not from a primarily honey-based product. In contrast, the sand found inside the vessel had large amounts of well preserved pollen reflecting the surrounding meadow landscape. A microscopic analysis with polarized light of the crust revealed the presence of a large amount of starch grains originally from cereals (Klassen 2005a:39-42, 58). Unfortunately, the granules were too deteriorated for the scientists to be able to ascertain through scanning electron microscope whether they displayed the typical pitting of the surface that occurs as a result of malting. It is not completely certain therefore that the starch present in the beaker actually went through a fermentation process, and it might be the remains of a porridge, for instance. However, as there is no evidence of secondary heating of the vessel, or any indication that the charred residue is the result of cooking, the Refshøj-beaker is nonetheless compelling evidence for the production of cereal based alcohol within the Corded Ware culture. Pollen analysis from the area showed that barley (Hordeum sp.) was the most common type of cultivated cereal at the time (Klassen 2005a:34; 2005b). The lower burial in which the beaker was found is dated through three separate charcoal samples to c. 2865-2680 BC, making this the earliest plausible find of beer in Northern Europe.

An even more substantiated case for beer beverages to be associated with beakers comes from the Bell Beaker site of Ambrona Valley in Northern Spain (Rojo-Guerra et al. 2006). Here four vessels out of ten analysed contained phytoliths of cereals, starch
granules with surface alterations caused by germination, and yeast which is needed to transform sugar into alcohol during the fermentation process. So-called ‘beerstone’ (*Calcis oxalatum*), which is produced by aminoacid chemical reactions caused by the heating of the malt, was also identified. The fact that the starch has been altered through fermentation strongly suggests that this is not simply the residue from porridge or a similar food product. In this case the cereal in question was wheat. Human bones associated with these bell beakers were dated to c. 2460-2200 BC (Rojo-Guerra *et al.* 2006:251-253).

Another liquid that could hypothetically have been served in the beakers is milk. Only milk from horses is sweet enough to truly achieve an alcoholic content, and although there are finds of horse bones on some Danish and German sites from this time, there is scarce evidence that domesticated horses were an established part of the economy in Scandinavia at this time (Damm 1991a:89). However, milk from cattle, goat or sheep might still have been a valued and privileged drink even if it was not fermented. Many have wanted to paint Corded Ware culture as a distinct herder economy, and Sherratt has discussed the ‘secondary Neolithic revolution’ that introduced dairy and wool as important subsistence economies (e.g. Sherratt 1994; Sherratt 1997a; c; b). There are some indirect indications that dairy farming becomes more important in Scandinavia at this time, such as lactose tolerance becoming more common within the population during the transition from the Neolithic to the Bronze Age (Linderholm 2008). However, since there have been almost no lipid analyses made on battle-axe pottery as yet, that possibility remains unanswered. There is always a danger in ascribing a specific function for a vessel. For instance, in Copper Age Hungary small, rounded vessels with a handle have long been referred to as ‘milk jugs’. However, when several of them were subjected to lipid analysis, none had any trace of milk in them. Strikingly, milk *was* identified in other types of vessels belonging to the culture, such as carinated dishes and storage jars – just not the ‘milk jugs’ (Craig *et al.* 2004a:261). It is clear that any theory about the use of a certain vessel type cannot rest solely on analogies with other cultures, or functional reasoning. Laboratory analyses of proteins, lipids and other chemical compounds are required.

At present, lipid analysis on battle-axe pottery has only been done on ceramic material from one Swedish site: the settlement Lötvreten (Valbo parish), Gästrikland (Isaksson ms.). At Lötvreten both Middle Neolithic A Pitted Ware material (Fagervik II) and late Middle Neolithic B Battle Axe culture remains were found, representing two separate phases almost a millennium apart. The battle-axe pottery is mainly type J, and there are also Late Neolithic stone materials at the site. Some of the pottery is not easily identified as belonging to any of the Neolithic cultures of South Sweden; instead it closely resembles vessels that have been found at Hedningahällan in Hälsingland. That site has been dated to the transition to the Late Neolithic as well, and the special appearance of the pottery found here is discussed further in chapter 11.2.

Four sherds that can more or less be identified as late battle-axe pottery were analysed for lipids by Sven Isaksson at the Laboratory for Archaeological Research, Stockholm
University. Sample 7 contained a mixed content with a high C18:0/C16:0 ratio indicating presence of terrestrial animal fats (see chapter 7.1 for methodological discussion). In combination with other lipid ratios, Isaksson finds it probable that the animal fats derive from a ruminant. There was also a presence of fatty acids from marine animals and plants in sample 7, and the contents had been subjected to heating. Sample 8, 10 and 11 contained low amounts of lipids, and the ratios indicate they probably derive from fish or marine mammals, and/or plants. Two pitted-ware sherd s from the earlier settlement phase were also analysed. One contained low amounts of lipids, probably deriving from lean fish and plants, and possibly also some land-living animals. The other had no detectable remains of lipids (Isaksson ms.).

The results from the battle-axe sherds analysed from Lötvreten would suggest that the beakers were not used as drinking cups, or at least not exclusively. The possible presence of fatty acids from a ruminant in one is certainly interesting, though it has not been determined whether the lipids derive from meat or milk. There are some problems, however, with interpreting the Lötvreten material as typical of the Battle Axe culture. Firstly, the site is probably dated to the early Late Neolithic, or at least very late in the Middle Neolithic B. This period brought significant changes in the production and use of pottery. As we will see in chapter 11.2, the craft and technology associated with battle-axe pottery changed and became less rigid at the end of the Middle Neolithic, and the same might therefore be true of the use of the beakers. Secondly, Lötvreten is situated in a region where Pitted Ware culture dominates the Middle Neolithic. Battle Axe material is rare and only dated to the later part of the period. Since there are as yet no lipid analyses of battle-axe pottery from any other part of Sweden, or on any of the older beakers, it is impossible to determine whether the Lötvreten material is typical of the use of beakers within the Battle Axe culture, or whether the Refshøj-beaker is a better indication of what the beakers were used for.

Based on my own experience with Neolithic pottery, where the thin-walled crust-free sherds of battle-axe pottery have always stood out against the other ceramic assemblages, I still support the notion that the beakers were mainly meant for holding beverages. What I find even more interesting is the fact that even the larger vessel types do not seem to display any evidence of repeated heating or cooking. It is always important to remember that the small beakers are not the only type of battle-axe (or corded-ware) pottery we find. Battle-axe pottery cannot be explained as simply a prestige object, because they are part of a varied craft tradition. Food preparation within the Battle Axe community was undertaken in a somewhat different manner than within the Pitted Ware society. The scarcity of battle-axe pottery on the settlement sites also testifies to a very different usage of the vessels they made. It is true that the amount of deposited sherds might be smaller due to the fact that old vessels were often ground up and used as temper for new ones. However, even as the use of grog becomes less common over time in the Middle Neolithic, often with only a token amount added, the quantity of pottery found on settlements does not increase significantly.
Sherratt and others who have highlighted the importance of what was contained within these beakers are in all probability right. They were not such an indispensible part of the burial ceremony solely because of their pleasing appearance. However, I believe Sherratt goes a bit too far in undervaluing the beakers themselves:

Whatever prestige attached to pottery is likely to have been derived from the special nature of what was consumed from it rather than from any inherent value in the pots themselves. (Sherratt 1997 [1987]:376)

Sherratt does not believe that the appearance of the vessel is unimportant, for instance he discusses the various containers used for different beverages in historic and modern societies. Even so, he confines the importance of the beakers to strictly a question of surface, a pleasing design (Sherratt 1997 [1987]:391f). I disagree, the significance of the beaker as a pan-European phenomenon goes a lot deeper or there would have been even more variation present. Although the contents certainly were of great importance, it does not follow that the beakers were simply a superficial fashion trend and a visual marker. I believe that it was not only the beverage that was the focus of the ceremony and/or ritual connected to it, but that the beaker as physical testimony of culturally significant practices that went into making it, made it an integral aspect of the event as well. The manufacturing process was just as important a signifier as that which was consumed – especially, but not limited to, the use of parts of old vessels (grog) in making a new one (see chapter 12.1).

The factor which we tend to forget is the making of the beakers: the craft and the individuals in possession of this skill. Just because we tend to undervalue skill in making things in our society today, does not mean that the prehistoric people shared these values. The pottery craft of the Corded Ware culture was rigidly controlled and it was not enough to simply use a beaker that looked right – it had to be right. Considering the quite special chaîne opératoire of the corded-ware ceramic craft, it meant having access not just to corded-ware beakers, but to corded-ware potters.
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8.2 Battle Axe Potters: The Craft Community

Material culture (specifically the skill of making objects) is believed to be the main manifestation of cultural tradition and content.

(Czebreszuk 2001:255)

Despite Czebreszuk’s perceptive observation, archaeologists often pay remarkably little attention to the skills and craft traditions behind the material culture they study. Although there are many reasons for this I suspect that modern society’s low regard for manual labour and the material world, as compared to ‘art’ and intellectual pursuits, is a contributing factor. Determining to what extent the early Battle Axe culture differs from, or is similar to, Corded Ware craft traditions in other regions is more than just an indulgence in curiosity. In order to understand the relationship and interdependence between the regions we must distinguish where primary and continuous contact was established. We must also appreciate which traditions were adopted and which were not, and the extent to which are we dealing with emulation, or with actual shared technological knowledge and taught practices. Is it just a matter of ‘outward appearances’ or do the changes run deeper? Analysis of material culture cannot be restricted to just style or just technology as they are inevitably linked to each other.

Even advocates of a model of internal development of Battle Axe culture in Sweden have always been convinced of the fact that the initial phase was heavily influenced by the Corded Ware cultures that at the time existed in most regions adjacent to the southern coast of the Baltic Sea. There are many parallels to be found among the Corded Ware groups: thin-walled cord decorated beakers and groundstone battle axes of the general A-type seem to have been present in many European regions, as well as similar burial practices with crouched inhumations (see chapter 3.2). On closer examination, the similarities tend to break down into many different regional varieties, from differences in vessel shapes, decoration patterns, details on the battle axes and aspects of the burial practices. While this has led to much needed criticism of the A-horizon model, disproving the tenet that it represents a homogeneous population movement across the European continent, the pendulum has at times swung too far in the opposite direction. The many variations and differences that do exist can at times blind us to the inescapable similarities that form the basis of the Corded Ware complex.

The most challenging concept for archaeologists after rejecting the simplistic evolutionary diffusion theories and mass migration models of the early twentieth century is this persistent homogeneity that does appear on certain levels of material cultures in prehistory. Especially in cases when the changes appear to have happened fairly rapidly, within a few generations or less. What mechanisms resulted in this widespread distribution of new pottery, new prestige goods and new burial practices? In order to even
attempt to answer such monumental questions we must first resolve what the basic mechanisms were:

Who is involved? There are actual human beings involved in these changes, who must have changed themselves, changed others, brought in new people, moved to a new place and displaced those living there, or a combination of all this.

- Is contact direct or indirect?
  - Superficial emulation
  - Completely new concepts, crafts and practices

- How is knowledge transmitted?
  - By some members of a group travelling to another and bringing back objects and some practices, but not all the know-how
  - By some members of a group acquiring detailed esoteric and technological knowledge that they alone are privy to
  - By bringing back experts and specialists from another group in the form of allies, adopted relatives and/or spouses
  - Some or all of the above

Many archaeologists have had strong opinions on this matter over the last century and more, and I will here only deal with those relevant to the Battle Axe culture of Sweden. As was related in chapter 3.2, some have believed the appearance of this culture in Sweden was the result of migrations, others have argued for diffusion of an ideology or a religion. Just as debated as the cause of the change has been the direction of it: from the East, the South or the West. Such is the immense influence of Malmer’s dissertation and the arguments presented there that the prevailing explanation among Scandinavian archaeologists since has been that it is a case of internal changes within the settled Funnel Beaker population, initiated in Skåne under the influence of Single Grave culture in Denmark. Although the question of at least partial migrations has been raised at times, the direct connection between Denmark and Southern Sweden has not really been challenged. Indeed, it never occurred to me to question this aspect of Battle Axe culture until a few years into my project. My own doubts were a case of a long process where finally the contradictory nature of the archaeological material became too problematic, forcing me to reconsider on several key issues.

A Peculiar Kind of Corded Ware Culture

As I have already discussed in chapter 3.2, the burial practices of the Single Grave culture and the Battle Axe culture are different. On Jutland the dead are laid out in a mostly east-west orientation facing south; the men were placed on their right side and women on their left. Burials were covered with small mounds, and later burials were often placed on top
of an older one, creating a vertical stratigraphy. In contrast, Swedish burials are oriented mostly north-south, with the dead facing east/south-east. Men are mainly placed on their left side and women on their right. The burials are often organized in a line cemetery and mounds were not constructed. Danish Single Graves correspond closely with Corded Ware burials of Germany and south Poland, whereas Swedish burials are more similar to the ones in northern Poland though with inverted position based on gender. This alone is cause for inquiry, as the Corded Ware culture is very much defined by its extremely rigid set of rules surrounding burials. The most pressing problem for me was not this discrepancy in mortuary practices, as pre-existing locally held beliefs could have been the underlying cause. Rather, it was the material culture which troubled me the most.

Battle-axe beakers do not look like the early corded beakers from Jutland, Holland, Germany or Poland. The latter are predominately slim with long necks and an s-profile. Battle-axe beakers, on the other hand, including the very early ones, have only a rudimentary neck or none at all and are more globular in shape. The bases on the vessels were also peculiar: diminutive and concave. This could simply mean that they are locally developed versions by potters who tried to emulate shapes they had only some basic knowledge of. However, the technological analysis suggests otherwise. Even the earliest vessels (A, B, D and E) were made with an operational sequence that differed in almost every stage from the contemporary funnel-beakers and pitted-ware vessels. Grog temper was unknown in Neolithic Sweden up until this point, as was pinching the shape of a whole pot. The shapes are new, including the shape of the rim, the surface treatment is different and most remarkable of all: the new technique of firing reduced is introduced. As the thin section analysis shows (Hulthén, this vol.) these were not gradual changes, regardless of region the early beakers are a product of the same craft tradition. Early beakers with poor shapes, inexpertly applied decoration or only rock temper are completely absent. Just as telling is the fact that the slightly larger and coarser domestic vessels have yet another type of surface treatment, i.e. brushed. This is a complete chaîne opératoire introduced in Sweden from the start, involving not just one new type of vessel but a full set of pots.

It is difficult to see how this drastic change could have come about without involving the actual movement of potters trained from a young age, rather than experienced local potters changing their craft. As discussed in chapter 6, while potters can and do change their techniques under certain circumstances the most persistent aspects involve fine motor skills such as shaping and surface treatment, and firing is a very conservative stage in the production sequence. But if the first Battle Axe potters did not come from local communities, where did they hail from? Unfortunately very few technological studies have been made on Corded Ware pottery, and although there seems to be a consensus that they were mostly tempered with grog this is usually based on the absence of visible temper in the thin-walled vessels. A few studies have supported this hypothesis with hard evidence (Engberg 1986; Korkeakoski-Väisänen 1993; Kulczycka-Leciejewiczowa 1997). Engberg’s study of late funnel-beakers and single-grave beakers from Jutland shows the
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same abrupt change in technology at the transition, suggesting that the Corded Ware pottery tradition was an integral and significant aspect of the social identity. It was not enough to have vessels that looked right – they had to be right (Larsson 2008).

In the light of this it is worth a closer look at the early beakers and domestic ware in burials and at settlements in Sweden. There are several aspects that make them different from the early pottery of the continental Corded Ware traditions.

- Globular shape for the beakers
- Base decoration
- A single wavy cord line below the horizontal lines of cord
- Double-dotted cordon on the coarse ware

There are also common themes of continental Corded Ware that are rare or even missing from the Swedish material

- Amphorae
- Short-wave moulding is almost completely absent from the settlements
- A-beakers rarely have a ‘fringe’ of vertical strokes or impressions. This is very common on continental A-beakers, but has only been found on a few in Eastern Central Sweden and none at all in Southern Sweden.

If the Battle Axe pottery tradition came from the Single Grave culture, it is difficult to understand why the beakers look so different. This difference in material culture is evident in the battle axes as well, and in the burial practices. One aspect of the early Middle Neolithic B that has become clearer in the last few decades with better radiocarbon dating is that the Single Grave culture initially only affected Jutland and parts of northern Germany (Schleswig-Holstein). The Danish isles continued to uphold a version of the Funnel Beaker culture, both materially and in terms of burial traditions. It was not until much later that aspects of Single Grave culture started to appear on the islands and it was a peculiar version that still involved megalithic burials and a regional type of pottery (Damm 1991a; Ebbesen 2006). Likewise, continued excavations and research in western Skåne has shown that early Battle Axe culture is barely present here. Instead something similar to the Danish islands seems to have taken place, with local continuation and development of the Funnel Beaker culture, and to a certain extent the Pitted Ware culture (Larsson 1982; 1986; Nielsen 1997; Lagergren-Olsson 2003; Brink 2004). Instead, the earliest Battle Axe culture can be found primarily in north-eastern Skåne.

Forssander (1933:fig 89-91) had also noted the peculiar shape of the Swedish beaker, and suggested a connection with the region of north-eastern Poland and southern Lithuania, by the Bay of Gdańsk (alt. Danzig). This is the region of the Rzucewo culture (alt. Haffküstenkultur), a coastal version of the Corded Ware culture with many unique characteristics. It is true that some vessels found in this region are similar to the Swedish ones, but they are a rarity compared to all the other types of beakers and vessels found...
The region around the outlet of the river Wisła (alt. Vístula, Weichsel) into the Baltic Sea has enjoyed unique status in many periods of prehistory, acting as a node for various networks and transports. The corded-ware pottery found here includes almost every type that can be found in the Corded Ware complex, from Denmark to Estonia to southern Poland. It is doubtful therefore that the few globular beakers found there represent a local tradition. The Polish corded-ware vessels are not globular and do not as a rule have base decoration, unless the whole vessel is covered in decoration. Wavy cord lines do occur, though generally as a form of zone patterning and not as a single wavy line on A-beakers. While domestic ware often has horizontal moulding, these are decorated with strokes across or a single line of dots impressed into it. The double-dotted moulding so prevalent in Swedish Battle Axe contexts is missing not just from Poland, but also from Germany and Denmark.

The Eastern Connection

The one region outside of Sweden-Norway where globular beakers are common is southwestern Finland. The Finnish beakers often have single wavy cord lines and decorated bases as well. Double-dotted moulding on coarse ware is very common, and deep nail impressions creating a sort of rudimentary short-wave mould are also known, very similar to the sherds found at Domarhagen (Fig. 8.9). The Finnish beakers were to a certain degree shaped by pinching and fired in a reduced atmosphere (Edgren 1970:33f; Hultén, this vol.). As was noted in chapter 3.2, the battle axes of Sweden and Finland are very similar. What differentiates the Finnish material from the Swedish is that, in addition to these globular beakers and double-dotted moulding, there are also beakers similar to the continental Corded Ware tradition – the eastern Polish Corded Ware especially. Beakers with more elongated necks, vertical fringe decoration, short-wave moulding, moulding decorated with vertical strokes and even an amphora (Edgren 1970:fig 27). This similarity between Finnish and Swedish corded-ware could be interpreted in two ways:

- The Finnish Corded Ware culture was influenced from two directions: both the Polish/Baltic Corded Ware and the Swedish-Norwegian Battle Axe culture
- The Swedish-Norwegian battle-axe pottery was initially made by potters brought up in the Finnish Corded Ware communities

If the first theory is correct, then we would still be left with answering not only how the Swedish-Norwegian Battle Axe culture came to be so different from any other Corded Ware culture, but also how they seemingly learnt a completely new technology while discarding so many other aspects of the operational sequence. The most straightforward explanation is the second one, i.e. that the first Corded Ware potters that settled on the Swedish mainland had been brought up and taught within those Finnish Corded Ware communities where this special type of pottery had developed from the continental types.
As both the stylistic and technological analysis has shown, innovation and experimentation was not encouraged within the Battle Axe culture. Adhering to ideal types with only minor variation was the norm. This becomes especially clear when considering the cords used to create the decoration as these were all, without exception, twined with an S-twist. Edgren points out that this is true of the Finnish beakers as well, in contrast with the Iron Age pottery which is often decorated with Z-twisted cord (Edgren 1970:21f). This use of S-twisted cord is a general feature of most corded-ware pottery, actually, and another testament to the conservative nature of the Corded Ware culture. This can vary, however, and in some regions Z-twisted cord is used as well (Butler & Fokkens 2005:fig 17.2). In southern Poland some regions have pottery decorated mainly by left-twisted cord and others by right-twisted (Wlodarczak 2006:fig 42). Äyräpää has pointed out that the Russian Fatjanovo culture, whose relation to the Corded Ware culture is another source of debate, has similarly rounded vessels, decorated with predominately right-angled (Z-twisted) cord (Äyräpää 1933:figs 112-117). These vessels are known to have base decoration similar to the Finnish ones as well (Nordman 1922). The battle axes of Russia commonly have butt-knobs and also shaft-socket, a peculiar feature on many of the Finnish and Swedish battle axes (see also Tallgren 1924; Äyräpää (Europaeus) 1924; Lang 1998; Kosko 1999). Unfortunately, the question of the relationship between Finnish Corded Ware culture and the Fatjanovo culture is beyond the scope of this dissertation, but it does suggest a special eastern influence in the Swedish-Norwegian Battle Axe culture via Finland.
Not only are the similarities between Swedish Battle Axe culture and Finnish Corded Ware culture pronounced, but the early types are more common in Eastern Central Sweden than in Southern Sweden. This fact was partly obscured by the way Malmer composed his distribution maps, for instance by including the cord decorated Late Neolithic C-pottery on the map showing A- and B-pottery, and not showing maps of the early battle axes. Early Battle Axe artefacts in Southern Sweden concentrate at a few closely situated sites in north-eastern Skåne, most of which are burials. In contrast, there are a number of early settlements known in Södermanland and Närke, as well as burials. The early battle axes (type A and B) are also notably more common in Eastern Central Sweden, where Malmer identified eighteen compared to only eight in Skåne-Blekinge. There are also nine early battle axes known from Östergötland-Småland, as well as thirteen from Västergötland-Halland (Malmer 1962:tab 64). Absolute comparisons are problematic of course, but it should be pointed out that early Battle Axe culture in Eastern Central Sweden involves mostly western Södermanland, Närke and small parts of Västmanland. In that limited region the number of early sites, burials and stray finds is impressive (see also Lindström 1996; 2002; Edenmo 2008:fig 5:17).

Malmer's model that Battle Axe culture spread northwards from a centre in Skåne is credible on the surface, as Corded Ware culture on the continent becomes established in areas previously dominated by Funnel Beaker culture. He seems deeply reluctant to accept anything that might challenge a model of a south to north expansion, even if it is suggested by his own analyses. For instance, the index value (height::width) on beakers measured by Malmer shows that the average in Denmark is 88, Sweden 115 and Finland 121. He describes this as demonstrating that the Swedish beakers are in between the Danish and Finnish ones, when it rather clearly shows that the Danish beakers have a very different medium index (Malmer 1962:833; 1965:93). His main argument is based mostly on the total range of Battle Axe culture material, not just the early types (Malmer 2002:168-171). The virtual explosion of battle axes and graves in the late Middle Neolithic B creates an image of a centre in southern and western Skåne (where stone-packing graves are common), areas where the early types are rare or even completely absent. Malmer does admit that there is a greater density of early finds in Eastern Central Sweden, but explains this as a result of ‘lagging behind’ and the conservative nature of communities in the periphery. If the beakers and battle axes looked anything like the Jutish, German or Polish ones this might be an acceptable explanation. Under the circumstances, I suggest that the more credible explanation is that early Battle Axe culture was initially established further north in Södermanland, Närke and possibly parts of Östergötland. From here it spread southwards to Småland, and westwards into Västergötland and Halland. Maps of stray finds of Battle Axe artefacts show this north-east to south-west distribution from Närke and continuing between the great lakes of Vättern and Vänern (Oldeberg 1952; Malmer 1962:fig 67; 2002:figs 55-58).

I have stipulated that the novel type of pottery, technologically as well as stylistically, appearing from the outset suggests a movement of potters taught in another region, and
that this region was probably south-western Finland. But the mobility of one social group does not necessarily entail the migration of a whole community. Are there any indications that a completely new population settles in Eastern Sweden at this time? I would say the rest of the material remains make this an unlikely theory. There is a strong element of local continuity in the stone craft and the raw materials chosen. More strikingly there is the localisation of early settlement sites in Eastern Central Sweden. At these sites there is almost always an Early Neolithic Funnel Beaker site as well. While there is no material or radiocarbon evidence for any activities at these sites in the Middle Neolithic A, it is still likely that the people whose ancestors had lived there retained considerable knowledge and oral history of them. During their use they would have been cleared with pastures for the animals and small fields of cultivation. Even after they were abandoned and nature reclaimed them they would have been grazed by wild animals and would perhaps have stood out against the rest of the deciduous forest. The people now living mostly by the coast, but moving through these parts in pursuit of game animals and plants, would have kept alive the by this time more and more mystical past, traces of which could be found at times such as pieces of polygonal battle axes, flint axes and cord decorated pottery. The use of a constructed history and past in the structuration of the present has been highlighted in other archaeological and anthropological contexts (Battaglia 1990; Gosden & Lock 1998; Knutsson 2005; 2007).

That there was an established long-term network of contacts and exchange between Eastern Central Sweden and south-western Finland has already been shown in the Pitted Ware pottery, technologically and stylistically, as well as through the introduction of zoomorphic art. Changes taking place in that region of Finland could therefore potentially affect communities in Sweden. As I see it, some people in the Pitted Ware community decided to follow suit and align themselves with this new social and cultural identity. Simply imitating the material culture would not be enough, however, and any network ties have been strengthened through more or less authentic kinship ties: e.g. adoption or marriage. If pottery production was a female activity, this would have meant acquiring wives from established Corded Ware communities. I think the importance of these potters goes far beyond the role they would have had as wives, however. The tightly controlled operational sequence of pottery production suggests that the potters as a group held a special position in society. Connected with the special know-how was perhaps more esoteric knowledge concerning the proper use of the beakers in ceremonies and rituals, and the correct procedure of these rituals. If the beakers were used for the consumption of special beverages, perhaps beer as has been suggested, the people who knew how to make the vessels were perhaps also the ones who knew how to make the drink. If this was the case, then these (women?) specialists held a position of far greater importance than as a link to an ally.

It is noteworthy that in several areas of the Corded Ware complex battle axes seem to appear earlier than the beakers (Glob 1945:64; Siemen 1997; Furholt 2003a:fig 28). One explanation for this would be that ground stone battle axes, already an established concept
in these parts of Europe, could be made locally by men who had been shown the new types. In contrast, the pottery required detailed know-how that had to be taught through direct contact with an instructor - an instructor who accepted little in terms of variation or innovation, instilling a sense of submission to authority. Perhaps far more than pottery craft was taught in the process: rituals, ceremonies, myths, meanings and the secret of brewing fermented beverages.

The model I have suggested for the introduction of the Corded Ware culture in Sweden concerns just the first phase. The passage of time is too often forgotten in archaeology as our ability to trace short-term events is limited. As the Corded Ware identity became established in communities in Sweden, it put them inside the larger network of northern Europe. The apparent connection between early Corded Ware culture in Finland with that of the Baltic states and northern Poland makes it likely that the Swedish communities became part of this wider network around the Baltic Sea. I also do not think that further changes only emanated from Eastern Central Sweden. It seems more than likely that tooth stamp decoration was initiated in Southern Sweden, and it remained more popular there than in more northern parts. There are also several artefacts found in Southern Sweden that demonstrate a close and continuing contact with the Polish Corded Ware culture, and the occurrence of Swedish battle axes in Denmark and Danish in Sweden reveal the complexity of the networks at this time (Hulthén 1977; Lindström 2003).

I will now turn to what the mortuary rituals can reveal to us of the ideologies of the Pitted Ware and Battle Axe cultures, as well as how they would over time negotiate a closer relationship after having initially worked very hard to maintain their differences. In chapter 11 I will return to the question of the pottery traditions and especially the hybrid types that appear at the end of the Middle Neolithic B.
IV

Dead Bodies
And death shall have no dominion.
Dead men naked they shall be one
With the man in the wind and the west moon;
When their bones are picked clean and the clean bones gone,
They shall have stars at elbow and foot;
Though they go mad they shall be sane,
Though they sink through the sea they shall rise again;
Though lovers be lost love shall not;
And death shall have no dominion.

Twenty-five poems Dylan Thomas

A body does not cease to be important when it ceases to be alive. This is true for social and cultural reasons, but we must not forget that it is true for personal reasons as well. The way in which grief and emotion is displayed and experienced is in many ways filtered through our cultural background, but that does not mean it is simply programming of the mind. Dealing with dead bodies, with the physical remains of people that were until recently part of daily life, involves practices which are very revealing about deeply held convictions concerning what it is to be a person – ideally. Considering this it is remarkable in how many ways the mortuary activities can be organised, and how they vary not just between different cultures but also within them. Perhaps the ultimate reason for this is because bodies 'are good to think with'. They are the one thing that we all share, the means for perceiving and experiencing the world, our basic measuring device.

How did the people of the third millennium BC think with bodies? What is revealed about their cultural concepts in the way they handled their dead? As I hope to show in chapter 9.1, the mortuary customs of the Pitted Ware people involved complex actions over an extended period of time. There was disinterment, removal, dispersal and reburial of body parts, including at times defleshing, cremations, and mixing not just with other humans but also animals, mostly seals and dogs.

The question raised at the beginning of this book was what the two mortuary houses of Turinge and Bollbacken might reveal about the events leading up to the Late Neolithic. In chapter 9.2 I will offer a closer description about both of them, and also a few other similar structures. What is interesting about them is not just their similarities, but even more so their differences.
9.1 Bodies: Broken and Burnt

The traditional view of burial practices within the Pitted Ware culture was discussed in chapter 3.1. This is based largely on the appearance of the well preserved burials and cemeteries in the calcareous soils of Gotland and Öland. The material from Gotland, which was excavated and published in the early twentieth century, is especially abundant. The graves contain adults and young children alike, in varied positions and with what seems like personal, or at least personally selected, burial gifts. These burials resonate and appear normal to today’s secular, individualized Westerners. They ‘make sense’ and look as a burial ‘should’ based on our personal experience. However, there is far more to the Pitted Ware burial traditions, including practices and customs that tend to strike us as odd, peculiar and even counter-intuitive.

There are two main problems with the standard view of Pitted Ware burial customs. Firstly, burials like these are extremely rare outside Gotland and Öland. This has generally been explained as a result of poor preservation of organic materials in the light acidic soils of the mainland, which is certainly a valid point. The other problem is that the burials on Gotland are not simply straightforward inhumations as they have traditionally been presented (Larsson 2009a). Even in the well preserved burials there are several skeletons that seem to be missing one or several body parts. Early excavators did interpret this at the time as evidence that some of the dead had been cut up, or that bones had been deliberately removed (Nihlén 1927:168ff). However, the increased focus on empiricism and methodology in post-war archaeology in Sweden led to a more sceptical take on the incomplete bodies. Gunborg Janzon (1974) interpreted these graves as disturbed by later events, such as ploughing and animal activities. Whereas Stenberger (1943) had included most of the features containing human bones on Västerbjergets in his monograph, Janzon intentionally excluded those burials that in her opinion were not representative of the mortuary practice (1974:14).

This approach to describe all incomplete skeletons as ‘damaged’ or ‘disturbed’ continued in the 1980s and ’90s. Helena Andersson, who has studied the Gotlandic burials, points out that the extensive and well illustrated catalogue of graves in Janzon’s book helped promote the idea of what a ‘typical’ Pitted Ware burial should look like to archaeologists in general (H. Andersson 2004:6). Meanwhile, most excavations at Pitted Ware cemeteries kept resulting in a number of pits, features and layers containing incomplete skeletons, assemblages of bones from multiple individuals, as well as scattered human bones (e.g. Norderång 2002; 2003; 2004; 2006a; b; 2007). By the beginning of the twenty-first century some researchers had started to pay closer attention to the fact that these incomplete and/or mixed skeletons could not always be explained as the result of later disturbances.
Defleshing and Removal of Body Parts

At Ajvide, the most thoroughly excavated cemetery on Gotland, several burials are missing one or several body parts despite extremely good preservation. There is for instance the peculiar case of grave 6: it contained a skeleton placed on its back, complete with the exception of the skull and jaw bone, which were missing. However, the teeth were found laid out in almost perfect order, upper and lower set, except they were found a few decimetres too far to the side of where the head should have been. Even more
remarkable was the fact that two of the canines were missing, and were apparently replaced with two animal phalanges: one from a pig and one from a seal. Several of the teeth show evidence of being forcibly pried loose from the jaws – post-mortem, one would hope, but obviously before complete skeletation (Burenhult 1997; 2002:46; H. Andersson 2004).

The 82 burials at this cemetery include at least nine where the skull is missing (Österholm 1997a:481). Since some of them, including grave 6, are cut perpendicularly at the uppermost part by another burial, this lack was initially interpreted as the unintentional destruction of older burials by newer ones. Helena Andersson (2004) has made a detailed study of the excavation reports and the position of the skeletons in the burial pits, and she concluded that the removal of body parts was in fact often intentional and planned. The later graves do not really cut into the part where the head would have been positioned, and the way in which the burials cross-cut each other seems almost too neat and planned. It is unlikely that this is the result of random accidents. There are four ‘T-shaped’ burials at Ajvide, though in one case the earlier grave is a cenotaph and lacks a body completely (Fig. 9.2). In three cases the body in the earlier grave lacked its cranium. Osteological analysis on the skeletons showed that either a woman’s grave crossed another woman (1), or a man’s grave cut another man (2). None contained children, but the ages varied between juvenilis (14-15 y.) to senilis (50-60 y.). It seems as if the first grave always contained the younger individual of the pair (H. Andersson 2004:tab 1). Similar T-shaped burials are found at Ire and possibly Grausne as well, though the same rules for age-sets do not seem to apply here (2004:13-15).

There are also burial pits that are superimposed on older ones more directly, but which are not dug down to their depth – what Andersson refers to as ‘dead-on-dead’ burials. She has identified six such burial pairs, two at Ajvide, three at Västerbjer, and one at Fridtorp cemetery. At Ajvide the custom of same-sex pairs still applies, as well as the fact that the earlier burial contains the younger individual. At the other sites these rules seem not to have been enforced, as there are women’s graves found above those of men. In several cases the upper or the lower burial - or both - contain an incomplete or even heavily fragmented skeleton (H. Andersson 2004:14-17). Skulls are not the only thing missing: there are also other burials where the bodies are missing one or both feet, e.g. two graves at Visby and at least one at Västerbjer (Janzon 1974:305, 316, 338).
Fig. 9.2. Section of the cemetery at Ajvide, Gotland, showing the ‘T-shaped’ graves and a few others with incomplete skeletons. Grave 10 in the lower right corner contained the body of a newborn infant, who had been given two bone arrowheads and a bone awl as burial gifts (after Burenhult 2002:fig 11).

Fig. 9.3. Package graves of the Pitted Ware culture. a.) Ajvide. Multiple burial, remains from four individuals packed into a space of half a metre – one adult, two children (c. 10-12 years old), and one foetus. (Norderäng 2007:17); b.) Västerbjer, grave 67:2 – double burial containing the bones of one adult, probably male, and a child (c. 9 years old). The bones were not found in anatomical position and the pit was only c. 1 x 0.6 m. Above the bone pit was another double grave with an adult woman and a 3 year-old child (Stenberger 1943:abb 36).
Johan Norderäng (2007:15) has discussed the occurrence of ‘package graves’ at Ajvide. This type of burial includes a skeleton whose bones are found so tightly together, and in such a position, that it seems likely the body was deposited either tightly wrapped or in a package, when more or less defleshed. One was found in 1958 in a 1.4 x 1.4 m pit where the bones covered an even smaller area of 0.6 x 0.6 m (Fig. 9.3a). The feature was excavated by archaeologist Erik Nylén, but the bones were not examined until 2007 and it became clear they contained the remains from at least four individuals: one adult, two children (c. 10-12 y.), and a foetus. A stone axe and a bone awl were probably included as burial gifts (ibid.:16). Grave 23 contained the skeleton of what is probably a young boy, 12-13 years old, in stretched out position. He was partly covered by a skeleton of an old person (50-60 y.), whose bones were found in such a position that he must have been at least partly defleshed at the time of burial. The grave contained a large number of burial gifts, such as stone tools and a harpoon. The old individual was determined to have been a male through osteological analysis. However a DNA analysis made in the 1990s had resulted in an identification as female. This inconsistency could be because the skeletons of very old women develop many ‘male’ characteristics (Geller 2005). However, the well preserved pelvic bone fell squarely within what is expected of a man, which still makes it surprising. Another explanation is that the DNA could have been contaminated. This was a fairly early study on a very old material, and the scientists could not be absolutely certain there was no contamination present from previous handling of the bones by archaeologists (Götherström et al. 1997:78f; Norderäng 2007:17). In the last decade the techniques for extracting uncontaminated DNA from very old bone material have greatly improved.

The third package grave was no. 79, excavated in 2006. It contained the body of a child, 8-10 years old, and an adult woman (18-20 y.). The woman was found next to the child’s right leg, but her bones were not in anatomical position - instead, they were packed together on a 0.9 x 0.3 m surface (Norderäng 2007:18). Apparently there were two separate pits dug for the individuals. They are both 14C-dated to the Middle Neolithic B, and it is possible that the woman is dated to the latter part of that period. The child had received a large amount of tooth pendants, including 60 made from seal teeth and eighteen made from elk teeth, an animal that did not live on Gotland. There was also a long flint blade which must have been made in southern Scandinavia. The adult on the other hand was only accompanied by a few possible gifts, including the base of a pottery vessel. Some burials gifts were difficult to ascribe with certainty to either individual, but a collection which probably belonged with the woman’s bones included the paw of a dog/fox, fish bones, and two balls of ochre – one of which contained a seal tooth (Norderäng 2007:19). Grave 67:2 at Västerbjers was a double burial in a 0.9 x 0.6 m pit where the bones were not found in anatomical position (Fig. 9.3b). One of the individuals was an adult, probably male, the other was a nine year-old child (Stenberger 1943:61).
While these features have contained more or less incomplete skeletons, they have still been categorized as graves—albeit damaged ones—by archaeologists. However, Pitted Ware sites often contain human bones scattered in the culture layers, or found in various pits and assemblages. For the most part, these have been explained away as the result of later destructive activities such as ploughing. Evidence that the bones belong to destroyed burials is based less on actual taphonomic investigation and more on the fact that such occurrences strike us as strange and disquieting (Larsson 2009a). HEMMOR (När parish) in eastern Gotland has been partially excavated and surveyed, and like most Pitted Ware sites on the island it has yielded both settlement and burial remains. In one area there was an extensive concentration of fish bones, and with this several more or less incomplete human skeletons were also found (Hedemark et al. 2000:18ff). One of these individuals lacked both a cranium and a leg bone, but skull bones from a dog were found close to where the human head should have been (Fig. 9.4). Next to a hearth were a number of human bones with traces of fire. Human skull bones have also been found in a hearth at Västerbjerje (Janzon 1974:34; H. Andersson 2004:10).

The phenomenon of broken bodies and scattered human bones associated with Pitted Ware sites is not in any way restricted to Gotland. JETTBOLE (Jomala parish) on Åland also contained large quantities of human bones in addition to the large amounts of pottery and many zoo- and anthropomorphic clay figurines. One of the largest assemblages of human bones was found in the eastern part of trench A, mixed together with smaller amounts of animal bones, mainly dog and seal (Storå 2001b:61ff; Götherström et al. 2002:62). A hearth and a large assemblage of pottery sherds were found close by. Human bones were found all over the 80 m² trench, mainly in the south part as well as the east, with little or no evidence of originally belonging to complete inhumations. There was one ‘regular’ inhumation burial with a complete skeleton which was originally interpreted as a Pitted Ware burial. However, 14C-dating on the bones later showed that it was in fact Bronze Age (Stenbäck 2003:183). Radiocarbon dating on the main bone assemblage on the other hand all yielded dates to the period 2900-2300 BC, whereas the dates on the scattered human bones mainly fell between 3300-2700 BC. These dates have been adjusted for a diet heavily based on marine animals, as shown by the 13C-values (Götherström et al. 2002; Stenbäck 2003:183).
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Fig. 9.4. Hemmor, Gotland. 1.) culture layer; 2.) extreme concentration of fish bones; 3.) edge of the layer with fish bones; 4.) skull bones of a dog; 5.) human skeleton lacking skull; 6.) human skull; 7.) human thigh and shin bone; 8.) human thigh bone; 9.) human skeleton lacking skull; 10.) human shin bone. (after Hedemark et al. 2000:fig 18b)

Fig. 9.5. Human remains at Korsnäs. a.) Feature A2, a greasy dark layer containing a human jaw bone, and a dog skull, as well as a great amount of fish bones. Beneath the jaw bone was a hollow-edge groundstone chisel. At the other end, just outside the feature, two complete vessel bases were found. b.) pieces of a human skull (A4) were found in the culture layer together with animal bones and pottery sherds. (after Olsson et al. 1994:figs 18, 20)
While most of the original excavation took place in 1911, Jan Storå conducted a new osteological analysis of the human and animal bones in the 1990s. He identified a minimum of thirteen human individuals in the total bone assemblage of trench A. Eight of these were adults, one was an adolescent (c. 15-18 y.), and four were children with ages ranging from 2-3 to 10-11 years old (Storå 2001a; Götherström et al. 2002:48f). However, it is by no means certain that the bones all originated from the same event, especially when considering the time span of the 14C-dates. It is perhaps more likely that the bones were deposited during several different phases. The eastern assemblage of bones was a clear concentration, and may represent a more specific event in time. Storå therefore analysed the bones here based on that premise as well, and the result was that it contained the remains from at least seven individuals, four of which were adult, one juvenile and two children. While the mixed nature of the bones makes it difficult to identify biological sex through osteological analysis, Storå nonetheless found several indications that both women and men were present in the material. This interpretation was confirmed by the DNA analysis on five adult bones and two children’s bones undertaken by Anders Götherström: DYZ1 was selected as a potential marker for sex. The result was three men and two women for the adult bones, and a boy and a girl for the children’s bones (Götherström et al. 2002:51f). The bones found at Jettböle represent a possible cross-section of a Pitted Ware community in terms of age and sex which does not differ from what we find at the inhumation cemeteries.

Storå’s analysis of the bones also included a detailed study of the body parts to determine whether or not the proportions conformed to what might be expected in a random distribution. He found that there were a number of elements that were clearly underrepresented: bones from the lower arm (radius, ulna), lower leg (tibia), and the collar bone (clavicula). In contrast, in the eastern concentration certain cranial bones were underrepresented. The temple bones (temporale) represented at least seven individuals, but there were only jaw bones (mandibula) from five people. The human mandible bone is both very compact and durable, as well as easily recognizable to osteologists even when fragmented. It is more common for it to be overrepresented than the other way around. There seems to be a sort of inverted relationship between the eastern assemblage and the dispersed human bones in the rest of the layer, in that the ones that are overrepresented in the former are underrepresented in the latter, though it was not valid for every element (Storå 2001a; Götherström et al. 2002:49f).

Cederhvarf (1912) who was in charge of the original excavation had noted that several of the human bones had cut marks and seemed to have been split for marrow, as well as being subjected to fire, and he interpreted this as evidence of cannibalism. The subject was revisited by Milton Nuñez in the 1990s as he initiated a more scientific examination of the cut marks (Nuñez 1995). Storå also examined this aspect on the human bones and found cut marks on 20 from both adults and children. The way they were positioned suggests the cuts were meant to sever the ligaments so that the body parts could be separated (Storå 2001a; Götherström et al. 2002:50).
While the possibility of cannibalism deserves to be discussed, the term is problematic as it tends to be associated with the consumption of human flesh for sustenance. Such practices are mostly ascribed to ‘Others’, exotic and strange peoples, and are often based more on legends and superstitions than factual information. However, there are - and have been in the past - some peoples who participate in the ritual and ceremonial consumption of parts of other humans (Hillson 2000; Ogilvie & Hilton 2000; Vilaça 2000; Knüsel & Outram 2006; Fausto 2007). It is important to realize that in these cases the custom is spiritual rather than physical. There are often very strict rules governing not just who can be eaten, but also exactly which parts, how they should be prepared and who is allowed to partake in the anthropophagic ceremony (cf. chapter 12.1). These events are usually either exo-cannibalism where parts of conquered warriors are consumed in order to gain their innate power, or endo-cannibalism where members of a group consume one of their own. In both cases it is usually only a very small part that is ritually eaten, and sometimes the whole ceremony may be more symbolic than real. This idea of partaking and incorporating parts of human or holy bodies occurs in many different settings globally over time. The Communion (Eucharist) of Catholic and Orthodox Christianity, where the bread and wine becomes the flesh and blood of Christ through transubstantiation, is an example of a ritual which is at the same time both very symbolic and in the minds of the faithful very concrete. It is by no means certain that the bones on Jettböle are the remains of meals, and if parts of the bodies were consumed by the living I would hold it as more likely that this was part of ceremonial activities rather than the remains of meals.

As we have already seen, similar cases of defleshing and dispersal of body parts are found at other Pitted Ware sites on Gotland, but there are also cases from the mainland. The settlement KORSNÄS (Grödinge parish) in eastern Södermanland is a rarity among mainland sites in that it contained both burnt and unburnt bones. In addition to the 17 kg of animal bones found there was also an unspecified amount of unburnt human bones (Olsson et al. 1994:25). Unfortunately, initial osteological analysis was undertaken on the animal bones only (Aaris-Sørensen 1978), and the human bones are still largely unanalysed. More recently Jan Storå has undertaken an age determination on some of the children’s bones (Fornander et al. 2008:295). The human bones have been 14C-dated to between 3300-2800 BC, adjusted for a marine diet (Fornander et al. 2008:292). They were found scattered all across the area, but there were also six features that were interpreted by the archaeologists as some type of ‘burial’. Most of these contained only partially complete skeletons.

Feature A1 was the best preserved: a pit with the skeleton of a small child (4-5 y.) in foetal position. The only possible burial gift was an undecorated pottery sherd (Olsson et al. 1994:21; Fornander 2006; Fornander et al. 2008:285). Feature A3 consisted of the skeleton of an adult man apparently placed on his back, but only the skull and thigh bones were actually preserved. The main outline of the rest of the body could be seen through heavily crumbled pieces of bone and as a dark colouring of the sand, though it is not
possible to say for certain if any specific body parts were missing or not. There were no
identifiable burial gifts next to the body, but in the culture layer above him there was a
concentration of pottery sherds (Olsson et al. 1994:70). Feature A10 comprised a pair of
thigh bones in correct anatomical position, and A4 had parts of a human skull together
with animal bones and pottery sherds (Fig. 9.5:b). A7 was clearly visible as a pit with very
dark filling in which 29 kg of pottery was found with tightly packed fire cracked stones,
some stone tools, and bones from both humans and animals (Olsson et al. 1994:70-72).

The most interesting feature is perhaps A2 (Fig. 9.5:a). It is a 2.2 x 0.6 x 0.3 m pit filled
with dark, sooty and greasy soil which contained a very large quantity of fish bones and
pottery sherds (cf. Hemmor above). In the north-eastern part a jaw bone (mandibula) from
an adult human was found next to a collection of fire cracked stones. A small hollow-
edged stone chisel was found beneath the jaw bone. Close by was the complete cranium
of a dog, in whose eye socket had been placed a decorated clay bead tightly packed inside
a bundle of fish bones. The dog skull and the human jaw bone are both very well
preserved, as were the tiny fish bones, yet there are no other human or canine bones
found in the pit. Since the clay bead was found inside the eye socket it stands to reason
that the dog skull was at least partially defleshed at the time of the deposition. The most
realistic interpretation is that the human jaw, which has no visible cut marks at the
ligaments, was also removed from a defleshed body. At the south-eastern end of A2, just
outside the dark feature, two complete vessel bases were deposited (Olsson et al.

The combination of human bones, dog skull and concentrations of fish remains at
both Hemmor and Korsnäs is interesting. Dog bones were also mixed with the human
bones at Jettbøle, in combination with seal bones. At Ajvide the graves are organized
around the so-called ‘black area’ (c. 20 x 10 m), which contains not only copious amounts
of pottery sherds and seal skulls and bones, but also bones from fish and pigs. The soil
here is extremely dark and greasy, probably due to large amounts of decomposing seal
flesh and/or blubber, and it has been interpreted as a ritual slaughter place for seals
(Österholm 1997a; b). The relationship between Pitted Ware people and different kinds of
animals, as seen in the treatment of bodies and body parts, will be discussed further
below.

Cremations in the Neolithic

PITTED WARE CREMATIONS

Scattered human bones, or small deposits with selected body parts, are a common
occurrence on Pitted Ware sites along the East Coast and on the islands (Larsson
2009a:tab 1). Since they are often found at settlements without any visibly marked context
or built structure, and without other objects that could be interpreted as gifts,
arqueologists have been hesitant in drawing attention to them. They do not fit in with
how we view ‘burials’ or the proper treatment of the dead. The haphazard manner in which they appear at these sites makes many assume that they are the result of damaged or destroyed graves.

Another complicated aspect is that several are cremated, a practice most do not expect to see in Sweden until the Bronze Age. While cremation is a fairly common type of burial practice in parts of Europe in the Neolithic, inhumation has long been understood to be the ordinary form of burial in South Scandinavia in this period (e.g. Hodder 1990:216). Funeral pyres do not become a widespread practice until well into the Bronze Age (Kaliff 1997), and burnt human bones are therefore routinely associated with Bronze or Iron Age burials. A complicating factor is that many Pitted Ware sites in Eastern Central Sweden lie on the slopes of eskers, while Iron Age cremation cemeteries were often placed on the ridge. It is therefore good sense to treat a find of a few cremated bone fragments found in sandy culture layers with certain scepticism. Difficulties in dating burnt bones directly was another problem, up until the breakthrough of Lanting and Brindley (1998). Before this there was no way of determining whether burnt bones found outside features or scattered across a site belonged to a Stone Age, Bronze Age or Iron Age phase. It was therefore usually assumed that any such finds were the result of damaged and destroyed Metal Age burials, merely because cremation was not practiced in the Neolithic. This led to circular reasoning, where the known fact that cremation was not practiced in the Neolithic resulted in all cremated bones being routinely interpreted as later, thereby reinforcing the notion further (Larsson 2003; 2009a).

**Mesolithic and Funnel Beaker Culture Cremations**

There are in fact a number of rather indisputable examples of cremations in both the late Mesolithic and the Neolithic in South Sweden. Known cremations in the Mesolithic are admittedly rare. At the large late Mesolithic cemeteries of Skateholm I and II in Skåne there were three cremation burials in addition to the many inhumation burials (L. Larsson 1988:117f; Nilsson Stutz 2003:207). The Early Neolithic Funnel Beaker settlement of Fågelbacken, situated a few hundred meters from the Battle Axe settlement, had several pits with cremated human bones and funnel-beakers (Apel et al. 1995; Steineke 1995; Bäckström 1996; Guinard 1998; Hallgren 2008:100-105). Each pit usually included bones from at least two individuals. Both sexes are probably represented and all were adults, with one exception. A modest quantity of cremated animal bones was found in the pits with the largest amounts of human bones, mostly belonging to birds, pig and possibly hedgehog. Other pits contained more animal bones, birds, fish and bovid/cervid, but only a small number of human bones. The cremated human bones were 14C-dated by Göran Possnert at the AMS-laboratory in Uppsala, in accordance with the method developed mainly by Lanting: they were all dated to the Early Neolithic, as were two seal bones at the site (Hallgren 2008:tab III, VIII).

Cremated human bones have been found on several other Funnel Beaker sites in Eastern Central Sweden as well, mostly on coastal sites that were probably in use
seasonally in connection with seal hunting. Some have cremated bones deposited in pits, others have yielded just a few bones in the culture layer (Hallgren 2008:105f). Östra Vrå in Södermanland was an inland site in the Early Neolithic, where two remarkable features were excavated. Both were 4.5 x 2.5 m pits, covered by stonelbuildings that were made up almost entirely of 50 or so complete and broken quern stones. In these pits burnt and unburnt (or poorly burnt) bones from very young children (infans I) were deposited. In each pit a funnel-beaker was also included, and a carbonized wheat grain found in one of them has been dated to the end of the Early Neolithic (Kihlstedt 1996; Lidström Holmberg 1998; Kihlstedt 2006).

There are also a few early Funnel Beaker features known with cremated human bones in West Sweden and south-eastern Norway. In Skåne and Denmark cremated human bones have been found both at long barrows and palisades such as Sarup enclosures, which are dated to the Early Neolithic. At Hindby Mosse long barrow 71 small concentrations of burnt human bones from at least ten individuals have been found together with amber pendants and Middle Neolithic funnel-beakers. Almost all the bones belonged to parts of the skull, but a few came from long bones. At the Sarup enclosures there are seldom more than small amounts of bone, but the pits still often include remains from more than one individual (Kaul 1994; Andersen 1997; 2000; 2004). Hallgren associates the practice of cremation with the introduction of agriculture and the Funnel Beaker culture in South Sweden as cremations are a common occurrence within the northern Polish and German Funnel Beaker cultures at this time (2008:106).

At the same time there are also inhumation burials known in South Sweden from the Early Neolithic (e.g. Persson 1999:55; Rudebeck 2006). While they are not numerous this can be due largely to the fact that unburnt bones tend to decompose in the light sandy soils preferred by the early farmers. However, the notion that inhumation burials were the standard procedure during this period rests more on the fact that this was common both in the preceding Mesolithic and the succeeding Middle Neolithic. In the latter period the practice of building megaliths is widespread in Southern and Western Sweden, but rare in Eastern Sweden and almost non-existent north of Alvastra in Östergötland (though see Hallgren 2008:107-111 for a discussion on evidence of a megalith at Fågelbacken). In these stone built collective tombs the dead were placed unburnt. Whether the bodies were defleshed at another location before entombment, and whether or not the bones were intentionally sorted inside the tomb, has been continually debated by archaeologists (e.g. Shanks & Tilley 1982; Strömberg 1984; Gräslund 1989; Bennike 1990; Gräslund 1994; Holten 1997; Ahlström 2004; Sjögren 2004).

Most evidence points to the fact that the dead bodies were not defleshed when they were placed inside the chambers, and that the defleshing took place there. The lack of certain bones is probably due to taphonomic circumstances, such as rodents and carnivores having access to the burial chamber, and the odd distribution of the bones is sometimes the result of the dead having been placed in a sitting position along the walls (Bennike 1990; Ahlström 2004). It is possible, however, that some sort of organized
sorting of the bones, and perhaps removal of certain body parts, also took place – at least in some of the passage graves. It is difficult to examine this aspect since the tombs were evidently reused on several occasions, in the Bronze Age and even the Iron Age (Persson & Sjögren 1996; Sjögren 2003). Burnt human bones have been found in concentrations and pits outside the Trollasten dolmen and the Ramshög passage grave in Skåne, together with burnt thin-butted flint axes and chisels, as well as other burnt flint tools (Strömberg 1968; 1971).

**Alvastra Pile Dwelling**

This remarkable construction in Östergötland in the bog lands east of lake Vättern and south of lake Täkern (which was larger in the Neolithic), contained artefacts associated with both the Funnel Beaker and Pitted Ware culture. It also had excellent preservation due to being water logged for most of prehistory. There were 700 kg of animal bones, 40% of which were more or less burnt, and another 10 kg of human bones. Of the latter, some 16% were partially or completely burnt. Generally the human bones were found at slightly higher levels than the animal bones. While the animal bones show extensive evidence of being crushed, cut or broken, the human remains are usually not damaged. At least 45 individuals have been identified, of which twenty are probably men. In contrast only one probable woman has been identified. Ten individuals are juveniles (teenagers), and there are also several children under the age of ten represented (Malmer 2002:110). Beside the entrance in the south part of the pile dwelling a complete skull of a man in his twenties, including jaw bone, was found. Across the forehead there were several horizontal cuts made with a sharp edge, probably a flint knife of some sort (During & Nilsson 1991; During 1993). The cut marks indicate the man had been scalped or possibly defleshed. Alvastra is a difficult place to interpret, and it seems to have been in use over a restricted period of time for very special circumstances.

The wood used to build the platform has been ^14^C-dated to c. 3100-3000 BC, and the scalped skull was dated to c. 2920 BC (Malmer 2002:111). A small portion of the pottery is typical funnel-beakers and there are several cases of Fagervik II-pottery as well, but the largest quantities are of Fagervik III. Birgitta Hulthén’s thin section analysis of the pottery shows that some vessels were made with poorly homogenised coarse clay fashioned by coils that were fastened through U-technique (see chapter 6.2) (Hulthén 1998). Another group of vessels was made using the N-technique, but their ware was more heterogeneous, with different kinds of clay, most of which were made with coarse clay, but a few with calcareous fine clay. They were tempered with different combinations of granite, natural sand, sandstone, and in one case calcite. Although the pottery was found all over the pile dwelling, the U-pottery is mainly concentrated in the north-western end, while the N-pottery is generally confined to the southern half. It is possible that they represent different chronological events (1998:46-48). While the bulk of the artefacts found at Alvastra can be said to belong to the Pitted Ware culture, the site is so unique it is difficult to untangle how it is connected with the changes taking place in the region.
from Funnel Beaker culture to Pitted Ware culture. The fact that no less than 39 pre-
forms of double-edged battle axes were unearthed here, a type of artefact found in both
cultures, highlights that this was a special place.

**BATTLE AXE CULTURE CREMATONS**

Cremations in Battle Axe culture contexts are rarer. Malmer discusses five burials in
Sweden that had been suggested as possible cremation graves (1962:223ff): Västra Hoby
and Bäckaskog (Skåne); Kvilla (Småland); Julsäter and Täby (Södermanland). He also
mentions two in southern Norway: Borgebund and Drange. He is sceptical about the
validity of most of them. Kvilla was discovered in 1830, and consisted of a coarse dark
vessel with burnt bones and an amber bead. A battle-axe (D:1b), two thick-butted flint
adzes and a thick-butted stone axe were found at the same spot. Hans Christianson (1956)
had been impressed by the careful documentation by the original discoverer, but Malmer
points out that the circumstances are highly problematic and that it is more likely a
Battle Axe inhumation grave with no preserved bones partially disturbed by a later burial
(1962:226f). Västra Hoby in Skåne was excavated by Folke Hansen, and three graves
with stonelings were found (Hansen 1917). Grave 2 included two battle-axe beakers
of type L and H, pieces of a burnt flint adze and cremated human bones. At this time
cremations were not known to exist in the Stone Age and Hansen interpreted it as a
secondary Iron Age burial. Later, he revisited and reinterpreted the grave as a cremation
of the Battle Axe culture (Hansen 1937:206f). Malmer accepted that this might possibly be
a genuine Battle Axe cremation (1975:41f).

Grave 221:2 at Täby in Södermanland included a very small battle axe (E:2), two flint
adzes, a flint chisel and two late battle-axe beakers. The latter are discussed in chapter
11.2, as one of them was decorated with pit impressions. According to Lindqvist
(1944:45) and Christiansson (1953:76) burnt bones were also found at this spot. However,
Malmer (1962:224) states that the unpublished find report (it was not properly excavated)
mentions unburnt bone remains. As the bones in question were not rescued from the
field, the issue is impossible to resolve. Julsäter (alt. Katrineholm) consists of a fire
damaged battle axe of type C:1 and a burnt thick-butted flint axe, found one metre
beneath the surface (Oldeberg 1952:226; Malmer 1962:226f). There were no preserved
bones. Malmer lists it as a burial although he does not really believe it was a cremation,
but it is also possible that this is a ritual deposit of some kind. While the stonelings
grave Bäckaskog is in all probability a cremation with at least two individuals, it is also
Late Neolithic in date rather than Middle Neolithic: it includes pieces of a flint dagger
and a flint sickle. The stone axe is more similar to a Late Neolithic simple shaft hole axe than a
battle axe, and bone pins existed in this period as well (Hansen 1937; Malmer 1962:224).
It is quite possible that this north-south oriented grave was a very early Late Neolithic
burial, however. At the cemetery of Löderup in Skåne both Battle Axe and Late
Neolithic burials have been found. A sooty concentration containing human bones was
found next to grave 78 which contained J pottery, outside the coffin but inside the dug pit which was partially marked by stone slabs (Strömberg 1975:15-17, 26).

The Norwegian BORGEBUND burial, Råde parish, Østfold, was one of the few actually excavated by archaeologists (Gjessing 1942). This feature was a NNE-SSW oriented pit measuring 2.5 x 1.3 m filled with sooty sand. At its centre was a compact layer of ash, two thick-butted flint axes and a flint blade which had all been burnt, and a beaker of type B:2 which had not been damaged by fire. At the southern end of the pit was a battle axe (C:1a) and a fire damaged thick-butted stone axe. It is very unusual for battle axes to be found in the southern end of a burial in the Swedish-Norwegian Battle Axe culture. As no bones were actually found, Malmer believes the fire damage to be the result of secondary events (Gjessing 1942:220; Malmer 1962:224-226; 1975:42). The DRANGE find at Vest-Agler consisted of a fire damaged thick-butted stone axe in a charcoal layer covered by a stone, one metre below the surface (Hinsch 1956:179, 212). TORJUSHAUGEN, also in Vest-Agler, was a mound beneath which according to reports a battle axe was found with a pot and burnt bones (Hinsch 1956:176, 212). Other places that have been suggested are even less persuasive: at Augerum (Blekinge) and Sandhammaren (Skåne) small charcoal layers have been found with Battle Axe objects but no burnt bones.

In 1998 and 1999 the site KVERRESTAD in south-eastern Skåne was excavated. This small plateau next to a river had been the location for large scale destruction by fire of over a hundred thick-butted flint adzes and chisels, as well as a large number of flint arrowheads, scrapers and blades. Battle axes and work axes in groundstone had also been subjected to fire and intentionally broken into pieces. There were several pits across the site, varying in sizes from 4 m to 0.5 m in which had been deposited some of the destroyed flint and stone artefacts together with battle-axe pottery and a small amount of burnt human bones (Larsson 2000b:603; 2000c:176ff). The flint artefacts were also found across a 70x70 m area, though this was partly because of ploughing in later times, whereas the pits protected the finds. The flint adzes, axes and chisels were polished to varying degrees, some being completely polished and others being completely unpolished and barely finished. The arrow heads are both tanged D-type and pressure flaked projectile points. Of the latter types some are leaf shaped and others have a broad tang of a type common in the Corded Ware culture of the upper Oder area (Larsson 2000a:97; 2000c:178). The battle axes are of regional Swedish types as well as a late type of Danish Single Grave culture battle axe. The pottery sherds have the typical globular battle-axe beaker shape and are decorated by cord, whipped cord and tooth stamp. They are heavily fragmented, but seem to mostly belong to Malmer’s groups J and K. 14C-dating of charcoal from one of the pits gave a date of 2460-2200 BC.

Different artefacts seem to have been treated differently. Two-thirds of the scrapers, half of the tanged arrowheads and a third of the pressure flaked arrows were subjected to fire, as compared to 90% of the flint adzes/chisels (Larsson 2000b:605; 2000c:178). Lars Larsson compared Kverrestad to a similar but much earlier site to the east, Svartskylle, which is dated to the transition between the Early and Middle Neolithic. Here, on top of a
PART 4

hill, a large quantity of thin-butted flint axes, flake scrapers and blades destroyed by fire were found deposited in four concentrations (Larsson 2000b:607; 2000c:175; 2004:75). As Larsson points out there are clear parallels with these places and the finds of burnt human bones and flint artefacts at the megalithic burials Trollasten and Ramshög mentioned above – both of which are situated south of Kverrestad. Some of the flint axes at Alvastra had also been altered by fire. He notes that the burning of flint causes its colour to change to light grey and white, very similar to what happens to bones that are burnt, due to the calcareous content in both. Experiments were carried out on axes and chisels subjected both to direct and indirect heat, some of which had first been soaked for weeks in water. In fires achieving temperatures of 1000°C destruction was almost total. Fires with temperatures of 600°C resulted in more complete pieces, but which had turned quite white. Since most of the pieces found are large it is clear that the practice of subjecting the axes and chisels to fire was carefully executed in order to achieve the desired results (Larsson 2000b:607f; 2004:76). Fire as a medium for transformation of both bodies and artefacts must have been a powerful ritual tool, and flint is the stone used to make fire after all (Larsson 2000a:100; 2000c:175, 185). There are several examples where axes and human bodies were treated in similar ways in the Neolithic (Larsson 2004:74).

DISCUSSION

Pits with cremations of multiple individuals, and deposits of small quantities of selected burnt/unburnt bones at settlements, Sarup enclosures, collective burial tombs and special sites such as Kverrestad and Alvastra show that the treatment of dead bodies in the Early and Middle Neolithic was a lot more complex and varied than is traditionally acknowledged. What perhaps strikes archaeologists as especially difficult to understand are the cases of both inhumations and cremations practiced side by side. We tend to contrast cremations with the practice of inhumation burials, since in the latter case the body is buried intact and with very little interference and manipulation, except perhaps surface appearance. At the turn from paganism to Christianity in the late Iron Age the two practices were indeed considered absolute opposites by proponents of both sides, due to the way early Christians viewed the individual body as a vessel of salvation and resurrection. It is quite possible that a similar conflict in religious ideology associated with subjecting the body to fire or not was present in the late Bronze Age as well, when cremations became standardised practice at most Scandinavian cemeteries (cf. Kaliff 2005; 2007). In these periods both proponents and opponents of the changes in burial customs may have consciously associated either practice with the opposing religious view.

The presence of both cremations and inhumations during the Early and Middle Neolithic does not necessarily mean that there were competing religious or ideological views at the time that were communicated through diverse treatments of the dead. There are many cultures around the world, including many in the West today, where cremations and inhumations co-exist with no perceived conflict. The re-instatement of cremation in parts of Europe and North America in the nineteenth century is due to a combination of
an ideology of rationality and hygiene in an increasingly overpopulated society, and combined in Sweden at least with a romantic view of the Norse (and Indo-European) pagan past (Pearson 2000 [1982]; Back Danielsson 2009). In other cultures the way in which a body is treated and disposed of is decided based on the status, age, social identity and/or the manner of death. Some groups burn the dangerous and powerful individuals to make sure they do not rise again. Others, such as the Hindu, cremate all dead except for the holy people since they are in effect dead before dying, removed from the usual wheel of existence. For some cremation is the quick and easy way to dispose of the poor and unwanted, in other cultures only the rich can afford to spend money on a funeral pyre. In Mongolia, traditionally the social standing and the way a person died decided to which of the four elements (earth, fire, water or air) the dead body should be presented.

The diverse mortuary practices of the Neolithic need further study and examination – from here on I will only really discuss the Pitted Ware and Battle Axe cultures. In order to understand more about the way bodies were viewed and treated, and the possible order behind the seemingly chaotic dispersal and collections of body parts at the Pitted Ware sites, I believe it to be helpful to focus on a category not mentioned above: the mortuary houses.
9.2 Mortuary Houses of the Middle Neolithic B

The practice of cremation in the Middle Neolithic B received increased attention in 1993 when two very similar looking house structures were excavated and both contained cremated human bones. One of these was discovered at a Pitted Ware settlement in Västmanland, the other was found in Södermanland and included pottery and tools associated with the Battle Axe culture (Fig. 9.1). A few possibly similar types of structures had been excavated earlier, though these were not nearly as well preserved. I believe that these houses, and the organic and inorganic materials associated with them, present us with a rare opportunity to understand how Pitted Ware and Battle Axe communities perceived and used bodies in mortuary contexts to communicate meaning and ideology to living members and participants. At the same time, they might also reveal important aspects about the process of co-existence and co-operation between the two cultures at the end of the Middle Neolithic, shedding some light on how ritual practice helped negotiate social and cultural changes.

This chapter is primarily a presentation of the mortuary houses mentioned above. The osteological material from Bollbacken is the focus of a detailed osteological analysis in chapter 10, which deals with the treatment and disposal of the dead bodies at this site.

Bollbacken

In the middle of the third millennium BC the Bollbacken Pitted Ware settlement in Tortuna parish, Västmanland was situated on a small island only a few hundred metres long, close to the mainland at the head of a bay (Fig. 9.6). To the south lay some larger islands and to the east was a more open archipelago, in what was at the time a part of the Baltic Sea (Artursson 1996b; 2006). About 7 km to the west lies the Badelunda esker where the Battle Axe settlement Fågelbacken has been found. At the time Bollbacken was settled the shoreline was c. 30 m.a.s.l. and Fågelbacken was about 3 km from the coast (Artursson 1996b:23; 2006:50).

The site is a low moraine protrusion with visible bedrock, at the highest point c. 34.5 m.a.s.l., and mainly oriented north-south. The Pitted Ware artefacts and building structures were found mostly on the ridge and along the western slope. This area was also excavated mostly by hand in 2.5 x 2.5 m squares in order to both retrieve most of the finds and to keep up an appraisal of the structures and features that were found (Artursson 1996b:50). Almost 95% of the 68 kg of Neolithic pottery was pitted-ware (Fagervik III and IV), 84% of which was notably poriferous (Artursson et al. 1996). There was also c. 500 g of battle-axe pottery and c. 600 g of cord-and-pit decorated vessels (see chapter 11.2). The stone material included mainly knapped quartz, as well as a small amount of flint knapped from axes rather than cores (Ahlbeck 1996). Other artefacts
included a few flint blade scrapers struck from a cylindrical core, tanged slate arrows, a thick-butted stone axe and the broken-off edge of a battle axe, possibly of Malmer’s type D. Only burnt bones were preserved, and the only bone artefact identified were two burnt fragments that were probably parts of the same harpoon. They were found together in the floor layer of hut 3 – the so-called mortuary house.

Fig. 9.6. Map of the area around Bollbacken, with the shoreline at the end of the Middle Neolithic (c. 30 m.a.s.l.). 1.) Bollbacken, a small island at the time; 2.) Fågelbacken, the Battle Axe settlement. The grey areas denote the glacial eskers, which can be seen as large ridges in the landscape generally running north-east. They were built up of sand and gravel deposits at the outlet of the large rivers created as the inland ice melted at the end of the last Ice Age. (after Artursson 1996a:fig 6)

Five, possibly six, house structures were identified on the excavated area (Fig. 9.7). Four or five are apparently constructed with posts in roughly rectangular or trapezoid
shapes, c. 5-4 x 4-3.5 m in size. Refuse layers with pottery, fire cracked stones and
knapped quartz were found around these houses. Houses no 1, 5 and 6 are situated at the
ridge, and to the east they have a slope that appears to be cleansed of stones down to the
east shore. On this eastern slope only a few features such as a cooking pit, a couple of
hearth and some other pits were found. The phosphate levels are low, the number of
finds notably less and the pottery more fragmented. Artursson interprets this as evidence
of a central activity area which was kept free of too much refuse. Down by the east shore
a local elevation of the phosphate values occurs, which might indicate that this was where
fish and other animals were butchered. These three houses certainly give the impression
of having been in use simultaneously considering how they are oriented (Artursson 1996a;

Fig. 9.7. The settlement at Bollbacken reconstructed, as seen from the south-west. The shore
is visible in the lower left corner, and also in the upper right corner. Several people are shown
gathered around the ‘cooking pit’ A645. (drawing by Jan Jäger, Artursson 1996a:fig 235)

THE MORTUARY HOUSE AND AREA

The sixth house, no 3, differed from the rest in construction details in that there were no
post holes marking the walls. Instead there was a trapezoid ditch, A152, 3.8 x 2.6-1.8 m
and c. 0.2-0.4 m deep, oriented NW-SE (Fig. 9.8). The filling was grey-black and sooty.
The inner border of this ditch was essentially vertical, suggesting it had been dug outside a
straight wall, possibly plank built. Parts of the ditch had been filled with a stone packing
and it contained burnt human and animal bones. Charcoal from the ditch has been
radiocarbon dated to 2620-2340 BC. Inside the ditch was a compact light yellow layer
(L1023) with traces of soot, beneath which came the sterile soil. It has been interpreted as
a floor layer. Above it was another compact but sandy grey-brown, sooty layer with some fire-cracked stones (L948). Since it covers the same area as the floor layer and contains the same finds, it is interpreted as the use layer. Charcoal from L948 has been ¹⁴C-dated to 2860-2490 BC. Taken together with the date from the lower floor layer this would date the house to c. 2600-2500 BC, though it may of course have been in use for longer than that. There were two pits or possible post holes at one end of the house: A166 and A954. Charcoal in A954, which also contained cremated human bones, was dated to 2470-2140 BC (Artursson 1996a:327ff; 1996b:61ff; 2006:53ff).

Fig. 9.8. The mortuary area at Bollbacken, features marked by number contained human bones. The small pits 166 and 954 are seen inside the house. Black shapes are stones. (after Artursson 1996a:fig 28)

To the north, east and south the house was apparently demarcated by a semi-circular row of posts. Immediately to the north-west of the house was A157, a large pit (c. 2 x 1.5 m) containing fire-cracked stones, pitted-ware pottery, flint and knapped quartz and cremated human bones. Charcoal ¹⁴C-dated it to 2470-2190 BC. At the edge of the pit was a stone filled posthole, A1108, which contained cremated human bones. Only 0.3 m south of A1108 was pit A1106 which despite being only 0.5 m across and 0.16 m deep contained no less than 2.5 kg of cremated bones, the majority of which are clearly human.
PART 4

The initial osteological analysis by Formisto identified a minimum of four individuals, and also bones from a small dog. Considering the tight concentration of all these bones, Artursson believes they must have been packed in a container or bag of some sort. Charcoal from the pit has been $^{14}$C-dated to 2860-2490 BC, which is the same as the upper floor layer in house 3. Next to A1106 was a relatively large stone-set hole where a post of some sort may have been placed to mark the spot. South of this was a concentration of pitted-ware pottery including at least two incomplete vessels, placed between two rocks (Artursson 1996b:65; Formisto 1996; Artursson 2006:56).

Nine pits of varying sizes were found around the mortuary house, containing dark and often sooty fillings with pitted-ware pottery, knapped quartz and fragmented burnt bones, animal or unidentified. About 9 m south of A1106 was a deep stone-set post hole next to which were two small pits, one of which (A1082) had a single human cranial bone. About 10 m to the west of A157 and A1106, right by the contemporary shore, was a large and complex pit with a large number of fire-cracked stones as well as poriferous pitted-ware, knapped quartz and some very fragmented burnt bones from animals and humans (A645). The latter included both adult and child bones. There was also a post hole immediately to the north, A2037, which contained cremated human bones. The 'cooking pit' A645 has been $^{14}$C-dated to 2580-2340 BC. All these pits and features are found in a part of the settlement that with some justification can be said to relate more or less directly with the mortuary house, and are separated from the rest of the settlement. The only pit outside this area to contain any identified cremated human bones was A1000 found directly to the south of house 2 (Artursson 1996b:90; Formisto 1996; Artursson 2006:57).

There were also some scattered human bones found in the culture layers elsewhere. However, part of the Pitted Ware settlement had been superimposed by a cemetery in the early Iron Age, which created some difficulties in differentiating between scattered burnt bones as belonging to the Neolithic or Iron Age phases respectively. About 660 g of burnt animal bones were found that the excavators felt could be credited to the Neolithic phase with some certainty. These bones have been identified as belonging to dog, pig, seal, large bovid/cervid (cow or elk), various fish (pike, perch, herring, carp fish, roach), as well as unspecified bird bones (Formisto 1996; Artursson 2006:57).
Fig. 9.9. The mortuary houses. a.) Bollbacken; b.) Turinge; c.) Häggsta; d.) Prästgårdskulle.
Häggsta is the only one where no cremated human bones were found in the ditch, although
unburnt human bones were found deposited some metres to the left. It is remarkably similar
to the Bollbacken house however, both in structure and orientation, although it is twice as
large. Note that the house at Prästgårdskulle was oriented east-west, unlike the others.
The Turinge mortuary house is both remarkably similar and dissimilar to the Bollbacken house. It was found in Turinge parish in Södermanland, about 2 km north of Nykvarn, on the south end of a small sandy ridge. The house itself was at c. 29 m.a.s.l., but at the time it was constructed at the end of the Middle Neolithic the shoreline was probably around 25-26 m.a.s.l. (Lindström 2000; 2006). Bollbacken and Turinge are contemporary from an archaeological standpoint, and the difference in shoreline elevations at the two locations is due to the fact that Södermanland is further to the south. At the end of the Middle Neolithic the Turinge area was part of a large island, separated from the mainland by a narrow strait in the west. The ridge on which the house was built faces a large bay opening up in the north to the archipelago. To the east was Södertörn, which at the time was a large island surrounded by smaller ones, and from where we know of many Pitted Ware settlements. About 700 m to the south a Pitted Ware site has been identified but not excavated (Lindström 2006:69). However, this is situated at c. 30 m.a.s.l. which places it in the same chronological position as the Middle Neolithic A phase of Häggsta on Södertörn (see below).

Not many artefacts connected with the Battle Axe culture have been found in the area either. An early type of battle-axe and a groundstone adze have been found a few kilometres to the south. Another battle-axe (later type) has been found a few kilometres to the east. Tentative evidence of inland settlements from this period might be found with the asymmetrical ground stone axes of the type known from Battle Axe burials in Eastern Central Sweden, which have been found in the inland close to lakes (Lindström 2006:fig 2b). There is no evidence of any contemporary settlement in the immediate vicinity of the mortuary house.

As with Bollbacken the house was outlined by a ditch, rectangular in shape in this case, and oriented NNE-SSW. It measured c. 4.80 x 3.10 m and was between 0.35-0.5 m deep, the inner wall being quite vertical, which suggested a plank built house (Fig. 9.9:b). The filling of the ditch did not deviate noticeably from the surrounding soil, except that it had somewhat larger quantities of gravel. There were traces of stone set postholes in the corners, and there were two pits with possible post holes in the centre of the floor. Inside the ditch were several narrow trenches that were around 0.2 m deep and with filling that was often dark and sooty. There were also about twenty very dark and sooty pits of varying sizes dug into and across these trenches, in which were found c. 3.2 kg of bones, almost all of which seem to be human, and large amounts of pottery. The pits were not evenly distributed around the house. Instead, at least twelve were found in the east wall and only two in the west wall. Charcoal from the pits has been 14C-dated primarily to the period 2500-2200 BC (Lindström 2000:18ff; 2006:67, 73ff).

Almost 3.7 kg of pottery (1914 sherds) was found deposited mainly in the pits, and all that could be identified belonged to the Battle Axe culture tradition. In pit no. 18 three virtually intact beakers were found, and it is possible that another beaker in pit no. 5 was
also originally intact. However, in the other pits the vessels seem to have been deposited in a fragmented and incomplete state. Lindström estimates the original number of beakers to at least sixteen, but possibly closer to twenty, based on decorations and the shape and thickness of rim sherds. Considering the weight of the sherds of the incomplete beakers he also deems it likely that only a third of the total sherds of the beakers were deposited in the pits. Most of the sherds seem to come from group J beakers, but there is also an example of group K in pit no. 5. Most are decorated with tooth stamp, but there are also several sherds with whipped cord stamp. A small number of sherds are decorated with nail impressions, suggesting group M is also represented. The sherds and beakers have visible rock temper, and most do not show any evidence of secondary firing (Lindström 2000:36ff; 2006:81).

The three complete beakers in pit no. 18 deserve a more detailed description. Two were found ‘nesting’ in a way known from Battle Axe burials. The outermost vessel was more of a bowl than a beaker (group J). Inside this was a smaller beaker/bowl with almost identical decoration. Next to these were found a slightly larger beaker with atypical decoration. Most of the body was covered with horizontal lines of sparsely spaced whipped cord stamp. The lower part and base had vertical lines fashioned in the same way. Close to the rim was a row of large pit impressions (Lindström 2000:36ff). This is the ‘third group’ beaker discussed in chapter 11.2. Apart from the pottery there were five axes found in various pits. One was a small battle axe of Malmer’s type E:2 which was found in the SW corner. Since it was only 12 cm long it belongs to the miniature battle axes. The rest were adzes, one made of flint and the rest of different kinds of groundstone. Two were found in pits in the eastern ditch, and the others were found one each in pits in the north, south and west ditch. There was also a fragment of a possible groundstone chisel, a fire damaged flint scraper, and a few flakes and tools of flint, quartz and quartzite, and an awl made of sheep bone (Lindström 2000; 2006:81).

Over 80% of the bones could be identified as human, and Boije (2000) noted that the bones were neither as deformed nor as fragmented as is usually the case with Iron Age cremation graves. Only 42 g could be determined as animal bones. At least seven individuals can be identified from the total amount of bones, based on age and body parts. The pits often included bones from more than one individual, and in eight cases at least two individuals could be identified in the same pit. Different ages and probably both sexes are represented as well. It is possible that bones from the same individual are deposited in several pits, for instance cranial bones from a very small infant have been found in pits 9 and 10. There are also bones from infans II, juvenilis, adultus and maturus in the various pits. Bones from sheep/goat have been found in at least three pits (Boije 2000; Lindström 2000; 2006).

Lindström notes that there seems to have been a selection of certain body parts to be deposited in certain parts of the ditch. The pits in the northern and eastern part of the ditch are mostly dominated by skull fragments. The southern pits on the other hand are dominated by bones from the body below the skull, mainly long bones from the limbs.
Lindström argues that the total number of individuals buried should be closer to sixteen, based on the number of artefacts, pits and the hypothesis that most of the pits containing skulls are not duplicates (Lindström 2006:79f). This is possible, but is unfortunately impossible to verify from an osteological standpoint. As some pits seem to have been dug into older ones, it is reasonable to suggest that the remains at the mortuary house represent not just a single isolated event, but several. The artefacts also seem to be unevenly deposited. Pottery sherds were found in all parts of the ditch, but the intact beakers were placed in pits in the southern half of the house. The stone artefacts, not counting the axes, were found in pits concentrated to the north-eastern part of the ditch (Lindström 2000; 2006).

Lindström (2006) makes a compelling and, in my opinion, well-founded interpretation of the mortuary house having been organised in essence like a Battle Axe single grave. The concentrations of pits in the eastern ditch reflect the fact that the dead were always placed facing east. The skull bones in the northern part and the long bones in the south likewise reflect a single body created by the parts of many. It is interesting that only one battle axe is found, since even in the case of double burials the Battle Axe graves in Sweden never contain more than one battle axe. The fact that it was placed in the south-west corner is odd however, as these objects are normally found in the northern part of the single grave burials (though cf. the Borgebund grave). All the axes in the mortuary house were found with their edges facing south. Lindström’s interpretation is that there was a perceived threat from that direction, real or symbolic. Placing the most ‘potent’ part of the axes in that direction was therefore a way of protecting the house and the dead from this danger (Lindström 2006:84-86).

**Other Mortuary Houses of Similar Kind**

The two mortuary houses of Turinge and Bollbacken are remarkable in their own right, but they are also fascinating because despite their apparent similarities and being virtually contemporary, one is firmly associated with Pitted Ware culture and the other with Battle Axe culture. It is worth considering other similar looking structures found in association with these cultures.

**HÄGGSTA, BOTKYRKA PARISH, SÖDERMANLAND**

The site is constituted by a narrow westward valley whose uppermost part is 45 m.a.s.l. and then slopes gently to 30 m.a.s.l. where it drops off more steeply. In the south was a brook and the north was protected by rock. It was in use from the late Mesolithic until the early Late Neolithic, and the artefacts of the different phases are mostly found on separate areas of the slope following the receding shoreline, though some overlap is of course also present. Area V is a plateau at the elevation of 31-29.5 m.a.s.l., which was dated through shoreline elevation, pottery, artefacts and $^{14}$C-dating to the Middle Neolithic A. The pottery sherds consisted mainly of Fagervik III. The dominating feature
was A67, a large rectangular ‘pit’ surrounded by a ditch measuring 8.5 x 3.5 m, 0.4-0.7 m deep (Fig. 9.9c). The ditch was dark, sooty and contained a large quantity of artefacts - mainly pottery sherds (c. 23.5 kg). The area inside the ditch was light and showed evidence of some digging, but it was devoid of finds. Daub, knapped quartz, pieces of polished groundstone and a small amount of unpolished sandstone and flint were also found in the ditch. Most of the pottery had firm ware and seems to have been tempered with crushed stones, but c. 20% is poriferous. Pottery sherds were found in all parts of the ditch, but a smaller amount seems to have been deposited in the northern part. Flint and ground stone was found in the western and south-east part of the ditch, where most of the quartz and sandstone were also found. Two ¹⁴C-dates, one on the charred crust of a sherd and the other on charcoal, gave the combined dates of 3491-3107 BC (Olsson 1996b:7f, 70, 126f; 1999).

There was only a modest amount of bone found in the ditch: 77 g burnt and 5 g unburnt (mostly teeth). Interestingly, a few bones from cattle were among these. Bones from domesticated animals are rare on Pitted Ware sites, but they do occur at some of the early ones (Ahlfont et al. 1995). The filling was at times noticeably fatty which indicates some organic material may have been decomposing there. In addition to these there were bones from red deer, pig, seal and various types of fish. Apart from the fact that the Häggsta feature is similar to that of Bollbacken, and even oriented in the same direction, it differs in that it is a lot larger and there were no identified human bones in the ditch or inside the floor area. However, some 8 m to the north-west a small concentration of cremated bones was found, fourteen fragments of which (11 g) have been identified as human. They are skull and long bones of an adult individual (Hårding 1996; Olsson 1996b:70, 126f; 1999).

If not for the clear similarity with Bollbacken, there is little to support interpreting this as a mortuary house. However, it is still possible that it could be construed as such. Only selected parts of the area were excavated in squares and the rest was excavated in trenches by machine. It is therefore possible that smaller deposits of cremated human bones could have been missed during the excavation, in the areas that were not excavated by hand. However, it is also possible that there were no more cremations at Häggsta other than the one mentioned, and it should be noted that these bones are not as yet ¹⁴C-dated. In the ditch no unburnt bones are preserved except for fragments of large teeth. Since the fat texture of the soil suggests that there may have been more organic materials present in the ditch, there is the hypothetical possibility that parts of bodies or bones that had not been cremated had been placed here. This is all speculation, unfortunately. To conclude, Häggsta and Bollbacken are not a perfect fit, but they are close enough to warrant attention. It should also be remembered that they are not contemporary, and anything from 600-1000 years may separate their constructions. Things change over time.
PRÄSTGÅRDSKULLE, VEDDIGE PARISH, HALLAND

The three ditch-houses mentioned above were all found in Eastern Central Sweden. However, there is a find from the West Coast as well. A large Bronze Age cairn was excavated in 1970 on a terrace on the western side of river Viskan at 12.5 m.a.s.l. As the cairn and soil was removed another feature was revealed beneath them, at the western part: A17. This was a 4 x 3 m ditch found in the sterile soil, whose edges were marked with charcoal and the filling was reddish in colour (Fig. 9.9:d). Within the ditch, which was only 0.1 m deep, battle-axe pottery sherds and a small quantity of cremated bones were found, as well as burnt flint and daub. Most of the finds seem to have come from the west half of the ditch. Some sherds and burnt flint were also found in the floor area in the middle of the feature. The sherds were decorated with whipped cord creating horizontal lines and angular bands, suggesting they belong to the second half of the Middle Neolithic B (Särlvik 1975).

The bones were not initially analysed by an osteologist. In connection with my exam project in osteology I was able to study and identify the bones in question (Larsson 1997). The material consisted of 86 fragments (53 g) that were all thoroughly cremated. There were 29 fragments that had belonged to at least one adult human. Most of these were skull fragments and parts of the jaw bone (mandibula). However, there were also a few pieces of a shin bone (tibia) and pieces of indeterminate long bones that were in all probability human. Either cremated parts of one individual had been spread in the ditch, or selected parts of several had been deposited at different places. Only one long bone could confidently be identified as animal (i.e. not human), while the rest of the bones were indeterminate mammalian. Prästgårdskulle is interesting as it seems to suggest that the practice of constructing these types of mortuary houses was not restricted to a small region. However, it is the only clear example found outside Eastern Central Sweden so far.

Concluding remarks

It is difficult to know what to make of these houses with ditches since there are as yet so few of them, they are associated with the material remains from at least two cultures, and have been found in different regions. It is tempting to look for roughly contemporary analogies in other countries, but so far there are no clear contenders. Several small square houses associated with ritual activities and/or mortuary remains are known from northern Jutland for instance, where plank walls have been placed in ditches: Tustrup, Ferslev, Herrup and Foulum to name some. They are quite consistently dated to the Middle Neolithic A and contain Funnel Beaker pottery. Human bones are not found in connection with these houses as far as we can tell (Becker 1993; Fabricius & Becker 1996; Kaul 2006; Mattes 2008). Since some have been found in direct proximity to passage graves, they are interpreted as having played some part in the rituals surrounding funerals and mortuary ceremonies.
Some possibly similar structures from the same period are also known from Skåne (Mattes 2008). At Elinelund 2B near Malmö a rectangular dug feature measuring 2 x 1.5 x 0.5 m with compact stone packing has been excavated. It contained burnt and unburnt bones and a large quantity of Middle Neolithic funnel-beaker pottery (c. 19 kg). Most of the bones came from cattle, some from pig, sheep/goat, dog, otter, bird, red deer, wild cat and hare. There were also eight unburnt human cranial bones, probably from just one individual. The feature extended on all sides of the central pit, and there were at least three large post holes found in three of the corners, so this might originally have been a cult building of some sort (Sarnäs & Nord Paulsson 2001:104ff).

None of these structures seem to be similar to the Middle Neolithic B mortuary houses. Archaeologically we are at an impasse, trying to understand what the mortuary house of Bollbacken represented to the people who constructed it and used it. Any discussion based on similarities with other buildings from the Neolithic in South Scandinavia runs the risk of becoming too vague and superficial: different times, different contexts, different practices. But we have far from exhausted the information that can be coaxed from the material at Bollbacken. Specifically, the osteological material has only been discussed in very general terms. Yet obviously the treatment and handling of bodies and body parts was an important, central, part of the funerary ritual at this site, as with so many other Pitted Ware sites and cemeteries. Before trying to interpret the ritual aspect of Pitted Ware life we should try to make the most of what the osteological material can tell us of the practices and activities taking place specifically. Theories of excarnation houses, cannibalism, sorting, reburials etc., can actually be tested, verified and falsified to some degree, just as important stages of the mortuary procedure can be highlighted. Osteology is far more than databases of abstract terms and quantities when we make an effort to involve it in the archaeological investigation. This is what I will attempt to show in chapter 10.
It has been proposed that the Bollbacken mortuary house could be understood as a temporary storage place for dead bodies until they were cremated: an excarnation house (Larsson 1995; 1997; 2003; Artursson 2006:61). Other possibilities are that it was used for ritual ceremonies associated with the funerals or veneration of the dead, or that it was mainly an ossuary for the deposit of the remains of the dead (Larsson 1995:43-45; Artursson 1996a:359). These theories are not mutually exclusive of course. The major question is whether there is any way in which we could evaluate the likelihood of some of these hypotheses further. Bones can reveal far more about post-mortem funerary practices than we usually assume in archaeology. Rather than settling for species, age and biological sex, there is a great deal more to be learned from the osteological material. This goes for both human and animal bones.

Chapter 10.1 provides a background for how bones are constituted materially and biologically and what happens to the bones as the organic material decomposes. As I will show, bones crack and fracture in different ways depending upon whether they are burnt with or without soft tissue, and depending upon how dehydrated they are when subjected to fire. However, many other aspects also play important parts in how the bones fracture, including the structure of the bone itself, the heat of the pyre and the length of time of incineration etc.

Chapter 10.2 is a presentation of an osteological analysis of the cracks and fractures on the human and animal bones found at the mortuary area at Bollbacken. In my opinion, the study shows that some individuals, but not all, had been cremated when partially or completely defleshed. There are also interesting differences regarding which body parts occur in the various features, suggesting that there was sorting and reburial taking place at Bollbacken. Finally, the different ways in which bodies of dogs and bodies of seals had been treated, and the possible reasons for their inclusion with the human bones, are discussed.
10.1 Osteology and Archaeology

Although osteology, the study of bones, has long been an important asset to archaeology, it is not always truly integrated with it. Cultural and historical backgrounds play an important part in whether osteology is seen as a completely separate biological science, or as a sub-discipline within the study of prehistory. The strong anthropological and scientific approach to archaeology in the USA means that osteology is both strong in its own right and an indispensable part of archaeology as well. In Britain, on the other hand, archaeology has always been strongly linked to the humanities and historical research, which has perhaps led to a divide between the two approaches (Trigger 1993; Sofaer 2006:xiv).

In both countries, as almost everywhere else, there is a rather sharp distinction between specialising in human osteology (anatomy/physical anthropology) on the one hand, and animal osteology (zoology/palaeontology) on the other. In Sweden historical circumstances have led to a rather different and unique situation. Initially osteological analyses were undertaken by anatomists and zoologists (Bennike et al. 2008), but in the middle of the twentieth century the zoologist Nils-Gustaf Gejvall (1911-1991) was put in charge of the osteological collection at the Museum of National Antiquities in Stockholm and developed an interest in human osteology as well. Gejvall was faced with the problem of cremated remains from Bronze Age and Iron Age burials, which many archaeologists felt were devoid of any information and might as well be reburied or thrown out. He undertook to show that osteological identification of age and even sex was still possible, with the help of studies on modern cremated bones (Gejvall 1947; 1948; 1969). He continued to develop human and animal osteology as a complement to archaeological research over the years, and finally helped create the Osteological Research Laboratory (OFL) at Stockholm University in 1967, and became its first professor in 1969.

Although it was a separate unit, the OFL was closely linked to archaeology and most who have gone on to study there have already taken basic courses or more in archaeology. The subject of osteology is therefore mostly viewed as a way to use bones in order to understand more about prehistoric societies, economies and environments: to answer archaeological questions. The basic education includes both human and animal anatomy, and although most osteologists tend to become specialised in one of these later on, it is assumed that osteologists should at least be basically proficient in both. What is lost in specialised knowledge is perhaps gained in a more holistic view of bone materials, and an ability to act as a specialised archaeologist in the field. It is a young university subject however, only 30 years old, and still under development as it now exists at two universities and one university college in Sweden.

I took my exam in osteoarchaeology, as the subject is now called, at Stockholm University in 1997. Being accepted as a PhD student in archaeology at Uppsala University,
one of my aims was to be able to combine the insights gained into the study of bones with archaeological problems, in ways that displayed some of its potential to tell us more than species, age and sex. Archaeology has always been a hybrid discipline, with one leg in the Humanities and the other in Science, and the two do not always co-exist peacefully. Internationally, osteology has often been associated firmly with the Science phalanx: it is a study of biology after all. Archaeologists and osteologists have not always found it easy to communicate across the disciplines and connect the qualitative musings of the one with the quantitative focus of the other.

In common with other specialists in archaeology, osteoarchaeologists are viewed as service providers to those higher up the disciplinary hierarchy who carry out the overall synthesis and thus the ‘real’ interpretation of the data. (Sofaer 2006a:8)

It is profoundly inaccurate, however, to suggest that osteologists do not have a theoretical approach to their subject matter, and a common agenda with the Humanities at large (cf. Kjellström 2005; Sofaer 2006a; b).

**Embodiment of Bones**

Archaeology has become more interested in the phenomenological approaches to practice and bodies/embodiment over the past decades, and one would have supposed this would be followed by a deeper involvement with osteology. Unfortunately, that is still too rarely the case. This is partly a result of the in many ways correct realisation in the 1960s-70s that the social identities that we have long tended to take for granted as biologically/genetically constituted (gender, ethnicity, behaviour, intelligence) are to a great degree fashioned by cultural and social settings. Bodies, rather than being the basis for all subsequent personal development, are actively crafted, changed and moulded by society and cultural prescriptions. When does a child become a 'human being': at conception, at birth or only after a few years? Is a post-menopause woman still a woman? Do pre-pubescent children have gender or do they belong to a category of their own? The cultural construction of identity was often perceived as an almost purely intellectual construction, where the physical body acted merely as a prop upon which culture was enacted (cf. Nilsson Stutz 2003:83; 2008). Even if embodiment theory has reinstated the physical reality of body and senses in the discussion about structure and agency, it has been difficult to reconcile the notion of the biological body with that of the social one (Sofaer 2006a:25f).

For most archaeologists, any discussion about social and cultural identities focuses more upon artefacts and features than on the actual remains of the body (Nilsson Stutz 2003:87-94; Sofaer’ 2006a:2, 10). It is material culture and context that creates identity, not biology. This viewpoint has been complicated somewhat with the introduction of phenomenology and embodiment theory into the archaeological mainstream, since these
approaches highlight how the body and its senses play an important part in how people perceive, experience and interpret the external world (see chapter 2.2). While embodiment theory has brought the five senses and three-dimensional physicality of the human being back into archaeology, this is mostly an imagined idealized human body. Someone who has the same basic biological functions as us, but who is not reconstructed from what the bones might tell us about his/her specific individual life history. Whatever individuality and personality we do ascribe to the bodies of the dead usually emanates from the artefacts and burial construction — not the body.

In most cases, though certainly not all, human remains come to the attention of archaeologists and osteologists alike in mortuary contexts of one sort or another. They are the end result of the challenges facing humans when dealing with mortality and the loss of a life, which results in the presence of a dead body, a cadaver. “The liminal character of the cadaver is a forceful materialization of the crisis of death” (Nilsson Stutz 2003:95). Leaving aside the circumstances where a human body is lost to the living at the moment of death (e.g. at sea, an avalanche, isolated accident away from home etc.), the reality of death is evident in the body. At the same time, the reality of life is also evident in the body — the biological entity that eats, drinks, works, talks, touches, moves etc. The social sciences and humanities have long realized that the living body is used and manipulated, moulded and embellished, in ways that both communicate and create social identities, and make them appear biologically given. The dead body must be dealt with in a way that conforms with ideological notions of what it is to be human, and it is manipulated for that very end. In fact, since the dead body is not likely to object (verbally at least) it is in effect the optimal cultural messenger. Investigating how dead bodies were treated must therefore be of just as great, or even greater, importance to archaeologists as speculating about the living. After all, the only bodies available to actually study are dead ones.

Human beings often use language and metaphors that draw upon the body and its senses as a starting point for more intellectual and ideological constructs. The philosophers George Lakoff and Mark Johnson (1999) have argued that since human perception of the world and our experiences are channelled through the body and its senses we tend to talk about and perceive even cultural and social categories in terms that draw upon bodily functions and the five senses: we taste defeat, reach for a better understanding, see the point of an argument, and are touched by someone’s kind words etc. Several other researchers have remarked upon similar aspects of the human experience as in and through the body (e.g. Varela et al. 1991; Hansen & Salomonsson 2001; J. Frykman & N. Gilje 2003; Dornan 2004; Joyce 2005; see chapter 2.2)

It is important to note that phenomenology does not view perception as a result of mechanistic sensory reactions to external stimuli. What we perceive through our senses is a dynamic interaction between the mind and the world, history and present, experience in of the past and experience of the moment. While it is easy to find important, even profound, differences between the approaches of Husserl, Merleau-Ponty, Bourdieu, Leroi-Gourhan and Varela respectively, they are still part of a general research tradition.
that tries to challenge the long held mind-body dichotomy in Western thought. In effect, this helps to bridge the separation of life science (biology) from the humanities. Their work is of greater interest than ever before to researchers within these disciplines, particularly for those trying to move beyond biological determinism and extreme relativism.

This approach is quickly gathering support among archaeologists and osteologists, who base their disciplines on the study of biological remains and material culture in order to reach an understanding about the human condition. I hope to show that the bodily remains at our disposal can grant us important insights into the cultural and ideological categories of prehistoric societies. But in order to do that we need to understand what bones are.

The skeletal remains that we find during excavations resemble finely crafted building blocks, almost sculptured pieces of art if they are well preserved. In cases where they are poorly preserved they are mostly a bewildering collection of fragments to the non-osteologist – and often to the osteologist as well. It is easy to forget that the bones were once part of a living system. The skeleton in an adult human body consists of 206 bones – most of the time. In some individuals certain bones may become fused, and other small bones can occasionally be missing. In very young children the different parts of the bones have not yet fused, and they are partly made out of cartilage that has yet to ossify. In very old people bones that are usually separated become fused. Our skeleton is not synonymous with the iron rods supporting a cement structure. It grows and changes all through life, both according to general biological programming and the specific life history of the individual.

Bone physiology

Bone is a composite created by minerals formed around an organic matrix made up of the fibrous protein collagen. The minerals consist mostly of calcium, which is combined with phosphate and carbonate in a crystal structure called hydroxyapatite. This combination of organic (30%) and inorganic (70%) materials give the bone its unique quality of rigidity and elasticity (McKinley 1994:339). There are mainly two types of bone: compact (cortical) and spongy (cancellous/trabecular). Compact bone, as the name implies, consists of tightly packed osteons with minimal spaces in between them. About 80% of the bones in the human skeleton are compact; e.g. the shafts of long bones (diaphysis), most of the skull etc. The rest is spongy bone which has a honeycomb appearance (Fig. 10.1). This type of bone is found in the marrow spaces (medullary cavities), most notably the articular ends of long bones (epiphysis), parts of the spine, and inside ribs, hip bones and shoulder blades etc (Fig. 10.2). Due to their differences in structure, compact and spongy bones react quite differently to both dehydration and cremation, as we shall see below.
Bones are intimately bound to the rest of the body through blood vessels that connect the outer periosteum to the inner bone marrow. It is in the red bone marrow that our red and white blood cells are produced. The periosteum is a thin membrane between the outer surface of the bone and the soft tissue of the body, and connects muscles and tendons to the bone. In the case of trauma and fractures the membrane creates the osteoblasts that generate new bone tissue. Since the periosteum also has sensory receptors that react to physical stimuli by signalling the spinal cord and brain, it acts as the means by which the bones in the body change and alter in response to different life experiences (Encyclopædia Britannica). Using muscles affect the tendons by which they are fastened to the bone, causes the surface in question to grow or become more pitted for instance (Molnar 2006). Likewise long term inaction of parts of the body, due to illness or paralysis, causes bones to degenerate. While there is definitely a difference between bone tissue and soft tissue, we should not forget that in the living body the two are not separate entities – one acts upon the other, and vice versa.

Fig. 10.1. The interior properties of various bones: a.) horizontal cross-section of long bone; b.) vertical cross-section of shin bone; c.) cross-section of cranial bone. (after Petrén 1984:figs 9-10, 12)
At birth the bones in the body are only partly ossified and are mostly made up of cartilage. For instance, in the long bones the compact shafts and the spongy ends are not directly connected and grow independently of each other. At a certain age diaphyses and epiphyses fuse, which marks the end of the growth process for a given bone. As this happens with genetically programmed regularity, osteologists are able to determine the age of a complete human skeleton fairly accurately to within a few years until the full ossification has taken place at around 18-21 years of age (generally earlier for women, later for men). The same applies to other vertebrates as well of course, but as most of them grow to full size within a year or two, there is less room for variation (seals are one exception). Bone tissue, like all other organic parts of the body, is continually remodelled and renewed, but at a much slower rate than soft tissue. The rate of remodelling varies with the age of a human being: in infants remodelling can occur in a year, in young teenagers every two years. As the skeleton is fully fused around the age of 20 (±2 years) the rate of reformation drops noticeably, and in adults over 35 remodelling of a bone takes about ten years. Individuals over 40 years old also have a greater rate of resorption.
than formation, resulting in a loss of roughly 10% bone mass in every decade, and therefore more mineralized and brittle bones over time (Encyclopædia Britannica, Nationalencyclopedin).

Osteologists generally recognize three main categories of bones (Petrén 1984:27f):

- **Ossa Longa**: Long bones, the extremities such as thigh, arm, shin, elbow bone etc., but also the bones of the fingers and feet. They consist of a long compact shaft (diaphysis), and two thickened ends (epiphysis) that articulate against other bones.
- **Ossa Brevia**: Short bones, irregularly shaped. These are found in wrists and ankles, and the vertebra also belong to this category.
- **Ossa Planæ**: Flat bones, such as shoulder blades, breast bone, hip bones, ribs and the cranial bones.

There are also the very thin and brittle bones inside the skull making up the nasal cavity and other similar parts. These are very rarely preserved in archaeological contexts unless the skull itself is well preserved. The way different bones are constituted, the different positions of the bones on the body, and how much or little muscular or fat tissue covers them, all have a bearing on their preservation and appearance after dehydration or cremation.

**Post-Mortem Practices from Cremated Bones**

For osteologists dealing with mortuary remains, one important question concerns how to differentiate between alterations and damages to bones before death (ante-mortem), at or near the time of death (peri-mortem), or after death (post-mortem). Naturally it is easier to make such a study on unburnt bones, as cremated bones crack, fracture, shrink and deform, making them difficult to analyse osteologically in general. However, cremated bones can by their very appearance offer important clues about post-mortem treatment of dead bodies.

**Cracks and Fractures on Dry and Burnt Bones**

The process of incinerating bones is in some respect an accelerated version of the dehydration that occurs naturally after death, but the speed with which this happens in a fire also affects the way the bones fracture and change in special ways. Before presenting the literature on cremated bones I will briefly discuss what happens to the body after death. Two processes start when a body ceases to be alive: the first is autolysis, the automatic destruction of the cells; the second is septic decay (putrefaction), the rate of which depends upon whether or not death was due to disease, or if there are open wounds. In both cases, the general temperature around the corpse influences how quickly the process occurs (DiMaio & DiMaio 1989:30f).
The soft tissue and organs putrefy, liquefy and decompose, and then the ligaments desiccate and disappear. Finally the organic content of the bones themselves, the protein, fatty cells and the marrow decompose, leaving the bone dry. In a temperate Scandinavian climate the speed of the first part of the process with the soft tissue depends heavily upon the time of year. Between spring and autumn putrefaction will be well under way after a week for a body that is not immediately buried after death, as larvae and bacteria will be active. An adult body can be defleshed in a matter of two to three weeks if the temperature is warm and rodents and insects have access to the body, a child even faster. The parts that become defleshed first are the ones covered by the least soft tissue: hands, feet and skull. Of course any clothing or shroud will affect the process. If on the other hand death occurs in winter the cold can result in a freeze drying of a corpse left unburied. However, if the body is kept inside a small structure the temperature can be kept above freezing, which will cause a quicker decay. This is all assuming the body is not buried shortly after death. In those cases the rate of decay depends on whether the body is placed in a casket with some air supply, or if it is completely covered with soil. The type of soil and the condition of the cadaver also affect the speed of the process. As the ligaments are the most durable of the organic tissues the articular areas where they are fastened will be defleshed last.

The finer details of post-mortem events can reveal much about burial practices and cultural concepts in general (cf. Nilsson 1998; Nilsson Stutz 2003; Duday 2006; Fahlander 2006). So ascertaining whether a body had been completely or partially defleshed before burial should be of interest to most archaeologists. It is also important to the osteologist to be able to examine whether the fractures found on the bones happened when the bone was still fresh (‘green’) which would suggest an event taking place around the time of death or shortly thereafter, or whether they are the natural result of dehydration. A fracture that occurs on fresh bone that still has a lot of organic content is generally known as ‘green’, as compared to ‘dry’ fractures. The latter may also involve natural cracks that occur as the bone becomes mineralized and shrinks. Dry fractures on long bones resulting from natural dehydration tend to run down the length of the shaft, and the surfaces of the crack are often rough and ‘granular’. In contrast a green fracture tends to be curved and the angle is acute or oblique, and the surface of it quite smooth (Tappp 1969; Merbs 1989; Villa & Mahieu 1991; Outram 2001; 2002; Knüsel & Outram 2006).

**Effects of Heat on Bone**

Temperatures up to c. 200°C have little outward effect on bones, though as experiments by Alan Outram (2002) have shown, heating a bone at low temperatures can affect the types of fractures that appear when the bone is deliberately struck. However, bones heated to such moderate temperatures do not really fracture of themselves, or show any alteration in colour. At temperatures above 200°C the collagen starts to be destroyed as a result of the hydroxy bond in the apatite crystals breaking down, and colour changes start to be visible. Above 400°C the bone becomes increasingly brittle as a result of losing the

Bones burnt to temperatures around 600-800ºC turn grey and then white, and they often have a markedly 'chalky' consistency as a result of changes in the cellular structure of the osteons. The shrinkage is more pronounced due to loss of the water bound in the crystals, but it is not until at temperatures around 800ºC that shrinkage becomes truly noticeable. At these temperatures the minerals fuse even more and cause a lot of strain in the by now almost completely mineralized bone structure, with the result that cracks and fractures appear. The colour of the bone is now grey or completely white, and the increased density gives it a very compact texture resembling stoneware. It is around 800ºC (±100ºC) that almost all of the shrinkage takes place and bones not heated to those temperatures will therefore not crack and fracture to any great degree. Above 900ºC very little additional shrinkage takes place, but the enamel around teeth is destroyed. At temperatures around 1100ºC the dentine tubuli inside the tooth melts (van Vark 1970:100; Heglar 1984:148; Shipman et al. 1984; Holck 1987:98, 144; Herrmann 1988:579; Buikstra & Swegle 1989:248; Ubelaker 1989:35-37; McKinley 1993; 1994:339; Mays 1998:207f).

Most of the above observations derive from experiments conducted on defleshed bones in order to study the impact of temperatures on bone structure. If bones are burnt with soft tissue still intact there are a number of factors to take into consideration. Firstly, the soft tissue (e.g. skin, muscles, body fat) protect and buffer the bones from heat at first. The bones will not be subjected to the full heat of a fire until most of the surrounding soft tissue has been incinerated. However, the presence of body fat can also act as a source of fuel, because if it is heated to 350ºC it will start to burn on its own accord (autoignition), increasing the overall temperature of the fire considerably (Holck 1987:27, 31; McKinley 1989:65; DeHaan 2008:2, 9). The subcutaneous fat will only ignite if it is in direct contact with air, but when this happens the temperatures caused by its flames are 800-900ºC, the kind of heat that is needed to cause complete calcination of bones (DeHaan 2008:9).

In fact bones normally not surrounded by a great deal of body fat (e.g. finger bones) are often not completely cremated due to this fact, as evidenced by a blue-black core (McKinley 1989; Ubelaker 1989:36f). Although the flames of burning wood may reach over 1000ºC under favourable conditions, the solid fuel itself is not hotter than 350-400ºC. Wood may smoulder and combist without actual flames, whereas body fat can only burn as a flame, and is therefore also in need of a porous solid 'wick' – for instance the bone (DeHaan 2008:9). Burning fat is therefore a contributing factor to complete calcination on an open fire exposed to the elements, but a fire that is well kept and supplied with solid fuel will also cause complete calcination in bones if it is allowed to burn long enough. The periosteum around the bone is also a source of fuel during
incineration and its presence causes intense tensions in the bone structure as the outer
temperature is for a while much higher than the core temperature – the bigger the bone
the more pronounced the differences (Shipman et al. 1984; Hummel & Schutkowski
1986). This strain is a prominent reason for the occurrence of fractures and cracks on
bones burnt in the flesh (DeHaan 2008; Schultz et al. 2008; Symes et al. 2008).

The fact that defleshed and dry bones experience a less intense type of strain during
incineration led some researchers early on to speculate that it was possible to ascertain
whether bones had been burnt fleshed or defleshed by studying the fractures. One of the
earliest recorded attempts along these lines was the examination conducted by the
prominent physical anthropologist Wilton Krogman, on human bones from Adena and
Hopewell burials in the USA. The archaeologists Webb and Snow wanted to find out
whether the cremations found there were the result of secondary burials of skeletonised
bodies. Krogman reached the conclusion that the Hopewell bones had been defleshed
when they were placed on the fire, whereas the Adena people had cremated their dead in
the flesh (Webb & Snow 1945:189).

One of the first to publish experiments specifically aimed at ascertaining the
differences in fractures on fleshed and defleshed bones was Raymond Baby (1954). While
he agreed on most of the criteria listed by Krogman as indicative of fresh or dry bone, he
also felt that Krogman had not included enough bones from the Hopewell material in his
analysis. His re-evaluation of the material led him to the conclusion that the Hopewell had
also cremated their dead in the flesh. However, he noted that there might have been some
cutting up of the bodies, as there were instances of completely disassociated bones fusing
gether in the heat, for instance a piece of a skull and part of a thigh bone. Baby based
his interpretation not just on the appearance of the fractures, but also on the evidence of
uneven cremation of different parts of the bodies. He noted that bones from the torso
(the mid region), that is protected by a lot of soft tissue and probably clothes as well were
the least burnt (1954:3f).

Lewis Binford (1963) was to take an interest in these two studies and attempt to bring
clarity by conducting his own experiments. Unlike Krogman and Baby, he made a detailed
presentation of these experiments and what they entailed. He listed various types of
fractures into categories and he connected these with either cremated fleshed or dry
bones, and came to the conclusion that the burial remains included in his study had all
been cremated in the flesh. After Binford, there were few new studies of a similar kind as
researchers either relied on the previous texts (Merbs 1967; Benjamin & Merbs 1990) or
experimented by burning bones, but did not apply these results on archaeological
assemblages (Wells 1960; Dokládal 1970; van Vark 1970; Herrmann 1972; 1977; Grupe &
Herrmann 1983; Herrmann 1988). Most of these experiments were performed in gas
ovens, but Piontek (1976) constructed a pyre to study if these conditions changed the
outcome. His conclusion was that the manner of cremation did not affect the appearance
of the bones in a notable manner, the same amount of shrinkage and similar types of
fracture occur. Other tests of prehistoric pyres have been undertaken as well
(e.g. Gräslund 1978; Henriksen 1989), and McKinley (1989; 1993; 1994) and Holck (1987) have done extensive study of bones cremated in modern crematoria.

Fig. 10.3. Bones cremated fleshed often display helical cracks and fractures (a-c), or deep transverse cracks and checking (d) (after Gejvall 1954:fig 6).

Fig 10.4. Delamination of cranial bone, as a result of the exterior surface being subjected to heat and shrinking before the interior (Pope & Smith 2004:fig 1).

Thurman & Willmore (1981) published results of their experiments cremating fleshed and defleshed bones. They highlighted the confusion present in many of the older texts between on the one hand cremating dry bones and on the other defleshed, but still fresh, bones (‘green’). Krogman had mentioned that this was another important distinction but had not elaborated further (Webb & Snow 1945:189). Thurman and Willmore were given access to eight human upper arms for their experiment, four fleshed and four defleshed but not dehydrated (green) (1981:280f). One problem with this study was that the bones
in question were only subjected to fire for a short while, the ones with flesh for only 50 minutes. The reason was that the fire was destroying these bones, as Thurman and Willmore describe it, so they removed them when the interior was still grey-black. In other words, all of the bone had not been heated to temperatures where the organic material is destroyed and therefore had not reached the temperatures where most of the fractures appear. The green bones on the other hand were burnt completely, so the comparison between them is tentative.

More successful experiments were undertaken by Buikstra and Swegle in 1977-78, but the results were not published until 1989. They included human bones from the thigh and upper arm (femur and humerus) that were fleshed, defleshed but fresh, as well as dry. Some were cremated in an oven and some were burnt on an open fire. Buikstra and Swegle point out that there is no easy correlation between a certain type of fracture and only one of the possible stages of the bone (fleshed, green or dry). An osteologist must analyse the overall appearance of the bones and make an informed judgement. The heat of the fire and the length of time spent in it also influence the outcome to a great degree (1989:256).

Taken together, the results of the many different experiments suggest that it is easier to ascertain evidence that bones were cremated fresh, than it is to get evidence that they were cremated dry. Fresh bones, especially if still covered by flesh when burnt, tend to have many deep transverse cracks and fractures ('deep checking'). Even more indicative is the presence of curved fractures ('helical'/'elliptical'), especially on the shafts close to the ends of the long bones (Fig. 10.1). Other indications of freshly cremated bones are deformation of the bones themselves or the fractures, and variation in the amount of incineration on different parts of the bone. The articular ends of bones that are attached to ligaments are often darker and less well burnt than the shafts for instance. Incomplete burning of skull bones, e.g. with a blue/black core, also suggests the skull was still attached to the body with the brain still intact. Under these circumstances the bones of the cranium are severely strained due to the thin layer of soft tissue on the outside and the internal sphere with organic tissue inside (Pope & Smith 2004). The cranial bones are also constructed in a rather unique way, with an outer and inner layer of compact bone separated by a layer of spongy bone (diploë), which is barely present on very young children, most developed with adults, and becomes increasingly ossified with the very old (Fig. 10.3). Cremating a full body will often result in deep curved fractures and parts of the cranium delaminate, that is the outer layer peels off in the heat (10.2). Exfoliation can also occur on long bones, as the periosteum takes part of the outer surface with it as it incinerates. This has been noted especially in the experimental burning of fresh bones where the flesh has been removed beforehand.

Dry bones will more easily become fully cremated, without blackened parts on the exterior. They are also more likely to show complete incineration internally, though this depends somewhat on how long the fire was kept going. Defleshed bones, whether dry or green, will also not have helical fractures near the end of the shafts of the long bones. Deep transverse cracks and so-called checking occur only infrequently on dry bones.
Bones that have already been mostly dehydrated will crack and fracture in a similar manner as bones left to dehydrate on their own. They will mainly have a few longitudinal fractures along the length of the bone.

In essence, it is easier to prove that bones were cremated fresh and in the flesh, than it is to prove that they were not. Identifying bones that were cremated defleshed, but still fresh, is even more complicated, as they tend to have traits of both. In cases where a cremation burial contains almost all the bones of an individual it should still be possible to do so, as a combined analysis of cracks and fractures on different bones and degree of incineration of certain parts of the body would give a fairly reliable result. If only a few bones have been selected for burial or preserved, and if bones from more than one individual are included, the task becomes quite difficult. Such an analysis can still have its merits, in my opinion, if for no other reason than as a way of testing whether a hypothesis of defleshing is at all likely.
10.2 Osteological Analysis of Bollbacken Mortuary Area

Although the bones from Bollbacken had been analysed in connection with the excavation report, as part of my own project I reanalysed all the bones found in the fourteen features at the mortuary area that also contained human bones. As I had more time to identify individual bones my results differ to a certain degree from those presented in the report. In total c. 2970 g of bones were analysed, and no less than 77% of these could be determined to species, family or class (e.g. seal, bird). Almost 68% of those bones were human. The total number of fragments was estimated to c. 5770, and the percentage of identified fragments (nisp) was only 23%. This reflects the fact that the larger (heavier) pieces are more easily determined, whereas cremated bone material often contains large amounts of very small fragments. Unless otherwise stated, all percentage values presented below will be based on weight.

Due to the brittle nature of burnt bones the very acts of excavation, transport and examination will cause the number of fragments to increase. The fact that 23% of the number of identified fragments equals 77% of the total weight shows that the material included quite a number of well preserved bones, considering the circumstances. As we shall see no feature at Bollbacken contained quantities of cremains that could be interpreted as a whole skeleton. The largest assemblage of cremains was found in A1106, which had c. 2.5 kg of bones. This would be considered a large quantity, if not for the fact that it contained at least four human beings and one dog. Based on studies in modern crematoria the weight of cremated bones from an adult body vary between 1.2-3.0 kg depending on age and overall size of the body, with an average of 2.0 kg. If bones <2 mm are removed from the equation the average comes down to c. 1.8 kg for an adult male body and c. 1.3 kg for a female, with a considerable area of overlap between them (McKinley 1993:285). A cremated adult would therefore yield between 1-1.5 kg of bones if almost all of them were collected. Based on this A1106 lacks perhaps half the amount of bones that should be present, and whether the lack is due to human intervention or natural causes will be discussed further below.

Method of Analysis

My main focus in analysing the bone material was on the aspects that could in some way be related to the stage the bone could have been in when subjected to fire. For any bone at least 1 cm in size that could be identified to species or class, several other characteristics were also noted in my database:

Method of Analysis
ANATOMICAL REGION (Fig. 10.2):
- Cranium (all cranial bones including teeth)
- Thorax (vertebrae, ribs, collar bone, hip bone etc.)
- Upper extremities (upper and lower arm)
- Lower extremities (thigh, shin and calf bone)
- Manus/Pedis (hand and foot bones)

ELEMENT (specifically which bone: e.g. humerus, temporale, coxae etc.)

PART OF BONE (diaphysis, epiphysis, proximal, distal, processes etc.)

SIDE (right or left side of the body, if applicable)

SIZE AND WEIGHT

Aspects of the bone relating to amount of burning:

• COLOUR (white, yellow, grey, blue, black)
  - Exterior surface
  - Core
  - Interior surface

A subjective evaluation on whether there were none (0), a little (1) or a lot (2) of the following characteristics:

• DEFORMED
• DELAMINATED/EXFOLIATED
• LONGITUDINAL cracks/fractures (straight, serrated or curved)
• TRANSVERSE cracks/fractures (straight or serrated)
• HELICAL cracks/fractures (i.e. curved, elliptical)
• CHECKING (superficial as in an old oil painting, or deep as in dry clay)

The appearance of the surface of the fractures

• ANGLE
  - Slanted/oblique
  - Perpendicular

• SURFACE
  - Smooth
  - Rough

The database also included other notations and comments about the appearance of the bones and possible age of the individual (infans, juvenilis, adultus). As is clear from the list above there is a great degree of subjective evaluation by the analyst, as well as the problem of the differences in size between various bones. It should be noted that many of the bones were remarkably well preserved and quite large compared to what is usually seen in cremation burials. For instance, the bones found in the Iron Age burials at Bollbacken were a lot more fragmented, despite being deposited under stone settings for
only 1500 years as compared to being placed in small pits for 4500 years. This highlights the fact that the condition of cremated bones depends on a multitude of factors, including treatment right after being burnt and deliberate additional destruction. The bones are at their most brittle when still warm, and if there is a lot of handling and reburial they will fragment even more (McKinley 1993; 1994). The bones at Bollbacken were noticeably more fragmented in some pits than in others (see below).

The main aim of the database was not to create a completely objective quantitative analysis of the fragmented burnt bones – that would simply not be possible. The compilation of the results focused mainly on highlighting traits that showed evidence of the bones being burnt fresh and fleshed: helical fractures, exfoliation, dark articular surfaces with superficial checking, blue-black interior surfaces suggesting they contained a lot of organic material at the time of incineration, and deep checking on the surfaces of long bones etc. The bones that did not fall into these categories were re-examined visually and compared to other bones found in the same feature. For instance, a bone that showed evidence of not being burnt at temperatures of at least 700-800ºC could not be expected to show as many cracks and fractures, even if it had been fleshed at the time. If such a bone was positioned on the body so that it would have been covered by a lot of soft tissue, the dark colour would in fact probably indicate that it had been fleshed when cremated.

Each bone was classified into one of four groups:

- Fleshed
- Fleshed/Green (fresh, but possibly defleshed)
- Green (probably defleshed, but still fresh)
- Green/Dry (probably defleshed, and possibly dehydrated as well)

These classifications should not be seen as absolutes. It is not each individual bone as much as general impressions that form the basis of the analysis. The compilations are used to compare differences and similarities between various body parts within a feature, as well as between features. The specific cases are discussed below regarding each feature.

The Mortuary House

This includes the ditch (A152), as well as the upper (A948) and lower (A95) floor layers, and the pits dug inside the house (A166, A954) (Fig. 10.5). Altogether 212 g of bones (340 fragments) were recovered, most of which came from the ditch and the lower floor layer. No less than 81% (in weight) of the bones could be identified and almost three-quarters of these were human (Tab. 10.1). There were also some bones from dog and seal, and a single fish vertebra. Human bones occurred in all the features except for the small pit 166. The bones found here were heavily fragmented and could not really be identified to any species. Bones from seal were found in the ditch and the two floor layers. Dog bones were found in the ditch, the floor layer and one of the small pits. The animal bones will be discussed in depth further below.
Fig. 10.5. The mortuary house, and the features in which cremated bones were found. Black shapes are stones. See also fig. 9.8 for the rest of the mortuary area.

Table 10.1: Features of the Bollbacken mortuary house containing cremated human bones. NISP = number of identified specimens.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Structure</th>
<th>Human (weight/nisp)</th>
<th>Dog (weight/nisp)</th>
<th>Seal (weight/nisp)</th>
<th>Other (nisp)</th>
<th>Total (weight/nisp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>95</td>
<td>Lower floor</td>
<td>71.72 g 30</td>
<td>1.97 g 3</td>
<td>2.62 g 1</td>
<td>Fish (1)</td>
<td>106.90 g 112</td>
</tr>
<tr>
<td>152</td>
<td>Ditch</td>
<td>31.91 g 33</td>
<td>2.69 g 4</td>
<td>0.72 g 1</td>
<td></td>
<td>51.64 g 135</td>
</tr>
<tr>
<td>948</td>
<td>Upper floor</td>
<td>18.07 g 6</td>
<td>1.56 g 1</td>
<td></td>
<td></td>
<td>38.13 g 29</td>
</tr>
<tr>
<td>954</td>
<td>Pit</td>
<td>2.14 g 4</td>
<td>7.59 g 3</td>
<td></td>
<td></td>
<td>9.8 g 8</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>123.84 g 43</td>
<td>12.25 g 10</td>
<td>4.90 g 3</td>
<td></td>
<td>206.47 g 284</td>
</tr>
</tbody>
</table>
THE HUMAN BONES

The relative proportions of body parts differ depending on whether one looks at the number of fragments or the weight. The parts of the body are defined based on anatomy, and contain very different amounts of bones with dissimilar structures. Interpretations based on weight or on number of fragments are both potentially problematic, but I have chosen to mainly discuss proportions of body parts based on *nisp* (number of identified specimens), since a compact thigh bone weighs considerably more than a cancellous vertebra. As I am interested in seeing which body parts are in fact represented in the features, the weight is not as important.

The minimum number of individuals (MNI) in the combined features belonging to the mortuary house is just one. That is based just on the fact that there are no duplicates among the few human bones that have been found, and no differences in age either. It is probably more accurate to assume that the five features making up the mortuary house do not contain bones from the same individual. However, it is impossible based on osteological evidence to surmise how many there could have been originally. Bones from all body parts are represented: cranium, thorax, upper and lower extremities, hand and foot. As already mentioned pit 166 had no identifiable bones, but all of the rest contained human skull bones and bones from hand and/or feet. The ditch (152) also had several bones from the torso, mostly fragments of ribs, but there were a few fragments of long bones from the extremities as well. By contrast, the lower floor layer (95) contained mostly pieces from extremities, apart from the skull and hand/foot bones. The quantities are so small that it is not possible to state whether this pattern is purely coincidental.

A few of the bones show evidence of only partial calcination, for instance a large piece of the shaft of a calf bone (*fibula*) is still blue/black inside, and a cranial bone has black patches on the exterior surface. This is typical for these bones when they are cremated fleshed, and the calf bone was also partially delaminated and had several transverse cracks. Helical/curved fractures and cracks appeared on a number of well burnt bones from the upper and lower extremities, but they do not appear on the cranial bones. Moderate deformation was observed on some of the long bones, including a few finger bones, and on a piece of a shoulder blade. A few of the cranial bones had been delaminated. Interestingly, the rib bones were thoroughly calcinated, including in one case the proximal part that is attached to the vertebra. This indicates that the burning of bodies was careful and thorough.

Classifying each individual bone to one of the four categories mentioned above, based on the degree of calcination, type of fractures, presence/absence of deformation and delamination etc. results in an overall impression that most of them had been cremated either fleshed or at least quite fresh (Fig. 10.7). Bones interpreted as more likely to have been cremated defleshed or even partially dry all come from the skull or the hand/feet. These parts of the body are both noted for having fairly little soft tissue, and are also the ones most likely to be defleshed early during the natural decomposition process that can take only a week or two during the warmer part of the year. A closer inspection of the cranial bones also reveals that the ones displaying the least evidence of being burnt in the
flesh are the facial bones (*frontale, maxilla*), which is only to be expected. Even so, there are bones from the face and hands that certainly appear to have been cremated fresh.

Fig. 10.6. Human bones in the features of the mortuary house, anatomical regions. Cranial bones were found in all that contained identifiable bones. In the floor layers (A95+A948) bones from the torso were scarce, and fragments from the extremities dominated. In the ditch (A152) bones from torso as well as hand/foot bones were well represented, but not bones from the larger long bones.

Fig. 10.7. The human bones from the mortuary house, interpreting the state of the body at the time of cremation. The appearance of most bones seem to suggest they were burnt more or less fleshed. The skull and hand/feet are only covered by a little soft tissue to begin with.
Fig. 10.8. Representation of anatomical regions of the human bones in pit A1106, which contained at least four individuals. Skull bones are easy to identify, and the bones from the torso fragment easily, which would explain why they dominate. All regions of the body are well represented.

Fig. 10.9. Interpretation of the adult human bones from the bone pit. Most were apparently cremated when still fleshed, but there is consistently an amount of bones from each region that show little trace of being burnt with soft tissue.
Pit 1106: Homo s. Upper extremities

Humerus | Radius | Ulna
---|---|---
Dry/Green | Green | Green/Fleshed | Fleshed

Pit 1106: Homo s. Lower extremities

Femur | Fibula | Tibia
---|---|---
Dry/Green | Green | Green/Fleshed | Fleshed

Fig. 10.10a-b. Adult bones from the extremities. Most show evidence of being burnt fresh and fleshed, but for each element there are some that lack those traits. Even the calf bone (fibula) which is covered by muscles and fat seems either to have been burnt fresh or defleshed.
Fig. 10.12. Anatomical regions represented in the ‘cooking pit’, includes the bones from both the adult and the child. Skull bones obviously dominate the small assemblage, but bones from all other major parts of the body are found as well.

Fig. 10.13. The adult bones in the ‘cooking pit’. The main indication is that the adult was cremated fleshed. A few cranial bones show no clear evidence of this, and this may be due either to the fact that the skull has little soft tissue to begin with, or the body had started decompose before it was placed on the pyre.
Fig. 10.14. The child was probably cremated soon after death as well. Children have less muscles and not as compact bones, so it is to be expected that the fractures are less extreme.

Fig. 10.15. Remaining pits with human bones in the mortuary area. Most just contained a small amount of bones altogether, some of which could be identified as human.
Fig. 10.16. Anatomical regions of dog (*Canis f.*) found in the mortuary house and bone pit A1106.

Fig. 10.17. The fractures, cracks and colouration of the dog bones in 1106 strongly indicate that the dog was cremated in the flesh. All the anatomical regions of the body were represented, and it seems clear a whole dog was included on the pyre.
Chapter 10

Fig. 10.19. Seal bones found in the mortuary house and the bone pit. Only a few could be identified, and they come from the main body, not the skull.

Fig. 10.20. Comparison of amount of human body parts in the mortuary house, the bone pit and the so-called cooking pit. Considering that cranial bones are likely to be overrepresented, since they are easy to identify, the bone pit has the closest to a realistic representation of a human body, except that it contained at least four human beings. The cooking pit has a clear overrepresentation of the cranial region. The mortuary house has an underrepresentation of bones from the head, but an overrepresentation of hand/feet bones.
PART 4

It is not possible to be any more specific than noting that the majority of the cremated bones were probably cremated in the flesh or only partially defleshed. However, as it is quite likely that the bones originate from more than one individual, and as there are several bones from parts of the body that show less evidence of being burnt fleshed than what would be expected, some might indeed have already been defleshed when cremated. Still, there is no evidence that the bones found in and around the mortuary house came from bodies that had been fully defleshed or skeletonised before cremated.

A1106 – The burial pit

This small pit was found three metres west of the mortuary house. Despite being just 0.5 m across and 0.16 m deep it was packed with 2527 g of cremated bones (c. 5150 fragments), many of which were quite large and well preserved considering the circumstances. Of the total weight 74% was identified to species or class (e.g. bird, fish), and no less than 93% of these bones were determined as human. Apart from this there were a number of dog bones, a few seal bones, one fish vertebra, and a possible bird bone (Tab. 10.2).

Table 10.2: Other features of the Bollbacken mortuary area containing cremated human bones. Nisp = number of identified specimens.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Structure</th>
<th>Human (weight/nisp)</th>
<th>Dog (weight/nisp)</th>
<th>Seal (weight/nisp)</th>
<th>Other (nisp)</th>
<th>Total (weight/nisp)</th>
</tr>
</thead>
<tbody>
<tr>
<td>157</td>
<td>Large pit</td>
<td>35.75 g</td>
<td></td>
<td></td>
<td></td>
<td>38.39 g</td>
</tr>
<tr>
<td>645</td>
<td>Cooking Pit</td>
<td>101.69 g</td>
<td>1.21 g</td>
<td></td>
<td>Fish (1)</td>
<td>165.84 g</td>
</tr>
<tr>
<td>1082</td>
<td>Pit</td>
<td>0.95 g</td>
<td></td>
<td></td>
<td></td>
<td>0.95 g</td>
</tr>
<tr>
<td>1106</td>
<td>Bone Pit</td>
<td>1732.29 g</td>
<td>81.86 g</td>
<td>8.25 g</td>
<td>Fish (1) Bird (1)</td>
<td>2527.37 g</td>
</tr>
<tr>
<td>1108</td>
<td>Pit</td>
<td>18.65 g</td>
<td></td>
<td></td>
<td></td>
<td>20.46 g</td>
</tr>
<tr>
<td>2037</td>
<td>Pit</td>
<td>1.86 g</td>
<td></td>
<td></td>
<td></td>
<td>3.37 g</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>1886.67 g</td>
<td>83.07 g</td>
<td>8.25 g</td>
<td></td>
<td>2756.38 g</td>
</tr>
</tbody>
</table>

THE HUMAN BONES

The initial osteological examination estimated that there were at least four individuals present in the assemblage. This is confirmed by my own re-examination of the material. For several cranial bones, including the side, back and front of the head, there are three of
each from adult individuals. However, there are also a number of skull bones with noticeably thinner compact bone and quite thin cancellous bone (diploë) between them. This is usually found on juveniles – teenage individuals. Additionally there are three proximal pieces of the radial bone of the left upper arm (radius) that must have come from three different adult individuals. But there is a fourth piece of a left side radial bone with distinctly thin compact bone and young looking tuber where muscles are attached. This, together with a few other bones from the upper and lower extremities (humerus, femur) appearing to be not fully grown, confirms that there is a juvenile individual present as well. This would bring the total MNI to 4: three adults (>18 years) and one juvenile (13-18 years). Since it is not really possible to know just how much a cremated bone has shrunk, a closer age definition cannot be made.

Of the total number of human bones 38% were from the skull (Fig. 10.8). Seen in percentage of total weight the cranial bones are still well represented (35%). This is partly because of the fact that the human skull is quite distinctly different from other mammalian skulls that mostly lack the cancellous diploë found between the thick outer and inner laminal bones. Therefore even very small fragments are easily identified as human. The extremities make up 29% of the number of fragments, or 43% of the weight. Since the long bones of arms and legs make up most of the mass of the skeleton this seems quite reasonable, as does the torso being represented by 32% of the nisp and only 20% of the weight, since ribs, vertebrae and pelvic bones are quite cancellous and therefore light and easily fragmented. Bones from the hands and feet make up 2% of the material – in both weight and numbers.

At the very most only half the amount of bones expected from three grown and one almost grown human being is present in 1106, but all parts of the body seem well represented. Some bones may of course have been destroyed by natural causes over the millennia, but it is worth noting that the collection was compact and several bones were still quite large. This suggests that the pit had never included all of the bones or even most of the bones from these four individuals. The lower human jaw bone (mandibula) is both compact, which ensures that it is often preserved, and of a peculiar shape not really found among other mammals, which ensures that osteologists can often identify even quite small fragments of it. In fact, one jaw bone could be almost completely refitted from several large pieces in 1106. There were also parts from two more jaw bones. If there was a fourth jaw bone as well it could not be identified in the assemblage. Either it was more thoroughly destroyed by the fire into very small fragments, or one of the jaws was not included in the bone pit, perhaps not even placed on the pyre. In the light of this it is worth considering the defleshed jaw bone deposited at Korsnäs, the missing jaw bones at the Jettbøle assemblage, and the removed skulls from the Gotlandic burials (see chapter 9.1).

While the majority of the bones are completely or mostly calcinated, there is a sizeable number that have darker coloration, including blue and black interior/exterior surfaces and cores. These are mostly bones from the extremities and the skull. It is noteworthy that so many of the cranial bones, including parts of the very thick occipital bone at the
back of the skull, are so completely calcinated. Most of the bones from the torso show
evidence of complete incineration, despite the fact that they are surrounded by muscles,
fat, blood and internal organs. In contrast, several of the dog vertebrae found in 1106
were still completely blue-black internally and externally (see below). Evidently, if the
human bodies were still fleshed when they were cremated, the living took great care to
keep the fires going to ensure that the bones were thoroughly cremated.

Delamination (or exfoliation) has occurred on a number of bones, specifically cranial
bones and the ribs (Fig. 10.4). Of the cranial bone it is especially the forehead (frontale)
that has split between inner and outer layers. This is consistent with what has been
observed on fresh bodies placed on a pyre (Pope & Smith 2004). It should be noted that
the cranial bones that looked juvenile were not delaminated. Some of the shafts on the
long bones are also partially exfoliated, and in one case of an almost 10 cm long diaphysis
of a thigh bone (femur) completely delaminated all around. There were few extreme cases
of warping and deformation of the bones, and only some cases of minor deformations.
Of the ones that were more or less warped, cranial bones dominate and especially jaw
bones and the forehead. Some warping at the fractures was also found on long bones,
mainly thigh and shin bones, but also upper and lower arm bones.

Not surprisingly, helical and curved fractures occur mostly on the long bones of the
arms and legs, on between 30-40% of them. Mostly there are just one or two such
fractures and cracks, and extensive helical fracturing was observed on only three long
bones and one cranial bone (parietale). Likewise, deep checking is found on a small
number of the long bones and a few of the cranial bones. However, since deep checking
will lead to bones being easily broken into small fragments, this will certainly be
underrepresented among the larger bones. There is still a considerable number of quite
large fragments of long bones that show no clear evidence of checking, despite being
almost completely calcinated.

Bones interpreted as being cremated in the flesh occur in virtually all body regions, and
the vast majority of all bones were probably burnt fresh, with or without soft tissue
(Fig. 10.9). However, there is consistently a portion of bones in each body region that is
interpreted as being burnt defleshed and possibly even partially dehydrated. The same
pattern is often repeated if one looks at specific bone elements. Some pieces of shoulder
blade are definitely burnt fleshed, but there are other pieces that show very little evidence
of being burnt in the flesh, and the same goes for the vertebrae. It is hardly surprising that
the cranial bones from the cheek (zygomaticum) and temple (temporale) show little evidence
of being burnt fleshed as they are covered with so little soft tissue to begin with, and the
facial region is one of the first to be reached by fire. But it is noteworthy that although
most of the thick occipital bones from the back of the head, which are subjected to very
strong forces during cremation, show evidence of this, there are also some that show little
or no evidence of this (Fig. 10.11:b). This includes an almost complete occipital bone
from side to side and mostly just the upper part missing. This bone was almost completely
calcinated, apart from some grey patches on the external surface, yet there was no warping
and very few cracks or fractures, that were mostly straight. It can be compared to pieces
of another occipital bone that still had blue coloration internally with some delamination,
curved fractures and deep checking in places. Naturally the placement on a pyre affects
the outcome of incineration and fracturing, but the differences between these occipital
bones are such that it could be viewed as evidence the bodies in question were at different
stages of excarnation when cremated.

Looking more closely at the bone elements from the extremities supports this notion.
For each of the bones in the arm – upper arm, radial bone, elbow bone (*humerus, radius*
and *ulna*) – the majority show evidence of being cremated fleshed, or at least fresh
(Fig. 10.10:a). But for each there are a small number of bones whose appearance suggests
they were cremated defleshed and perhaps partially dehydrated. The exact same thing is
true for the bones of the leg – thigh, shin and calf bone (*femur, tibia* and *fibula*)
(fig. 10.10:b). The calf bone is especially interesting, as it is a very long and compact bone
surrounded by a lot of soft tissue on one side and protected by the thick shin bone on the
other. Most pieces of calf bone in the material show evidence of deep checking and
numerous transverse cracks, as well as delamination, curved fractures and deformation.
However some pieces that are thoroughly calcinated show none of this. Again, this is not
incontrovertible evidence that these were partly or completely defleshed when cremated,
but taken in combination with all of the bones, I believe there are strong reasons for
surmising that at least one of the individuals found in the bone pit was partially or
completely defleshed. This is not the juvenile individual, as almost all of those bones show
evidence of being cremated fresh and fleshed.

To summarise: One of the adults was in all probability cremated fleshed, and one was
cremated at least partly defleshed. The third adult is more difficult to interpret, although
this body was probably more fleshed than not. The juvenile was not defleshed.

The theory that at least one of the individuals was defleshed is strengthened by the
presence of a large piece of thigh bone, 8 cm in length, which had several shallow but
clearly visible cut/scrape marks (Fig. 10.11:g). It was mainly fractured longitudinally and
had no curved or helical fractures. The piece came from the upper part of the bone, and
this suggests that the cut marks were made when someone cleaned the bone from flesh
and tendons at the part where the thigh bone joins the pelvic bone, perhaps separating
them from each other. Despite careful scrutiny, this is the only bone on which I have
found any such marker. This, together with the abovementioned evidence for bodies
cremated fleshed, suggests there was no organised removal of soft tissue from all bodies.
Perhaps the one body treated in such a manner had already become partially defleshed at
the time of cremation, and tendons were removed to make transportation to the pyre
easier.

The tightly packed bone pit and the unusually well preserved bones, suggest that this
was the result of a single event and therefore that the bodies were cremated at the same
time – though it is not possible to say whether they were all placed on the same pyre or
separate ones. The fact that these bodies then show evidence of being in *different stages of*
decomposition would suggest that they had not all died at the same time. Since it is not possible to determine which time of year they died, we cannot know whether they had died weeks or months apart. As only one body shows any evidence of being defleshed and partially dehydrated, it is likely that not too much time had passed between the demise of the first and last individual – possibly less than a year.

Fig. 10.11. Cremated human bones from A1106. a.) Lower jaw bone (mandibula); b.) Occipital bone from the back of the skull from two individuals. The right one was almost complete, completely calcinated and with few cracks. The left piece is deeply checkered and cracked; c.) Shafts from two thigh bones (femur), the upper one is exfoliated and deformed at the fracture, the lower has mainly longitudinal fractures which are acute, not angled; d.) A complete cheek bone (zygomaticum) without cracks or fractures; e.) Large part of a cranial bone (parietale), slightly deformed at the central fracture, but no angled or serrated cracks and no delamination; f.) Two shin bones (fibula), the upper being deeply checkered and deformed, the lower having few fractures and no apparent deformation apart from some shrinkage; g.) Upper part of thigh bone (femur) with no helical cracks and few fractures. Cut marks can be discerned on the lower half. (photo: Å. M. Larsson)
A645 – The ‘Cooking Pit’

Somewhat removed from the mortuary house, but still in the general mortuary area, close to the contemporary shoreline, was a large complex pit that showed evidence of having been re-dug several times (Fig. 9.8). The main pit and its filling were called A645, but the additional layers found within it were referred to as 642, 643 and 644 by the excavators. However, as the materials found in these layers are in all likelihood mixed I have chosen to analyse all the bones together. The presence of fire cracked stones made the archaeologists classify it as a cooking pit. It is difficult to determine whether the feature was indeed used in this manner. Apart from burnt bones it also contained poriferous pitted-ware and knapped quartz. Only 165 g of burnt bones were found (225 fragments), 61% of which was identified as human (Tab. 10.2). There was also a piece of a dog’s front leg (humerus), and a vertebra of a pike fish (Esox lucius). Several other fragments from a non-human mammal were also found, pieces from the skull, ribs and long bones. These might also derive from dog, but it is not possible to say for certain.

The Human Bones

Despite the modest amount of bones in the pit, there is at least 2 individuals present, as some of the bones come from an adult, and some belong to a child. The child seems to have been in the transition between infans I-II. The posterior arc of the first vertebra (atlas) shows evidence of being recently fused, which normally occurs at age 3-5. The structure of the child’s cranial bones suggest that they belonged to an individual older than 4-5 years, and the striations found on them are similar to those of children around the age of 5-7. Comparing the size and thickness of the pieces of long bones to those of children of different ages, and taking into account the shrinkage that has occurred during cremation, it is likely that the age of the child should have been around 5-8 years old. No bones suggest any other age and although it is of course possible that they are the remains of more than one child, there is nothing in the material to support this. The adult and child bones were found together in almost all of the different layers of the pit (642, 643 and 645). This could of course mean that there are cremains of several adults and several children, but the more probable explanation is that the bones come from the same two individuals and that the pit has been disturbed on several occasions.

The absolute majority of the human bones found in 645 came from the skull: weight: 78%; nisp: 66% (Fig. 10.12). As stated previously, the human skull is more easily identified than other bones in the body, but even so this is an extreme amount. Considering there was only 42 g of unidentified bones there is no possibility that the rest of the body parts are simply unidentified. However, the remaining human bones contain elements from the torso (ribs, vertebrae), the upper and lower extremities, as well as the feet, so most of the body parts are present to a moderate degree. Apart from cranial bones, the child is represented by a vertebra and pieces of the lower arm and thigh bone (radius, femur). The adult is mostly represented by cranial bones, including parts of the
lower jaw, but also pieces of the elbow bone (ulna), calf bone (fibula) and the foot (metatarsus).

**THE ADULT**

In contrast to the features discussed above, the bones in A645 were not quite as well cremated. Several of the cranial bones of the adult had blue-black, blue or grey cortex and/or interior surfaces. Part of the occipital bone from the back of the head had a bluish exterior surface. If a body is placed on its back on a pyre that part of the skull will usually rest upon the wood, meaning that the exterior of the occipital bone will be both protected from the warmer flames and from oxygen for a longer time than other parts of the skull. If the skull cracks open in the fire and the brain incinerates, the interior surface of the occipital bone may actually become calcinated before the exterior, as the internal temperature of burning wood is only 350-400°C, and it is only the flames that reach temperatures of 800°C (DeHaan 2008:9). Pieces of the jaw bone and the upper part of the elbow bone also had bluish cores and interior surfaces, showing that the cremation had not completely calcinated the bones.

Only one of the skull bones showed moderate delamination, and only a couple seemed at all deformed or warped. However, there was some deformation of the foot bone and the calf bone. Helical fractures were slightly more common, found on some of the skull bones, the elbow bone and a calf bone. Superficial checking of the articular surfaces was noted as well, and there was quite a lot of serrated transverse cracks on the skull bones. The evidence strongly suggests these are the remains of a body burned fleshed or at least quite fresh (Fig. 10.13). The bones could of course come from more than one individual, but there is nothing in the appearance of the adult bones that would support the interpretation that they were burnt defleshed.

**THE CHILD**

Not surprisingly the child’s thinner cranial bones were more thoroughly calcinated, with only some grey coloured areas. A piece of the shaft of the radial bone still had blue coloration, though. Exfoliation is only observed on a small part of one of the radial bones, but several of the cranial bones appear to be deformed, either flattened or excessively convex. Helical fractures are not common, but the parts of bones most likely to display such characteristics are not present in the pit either. There is some superficial checking of articulating surfaces, and one shaft bone has deep checking. Although longitudinal fractures are more common than transverse on several of the long bones, most still display transverse cracks and most of the skull bones have serrated cracks.

The structure of a young child’s bones is different from that of an adult, and the young body also has comparatively less soft tissue to support incineration. A small body will become defleshed quite quickly unless it is kept very cold. Of course if death occurred in the winter, there could have been a longer period between death and cremation. Freezing is another form of dehydration however, and nothing overtly confirms such an
interpretation, so it is better to err on the side of caution and interpret this as a body cremated fairly soon after death (Fig. 10.14).

Other Pits With Human Bones

A few other small pits in the mortuary area contained small amounts of human bones (Tab. 10.2, Fig. 10.15).

A157

The large pit 157 (2 x 1.5 m) lay just 0.5 m north of the bone pit 1106, but contained only 38 g of bones (34 fragments). Nine bones, representing 93% of the total weight, were identified as human, and the remaining ones were not possible to determine at all as they were too fragmented. The human cremains included some cranial bone, ribs and part of the hip bone, part of an upper arm and two pieces of shin bone. Despite the fact that there are far too few bones to make up a complete body, most body parts are in fact represented. The bones appear to come from an adult (MNI = 1), but it is not possible to rule out that these are bones from a separate individual distinct from the ones found in 1106. Apart from one of the fragments of a shin bone which had a light blue core, all the bones are completely calcinated. The pelvic bone and the upper arm are partly deformed and have helical fractures, strongly suggesting they were cremated fleshed. One of the shin bones has deep checking and the other has curved fractures. Of the cranial bones one has checking and another is delaminated. The human bones found in this pit give every indication that they were cremated when still fleshed.

A1108

This small pit/post hole was found at the edge of the large pit A157, and a few decimetres north of bone pit A1106. It contained fifteen cremated bones (20.5 g), six of which were identified as human (91% of the weight) and the rest seemed to be human as well, but this could not be absolutely confirmed. Three of the bones could be identified as fragments of an elbow bone (ulna), a thigh bone (femur) and a shin bone (tibia). They were all completely calcinated, and the long bones all had helical fractures and several serrated transverse cracks. The elbow bone was also slightly deformed. The overall impression is that these bones were cremated fresh, with or without soft tissue.

A2037

Post hole next to the large cooking pit 645. It contained only five bones (3.4 g), one of which was a human metacarpal bone from the left hand. The other four fragments were part of one or several unidentified long bones, human or animal. They were only partly calcinated as the core and interior surface are blue-black. The human hand bone is slightly deformed and is fractured transversely across the shaft. This suggests that it was fairly fresh at the time of cremation, although there is no checking on the articular surface.
In a posthole found almost 10 m south of the bone pit 1106, a single completely delaminated (internal tabula) fragment of a human cranium was found (1 g).

The Animal Bones

Dividing the analysis of bones into the categories human/animal is for the most part a valid way to proceed. There are to a considerable degree quite different questions we can and should ask of the remains of human beings. When alive they were the cultural beings whose experiences and actions created society. Their disposal is therefore almost always something the living themselves view as different from the disposal of non-human animal remains. As self-aware cultural beings our biographies are also more complex than those of wild animals whose actions are more biologically and habitationally circumscribed. Even domesticated animals have a narrower range of options and experiences than the people who care for them. But animal remains found in contexts created by humans are still part of that human world, and should not simply be consigned to the sphere ‘biology’ as opposed to ‘culture’. This approach to a certain degree defines animal osteology as a discipline in its own right, separate from zoology.

Although the distinction between human and animal osteology is methodologically valid, it is still important to only use this as a starting point, and to continually probe and test it. One important factor to remember is that the category ‘animal’ is not now, and never has been, self-evident. We tend to classify different species according to a culturally prescribed value system. Domestic animals and wild animals are different categories for many people, and some domestic animals may almost transcend the animal category all together. Dogs, cats and horses whose lives are intimately intertwined with ours are often referred to as ‘more’ than mere animals, but at times also as dangerous and potentially harmful because of this very fact. The dog is both humanity’s oldest and most trusted companion, and at times one of the filthiest most despised animals in society. The underlying logic behind this seemingly paradoxical reaction in many cultures was thoroughly analysed and explained by Mary Douglas in her seminal work on purity and danger (1966).

Many cultures also distinguish between various wild species, and view them as more or less on a par with human beings or spirit beings based on their mythologies and cosmology. The bear, one of the more impressive animals one can come eye to eye with in Scandinavia, and who also has the quite unique ability to stand on two feet like a human being, has for a very long time been an object of veneration and superstition in the whole circumpolar region (Edsman 1965; Hultkrantz 1965; 1975). For instance, in the widespread shamanistic traditions of this region, the body of a bear – its bones especially – could not be treated in the same manner as those of other animals. Instead they had to be collected in full and deposited in a sacred place, and left undisturbed by human intervention. From a methodological viewpoint such bones should be analysed...
zoologically, determining age, sex and possibly mode of death or post-mortem treatment. But to stop at that would be to miss the whole point of why they are of importance to archaeology. Even if the flesh of the bear was sustenance, it was not just another animal to the people who hunted and ate it. To place a bear into the same category as a deer or a rabbit would be profoundly inaccurate.

Determining which categories a prehistoric group used to designate various species of animals, and how they related to humans beings, as well as the categories of beings there may have been among humans themselves, is hardly an easy exercise. As with so many other questions we would wish to ask of our material, the answers are mostly lost in the abyss of time that separates us. Even so, it is worth a closer look at two species of animals that have appeared on numerous occasions whenever we have discussed Pitted Ware mortuary practices, including those at Bollbacken: dogs and seals. It is fairly easy to see how both of them occupied an important place in the myths and cosmology of these groups. For the marine hunter-gatherers the dog was a companion and helper, while seals were the main source of food. It is not surprising therefore to see that remains of both occur in burial contexts and at mortuary areas. A closer inspection, however, shows that they were hardly treated in the same way.

Fig. 10.18. Cremated dog bones from 1106. a.) Long bones with helical and transverse fractures but no longitudinal. Dog bones are more compact than human bones, but also thinner and not surrounded by as much soft tissue generally, so they fracture differently when fired; b.) Pelvic bone (coxae) with several helical cracks and fractures. The articular area was darker than the rest; c.) Jaw bone (mandibula) with deep, curved and transverse cracks; d.) Vertebra which were blue-black, showing that they had not been fully cremated. (photo: Å. M. Larsson)
DOG
Bones from dog occur mainly in the mortuary house (the ditch, floor layer, and a pit/post hole), and in the bone pit 1106. In the ditch around the mortuary house a few pieces from the torso were found: breast bone, rib and vertebrae (Fig. 10.16). They were fairly well cremated, though with grey coloration internally as well as externally on most of them. The cracks and fractures were mostly serrated, transverse and longitudinal. Estimating degree of fleshed/defleshed is difficult. The bones are quite small even for cremated ones, so this was probably a small breed of dog, or possibly not quite fully grown.

In the lower floor layer came two fragments of a posterior leg from the right side (fibula, calcaneus), as well as a sesamoid bone that can be found by the joints between bones in the leg, for instance. They were all completely calcinated and had a few serrated cracks. Unlike the human body, the calf bone (fibula) on a dog is not covered with a lot of fat and soft tissue. It is not possible to be more specific about whether the bones were cremated fleshed, but nothing explicitly contradicts this. The find of the small sesamoid bone, which is only attached to the rest of the skeleton through tendons, strongly suggests that the leg in question was not completely defleshed at the time of cremation. Finally, in pit 954 inside the house, two vertebrae (thoracicae, lumbales) and a fragment of a rib were found. The thoracic vertebra was only partially calcinated, with black patches internally and externally. It had serrated cracks, and the lumbar vertebra had helical fractures. This strongly suggests that they were cremated fleshed.

The dog bones in 1106 are quite interesting. All evidence points to the fact that these are the cremains of a single complete dog. All parts of the body are well represented, including large portions of the jaw bone, anterior and posterior extremities, paws and the torso (Fig. 10.17). There is no variation in size, nor any duplicates of bones suggesting this is more than one dog present. Compared to the human bones in 1106, the dog bones are not as well cremated. A piece of the occipital bone is still completely blue-black, and the interior of the jaw bone in particular is still only partly calcinated and partly blue. The long bones of the legs are more calcinated, but still quite grey both externally and internally, and some bluish coloration still exists on a shaft bone. The thoracic bones are the least well cremated, several vertebrae from the neck area are still blue-black or at least blue-grey. Parts of the pelvic bone are more completely calcinated, though. One of these pelvic bones has extensive helical fractures, as does the jaw bone and the thigh bone. The upper arm bones, and parts of a shin bone, also have some helical fractures. Transverse serrated cracks are common (Fig. 10.18). The full picture, then, is wholly consistent with a complete body of a dog, probably very recently dead, cremated in full on a pyre.

Some interesting questions arise from the appearance of the dog bones in 1106. Albeit larger than the dog bones found in the mortuary house, this dog would certainly have been smaller than a German Shepherd, perhaps similar in size to present day Spitz dogs. It is striking then that the fairly small body was not more calcinated. One possible explanation is that it was cremated separately from the human bodies on a smaller and less carefully attended pyre. Or, perhaps it was placed on the main pyre at the end of the
ceremony. It is also possible that the canine body was very fresh at the time of cremation, perhaps killed then and there, and that the human bodies had become a bit more dehydrated in the period between death and cremation.

SEAL

Seal bones have a rather peculiar appearance, as they belong to mammals readapted to a life in the water. The paws are extremely compact with hardly any cancellous bone, and with anatomical features not really found on land mammals. The skull is also different in structure and form, and the temporal bone is very compact and conspicuous in osteological materials. The vertebrae tend to be large and the ribs are characteristically rounded. Seal bones are therefore not only often well preserved compared to many other species, they are also fairly easy to identify. Still, the bones of the main body (ribs, vertebrae and pelvic bones) would probably become very fragmented, almost destroyed, if a more or less complete body was cremated. The seal has a large reserve of fat (blubber) that will certainly act as fuel if it is heated to the right temperature. Flippers and skulls on the other hand mostly have just a layer of skin and fur, and should not crack and fracture to an extreme degree if incinerated.

Considering this, it is interesting that so few seal bones could be identified in the features containing human bones at Bollbacken. At the mortuary house, part of a thigh bone (femur) was found in the lower floor layer, and part of a shin bone (tibia) in the upper floor layer (Fig. 10.19). In the ditch, a phalanx from a posterior flipper was identified. These bones were almost calcinated, though they had some grey colour externally and internally. Helical and curved fractures on all the bones and delamination of the phalanx strongly suggest that they were all burnt fresh. The still black articular surface of the shin bone indicates that at least this bone was still fleshed and joined to a thigh bone when it was cremated.

It is worth pointing out again that bones do not begin to calcinate until the soft tissue surrounding them is more or less completely incinerated. Cooking a carcass, or parts of a carcass, means stopping well before the flesh is heated to 100ºC (preferably no more than 60-80ºC for most kinds of meat). Anything above that will be practically inedible. A normally prepared piece of food will therefore not result in even visibly burnt bones, much less wholly calcinated ones. However, disposal of food remains can often entail putting them on a hearth. Finding cremated animal bones is then technically not evidence of cooking food, at the most it is evidence of disposal of leftovers. Evidence of the complete incineration of a fleshed animal bone should not be treated as the result of preparing food – the meat in question would have been nothing but char by the time the bone was more or less calcinated. Finding almost completely calcinated seal bones from fleshy parts of the body that seem to have been cremated still surrounded by flesh/fat therefore suggests they were more than mere leftovers of a meal for the living.
Only three seal bones have been identified from 1106, though there could have been more among the smaller fragments of course. These include part of a vertebra from the neck (cervical), and parts of an elbow bone and a thigh bone (right side). They were all almost completely calcinated. The vertebra had helical fractures, as did the thigh bone which was also partly delaminated. The elbow bone had some curved fractures and transverse serrated cracks. They were certainly burnt fresh, and it is fairly likely that they were cremated fleshed as well.

OF DOGS AND SEALS

It is striking how differently the bodies of dogs were treated to those of seals. If anything, the treatment of dogs at Bollbacken seem to be more similar to that of humans than of other animals. Similar concepts can be found at other Pitted Ware sites such as Korsnäs (Södermanland), Jettböle (Åland), and Hemmor (Gotland), where the body parts of dogs have been divided, sorted, defleshed and deposited with human body parts (chapter 9.1). Should we interpret this as evidence that the Pitted Ware people placed dogs and humans in the same conceptual category? I think this would be going too far – there are several telling differences between how bodies of dogs and humans were treated. For instance, there is no indication that all dogs were treated in this manner, and unlike in Mesolithic times when dogs could be found in single burials, this has not been identified on any Pitted Ware site (cf. Evans & Welinder 1997). In fact, the single burials on Gotland often contain animal bones, but only rarely dog bones with the exception of beads and pendants fashioned from canine teeth.

The almost complete cremains of a dog found in 1106 do resemble those of several of the human individuals found in the same pit, being cremated fleshed. This is in contrast with the few seal bones found in the bone pit, that more closely resemble what might be interpreted as a ‘food offering’ of pieces of meat on a fire. However, the dog bones are less well cremated than the larger human bodies, their appearance suggests an extremely fresh body (newly killed?) unlike the human ones, and there is only one dog included not several in different stages of decomposition. The overall impression is therefore that while dogs were treated differently from seals, they were treated almost but not exactly the same as humans, at least in this specific context. This mirrors the diet analyses of dogs found in Pitted Ware contexts at Korsnäs and on Gotland, where they were shown to have a very similar, though not quite identical, diet to that of the humans at the same site (G. Eriksson 2003b; Fornander et al. 2008). Dogs often eat scraps and leftovers of course, but the dietary analyses show that they must have been allowed some seal meat, and not just fish that might have been a more regularly occurring food. Dogs were not kept apart and on a special diet to separate them from humans in Pitted Ware society.

Dogs are many things to many people: they can be guardians, hunting partners, friends, comfort and food. They ‘speak’, have an innate inclination to be social (part of a pack), and understand sounds and gestures to such an extent that we humans find it easy to project our own feelings and intentions on them. These are the very tendencies that
make dogs both lovable and dangerous to humans, as they seem to blur the distinction between what is human and what is not. Their superior smell and hearing also give them an air of the supernatural at times, so it is not odd that many cultures view dogs as potential guides into the otherworld. The Huron of North America, who practiced horticulture and hunting, used dogs as hunting companions but apparently ate them as well. The consumption of dog flesh seems to have been restricted to ceremonies and special feasts, such as the Feast of the Dead. The Huron practiced secondary burial practices where the dead were disinterred after about a decade, cleansed of any remaining flesh, and brought collectively to an ossuary (see chapter 12.1). The souls of dogs were also said to travel to the village of the dead, which lay in the direction of the setting sun (Trigger 1978:374f, 382). It is possible that the Pitted Ware people viewed dogs in a similar manner, as guides and guardians of the souls into the afterlife.

The seal is an animal that has often piqued the imagination of humans. A sea dwelling mammal, it was referred to in Scandinavia in historical times as the ‘sea-dog’, partly because of the shape of its head and partly because of the fact that they utter barking sounds (Brethm 1882). The seal is a curious animal, and the young individuals can be drawn to music and human activities. The discharge of excess salt water through their eye canals makes it appear as if they are capable of crying, a behaviour otherwise considered uniquely human. There is little doubt that the Pitted Ware people, who based much of their diet on these animals and probably used much of their skins and bones as well, treated the remains of these bodies according to culturally prescribed rules. The skulls especially were handled differently (Österholm 1997b; Storå 2001a:48f). Although the seal bodies and bones were not treated in the same manner as the human bodies and body parts, there is a contextual connection between them on most sites. Jan Storå has suggested that the peculiar clay figurines found on Åland are actually anthropomorphic. He points out that almost all figurines found on Pitted Ware sites are zoomorphic, and that the ‘anthropomorphic’ ones have strong animal characteristics (Fig. 3.1:e). In fact, they may be interpreted as intermediaries, with traits of both human and seal. At Jettböle most of these figurines were recovered in the same area as the deposited seal skulls (Storå 2001a:50f).

Human, dog and seal seem to be linked together in death as well as in life – partly joined and partly separate. For the Pitted Ware people seals were both a way of life and life itself, as their meat constituted much of the sustenance. Scientifically speaking, what we eat creates us, both the chemical components and the energies gained from our food help to build and create our bodies, bones and flesh alike. Although the science of this has been unknown to people for a long time, many have still made this connection in cultural terms. For this reason, perhaps, food is and always has been circumscribed with taboos, rules and regulations: what is and is not considered edible, when it can be eaten, and with whom (Janik 2003; Pearson 2003; Haaland 2006; 2007; Mills 2008). It is not always the main source of food that is the most culturally important and ritualized (e.g. Evans-Pritchard 1969; Hamilakis 1999). In the case of Pitted Ware culture, however, there is
ample evidence that seals were given special treatment even after death. On several sites remains from seals deposited as food or food offerings with human remains suggest that there was a very conscious association between the consumption of seals and cultural identity. I have argued elsewhere that dogs were perhaps considered intermediaries not just between humans and animals in general, but between humans and seals especially – and by extension between land and sea, life and death (Larsson 2009a:123).

**Broken Bodies at Bollbacken**

Comparing the three features/structures with the largest amount of human bones, the mortuary house, the bone pit and the cooking pit, reveals some telling differences (Fig. 10.20). The bone pit stands out as the one with far more bone than was found in any of the others. It also contained the remains of at least four individuals. The cooking pit had remains from at least two individuals and the mortuary house had only a small amount of bone altogether, especially considering there are several features involved. It is impossible to know whether the bones come from one person or a dozen people, and whether they represent one event or many over a period of several generations. They also differ with regard to the representation of body parts. The bone pit has the kind of representation one would expect if most of the bodies had been interred here. The relative amounts of human bones from the skull, torso, extremities and hand/foot bones compared to that of the one dog found in the same pit, show remarkable similarity.

Considering the small size of the pit, the compact nature of the bone assemblage, and the preservation of the bones it is likely that they were deposited in a container of some sort – a leather bag for instance. The total weight of bones is far too little for three adults, one juvenile and one dog: it should be almost twice as much. Some of the bones could have been destroyed over the years, others could have been left at the pyre. However, many small bones are present, including ones from the hand and feet, and one may legitimately surmise that it was not just the largest bones that were gathered at the cremation site, but that there was a real effort to retrieve most of them. It is also not too farfetched to interpret the lack of a large quantity of bones in the pit as deliberate. The living probably never intended to deposit all the bones from the four dead humans and the dog in the small container.

The other pits could support this interpretation. Most of them seem to contain only a fraction of a full body. Although pit 645 by the shore was apparently disturbed several times, it is interesting that skull bones dominate for both the child and the adult. This is in contrast to the mortuary house where far too few skull bones were found. The three small pits with only one or a few bones deposited contained in one case a cranial bone, in another a hand bone, and in the last a few pieces of long bones from the upper and lower extremities. The large pit 157 also had only a few bones identified as human, representing the skull, the torso and the extremities. While we should not read too much into the
contents of every pit found at the mortuary area of Bollbacken, the general impression is still not completely chaotic. Body parts from more than one individual are mixed together, and body parts are also dispersed and deposited in small pits. Either a lot of the remains have been removed from Bollbacken, or the bones we find here initially came from another location. Since the cremains in 1106 are so well preserved I consider it unlikely that they were transported over a long distance, or that they have been considerably handled after cremation. These bodies were probably cremated at or near Bollbacken and deposited shortly thereafter. It is possible that the defleshed individual in 1106 was brought from another location to be cremated with the others.

Pit 645 has been designated a cooking pit and the bones have been interpreted as being defleshed in it. This is highly unlikely. Temperatures of 700-800°C are needed to cause the complete calcination witnessed in most of the bones, and this kind of heat can only be generated by the flames of an open fire. That is not to say that the pit itself was not a cooking pit once, and it is possible that the cremated bones found here are a secondary deposit. An alternative explanation could be that the human bodies were first cooked/prepared in the cooking pit, and the bones were then burned in a fire, and finally reinterred in the pit. The fact that so many of the bones appear to have been fully cremated when still fresh contradicts this interpretation, since they would then have cracked and fractured more like green or even partly dry bones. Also, the fact that mostly skull bones were found in the pit suggests this is not mere ‘refuse’, but sorted and selected body parts.

The mean weight/nisp of the human bones found at the mortuary house is 1.7 g, as compared to 1.9 g in the bone pit and 2.3 g in the ‘cooking pit’. The ditch contained only 33 identified human bones: three were from the skull, one was a piece of a vertebra, and there were only two fragments of larger long bones. In contrast, eleven bones came from the hands and feet, and the remaining sixteen were fragments of ribs. Hand/Feet bones are small, and ribs are brittle and easily fragmented. The overall impression is that the cremains found in the ditch are ones that were missed or overlooked when the bulk of the bones were removed at some point. The process of burial therefore moves through several stages:

- Death
- Period of storage
- Retrieval (possibly defleshing)
- Cremation
- Burial
- Retrieval
- Reuse/sorting/dispersal/reburial

The re-deposition of bones seem to have been a deliberately vague practice aimed more at dispersal and mixing than containment and interment. The small number of bones found
in the other pits could have been scattered across the area, and could then have fallen into holes as posts were removed. Or they may have been intentionally deposited as just one or a few bones in that particular pit.

Either explanation presents a picture of a mortuary ritual aimed at breaking up and dispersing body parts, and mixing them together. The result is burial without specifically marked individuals – without specifically marked places even. If anything, this burial practice focuses on the absolute opposite of ‘individual’ and ‘singular’, and can therefore seem both alien and disturbing to us today. There are anthropological analogies that can be helpful in trying to understand the fundamental aims of these practices, and these will be discussed in chapter 12.
V

Synthesis
In chapter 7 and 8 I discussed the pottery craft of the Pitted Ware and Battle Axe culture respectively, based on the operational sequence. In this chapter I will compare them with each other in order to discuss the deeper conclusions that can be drawn from the results. Are there similarities between the two pottery traditions despite the differences in physical appearance, or are the differences in fact even greater beneath the surface? This question also connects directly with the perceived social role of the potters within the wider community and their part in creating, shaping and visualising cultural identity both when carrying out their craft, and by producing objects used by members of the group.

In chapter 11.1 I will try to sum up what the pottery can tell us about potters, social structure, cultural practice and ideology within the Pitted Ware and Battle Axe culture. Within each, pots were made, used and disposed of in accordance with very different sets of principles. For the Pitted Ware people, pots were broken, fragmented, dispersed and inverted. Their final resting place not so much in flat-earth burials as on the settlements, close to the sea. In contrast, the Battle Axe people had a more frugal use of their vessels, and very little is left at settlements. Old vessels were given new life in new ones, and beakers were often associated with the burials.

At the end of the Middle Neolithic something new appears: ‘hybrid’ vessels displaying technological and/or stylistic traits of both crafts. Chapter 11.2 presents these few vessels and discuss what they might reveal about the changes that both cultures were undergoing at that time. Remarkably, these pots give us clues to the fates of individuals living and interacting during that time. Some even paints a picture of the networks that were undoubtedly established across the Baltic Sea region, and which helped usher in the Late Neolithic.
11.1 Breaking and Making Pots

In this chapter I sum up and compare what we have learned about pitted-ware and battle-axe pottery in South Sweden, first in terms of how they were made, and secondly how they were disposed of. Both aspects reveal strikingly different practices in the two groups.

Making Pots: co-existing craft traditions

EASTERN CENTRAL SWEDEN

This is an interesting region to begin the comparison with. The two groups are fully established here during the whole Middle Neolithic B, with both settlements and burial remains. Even though the Battle Axe culture is mainly found in the inland, the distances contemporary Pitted Ware settlements on the islands was often quite small. Artefacts also point to the fact that they were often in contact with each other. However, pitted-ware pottery is never really found on Battle Axe sites, unless they represent a decidedly earlier settlement phase. In contrast, many Pitted Ware sites have yielded battle-axe beakers. It should be noted that these are most often associated with the latest phase, preferably Fagervik IV pottery, and the beakers in question also belong to the younger groups (GH, J, K). Despite the proximity in time and place, the operational sequence shows little overlap between the crafts.

Virtually all battle-axe beakers analysed by thin section microscopy are tempered with either grog or granite, or both. The two battle-axe sherds that did contain burnt bones were found in Västmanland, at a Battle Axe settlement and a Pitted Ware settlement respectively, only a few kilometres apart. In contrast, the pitted-ware vessels are tempered with a greater variety of non-plastics: granite, quartz, sandstone, sand, calcite and burnt bones. No less than 84% of the sherds analysed contained calcareous temper in the form of bones or calcite, or both. Not a single one of the 56 sherds analysed contained crushed burnt clay or pottery (grog). Moreover, the different temper materials were mixed together in various ways creating an even more complex picture of the craft traditions of the Pitted Ware potters. These different ‘recipes’ seem to depend very little on either regionality or chronology – sites only a few kilometres apart and dated to the same part of the Middle Neolithic B have apparently local traditions, perhaps even individual traditions for each potter, dictating the choice of temper. Battle-axe pottery, on the other hand, is almost exclusively tempered with grog at the outset, and later types are mainly tempered with a combination of grog and granite. Grog seems to become less commonly used in later types; sometimes only a few grains of grog can be discerned in a thin section, and sometimes only granite.
If temper is varied in pitted-ware, clay selection is all the more constant. From the Middle Neolithic A onwards, virtually all vessels in Eastern Central Sweden were made using fine clay. The exceptions are few and far between. In the case of typical pitted-ware (Fagervik III/IV), only four sherds out of 56 were made with medium-coarse clay. One was the single pitted-ware sherd analysed from Fagervik, Östergötland. Two of them were undecorated sherds found at Bollbacken, made out of calcareous medium-coarse clay tempered with sandstone. The fourth was decorated with herring-bone motif applied with comb stamp, and was found at the late Pitted Ware site Tibble in Uppland. All three sites have in common a minor occurrence of late battle-axe pottery of both typical and atypical appearance (see chapter 11.2).

In contrast, of the battle-axe sherds analysed from Eastern Central Sweden, almost half were made with coarse or medium-coarse clay. As noted in chapter 8.1, there are indications that this variation is present from fairly early on: although the Östra Vrå beakers were made with fine clay, the Barrsjö beaker had medium-coarse clay and the Vallby beaker from Närke was made with coarse clay. It is not possible to ascertain at this time whether this variation is due to local and/or regional differences. A possible reason for the variation might be that the preference for coarser clay is connected to an established craft tradition in Southern Sweden with roots going back to the Funnel Beaker culture. However, coarse clay is also commonly used on Gotland and Öland, and unfortunately it is not clear at this time what the preferences of the contemporary West Coast potters had. The conservative inclination of potters tends to make them select clay which has the ‘right texture’, i.e. that with which they are familiar (see chapter 6). It is certainly interesting that coarser clay is used so often when making battle-axe pottery in Eastern Central Sweden, when at the same time no similar tendency can be noted among the contemporary pitted-ware vessels.

THE LOCAL AND REGIONAL VS. THE SUPERREGIONAL

Technological analysis of pitted-ware and battle-axe pottery offers insights into more than the ‘recipe’ for making ceramics within each community of practice. It can also help us learn more about the structuring of these communities, and how they organised the transmission of know-how between generations. Stylistic aspects and evidence of the use of vessels is also important to include in such an analysis.

The potters of the Pitted Ware culture created vessels that in general shape and decorative composition display remarkable similarities, from Gästrikland-Dalarna to Gotland and Öland, and to Skåne-Blekinge. Even so, no archaeologist has as yet been able to define a typology based on the composition of these decorations, mainly due to the great variation allowed in the combinations of different patterns. The basic pattern is one with horizontal bands made up of incisions, comb stamps or a great number of different single stamps, combined with one or several rows of large pit impressions. More geometric designs are also present on some. The vessels might have slightly different necks in terms of angles and height, but the clearly marked carinated shoulder and mostly
Chapter 11

conical body shape is another homogenous trait. There can be no doubt that at least the potters practicing their craft from Gästrikland all the way to Jonstorp in north-western Skåne were in accord as to what a proper vessel should look like.

That being said, there is a clear regional division within this community that is shown in three respects: the tool used to apply the large pits, the use of comb stamp and the use of calcareous temper. A fourth indication might be the prevalence of certain forms of rim shapes, but this needs to be studied further. The southern group of pottery which includes Skåne, Blekinge, southern Öland and the coast of Småland up to Oskarshamn is just as likely to have large irregular/rectangular pits as conical ones. Comb stamp occurs but does not dominate, and calcareous temper is very rare. In contrast the northern group of pottery, which includes Gotland and to some degree northern Öland, has almost exclusively round/conical pits, and both comb stamp and calcareous temper is very common. There are also regional traditions present that both adhere to and transcend the two super-regional groups. The pitted-ware found at the two Pitted Ware sites on Öland, Köpingsvik and Ottenby, highlight this. Köpingsvik conforms to the northern group and Ottenby to the southern, however, technologically they also have a lot in common. The temper materials chosen often include natural sand, as well as several vessels that have no added mineral temper at all. At both sites, the absolute majority of the pots were made with coarse or medium-coarse clay. The few microscopies of older pottery on Öland indicate that these technological choices might be rooted in a previously established local tradition.

The pitted-ware from Ire on Gotland was mainly made with a local coarse, calcareous clay tempered with calcite. In Eastern Central Sweden calcite and burnt bones are often used as temper, sometimes on the same site, and even mixed in the same vessel (e.g. Bollbacken, Fagervik). On other sites calcareous temper can be combined with crushed stone, such as granite, sandstone or quartz. The variation in temper combinations is contrasted with the prevailing use of exclusively fine, mainly non-calcereous clay. In this latter respect, pitted-ware in Eastern Central Sweden is a continuation of the regional pottery traditions of the Early Neolithic and Middle Neolithic A.

The sub-regional traditions are further divided into local practices found at individual sites – perhaps even within individual settlement assemblages. Vessels might be tempered with one, two or even three different materials in almost any kind of combination. Pitted-ware is fairly homogenous in terms of general shape, method of shaping, and firing. Choice of clay varies with the sub-region, and temper materials vary both regionally and locally to a significant extent. The lingering impression is that the Pitted Ware pot should resemble a general type, but that apart from this there are regional, local and possibly even individual tastes and choices. Creative solutions were permissible, perhaps even encouraged. It is likely that each community had more than one active potter and that these were joined together by sticking to an idealized form and design, and retrieving clay from mostly the same communal sources. However, the variations of temper recipes, rim
shapes and decorative designs testify to the fact that the finer motor habits involved in the actual process of making these vessels were not rigidly controlled.

It seems the operational sequence was determined partly by already established regional craft traditions, perhaps strengthened by more frequent contacts between certain settlements. It may in part have been situated in a more informal learning structure, where young people participated in the process of making vessels with a close relative. Based on the great variation present not just in the technology but also the decoration, it seems unlikely that this learning experience was tightly controlled or that proper behaviour was enforced by the mentors. However, it is important to keep in mind that there was not complete freedom in either creating shapes or constructing new patterns of decoration. The end product should at least visually be identifiable as 'pitted-ware'. The variation present even within a single settlement could suggest that many different people in the local group were involved in making pottery, and that new potters moved in after marriage without being pressured to change too much of their own practices. If that is the case, the northern and southern pottery groups might represent primary marriage networks within which most, though certainly not all, pottery-making spouses moved. This is a hypothesis that might be further explored by studying other parts of the material culture, such as stone craft.

In contrast, the potters of Battle Axe culture operated within a differently structured network. The craft technology is decidedly homogenous, with only small regional differences, such as the use of sandstone/quartzite and natural sand in a few vessels in Southern Sweden. The pottery styles are also far more structured, a set pattern adhered to in most cases with only small variations in application techniques (cord stamp or comb stamp), or combination of elements. The fact that changes in the decorative patterns occur all across South Sweden in much the same way is another telling aspect, although some groups might be more common in certain regions (F-beakers in the northern parts, H-beakers in the southern). The homogeneity in both technology and style is especially apparent in the earliest pottery. This suggests that the early potters were fairly few at first, that they placed just as much emphasis on the operational sequence as the visual appearance, and that they had a lot invested in the social role of potter. This would have meant that teaching the craft to new potters, whether children or adults, also communicated social ideals of proper respect of authority and tradition. It was not the potter's prerogative to innovate or experiment – a successful potter was one who learnt how to follow and perform the stages of the chaîne opératoire properly.

As new generations took over and more potters were established at Battle Axe settlements some minor changes were allowed. Initially, these affected the visual appearance of the beakers more than the process of making of them. The wavy lines on the upper and lower parts were developed into broader elements, first wavy and then angular. Comb and cord stamps were introduced as application tools, although cord impressions continued to be used, especially in Eastern Central Sweden. The angular bands were allowed to cover the whole beaker, and to be broken up into separate angular
stripes and lines over time (H and J). What is striking is that the other early groups (E and D) also continued to be expanded upon in some way (into L and M). The diminutive bases were slowly replaced with the rounded bases. Innovation was only allowed within a narrow framework, building upon what was already established. Importantly, even though these new patterns are more removed from the continental and Finnish Corded Ware tradition than the earlier ones, they still occur on beakers from Skåne, Uppland and Västergötland, and the similarities between the regions are far greater than the differences. This suggests a craft community with a strong sense of identity and social position, a thriving network, autocratic teaching structure and observance of common principles.

By the third phase of the Battle Axe culture some loosening up of the craft seems to take place. The J group might benefit from being divided into two sub-groups, one with horizontal patterns, the other with vertical ones, but mainly it is a clear continuation of the GH-vessels. K-beakers are in all probability influenced by the contemporary Bell Beaker tradition on the continent, and use the same logic of oblique strokes and lines creating zonal division of patterns. Still, in many cases the beakers are no longer as well made: thicker walls, coarser comb stamps, less careful application of the decorations and less elaborate patterns altogether, covering the whole vessel without apparent differentiation. Fewer beakers seem to have been fired in reduced atmosphere and grog temper becomes less and less common. The technique of coiling rather than pinching might also to be more common than before. In short, the Battle Axe potters of the late Middle Neolithic B include practices more commonly found among the Pitted Ware potters. Still, the battle-axe beakers continue to be distinctly different from the pitted-ware vessels, even in this late phase. There are, however, only a few examples of late beakers that seem to be more consciously ‘hybrid’ in appearance and/or technology. I will return to these in chapter 11.2.

As discussed in chapter 8.2, I believe that the Battle Axe potters who made the first beakers in Sweden were taught the craft in another region – probably Finland. This is strongly suggest by the fact that the first vessels appearing on settlements and in burials differ in almost every technological aspect from both the Pitted Ware and the Funnel Beaker traditions. Learning what kind of temper to use, the shaping technique, as well as a completely new way of firing ceramics would have taken more than strong social pressures on established potters. It would have necessitated access to at least a few new potters well versed in the craft. Just as important is the lack of any early vessels imitating the corded-ware pottery, but made by an at least partially different chaîne opératoire. This tells us that these vessels achieved their social importance not just through their appearance, but primarily through their making. It also implies that these early potters came with more than basic technological know-how; that this knowledge was irrevocably connected with ceremonial, esoteric and perhaps ritual knowledge associated more or less directly with the use of the beakers. If the potter in the Corded Ware society inhabited a position that went very much beyond making a functionally important object, it stands to reason that this position was carefully guarded by the potters themselves. The teaching
process afforded many opportunities to instil this sense of the wider social importance of adhering to traditions as part of the craft. Integrating old pots into the new ones in the form of grog was a patently material way of expressing the potter’s role as a link in a long chain of potters.

One technical aspect in battle-axe pottery stands out as varied when all others are markedly homogenous: choice of clay. Unlike pitted-ware, battle-axe pottery can be made with anything from fine to coarse clay within the same region, even within the locality, despite all outward appearance of similarity. There are four possible explanations for this:

- The potters used whatever clay was close at hand.
- The potters used different kinds of clay depending on the planned function of the beaker.
- There were potters with different backgrounds moving into new communities who had developed a preference for certain kinds of clay and there was no apparent pressure to conform. If this were the case, it would suggest either that each potter had to manage the clay source individually, or that a community rarely had more than one active resident potter at a time.
- The vessels were actually made at a few potting centres with their own traditions, and traded/given as gifts to other communities/families. Heirlooms might also fall under this category.

Considering how rigidly prescribed most aspects of the pottery craft were within Battle Axe culture, I would consider the first suggestion the least likely. It is telling that both the Pitted Ware culture and the Funnel Beaker culture in Eastern Central Sweden used fine clay almost exclusively, so there could not have been a question of availability. It is also difficult to see how diverse functions could have been planned for vessels that looked very similar. Different coarseness of clay may be felt by a potter, but once fired it is not really apparent to the naked eye. The possibility that a few potters in each region supplied all other families with beakers is feasible, especially considering how sparse the pottery assemblages are at settlements. However, over time this would be more likely to create very clear micro-styles around the centres, and one would expect more homogeneity at least within the sub-region primarily served by the centre (cf. Dietler & Herbich 1989; Herbich & Dietler 2008). The fact that even early battle-axe pottery can be made with anything from fine to coarse clay suggests something else.

Although potting might have been a restricted practice, I would find it more likely that potters actually re-location at some point in their lives, for instance when getting married. Clay property is a very sensuous matter, connected to the child’s primary learning phase. Unless being actively pressured to adapt to a new kind of clay due to collectively prospected clay sources, or collectively processed pastes, the potter would be likely to seek out the type of clay she is most familiar with. After all, no one but the potter would really know or care what kind of clay was used unless the properties were markedly different. New Battle Axe communities were established partly or even mostly by local
peoples adopting this new way of life. The Battle Axe settlements apparently consisted of a single longhouse, so it is likely it contained only an extended family unit. In order to uphold the new social identity, connections with other Battle Axe communities and networks across regions were established with the help of marriages. If the potters changed residence after marriage and became the only potter in the new household, it would explain not only why the use of medium-coarse and coarse clay becomes more common over time in Eastern Central Sweden, but also the apparently rapid spread of a completely novel chaîne opératoire over large areas. Moreover, it would fit with the quick spread of new patterns and designs across all of the Battle Axe culture as well. For instance, tooth stamp was probably introduced as a tool first in Southern Sweden and then quickly spread to the other regions. However, the older tradition of cord stamp continued to be in use in Eastern Central Sweden despite this. This reveals the layers of interactions and networks at work beneath the surface.

The craft tradition of Pitted Ware pottery was also transmitted through a kinship network that reflected different levels of social interaction on a local and regional scale: the superregional scale is more evident in style than in technology, for instance. Within the Pitted Ware culture there was little in the way of a ‘potter identity’ linked to the chaîne opératoire, and considerable local and individual liberties were allowed both in the technology and the decoration of the vessels, within a broadly defined framework. Whether there was a specific social position linked to pottery making at all, or if most members of the group made pottery, needs further study. The emphasis was instead laid on the use of pottery within the community, up to and including the deposition of broken vessels. I will now discuss in more detail the various ways in which the Pitted Ware culture and the Battle Axe culture used not just their vessels, but also the pieces of them.

**Breaking Pots: death vs. rebirth**

One’s condition is always confronted with change. A broken calabash or pot means that some kind of change has taken place. But it doesn’t mean a break with tradition. It just means change.

_Azure, interviewed by Fred T. Smith (1989:64)_

Pitted-ware and battle-axe pottery differ in terms of both technology and social structuring of the craft. But there are also marked differences in the life of pots, and even more so in the ‘death’ of pots, within the two groups. While pottery plays an important – even central – part in each of the two societies, it does so in markedly different ways.

**Pitted Ware Culture**

The settlement materials are rich in pottery, to a degree unparalleled in the Neolithic. The sizes of the vessels vary from fairly large to very small, but there is no notable difference in the shape of the vessels, nor in their surface treatment or temper composition. Even the small ‘cups’ that are between 4-9 cm in height are occasionally shaped as miniatures
with carinated shoulders and decoration. Those that lack shoulders instead resemble the conical base present on most of the vessels. This similarity in shape between the mini-vessels and the bases is interesting since it seems that bases, in effect ‘decapitated’ pots, are often deliberately deposited intact in the settlement layers (Fig. 11.1). Complete bases have been found all across the Pitted Ware culture area: at Södra Mårtsbo in Gästrikland; Korsnäs and Sittesta in Södermanland; Jettböle on Åland; Västerbärs, Ajvide and Visby on Gotland; and Siretorp in Blekinge - to name some (Bagge & Kjellmark 1939; Janzon 1974:104ff; Olsson et al. 1994; Burenhult 1997; Andersson 1998; Götherström et al. 2001; Norderäng 2001; Björck et al. 2004; Norderäng 2004; Holm 2006:136f; Papmehl-Dufay 2006:54ff; Kihlstedt et al. 2007; Norderäng 2007:19). On Södra Mårtsbo, Ajvide and Sittesta the lower part of vessels were deliberately deposited upside-down, and at Jettböle a complete vessel was found apparently deliberately placed upside-down (Stenbäck 2003:157).

![Fig. 11.1. Vessel bases often appear in Pitted Ware contexts, generally placed upside-down, both in burials at Ajvide (a) and Västerbärs (b) on Gotland, and on settlements such as Sittesta in Södermanland. (Stenberger 1943:abb 29; Norderäng 2001; Kihlstedt et al. 2007)](image)

In fact, although there are a few cases of complete vessels (Bagge & Kjellmark 1939; Forssander 1941:fig. 8), pitted-ware is mostly deposited as fragments or as incomplete parts of pots. The fragments and sherds are often found in concentrations close to the contemporary shoreline (e. g. Welinder 1970; Lofstrand 1974; Olsson 1996b). Only the miniatures are regularly found complete and unbroken. Mini-vessels and small cups occur
on numerous Pitted Ware sites in eastern Southern Sweden: e.g. Ringsjön in Skåne; Pysslingebacken and Siretorp in Blekinge; Säter in Östergötland; Brunn, Korsnäs and Sittesta in Södermanland; Bollbacken in Västmanland; Brännpussen, Lindskrog and Åloppe in Uppland; Ajvide and Västerbjer on Gotland; and Södra Mårtsbo in Gästrikland – to name a few.

A fundamental difference between the uses of pitted-ware and battle-axe pottery appears in relation to burials. Whether one looks at the flat-earth burials of Gotland, Öland or the mainland, it is immediately obvious that the prodigious depositing of pottery does not involve the Pitted Ware graves. Some burials do include a miniature/cup, though as is clear from Lindskrog, that vessel is not necessarily placed on the same level as the deceased, but rather in the fill material (Lindholm 2003). At Södra Mårtsbo a rectangular feature marked by stones on three sides contained two poorly preserved molars from an adult human. At one end a vessel, complete except for the missing neck and rim, had probably been placed upside-down. The sandy soil inside it contained partially burnt bones from seal and various types of fish (Holm 2006:136f). Bases, often deliberately placed upside-down, have been found in a few burials at Ajvide and Västerbjer as well (Stenberger 1943:99ff; Norderäng 2001; 2004; 2007:19).

Sherds of pots may also be included in graves, but again they are more likely to occur in the filling than on the same level as the other burial gifts. In one grave at Köpingsvik, the dead had a pottery sherd with a drilled hole under the rim placed by the pelvis (Papmehl-Dufay 2006:102f). The hole might have been drilled as a way of repairing a broken vessel, but it is interesting that the rest of the pot did not seem to be part of the otherwise well preserved burial. The young child found in a grave at Korsnäs had no discernible or preserved burial gifts apart from a single undecorated pottery sherd. At the same site a grave with a partially preserved skeleton of an adult had pottery sherds in the filling, but no objects otherwise associated with the body (Olsson et al. 1994:21, 70).

The practice of fragmenting or ‘killing’ objects has of course been discussed by archaeologists in regard to many phenomena: from *pars pro toto* in wetland offerings during the Iron Age (Fabech 1991), to smashed drinking cups in Aegean Bronze Age tombs (Hamilakis 1998). John Chapman (2000) discusses the subject in depth focusing on Neolithic and Copper Age Balkan. He points out the inherent interrelation between parts and whole, unit and set, as seen in the treatment of both material culture and human bodies. There are many potential explanations for finding broken objects at archaeological sites. The simplest reasons might be that they were either broken accidentally when in use and therefore discarded, or that they were originally deposited whole and later fractured due to human/animal activities, or other natural post-depositional processes. However, even objects that were broken unintentionally might be treated in a ritualistic manner if there was a perceived power or danger by it being in an incomplete state (cf. Gosselain 1999:212).

Intentional breakage can have many reasons. Some objects must be at least symbolically damaged before they can be taken out of circulation, or they are routinely
broken once their purpose is fulfilled. Others are chosen for special destruction based on seasonal activities or unique events such as death, misfortune, need for luck, fortune telling, weddings etc. For instance, among the Gurensi and Kassena of Ghana a woman’s eating bowl is a symbol of her persona, and is therefore ritually broken at her funeral. The purely domestic vessels stored in the woman’s room were also broken at the time of her death. They had no specific ritual importance in life, but their identification with their user was such that they could not be used by anyone else (Smith 1989:61). Traditional Hindu practice is to break all cooking utensils after a death, or any kind of ceremonial pollution (Nicklin 1971:19). Even in our modern Western culture, some objects can be so strongly associated with a deceased that no one can bear to use them – they must be either destroyed or given away. The Sirak Bulahay of northern Cameroon place sherds of broken household vessels as offerings along the road side, and the broken off necks can be placed at sacred sites after the vessel has been used to trap malevolent spirits (Sterner 1989:458). African-American plantation workers in the South of the USA used to place broken pottery on graves as a symbolic representation of a life ended, broken. In contrast, among the Asante intentionally breaking a pot was considered incredibly dangerous, and potentially life threatening due to the perceived symbolic equivalence between a pot and a woman’s womb, which is also a container of fertility (Barley 1994:112). Breaking need not necessarily be associated with death or danger of course, it could simply symbolise the end of one phase and the beginning of another: plates are traditionally broken at Greek weddings for instance. At Jewish weddings the groom breaks a glass as an act of commemoration of the destruction of the Holy Temple in Jerusalem.

A broken object can then be deposited, or the fragments can be intentionally separated and dispersed. The parts might be discarded without any second thought, or they can be deliberately removed from the community by being placed in water, spread to the wind, carefully buried or hidden etc. The fragments may also continue to be part of the community, kept by members of the group and passed around as keepsakes, material memories and/or inherently powerful objects. In fact, some objects may not become powerful until they are fragmented. For instance, the Gurensi use large pottery sherds to protect/hold down offerings and sacred materials at their ancestral shrines:

The broken pots help keep the shrine offerings from being blown away, but they are special; they involve the Earth in these shrines to our ancestors. Without the Earth we could not exist.

The potter Atagdole, interviewed by Fred T. Smith (1989:61)

Dividing an object, or indeed a body of a human or an animal, can result in the creation of a new and powerful category of possession, just as dividing a meal and sharing it between individuals creates new bonds and relationships between the participants.

Metaphorical reasoning in relation to pottery is easy to imagine: Building a ‘body’ where earth mixed with water acts as the ‘flesh’, stabilising it with a ‘skeleton’ made up of temper, giving it permanence through an ordeal in fire. And then, filling it with produce...
like food or drink which helps sustain the group and its members. Several cultures do
make a conscious connection between ceramic vessels and human bodies, or even specific
members of society (e.g. David et al. 1988; Smith 1989:61; Barley 1994).

[V]essels are often equated with persons while the manufacturing process is metaphorically
associated with other kinds of transformation processes, either natural (gestation, sexual
maturation, menstruation, germination) or cultural (care of new-born, initiation, wedding,
funeral)

(Gosselain 1998:91).

However, this kind of metaphor does not necessarily play an important part in every
pottery-making culture’s cosmology. In regard to Pitted Ware culture, however, I believe
the metaphor is not just valid but consciously embraced by the people themselves. Pitted
Ware vessels had many uses, from cooking various kinds of food to storing water and/or
dry goods, and they come in all sizes, from small thimbles to large containers. I do not
doubt that handling of vessels in one way or another was a common daily practice by
many members of the community. However, I would also suggest that within the Pitted
Ware culture, clay in general and pottery in particular, carried strong, conscious
connotations of bodies beyond mere figurative speech. One clue is the prevailing
production of clay figurines.

The meaning of the anthropomorphic and zoomorphic clay figurines has been
discussed many times, with interpretations ranging from the religious to purely mundane,
such as toys or a way of testing firing clay etc. While reaching a conclusion on this matter is
virtually impossible, it is important to note that while clay beads and miniatures of
inanimate objects such as battle axes existed in the Funnel Beaker culture, clay objects
resembling living beings are conspicuously absent from the other Neolithic cultures, or
indeed most other periods. It is a cross-cultural trait that any imitation of life carries
hazards – or potentials – and is often circumscribed with powerful taboos. Imitation of
life in a plastic material, made up of earth and water and given permanent shape through
fire, certainly comes with many symbolic overtones. Indeed, several cultures have creation
myths which state that the first humans were made of earth or clay by the gods (Eliade

Unlike both the Funnel Beaker culture and the Battle Axe culture, Pitted Ware culture
seems more open to the possibility of reproducing actual representations of at least
animals, and sometimes humans (or human-like figures). Not just in clay, but to a lesser
extent in bone and stone as well. This strongly connects with practices in the East Baltic
Region: Finland, the Baltic States and parts of Poland. It also has strong links with Early
and Middle Neolithic Slate cultures in Northern Sweden, where depictions of wild animals
and occasionally humans can be found on slate objects and rock carvings/paintings. In
contrast, Funnel Beaker culture and Battle Axe culture use mostly abstract decorations on
clay, bone and stone – though possible ‘eye designs’ can be seen on some megalithic
bowls. Inanimate objects or possible solar/lunar representations are created, but not
PART 5

anything like the small clay figurines or animal headed ‘axes’ of Pitted Ware and Comb Ware cultures. In fact, within the Battle Axe culture even the animal tooth pendants are mostly ‘fake’, being fashioned from bone rather than using the actual teeth.

In the light of all this, the use of burnt bones as temper is extremely interesting, and I doubt the reason was purely functional, even though the material was easily crushed and readily available. The use of crushed calcite as temper might suggest that bones were just a reasonable alternative, and that nothing more profound was implied or perceived. However, there are some observations that suggest otherwise:

- The established association between living beings and clay objects as seen in the making of figurines.
- Bone temper is not spread all over the pitted-ware making area. Despite making similar pottery, and using it in an identical manner, some regional communities apparently resisted the use of this type of temper.
- Bone temper increased significantly over time, being by far the most common temper of the late pitted-ware of Eastern Central Sweden, but then ceases to be used almost immediately in the Late Neolithic.

While craft traditions within certain networks might have been responsible for the restricted distribution of the practice of bone temper, it still suggests that there was some kind of opposition among several groups to include broken parts of bodies when making a vessel. The fact that the practice ceases all but completely with the introduction of Late Neolithic pottery in Eastern Central Sweden, despite continuity in other aspects of the craft, strongly indicates that it was not perceived in completely functional terms.

Bone temper might have been part of the pottery craft in the south-western region of the Finnish Comb Ware culture at the end of the Early Neolithic: Uskela pottery (Ka III:1) is tempered with calcite and/or bone (Stenbäck 2003:69-71). Unlike the probably contemporary Sipilänhaka pottery (Ka III:2) from the same region, Uskela pottery commonly has several horizontal rows of large pit impressions, sometimes organized in the alternating ‘chess manner’ Timofeev noted as common on Fagervik II pottery (Timofeev 2000:212; Stenbäck 2003:71, fig 4:7). The Uskela type, like all Finnish comb-ware, lacks the shoulder and separate neck present on both Fagervik II and Fagervik III pottery, but there are still apparent similarities between Uskela and pitted-ware. The Pitted Ware pottery craft has a clear continuity back in time to the Early Neolithic funnel-beaker pottery of Eastern Central Sweden, both in design and technology. However, in the case of the Fagervik II style there are also increasing influences from the East in terms of anthropomorphic and zoomorphic figurines, ‘chess mannered’ pits, thickened rims, and the first cases of calcareous temper in Swedish pottery.

Although the task of making pitted-ware pottery might not have been shared by everyone in the community, I would still think that based on these premises it is likely that it would have been potentially open to most of those who showed an interest and
inclination. It might have been restricted by gender: the fact that some regional patterns in both technology and design emerge and continue to exist could suggest that the knowledge was primarily passed on through one segment of society, and that the patterns reveal regional marriage networks. The apparent technological variation within sites suggest that there was little in the way of strong localised tradition communicated through the pottery, where potters were trained either only within the settled group or had to retrain if they moved to a new community. More intra-site studies are needed however, especially on Gotland where the site Ire had an uncommonly uniform formula in terms of temper.

Despite the lack of technological cohesion, both the unprecedented quantities of pottery found at Pitted Ware sites and the figurines testify to the central importance of clay objects within this society. The custom of depositing intentionally destroyed vessels, preferably placed upside-down, is also interesting. Bases or a selection of a few sherds are commonly associated with burials, alternatively miniatures that are often shaped as bases. As we have seen in chapter 9.1, not only do the Pitted Ware people place broken pots in the burials, they break the bodies as well. Clay, flesh and bones are categories that occur repeatedly in a fragmented state in ritual contexts on Pitted Ware settlements.

**BATTLE AXE CULTURE**

The pottery material of the settlements is extremely sparse compared to both Pitted Ware culture and Funnel Beaker culture, but not compared to Late Neolithic sites or some Iron Age periods. The small quantities found are due to several reasons, which I have discussed elsewhere (Larsson 2009c):

- Battle-axe vessels are not extensively used as cooking utensils or storage containers. There are therefore no large collections of pots at the settlements, such as what we see on Pitted Ware sites or the late Bronze Age.
- Depositional strategies seldom include whole pots, or collections of sherds in dug pits, or as an assemblage covered by stone packing – practices that would have resulted in better preservation in the succeeding millennia. Pottery sherds are mostly found scattered around or inside houses, in barely traceable culture layers that are easily missed by excavators using machines to remove the topsoil.
- Battle-axe vessels are often small, thin-walled beakers. The sherds from broken beakers are therefore quite easily destroyed by post-depositional events, especially since many of the younger Battle Axe settlements have direct continuity into the Late Neolithic, which means a long period of human and animal activities further destroying the remains.
The coarser storage vessels of the Battle Axe culture do not conform in appearance or texture to what most archaeologists associate with battle-axe pottery. Since many sites with battle-axe pottery also contain phases from the Late Neolithic and Bronze Age, this may result in the misidentification of these undecorated rock tempered sherds with cordons and brushed surfaces. Regardless of missed identification and destroyed sherds, it is clear that the context with which battle-axe pottery is most prominently associated is the grave. At least 40% of Battle Axe graves contained pottery, mostly one or two of the globular beakers. This number is in all probability an underestimation. Most burials are found not by archaeologists, but in the process of gravel extraction, where attentive individuals have turned in the objects found. Fragile vessels and small sherds are far less likely to be spotted under these circumstances than battle axes, or stone and flint axes. Since unburnt bones are but rarely preserved, and not all in the sandy soils of Eastern Central Sweden, many of the burials are known only through these stone objects collected in fields, in gravel pits or during construction work. Any burial that contained no large stone tool, but only a beaker and perhaps a flint blade, would be extremely difficult to discover, unless it was covered by a stone packing. Unfortunately, stonelapping graves are rare outside Skåne and even there they occur mainly in the second half of the Middle Neolithic B. While not all the dead were buried with a beaker, in all likelihood this burial gift was probably included in at least half the burials, probably more considering professionally excavated graves often include beakers.

One contributing factor to the scarcity of pottery on settlements might of course be the use of crushed vessels as temper for new ones. This practice would have entailed grinding and crushing sherds of pottery to fine grains which were then added to the selected clay. Grog is an eminently practical and functional temper material, it is easy to reduce to fine, fairly homogenous grains and the vessels produced with this mixture can be made very thin and light. Yet despite this grog is used as a temper only in certain periods and regions during the European prehistory. Just as is the case with bone temper, grog ceases to be used in vessels during the Late Neolithic.

This reticence may be attributed to certain cross-culturally common superstitions connected to the use of old products when making new ones. To take an object that has been used by others or during special events, and to in effect give it new life in another object, is potentially both powerful and dangerous. There are a number of ethnographic sources that discuss the use of grog within groups where the concept of rebirth and creating something with a direct link to the past is very consciously and openly acknowledged. For instance, the Gurensi (Ghana) who smash the domestic vessels (especially the eating bowl) of a deceased woman, then take the sherds and ground them to grog to use as temper for new pots. In this way, the link between the woman, her family, and the Earth is openly acknowledged to be preserved beyond death (Smith 1989:61). Among the Sirak Bulahay and Kapiski (Cameroon), sherds of a ceremonial pot that has been accidentally broken are brought to the blacksmith who grinds them gives
them to his wife, the potter, to use when making a new container (Sterner 1989:458, Gosselain 1999:212). Married couples of Bemba (Zambia) have a special pot that the woman makes upon marriage, which should be used after intercourse. If that is broken, the pieces are ground up and used as temper for the new pot, and the couple has to be celibate until it is finished (Gosselain 1999:212).

The pottery materials used for grog may also belong to more unspecific vessels, though they might be important in other respects. The Songhai and Zarma of Niger, Fulani/Gurma of Burkina Faso, and Nama/Somono of Mali make use of ancient pot sherds from nearby archaeological sites as material for their grog, explaining that it is good to tie the new vessels to those of the ancestors, since “they knew how to make strong pots” (Gosselain & Livingstone Smith 2005:41). Some potters crushed the sherds with grinding stones also recycled from the prehistoric site (ibid :fig 14). Grog was used as temper by the Inca potters of the Andes, as well as the Seq’ueracay potters in the region today. However, in contrast to the West African groups mentioned above, they never seem to use parts from ancient pots or non-local contemporary vessels as temper material. There are strong cultural notions of community essence and reciprocity with the supernatural ‘owners of the earth’ in this region. Sillar interprets the rejection of ‘other’ pots as raw material for making new ones, as a direct result of this ideology (Sillar 1997:12). Grog temper certainly seems to lend itself to powerful concepts about earth, permanence, tradition, continuity and unity.

The use of grog is basically a new concept for the potters of Neolithic Scandinavia, it was not used when making vessels within either the Funnel Beaker or the Pitted Ware culture, nor was it used by the first Mesolithic potters of the Ertebolle culture, except in the making clay oil lamps (Hulthén 1977:34). Yet the earliest battle-axe beakers were tempered with little else. Over time, the grog temper was often combined with crushed granite, and in some vessels hardly any grog seems to have been added – though identification of the grains is dependent upon favourable circumstances. In some vessels it is clear that grog has been added, but to a very small degree compared to the crushed stone. From a functional viewpoint, the small percentage of grog made no difference whatsoever. The potters did not seem to think so, however, or they would not have added it. There are several possible explanations:

CUSTOM. It was considered part of the process to add crushed pottery to the clay matrix, and this was done as a matter of form with little or no deeper meaning or afterthought. ‘This is how we do pottery’.

FUNCTIONAL. While adding a small amount of crushed pottery might have no empirical effect, the potters themselves might have been convinced the new vessels would be strengthened or have a better quality if parts of old beakers were added.
SYMBOLICAL/RELIGIOUS. Adding parts of old vessels, and through them their history of use and their link to the potters that created them, and further back to the beakers and potters before them, could have been seen as both essential and significant. It was considered imperative in order to make the beakers become all that they had to become during ceremonies, events and funerals, even when the major part of the temper consisted of crushed stone.

These reasons are not exclusive of course, over time and in different parts of South Sweden, individual potters might use grog temper for one or two, or even all of the reasons above. The fact that grog temper was discontinued in the pottery of the Late Neolithic, despite the clear cultural continuity in many other sectors of life at this time, makes it likely that the grog was seen as more than just customary and/or functional. In all probability, the Battle Axe potters, and possibly all other members of the community, had a strong sense of using vessels with a genealogy, a line of ancestors. If the Pitted Ware groups 'killed' their pots, Battle Axe groups in contrast gave them new life through a 'rebirth'.

The common practice of beakers as burial gifts in the single graves is therefore very interesting. Some of them were probably placed upside-down, accentuating that they were not in use. This seems to have been the practice with certain G- and H-vessels, whose bases were richly decorated in patterns reminiscent of solar symbols, when at the same time the dead were all laid out to face the East – where the sun rises. However, most vessels seem to have been placed with their opening up. Whether they were the personal property of the deceased, or his/her relatives, or the drinking beakers used by the mourners in the mortuary ceremony, is not easy to know. The differences in the choice of clay and temper seen in some beakers found in the same grave suggest that they were not necessarily all crafted by the same potter. While certain beakers might indeed have contained beverages or food when they were placed in the grave, the fact that they are occasionally found upside-down or with smaller beakers 'nesting' inside, suggests this was not always the case. They could still have been used for the purpose of serving drinks or food by the living, during the earlier funerary ceremony leading up to the burial. Since the larger storage vessels and household pots were never included in the Battle Axe graves, it is unlikely that the burial gifts should be seen as tokens of necessary sustenance in an afterlife, or that the gifts represented a full set of necessary objects for a successful life in the hereafter. So why were the beakers so essential to the mortuary context?

A possible answer would be that the beakers were held to be part of what defined a member as truly part of the Battle Axe community, and through this the Corded Ware society as well. For the Battle Axe members, the mortuary event established the deceased as a worthy representative of the society, perfect and idealised since the dead body is both mute and immobile. The ideal Battle Axe burial should contain a properly oriented body in the right position, with the correct set of burial gifts indicating that this was a true member of the community – and by extension, so were those that officiated at the funeral. To this concept we should add that the beakers should be made not just in the proper way with
the proper tools, but also incorporate past beakers, and through them all other past beakers. This is a cultural fixation on control and *completeness* in regard to both bodies and material culture that verges on obsession.
11.2 Pottery Traditions in Transition: Mixing It Up

Where pottery making is constitutive of the potter’s identity, individuals take great care to avoid blurring social boundaries through using inappropriate processing recipes.

(Gosselain 2008b:77)

The different operational sequences in the Pitted Ware and Battle Axe pottery traditions involve not just technology, technique and style, but also the organisation of the craft, the social position of the potter, and role of the pots in communal daily life. However, over the years there has been some pottery found on settlements, in burials and in other contexts that do seem to incorporate aspects of *both* traditions. It is worth taking a closer look at these exceptional vessels, not just because they are interesting in themselves, but because of what they might tell us about changes taking place in the Middle Neolithic societies, as well as among the potters themselves.

This chapter is mainly devoted to atypical battle-axe beakers, partly as defined in stylistic terms, partly as seen technologically through thin section analysis. I will also briefly discuss a type of shoulder-less vessels that are apparently manufactured in the late Middle Neolithic B, which also display a mixture of stylistic and technological traits. I aim to demonstrate that these ‘hybrid’ and ‘atypical’ vessels are not the result of random chance, but must be understood through their cultural and temporal context. They also hint at some important cultural changes taking place in South Sweden a few generations before the Late Neolithic.

**Atypical Battle-axe Pottery – Pits and Bones**

The first archaeologist to specifically point out the oddity of pit impressions on a battle-axe beaker was Axel Bagge, who had found sherds from one such vessel at Fagervik (Bagge 1951:83). This site was mainly settled by Pitted Ware culture, but at the lower elevations of the slope some 50 sherds of battle-axe pottery were also found. Bagge remarked that the sherds belonging to the pit decorated vessel had a decidedly coarse ware (rock tempered?), similar to that found in other late battle-axe beakers in Eastern Central Sweden (Forssander’s phase III). He also compared it to another pit decorated beaker found in a Battle Axe burial at Öja (see below). By coincidence, just prior to the publication of the Fagervik article, Bagge in his function as curator at the National Museum of History received a few sherds found at Torpaskog on the island of Muskö in the Stockholm archipelago. The large sherds came from a coarse vessel of beaker-like shape decorated with wolf-tooth pattern and a horizontal row of pits beneath the rim. In a footnote he discusses the similarity of the three beakers with pit impressions, in ware as well as their probable late date considering the elevation at which they were found, and the phase III character of the Öja burial gifts. The similar appearances of a number of vessels found at Hedningahällan in Hälsingland are also mentioned (Bagge 1951:note 15a, 83f).
In 1993 the mortuary house of Turinge was excavated by the Stockholm county museum (Lindström 2000). Apart from a number of typical battle-axe beakers, one virtually complete vessel was prominently decorated with large pit impressions (Fig. 11.2). The house and its pottery will be discussed further in chapter 10.2. As the number of atypical battle-axe beakers grew they generated some discussion mainly among field archaeologists. The term 'third group' came to be used to designate these 'hybrid' vessels, and it was defined in print by Eva Olsson as pots with the typical shape and decoration of battle-axe beakers, but with a row of large pits (Olsson 1996a:46). One such had been found during excavation at the Pitted Ware site Kyrktorp in Södermanland. However, in a slightly later text which she co-authored, the category is more broadly defined as battle-axe vessels with stylistic and/or technological aspects of pitted-ware. This includes beakers with no pits, but with poriferous ware as a result of calcareous temper, such as those found on the Pitted Ware site Tibble in Uppland.

Fig. 11.2. Pit-decorated beakers, the so-called third group of pottery. a.) Täby, Södermanland; b.) Vrå, Uppland; c.) Torslunda, Uppland; d.) Turinge, Södermanland; e.) Hedningahällan, Hälsingland; f.) Kyrktorp, Södermanland; g.) Torpaskog, Södermanland; h.) Fågelbacken, Västmanland; i.) Torslunda, Uppland. (Drawings by Gunlog Graner (a, c-d, g); Pia Larsson (b); Eva Crafoord (e); Anders Eide (f); photo: Å. M. Larsson)
The name ‘third group’ is unfortunate, since many archaeologists have mistakenly taken it to mean group of people, which has led to a lot of confusion. It is imperative to note that the term was not meant to suggest a third group of people, or a new archaeological culture. The term simply designates a third type of pottery that had traits from both Battle Axe culture and Pitted Ware culture, and which were found on sites that were otherwise dominated by either typical pitted-ware or battle-axe pottery. Still, what these traits were, and if there was anything to suggest that the third group was a valid category to begin with, were still unresolved.

As part of my research I initiated a small research project aimed at compiling and evaluating the third group as a category. My partner in the project was Gunlög Graner, archaeologist and potter. We received funding from the Berit Wallenberg Foundation. The sites and general results of the project are discussed more in detail elsewhere (Graner & Larsson 2004; Larsson & Graner in prep.). Here, I will discuss the microscopies of the sherds in the light of the general pottery craft traditions of the Battle Axe culture and Pitted Ware culture. Details about the petrographic analysis are presented by Hulthén in this volume.

Third Group Pottery
This group of pottery (not synonymous with an independent archaeological culture), comprises beakers in the general battle-axe tradition, but with a horizontal row of large pit impressions of the same type found on pitted-ware.

TÄBY, ÖJA PARISH, SÖDERMANLAND
Burial 221:2 contained a late battle axe (E:2), two thick-buttet stone adzes, a hollow-edge stone chisel and two beakers (Christiansson 1953; Malmer 1962:934). One was decorated with oblique lines forming angles (type J). The second beaker is decorated with sparsely placed horizontal lines at the rim and vertical lines over the body (Fig.11.2:a). There is also a row of large pit impressions by the rim. A sherd from each was analysed by thin section microscopy.

The first vessel was made with fine clay and tempered with a combination of crushed granite and grog. In contrast, the second vessel was made with coarse clay and only tempered with granite. On the one hand, the third group beaker differs from the J-vessel in that it does not contain grog, although that is not wholly unusual in the late Middle Neolithic B. On the other hand, the use of coarse clay is very much in keeping with the battle-axe pottery craft, and highly unusual in pitted-ware in Eastern Central Sweden (though see Brorsson 2008b). In short, although the result seems to suggest that the two vessels might have been made by different potters, there is no technological evidence of either of them being made by a potter trained outside the Battle Axe community.
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Fig. 11.3. Map showing sites where pit decorated or poriferous beakers have been found. 1.) Torslunda; 2.) Tibble*; 3.) Vrå; 4.) Apalle; 5.) Fågelbacken; 6.) Bollbacken*; 7.) Täby; 8.) Turinge; 9.) Kyrktorp; 10.) Torpaskog; 11.) Fagervik. Hedningahällan is the only site not visible on the map as it is too far north. *= only poriferous beakers. Shoreline map for 4000 BP produced by Lars Andersson and Tore Pässe.

FÅGELBACKEN, HUBBO PARISH, VÄSTMANLAND

This house belonging to the Battle Axe culture was excavated in 1993, and c. 1.5 kg of pottery was found, mainly in the lower southern half of the house (Hallgren 2000b). The pottery types identified at the site mostly belong to types G, H, J and M. One rim sherd of typical battle-ax beaker shape was decorated with horizontal lines of tooth stamp, and impressions of large round pits. This sherd, as well as two other sherds (type M and G/H), were analysed (Fig. 11.2:h). Both of the two latter sherds were made with coarse
clay and tempered with a combination of crushed granite and grog. The pit-decorated sherd on the other hand was made with calcareous fine clay tempered with calcite. Unfortunately, the sherd was so small that a thin section could not be made, and instead only the cut and polished surface was analysed. This meant that although the clay type and grains of calcite could be identified, it was not possible to establish whether there was any grog temper or not (see Hulthén this vol.).

It is a very interesting result that the third group sherd differs so significantly from the other two in terms of both clay and temper. It is doubly interesting that the difference is indicative of a Pitted Ware craft technology. While calcareous clay is not common for pitted-ware in Eastern Central Sweden, it does occur in 25% of sherds analysed. So far, the only battle-axe beakers made with calcareous clay is the third group beaker at Fägelbacken, and a beaker found at the Pitted Ware site Tibble (see below). There was one more interesting result of the thin section analysis. The G/H-beaker which was tempered with grog and granite also contained a small fragment of bone. There is a possibility then that the pot was tempered with a combination of granite, grog and bone, which highlights how much more may be lurking beneath the surface of pottery.

The Battle Axe settlement at Fägelbacken was situated only about 7 km from the contemporary Pitted Ware site Bollbacken, as the crow flies. Battle-axe pottery found at Bollbacken has also been analysed previously, and is discussed below. Unlike the Täby-vessel, the Fägelbacken beaker seems to have been made with a technology foreign to the Battle Axe craft. To the observer, the Fägelbacken third group vessel seems well made and not dissimilar from other sherds found at the house, except perhaps for a slightly less smoothed surface. It is quite possible that it was made by a potter who had been taught the craft within a Pitted Ware context as a young person, and was then forced to learn another tradition of making and decorating vessels later on. Alternatively, the pot may have been made by a potter whose teacher had originally lived in a Pitted Ware community before moving to a Battle Axe group, and whose preferences in clay and temper were transmitted to the apprentice.

**TORSLUNDA, TIERP PARISH, UPPLAND**

This archipelagic site in northern Uppland has rich remains of Pitted Ware culture spanning a large part of the Middle Neolithic B. A short distance to the south-west, on a small and slightly lower promontory, another assemblage which contained mostly sherds of Fagervik IV pottery (wolf-tooth pattern) has been found. Among these there were also a small number of thin-walled sherds from small globular vessels, decorated with whipped cord impressions and very fine string. On a few of the rim sherds pit impressions are also evident. Thin section analysis has been done on two of these thin-walled rim sherds with pits, one sherd with a finely smoothed surface and whipped cord decoration, three pitted-ware sherds with comb stamp decoration, and a convex rim sherd with pit impression (Fig. 11.2c, i) (Brorsson 2006c; Hulthén this vol.).
Most of the pitted-ware sherds were tempered with a combination of granite, bone and/or clacite. The two third-group rim sherds were simply tempered with granite. Interestingly, the sherd that looked the most like battle-axe pottery was tempered with a little bit of grog in addition to the granite. The lack of grog in the third group pots is noteworthy. They seem to be made with all the intention of resembling battle-axe pottery, while not actually copying it correctly. Whether the lack of grog temper is a coincidence, a conscious choice, or due to lack of know-how is hard to tell.

**THIRD GROUP BEAKERS CONTEXTUALLY**

The technological analysis gave a heterogeneous result: the pit decorated beakers are made in different ways and do not in any way represent a new coherent craft tradition. There is no reason to believe that the makers of these vessels were part of a separate craft tradition, either within the other potting communities or apart from them. Moreover, the technologies associated with them are at the same time consistent with battle-axe pottery craft, and deviate from it in a manner more in accordance with pitted-ware craft. The petrographic analysis therefore confirms that there is more going on beneath the surface than mere pit impressions. There are similar pit decorated beakers found on a small but significant number of sites in Sweden, and it is worth taking a closer look at this contextual evidence before dismissing third group pottery as a simple ‘aberration’. The most immediately obvious impression is that the phenomenon is very much confined to Eastern Central Sweden (Fig. 11.3). Despite Battle Axe culture being found in most of South Sweden, and Pitted Ware culture being established along the eastern and southern coast to west Skåne at least, I have not found any example of pit decorated beakers from these regions, or from West Sweden for that matter.

The southernmost example so far is found at Fagervik. To date, the northernmost find location of these beakers is at Hedningahällan, Hälsingland. This uniquely situated site, with pottery of several different traditions belonging to the late Middle Neolithic and Late Neolithic, was probably an aggregation site. Apart from battle-axe beakers of more or less atypical appearances, there were typical Late Neolithic vessels and also a type of cord decorated vessels. This latter type of pottery will be discussed further below. There are several examples of globular beakers that appear to be very similar to battle-axe beakers, although the application of the decorations were mostly made with tools not commonly used on battle-axe pottery.

The rest of the sites where pit decorated beakers have been noted are found in Eastern Central Sweden: Södermanland (3), Västmanland (1) and Uppland (3) (Fig. 11.3). As mentioned previously, one of these places is the Turinge mortuary house in Södermanland. Sherds from c. 20 battle-axe vessels were deposited with cremated human bones in pits outside the walls. The third group vessel was found almost intact together with two bowl-shaped pots similarly decorated, but without pit impressions. With the exception of perhaps one or two other vessels, these three were the only ones clearly deposited intact – the rest seem to have been placed in the pits in fragments (Lindström
2000:39; 2006:81). This is a curiously inverted practice, since in ‘normal’ circumstances battle-axe beakers are placed whole in burials, whereas pitted-ware is included mainly in the form of a few sherds. Possible reasons for this will be discussed in chapter 12.2.

**SUMMARY REMARKS**

Third group vessels are apparently not connected by similar technology or by similar decoration. They are found on Battle Axe settlements, in Battle Axe burials, in a couple of cases on Pitted Ware settlements, and also on an aggregation site outside the usual Pitted Ware/Battle Axe region. They therefore have little in common contextually as well. There is however one more aspect that they have in common apart from the narrow geographic occurrence: chronology. All of the sites have in common that they appear to belong to a decidedly late phase of the Middle Neolithic B, or even an early phase of the Late Neolithic. Despite the fact that for a long time pitted-ware was almost always decorated with a horizontal row of pits, and the fact that this type of decoration is both easy and quick, battle-axe pottery was devoid of large pit impressions. The appearance of them on certain vessels at the end of the Middle Neolithic B, and only in a specific region, is therefore hardly a coincidence. It does represent something, though not a new and separate craft tradition. Before discussing this further, it is instructive to look at other examples of atypical beakers.

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**PORIFEROUS BATTLE-AXE BEAKERS**

The other kind of pottery sometimes mentioned in the same sentence as third group is battle-axe beakers with poriferous ware. In Eastern Central Sweden poriferous pitted-

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Fig. 11.4. Poriferous beakers, tempered with calcareous material which has subsequently disintegrated in the ground. a.) Bollbacken; b-c.) Tibble. (photo: A. M. Larsson)
ware becomes increasingly common over time – completely dominating the latest phases. Battle-axe pottery on the other hand always has dense ware – except in a few interesting cases.

**BOLLBACKEN, TORTUNA PARISH, VÄSTMANLAND**

There were no third group vessels found at the mortuary house at Bollbacken, or at any other part of the settlement either. However, there was c. 500g of regular battle-axe pottery found (1% of the total amount of Neolithic pottery), representing some 10-15 vessels. These sherds were found in the northern part of the settlement and not at the mortuary area. Some seem to come from very typical beakers of G/H/J-type, as well as some less easily defined ones, such as a possible M-vessel and one which was undecorated apart from two lines of tooth stamp by the rim. The surface treatment was carefully done on all the sherds, smoothed just as can be seen on most battle-axe pottery, but not on the pitted-ware (Artursson 1996b:206f). However, thirteen of the 70 battle-axe sherds had poriferous ware (Fig. 11.4:a). Four battle-axe sherds, including one of the poriferous ones, have been analysed (Hulthén 1996, this vol.). One G-vessel had been made with medium-coarse clay and tempered with granite and grog. This is consistent with battle-axe craft, though it had fractured in a way that suggests it was shaped through coiling rather than pinching. Two other sherds (H/J, and possibly M-group) had been made with fine clay tempered with granite. The poriferous H/J-vessel had also been made with fine clay, but was tempered with burnt bones.

Bone temper was also used in eight of the 26 analysed pitted-ware sherds at Bollbacken (and calcite was used in two more sherds). Six of the pitted-ware vessels analysed had been made with calcareous clay, but only non-calcareous clay was used in the battle-axe beakers. The battle-axe pottery at Bollbacken is therefore not really consistent with the pitted-ware pottery craft at the site: as seen in surface treatment, grog temper and tooth stamp. However, it is not wholly consistent with battle-axe pottery craft either.

It is tempting to view the battle-axe pottery at Bollbacken in relation to that of nearby Fågelbacken. Archaeologically speaking they are virtually contemporary, dated to the second half of the Middle Neolithic B. However, there is no real way to determine to what extent they were actually contemporary, or even inhabited in the same generation. Any such theory would also have to resolve the issue of whether each was inhabited over several decades, or just for a few seasons, and radiocarbon dating is too crude a method to determine this. We are always faced with the problem in settlement materials that certain objects could have been fashioned years or even decades apart. It is important to note that typical battle-axe pottery found at the Fågelbacken house is apparently made with typical Battle Axe pottery craft tradition, and does not represent ‘imitations’ made with little or no technological know-how. Whether the battle-axe beakers at Bollbacken were made by pitted-ware potters with a limited introduction into the craft (through a parent or a relative), or by Battle Axe potters relocating to the Pitted Ware community, is not possible to say for certain - especially since both explanations might in fact be true.
There is also the possibility that all or some of the battle-axe beakers found at Bollbacken were made in a completely different location, and subsequently gifted or traded to the Pitted Ware settlers.

**Tibble, Björklinge Parish, Uppland**

Tibble is a Pitted Ware settlement situated on a typical slope with mostly poriferous Fagervik III and Fagervik IV pottery. On the lowest elevations, some five sherds of more or less atypical battle-axe pottery were found as well (Bergh & Segerberg 1993). One of these belonged to a small beaker (vessel 3) with an actual neck, something that hardly ever occurs on battle-axe pottery in Sweden (Fig.11.4:b). The ware is extremely poriferous. Another sherd (vessel 4) was decorated with whipped cord, possibly in J-style. The ware was poriferous, though not to the same extent as the previous one, and the surface seemed to have been carefully smoothed. Both these sherds have been analysed through thin section microscopy, as well as two poriferous and one dense pitted-ware (Hulthén this vol.). Vessel 4, which still resembles battle-axe pottery apart from the poriferous ware, was made with calcareous medium-coarse clay tempered with granite, calcite and grog – an interesting mix of both pitted-ware and battle-axe pottery craft. The odd-looking vessel 3 was made with calcareous coarse clay tempered with calcite and bone, but no grog was identified.

The pitted-ware at the site, which might represent a significant period of time, was made in the usual northern Pitted Ware craft tradition, with fine or medium-coarse clay, calcareous and non-calcareous, and tempered with different mixtures of granite, calcite and bone. Vessel 3 is the true oddity: with the ‘wrong’ shape, the ‘wrong’ decorative pattern, and the ‘wrong’ temper, everything suggests that it is a (rather poor) imitation of a battle-axe beaker by someone copying mostly from her own perceptions and recollections of beakers. There is also the possibility that this vessel was not made at Tibble, but elsewhere. Another thing to take into consideration, bearing in mind that the beaker is atypical in both shape and decoration, is that it might not have been intended as a copy of a Swedish battle-axe beaker at all, but rather a bell-beaker or a continental corded-ware beaker.

Vessel 4, which before the temper was dissolved would have looked like a fairly typical battle-axe beaker, is also made with what is essentially battle-axe technology: medium-coarse clay tempered with granite and grog. It differs through the addition of calcite as temper, as well as the use of calcareous clay which is otherwise only known in the third group vessel from Fågelbacken. Since four out of five sherds analysed from Tibble were made with calcareous clay, it suggests that they were made with clay from the same general source or location. The same source can yield both fine and coarse clay, and it is up to the potter to select the preferred kind.

One last aspect about the beakers is peculiar – the amount of temper added is no less than 30%. This is significantly more than the 15-20% that is usually added to clay within the Battle Axe tradition. While most pitted-ware vessels also contain 15-20% of temper,
there are several that have an excess of that – including two of the three analysed at Tibble. The overall impression is that the battle-axe beakers were made by local potters using local clay sources, and working with a paste prepared mostly according to pitted-ware traditions. However, the addition of grog in one of the beakers, and its smoothed surface still suggests that this was more than mere superficial imitation of another style of pottery. Some sort of exchange of experience and technology must have taken place.

![Fig. 11.5. Cord-and-pit 'bucket' vessels. a-c.) Bollbacken; d-e.) Hedningahällan; f.) Bjästamon. (photo: a-e: Å. M. Larsson; f. Pehr Lindholm)](image)
SUMMARY REMARKS

Poriferous battle-axe pottery does not appear on Battle Axe sites, only on Pitted Ware sites. This might suggest that they were made either by Battle Axe potters relocating to Pitted Ware sites, or by Pitted Ware potters attempting to copy battle-axe pottery – or a combination of both. Pit decorated beakers do appear in some Battle Axe contexts however, including burial contexts. A possible scenario is that the beakers made in a Battle Axe community must conform to standard craft practices, but that a few were allowed pit decoration for a very specific reason (which may or may not have been graciously accepted by the other community members). Or it may have been that mixing bones, or materials resembling burnt bones, into the clay was viewed as culturally objectionable. Again, it should be noted that the one thing all these vessels have in common is the late date. Battle-axe beakers occurring on Pitted Ware sites in Eastern Central Sweden are almost invariably of a late type, found on the lower elevations, and there are no cases of mixed technologies in the earlier battle-axe vessels.

Cord-and-Pit Decorated ‘Bucket’ Vessels

The Bollbacken pottery assemblage did not just contain pitted-ware and battle-axe beakers, but also a third kind of pottery. Some 100 sherds (c. 600g) came from neck-less vessels that seem to have had a sort of ‘bucket’ shape (Fig. 11.5a-c) (Artursson 1996b; Hulthén 1996). They were found in the same features as the other Middle Neolithic pottery at the site. The shape was not the only curious thing about these sherds, as they also seemed to have traits from both pitted-ware and battle-axe pottery, and were also reminiscent of Late Neolithic pottery:

TRAILS SIMILAR TO PITTED-WARE:
- Pit impressions on several rim sherds
- Thickened rims, often quite flat
- Thick walls, comparable to the pitted-ware at the site
- Occasionally untreated interior surfaces
- 72% have poriferous ware, though not as notably as the pitted-ware

TRAILS SIMILAR TO BATTLE-AXE POTTERY:
- Cord decoration, mostly a few horizontal lines by the rim and also on the rim
- Left-angled cord impressions (S-twisted cord)
- Carefully smoothed and polished external surfaces, often internally as well.
- Dense almost ‘plastic’ ware, even on the ones that are somewhat poriferous.
TRAITS SIMILAR TO LATE NEOLITHIC POTTERY:

The ‘bucket’ shape, with no visible neck.
The at times very thick rims
Flat bases
The cord used was generally thicker and coarser than what is usually seen on battle-axe pottery, but similar to those used on Late Neolithic vessels.
Sparse decoration, placed only on the upper part of the vessel and across the rims.

Six of these sherds have been analysed with thin section microscopy, three with dense ware and three with poriferous (Hulthén 1996). Two of the sherds with poriferous ware were made with fine clay tempered with calcite. The third was made with calcareous medium-coarse clay with no added temper. Fine clay tempered with calcareous materials, such as calcite and bone, is commonly used in pitted-ware at Bollbacken (n=9), but medium-coarse clay is only known from two out of 26 analysed sherds of pitted-ware. The three sherds with dense ware were all tempered with granite and made with non-calcareous clay, two with fine clay and one with medium-coarse. Non-calcareous fine clay tempered solely with granite is also very common among the pitted-ware sherds analysed (n=11). As already stated, medium-coarse clay is found in only two pitted-ware sherds.

Technologically speaking then, these cord-and-pit decorated vessels are more similar to pitted-ware than battle-axe pottery – the exception being the carefully smoothed surfaces that are associated with the secondary shaping stage (see chapter 6.2). That is not to say that they were necessarily made by pitted-ware potters, or even manufactured at Bollbacken for that matter. Before any such suggestion can be made they have to be placed into context. Although they are unusual, they are not without parallels in the Middle Neolithic. Similar pottery has been found at Hedningahällan and at Bjästamon in Ångermanland, dated to the transition between the Middle and Late Neolithic (Gustafsson & Spång 2007). Thin section analysis has found that they were tempered with granite, and the Bjästamon pottery was in all likelihood made locally (Brorsson 2000; 2006d; Lindholm et al. 2007:220).

The cord-and-pit decorated pottery with thick rims has also been found together with third group vessels at the Late Neolithic settlement at Apalle in Uppland (T. Eriksson 2003:111f). These vessels must be seen in relation to similar ones found at Jettböle II and Krokars (Åland), and at Stora Förrvar (Gotland), roughly dated to the same transition period (Schnittger & Rydh 1940; Meinander 1954:fig 23; Stenbäck 2003:169). Decidedly similar pottery has also been found in Late Neolithic Kiukais contexts in Finland: at Saama (Satakunta), Rainäsen (Etelä-Pohjanmaa), Knipäng (Varsinais-Suomi) (Meinander 1954:figs 15a, 31a, 82). It is also important to take the Southern Swedish type C pottery into consideration.
MALMER’S GROUP C

In chapter 5.1 it was mentioned that Malmer initially created a group C of cord decorated pottery when he was classifying battle-axe vessels. As his analysis progressed, however, it became clear that this type of somewhat larger, thicker vessel with s-shaped profile or almost straight walls, as well as coarser cord decoration, could not be directly connected with the early cord decorated battle-axe beakers. Rather, they seemed more Late Neolithic in date. Even if this has been accepted, most archaeologists tend to view C-pottery as intimately linked with Battle Axe culture, a continuation of that pottery tradition. On closer inspection, there are some problems with this approach. First of all, C-pottery is not found in burials, only in settlement layers. Malmer identified it at Jonstorp M2 and M3 (Malmer 1962:13-16, 941). These two sites are otherwise known for their rich remains of Pitted Ware and Late Neolithic – but no battle-axe pottery has been found here, only on nearby Jonstorp RÅ. Another site in Skåne with C-pottery is Kvarnby, which otherwise only had remains from the Late Neolithic and Bronze Age. In Blekinge C-pottery occurs at Lörby Kladd, Mjällby and Senoren – all large complex settlements with large quantities of pitted-ware, and a few sherds from battle-axe beakers as well (mostly G/H/J). In Halland C-vessels have been found at Hallehög, where there are also remains of funnel-beakers, battle-axe beakers, pitted-ware and Late Neolithic pottery.

In short, C-pottery appears where in most cases there are also Late Neolithic remains, but also where there are Pitted Ware settlements. There is no stronger connection of C-vessels to Battle Axe culture than to Pitted Ware culture – quite the opposite. The most consistent connection is with the Late Neolithic of course. During this transition period between the Middle and Late Neolithic, there is a general trend in the Corded Ware regions around the Baltic Sea, including Denmark, towards both straight-walled ‘flower-pot’ vessels and s-shaped vessels that have thick flattened rims with cord decoration (Krzak 1970; Machnik 1970; Hvass 1986; Hübner 2005a; Ebbesen 2006; Włodarczak 2006).

I am not suggesting that C-pottery should necessarily be seen as a northern and/or eastern type of pottery being introduced into South Sweden at this time. The similarities with other Late Neolithic pottery, which certainly is strongly associated with contemporary pottery types on the continent, is an indication that such an explanation would be flawed. However, I will suggest that the various types of cord-, and sometimes pit-, decorated pottery appearing at this time reveals a network in existence across the Baltic Sea region, which includes many of the coastal regions and large islands. The single-direction diffusion and innovation models so often applied in archaeology are especially inaccurate in this case.
The subject of prehistoric rituals and religious practices is contentious, not just because they are difficult to study from material remains, but even more because there is no consensus about what relationship actually exists between people, society and rituals. Are rituals the basis for all supernatural beliefs and value systems, are they pointless leftovers from primitive times, are they the means by which society worships itself or the process by which society is created? Archaeologists are sometimes so preoccupied with the exciting world of ritual remains, or what might conceivably be interpreted as traces of ritual activities, that this has at times dominated research to such a degree that it seemed prehistoric people could hardly have had time to find food or just live their lives. The same critique has been directed against anthropologists, who have occasionally been overly concerned with ritual aspects and missed the importance of everyday life and tasks in the creation and affirmation of identities, values, ethics and world view. However, as Sergei Kan points out in his book about the role of the potlatch in Tlingit society, rituals and ceremonial systems can be far more than just an extraordinary custom (Kan 2001:9).

In fact, as I argue throughout this work, this ranked society was, to a large extent, constituted in the context of the mortuary rites, and especially the memorial potlatch (compare Bloch 1982). In these rites, an attempt was made to reach an agreement on the current distribution of power and prestige among the participating individuals and groups, by arranging all of them in a hierarchy. Hence understanding the workings of these rites is indispensable for getting the essential features of the nineteenth century Tlingit culture and society, and particularly the political process.

(Kan 1989: 9-10, orig. emphasis)

The potlatch tradition of the Northwest coast of America is an historically specific occurrence, but remarkably similar traditions involving secondary mortuary rituals, memorial ceremonies, feasting and redistribution are found all over the world among small scale horticulturalists to divine monarchies. In the following chapter I will present some views and approaches to rituals in the lives of people in general, and mortuary rituals involving double obsequies with the bones and bodies of the dead especially. I will attempt to show some underlying themes and aims of these practices that could be of help when we try to understand the broken and burnt bodies at Pitted Ware sites.
12.1 Thinking Through Bodies – Acting Through Rituals

The term ritual, like so many other terms we use in academic discourse, is problematic. Study of ‘ritual’ as a category in itself grew out of the interest by nineteenth century historians, theologians and anthropologists in the history and origin of religions (Bell 1992; 1997; Bowie 2006). At the heart of controversies were the perceived relationships between myth and ritual to religion – which should be considered the primary reason for religion to first appear among humans. William Robertson Smith (1846-1894), a linguist specialising in the Old Testament, focused specifically on rituals. In his opinion these were originally activities meant to cement the bonds of community that later developed into a worship of representations of the social order. The whole fundamental reason for religion was therefore the ritual observances that acted for the preservation and well being of society. Robertson Smith interpreted the early Semitic ritual practice of consuming a sacrificed animal as a communion between humans and gods aimed at making the unity of the group sacred and divine. He connected this with the concept of totemic animals present among North American Indians, who in his mind represented a more primitive and therefore primordial religion. Ritual was at the heart and centre of all religions, and myth was simply a way of creating stories around the rituals and imbuing them with specific meaning for the members of society. Myths varied where rituals stayed constant over long periods of time (Bell 1997:4).

Robertson Smith’s work laid the foundation for no less than three major schools of interpretation of religion. The ‘myth and ritual’ school is mainly associated with James Frazer (1854-1941), who argued that in order to understand any myth one must first identify the ritual with which it was associated. Émile Durkheim (1858-1917) saw religion as a sociological phenomenon aimed at celebrating and preserving society and its institutions. Sigmund Freud was influenced by the concept of totemism and primal sacrifice when he formulated his psychoanalytical theory of religion. Catherine Bell (1997:5) has pointed out that all these approaches have in common that they “…look beyond what people themselves think about what they do and believe.” One major problem with these early models of interpretation was that many of the proponents tended to look for the primal, original ritual – the one universal ritual that acted as the ancestor for all religions of the world. As noted above, Freud had identified the totemic sacrifice as that universal ritual act. Frazer on the other hand, felt that the enactment of the death and resurrection of a god/divine king, which in turn symbolised the fertility of the land/people lay at the root of all religions, and collected myths and stories from around the world that he considered as proof for this. This search for the primordial ritual was similar to the search for the missing link, the ancestor of all human beings in our biological evolution.
The ‘myth and ritual’ school was mainly rooted in British academia, and considered rituals the origins for all subsequent myths and religions. However, the main focus of interest was on mythologies and sacred texts, and not the rituals that may or may not have existed at the dawn of civilisation. Ritual, the act of doing, was therefore seen as something primitive and less developed than the spoken and the written. As time passed, most rituals were discontinued and forgotten and only the myths evolved into religious teachings and philosophy. For many researchers of this school of interpretation what was essentially ritualized was the seasonal pattern, the cyclical events of death and rebirth. This was translated into stories and poems about deities and kings dying and being reborn that were to exist universally. The argument was essentially for a universal mental predisposition for human beings to observe nature, and thereafter ritualize it in action and speech as a way to explain it. As later critics have shown, there is little or no actual evidence that rituals always precedes myths, and although the school of thought generated much interesting research into rituals, the concept of belief and early religions few if any adhere to the more extreme tenets of the ‘myth and ritual’ school anymore (Bell 1997:6ff).

Another approach was suggested by Edward B. Tylor (1832-1917) who was less interested in ritual than in myth, which he saw as a way for primitive people to construct meaningful stories about the experience of dreams. For Tylor religion and myth were primitive and erroneous attempts to formulate rational explanations before there was science. A similar interpretation was put forward by Herbert Spencer (1820-1903), who like Tylor had a very evolutionist approach to humanity. Seeing the dead in dreams caused people to offer food and drink (libations), and ancestor worship eventually grew into concepts of divine beings. Both Spencer and Tylor therefore took the human mind and psychological experiences as the starting point for religion (Bell 1997:4; Bowie 2006:12ff).

The early phenomenology of religion, mostly developed in Germany by Rudolf Otto (1869-1937), criticized this focus on religion and myth as failed attempts at explaining the natural world. For these scholars religious experience had a universal nature for all human beings, and was something ‘other’ than mere attempt at reason. Over time phenomenologists rejected the search for ‘origin’ or the construction of an evolutionary model for magic, ritual, myth and religion. They argued that a purely historical approach is reductionist, and fails to explain why people have religious experiences to begin with. It was suggested by several researchers that the common phenomenological structures of religious concepts around the world originated in common cognitive structures of the human mind (Bell 1997:9).

This approach meant that the evolutionary models that permeated much of the humanities at this time could be side-stepped, but it also meant a loss of understanding about the historical particulars and cultural contexts. It also led to a decreased interest in ritual practice, as one of the most prominent researchers, Mircea Eliade (1907-1986), concentrated on symbolism and myths. In his opinion these representations are purer expressions of religious concepts, whereas ritual was of a more secondary concern developing out of symbolism. Rites recreated and re-enacted the mythological stories of
creation and made people feel a part of these primordial events (Eliade 1958; 1959). Eliade studied the same rituals of fertility and agriculture that Frazer had done, but where the latter saw these as attempts by humans to actively make the seasons turn, Eliade saw them rather as repetitions of cosmogonic myths. Idea came before action.

Another school of thought centred more on the relationship between religion and society, than religion and the individual. Fustel de Coulangé (1830-1889) argued that it was essential to study the early beliefs of a culture in order to understand its institutions. Based on his analysis of ancient Greece and Rome, he formulated a theory that ancestor cults helped establish and maintain the central role of the family lineage in these societies. He also showed that a vast array of customs, from marriage ceremonies to inheritance rules, made sense in the light of how they related to the preservation of the basic institutions of society. His most famous pupil was Émile Durkheim (1858-1917) who would continue to develop the idea of religion as a social phenomenon rather than a psychological one. Religion both mirrored society and helped create the conviction that the social order was ordained by a higher power – religion was society worshiping itself in idealized form. Rituals were the means by which individuals were brought together as a collective, not so much consciously as through the shared experience of the community as both immediate and transcendent (Bell 1997:23ff; Bowie 2006:15).

The great contribution by Durkheim was the way in which he showed how interconnected society, ideology and religion were, and how each fed into the other. His model was perhaps too deterministic, as it tended to overlook the fact that societies are not perfect machinery where all parts fit neatly with each other. It was Karl Marx (1818-1883) who highlighted the often suppressed and concealed internal conflicts between different segments of society. He also stipulated that religion was not so much a symbolic image of society as a whole as it was an idealized image of the status quo, aimed at supporting the ruling classes and repressing the lower classes. Since Marx’s theories were profoundly connected with his revolutionary political struggles, they were mostly ignored by established scholars at the universities until well into the twentieth century. Politics notwithstanding, Marx’s understanding of society as complex, ideological and above all dynamic and conflicted eventually led to great insights into the study of both society and religion. One anthropologist who was to build upon a Marxist understanding of social conflict and dynamics in relation to rituals was Max Gluckman (1911-1975). As society was always a breeding ground for strife and stress, Gluckman argued that rituals were used as an expression of these tensions. Conflicts that existed in everyday life were in fact exaggerated and put on display for the community, who were even allowed to subvert normal rules and customs during certain rituals of rebellion. The effect is cathartic for the participants, and also a way of stressing that deviation from the normal is just that: deviant. For Gluckman, rituals are the symbolic enactments of social relations, and he widened the concept to include even ceremonies and events that had little or no supernatural connection (Bell 1997:38f).
Apart from Gluckman, Durkheim’s model was at least initially far more influential in anthropology. This is especially true in the work of Radcliffe-Brown, who formulated a more ahistorical model of how social organisation could be inferred from how the divine was represented, and vice versa (Bell 1997:27f; Bowie 2006:16). E. E. Evans-Pritchard also viewed religion and ritual as inherently social products, but he was also a determined critic of what he saw as a gross simplification by Durkheim. Religious life was at the same time both collective and individual, and to understand cosmology and mythology the anthropologists needed to take the time to systematically study the philosophies that permeated a culture. Religion was not just a supernatural version of structure, as Radcliffe-Brown often portrayed it, nor was it a psychological safety net in the manner of Malinowski’s depiction. For Evans-Pritchard, rituals are where religious concepts are externalized and observable. He noted that not even the emotional response of the participants could be easily gauged, as some would seem excited, others saddened and still others mostly indifferent. If ritual was supposed to make everybody feel the same way it often seemed to fail. What was important then was not how people felt, or even how they behaved – what was important was that the deed was done. The rituals were important not the least because they highlighted and formulated the structural relationships between different categories, which were also defined through the rituals (Evans-Pritchard 1974; Bell 1997:34f).

**Ritual Practice, Ritual Bodies**

The term *practice* became a pervasive part of anthropology in the 1970s and continues to be a focus of interest for many different disciplines. Though most researchers today tend to associate it with Pierre Bourdieu’s theory of practice, it was initially a prominent part of Marx’s theories as he emphasized the reality and practices of daily political and economic life for human beings. As Marxist historical-materialism gradually received more interest from researchers in Europe in the twentieth century these issues became more widely discussed – especially in France. As mentioned in chapter 2, there was growing critique of the focus on mind and mental structures which tended to treat the body as a machine, a carrier, but not an active force in itself.

Although theories of practice take a keen interest in all forms of activities, daily routines even more so than the extra-ordinary events, ritual has been highlighted by some as a ‘paradigmatic’ activity which is particularly important for showcasing cultural values (Bell 1997:76). Marshall Sahlins has shown how rituals can be used to deal with real events and new challenges through the lens of cultural context and symbolic structures. Through the ritual these structures and customs can also be renegotiated without risking a collapse of the value system. As Catherine Bell (1997:77) puts it: “For Sahlins, as for Turner and Geertz, the traditional formality and self-consciousness of ritual make it a type of human practice in which basic cultural processes are particularly accessible to observation and analysis.” Ritual is the means by which new and strange situations and experiences can be made comprehensible and
familiar by filtering them through the lens of existing cultural values and traditions. The result will be both a culturally nuanced understanding, and possibly an altered structure as well which will influence any future practice. Sahlins’s contribution was the way in which he showed how history is a continuous dynamic process, where change is constantly happening, and at the same time heavily shaped and moulded through both the present and the past. This is a valuable and necessary contribution to the often ahistorical systems-theory of structural-functionalism in culture studies, with its focus on equilibrium as an ideal state of society. Ritual is no longer simply a conservative and primitive form of emotional support, it is a dynamic tool in the process of both preservation and alteration in human lives.

Bourdieu did not really concern himself with rituals per se, though he did discuss some ritual practices among the Kabyle of Algeria where he did his anthropological fieldwork. Rituals can disguise inconsistencies or conflicts between cultural principles, or act as a means of neutralizing the dangers occurring as cultural categories must be transgressed or changed. All cultures create categories of classification of both the natural and social order, yet at times things and people must pass from one classificatory stage to the next, which challenges the whole order of the structure. Rituals are the means by which such an alteration can be made without causing a collapse of the belief in the natural order. Bourdieu also pointed out that rituals may act as a tool for political and social competition, a medium through which power and relationships are negotiated under the guise of common purpose (Bell 1997:78).

As Catherine Bell has pointed out, many studies and theories of ritual have painted themselves into a corner by first defining what constitutes a ritual and then proceeding from that definition to explain why rituals exist and what they are used for, often creating circular reasoning.

The dilemmas that attend two major ways of defining ritual, either as a distinctive and essentially different set of paradigmatic activities or as a set of qualities found to some degree in all activity. Both approaches can get bogged down in elaborate taxonomies and problematic distinctions between utilitarian and nonutilitarian action that end up with ritual action as expressive, noninstrumental, or irrational.

(Bell 1997:81)

Bell has suggested a systematic framework analysing ritual as practice as a way of circumventing some of the worst pitfalls (Bell 1992; 1997).

As practice, the most we can say is that it is involved in ritualization, that is, a way of acting that distinguishes itself from other ways of acting in the very way it does what it does; moreover, it makes this distinction for specific purposes. A practice approach to ritual will first address how a particular community or culture ritualizes (what characteristics of acting make strategic distinctions between these acts and others) and then address when and why ritualization is deemed to be the effective thing to do.

(Bell 1997:81)
While one might argue that Bell’s definition is a bit vague, the important point she makes is that while not all actions are rituals, ‘ritual’ is not an objective category of classification that exists independently of other forms of actions or practices. Ritualization is a universal human phenomenon, but which aspects of life and the natural world are singled out for ritualized behaviour in each society? The central quality of ritualization is the body “moving about within a specially constructed space, simultaneously defining (imposing) and experiencing (receiving) the values ordering the environment” (Bell 1997:82).

It is not the aim of this dissertation to define what is or is not a ritual, and what might theoretically distinguish religious rites from just ritualized behaviour. I will, however, try to find ways in which to interpret the prehistoric practices involving dead bodies of human beings that I have presented in chapters 10 and 11, as I consider them to be the result of mortuary rituals. Dealing with cosmological and religious concepts in a population separated from us by millennia, with no written record, no direct historical connections and quite probably a by now extinct language presents its own challenges. There is no possible way, in my opinion, of recreating even the most basic myths and stories of that time. Our understanding of the religious fundamentals is severely hampered by the fact that we can only deal with those that actually left material remains. We have no way of knowing what the people may have ritualized in other ways, and which rituals were the most socially significant. To reconstruct the whole religious life of the Pitted Ware or Battle Axe communities is beyond the realm of possibility. Still, the material remains we do have deserve to be studied and analysed in themselves, as we can learn much if certainly not all.

Mortuary rituals often present an interesting window into a society, for instance by visualizing the cultural values and structures more prominently, or in contrast by attempting to mask and distort reality by focusing on ideals and the afterlife. Any attempt by anthropologists and archaeologists to devise rules and laws about the relationship between mortuary rituals and social organisation tend to fail on a cross-cultural analysis. The only constant is that people tend to have prescribed general rules regarding the treatment and disposal of a dead body. Even if some cultures have extremely unelaborated burial practices, the fact stands that the body of a dead person is not just abandoned without second thought where he or she perished, unless there are extreme circumstances such as war, plague or famine – and often not even then.

There have been attempts to categorize mortuary practices based on social organisation (band, tribe, state) and/or on economic livelihood (hunter-gatherer, farmer, pastoralist). The problem with this approach is that it assumes these categories are always valid and inherently different to some extent. It is true that hunters tend to have rituals geared towards these specific economic strategies, whereas farmers often do not. However, modern studies have questioned many of the old truths in anthropology about the classification of social organisation or manner of livelihood. Hunters have livestock, farmers hunt, pastoralists get by without any cattle etc. These old distinctions, as well as those of band, tribe or state were too often based on a presumption of evolutionary
development that is inherently flawed. When analysing prehistoric rituals aimed at economic pursuits it may be valid to study primarily such rituals among groups with an assumed similar kind of life, but there is no convincing evidence that mortuary rituals are always different among hunter-gatherers compared to farmers. Nor should we automatically restrict ourselves to studying rituals only in traditional societies with a low level of hierarchical complexity without first establishing that there exists a valid distinction. There may or may not be one – it is not a given.

Secondary Mortuary Practices: a cross-cultural analysis

The osteological analysis of the bones at Bollbacken suggested that the individuals had been in different stages of defleshing when cremated. The features containing human bones at Bollbacken as well as on a number of Pitted Ware sites in Eastern Central Sweden, on Gotland and Aland also suggest that the Pitted Ware communities practiced retrieval, sorting and secondary disposal of human body parts as part of their mortuary practices. Practices such as these are often associated with secondary mortuary rituals, a burial custom where the dead go through two stages of funerals. Traditions such as these are actually wide spread around the world and occur in societies ranging from extremely hierarchical monarchies, to farmers, to hunter-gatherers.

The custom of secondary funeral has elicited a lot of research over the years, ever since Robert Hertz (1881-1915) and his seminal study *A contribution to the study of collective representation of death* (1960 [1907]). Unlike most of his predecessors Hertz did not focus on the ritual life of ancient Mediterranean cultures, instead he used ethnographic research among Malayo-Polynesian groups as a starting point. He was interested in the prevalent South-East Asian contrast between bones and flesh, and the parallels he discovered between the state of the corpse, the journey of the soul and the expected behaviour from the mourners. It is clear that Hertz was influenced by his mentor Durkheim, whose analysis of suicide had shown that even this supremely individual act is always influenced by social structures. Just as self inflicted death is cultural, so ‘natural’ death and our reactions to this inevitable event are inherently cultural. Hertz argued that mortuary rituals were aimed at organising and structuring private emotions into acceptable social behaviour. The living bodies needed to be controlled very much in the same way as the dead body had to be. As death results in the loss of not just a biological individual but a social one as well, society must recuperate the status and position granted the person in order to transfer them to someone else. When this is especially emphasized it can result in a secondary burial of the dead. In such cases the first funeral represents the disaggregation of the person from the community, and the second the transfer of the deceased’s social obligations and privileges to another living member of society.

It is easy to see how Hertz’s study connected with the work of Arnold van Gennep (1873-1957) on rites of passage published in 1909. Van Gennep argued very strongly that any ritual must be understood in sequence, what comes before and what follows. He also
saw that the ‘sacred’ was not a fixed and given category which rituals reacted to, but rather the rituals defined what was to be considered sacred in each specific context. Rites of passage are a virtually universal phenomenon, a sequence of rituals connected to a life crisis or change of some sort, from the agricultural cycle, to reaching maturity, to death. Which events are singled out for a rite of passage varies with cultural and historical circumstances, but when they are in effect they invariably contain three distinct stages: separation, transition and incorporation (van Gennep 1960 [1909]).

Separation is often marked by a purification process, loss of identity or even symbolic death. The clothes can be removed, hair shaved off, embellishments stripped, the body (living or dead) washed or painted. The transition phase usually involves keeping the individual apart from ‘normal’ society, either literally in a special location, or symbolically through special clothes and restrictions on which activities, speech and food are allowed. The third stage, incorporation, often involves symbols associated with birth, regeneration and fertility – the social order is openly expressed and confirmed (van Gennep 1960 [1909]). Victor Turner would later continue to build on van Gennep’s research by focusing on those rites of passage where the second stage, that of transition called the liminal phase, was emphasized and elaborated to a considerable degree. Turner contributed much to the understanding of how a state of being neither here nor there could be used as an opportunity to define structure through anti-structure, order through disorder etc. (Turner 1972 [1964]).

Most funerals are in a way a rite of passage for both the dead and the mourners, though the extent to which this is dwelled upon varies considerably between cultures. However, it is far from uncommon to find societies where the mortuary process has given rise to a whole number of sequential rites often involving physical handling of the dead body or parts of it. Also, in a number of cultures around the world the process is extended to involve double mortuary rituals: one immediately after death and another a period of time later. A cross-cultural survey of such rites reveals some very interesting common themes, but also how richly varied the particulars are. No one such mortuary tradition can ever stand as a blueprint for others, because the cultural context and historical circumstances will always influence the details. Still, a number of common themes emerge, and also some important insights into why handling of dead bodies is a universally powerful tool when communicating ideals, authority and cultural values. I have selected four examples for a detailed presentation, but will also discuss several others that in their own way shed light on the phenomenon.

**Dowayo, Cameroon, Africa**

The Dowayo are patrilineal farmers and cattle herders who place the greatest cultural and ritual importance on their cattle, whereas the women are mostly in charge of farming as well as beer making. Most men practice some hunting as well, but there are also designated ‘hunters’ who specialise in that economic pursuit. Blacksmiths are, as so often in this part of Africa, a special caste, ritually important but dangerously polluting. The
Dowayo live in villages with compounds for families that often include the male head of the family, his many wives and their children. Men are initiated at adolescence through circumcision, which creates age-sets of ‘brothers of circumcision’ that continue to be an important social group through a man’s life. The initiation ceremony is a secret for women, who are told that the procedure in fact involves sealing the man’s anus so that he never has to defecate. Women of course know that this is not the case, but everyone keeps up the appearances of the secret, which often includes bantering and teasing innuendos on both sides. A very important ritual position is held by ‘clowns’, liminal tricksters who during ceremonies dress in rubbish, speak like women, move either too fast or too slow, act totally inappropriately by shouting obscenities, and threaten to show their penis to women who are never allowed to see it since it would ‘reveal the secret’ of circumcision (cf. Hultkrantz 1980:32ff). Dowayo culture is highly concerned with male-female separation, sealing entrances of any kind, bodily purity and control, and the continuation of the patrilineage despite being dependent on outsider women (wives, mothers), from other lineages and villages. Men gain wives by giving cattle among other things, but a woman still belongs in a sense to her father’s lineage, especially since few ever manage to pay the full bride price (Barley 1983).

**SEPARATION:** The initial funeral differs for men and women. A dead man is taken to the men’s shelter by the cattle park, his body is smeared with oil and ochre and he is dressed in blue and white robes. A bull is also smeared with oil and ochre, placed on its back next to the man and killed and its skin is draped over the deceased. The flesh is consumed by the men, but the head is eaten by the clowns. Male kinsmen and the ‘brothers’ go together to a crossroads with clowns and sorcerers (another ritual specialist in charge of skull-houses) to hold a small ceremony. Upon returning to the village men and women perform a dance together. The brothers of the dead man give the brothers of circumcision a goat which is killed and its excrement is rubbed on the dead body, the skin covering his head. The dead body and the hides are wrapped in burial cloth and for three days there are continuing dancing ceremonies while the widows stay by the dead man’s shelter and are not allowed to cook or go into their own compounds. Each day they must be washed. (Barley 1983:109)

During this time relatives and affines from other villages arrive bringing gifts, and there is much ceremonial interaction between the ‘wife-takers’ and ‘wife-givers’, highlighting the obligations that exist between them. On the fourth day more cattle is killed, and meat is given to kinsmen and the legs to the affines (in-laws). The body is re-wrapped in the hides and burial cloth, blue and white robes, and there is a fire which has been kept burning by its head all this time. The brothers of circumcision are led by a clown to the body, which they rush as the women flee. One of the ‘brothers’ and a sorcerer drink beer made from the dead man’s millet. The body is buried vertically in the ground outside the village, the place marked with a stone. (Barley 1983:110)

A married woman’s funeral is slightly different, as she tends to die at another lineage’s residence. Her body is wrapped by her brothers in skins of cattle and goats, and in burial
cloth but no robes. She is brought to her natal village and re-wrapped, the widower and her sons accompanying her. The main entrance to any village is the great gate at the cattle park. The procession is met here by women wailing and banging calabashes and the body is brought to the public circle of the hamlet. The widower drinks beer and then he and his sons leave. The women sing and perform a mourning dance. Three piles of cloth and hides are collected by the cattle gate: one for her patrilineage (wife-givers), one for her husband’s lineage (wife-takers), and one for her mother’s lineage (original wife-givers). On the fourth day the widower and sons return, stopping by the crossroads to have their head shaved in the traditional mourning pattern. The body is wrapped for the last time, women sing, men drink beer and the widower leaves without looking back. The body is buried, same as a man’s. (Barley 1983:111)

TRANSITION: After about three weeks the grave (male and female) is reopened and the head is removed and cleaned of soft tissue, and put in a pottery jar which is then placed in a tree. In the intermediate period, before the collective skull feast, there is a secondary burial of the individual with symbolically charged objects taking the place of the dead body: for men the bow and for women a water jar. Since his death the personal possessions of the dead man have been kept at the men’s shelter, where his male kin, brothers of circumcision and the clowns now return. Women are normally not allowed anywhere near this place, but his widow being in a state of extreme liminality will take position outside the hut completely immobile. Beer has been brewed specially for this occasion and a clown fetches the skull from the pot in the tree. The ends are cut off the bow, and a stone and a pottery sherd are fastened at each of them. Pot sherd are also attached to the middle – the ‘navel’ – symbolically sealing all openings. The bow is drenched in beer and ochre, and smeared with blood. (Barley 1983:106)

As the women flee the men rush with the skull and bow to the skull house which is situated outside the village, where they are placed outside until the skull festival. As the men return to the village the special attire they have donned is removed and the women bring beer, some of which is poured on the earth and the rest is drunk. The possessions are brought forward and the clown spits water and germinated millet on the widows, children and goods. The brothers of circumcision are allowed to take one item each. All then go to the crossroads where a piece of pottery dipped in oil and ochre is knocked off the head of the widow by the clown, and her belly is smeared with oil and ochre by the ‘brothers’. She can now put on ordinary clothes and is fed smoked meat and salt. A dead woman’s possessions are also gathered at a ceremony and her sisters and the clown will spit on the widower and goods before they are redistributed. The widower will visit the crossroads, have his hair shaved and the clown will rub him with oil and ochre. He can then put on normal clothes and eat smoked meat. (Barley 1983:107, 112)

However, there is also a jar ceremony for women, organised not by her patrikin, but her husband. A water jar filled with beer is placed in a hut and dressed in jewellery, and her brothers arrive and drink beer. Germinated flour will be sprinkled in the pot, and the participants will call out for the woman to join them. The fermenting bubbles in the beer
will be seen as proof of her presence. Women will lick the pot to ensure fortune and fertility, and men and women will circle the pot singing. Half the beer in the jar is then emptied out and the pot is dressed in white and blue robes, sheep skins, burial cloth and more jewellery. The woman’s brother will spit beer on the pot and on her daughter’s belly. Blood is smeared on the widower, daughter and jar. At the crossroads the jar is smeared with oil and ochre, and then taken by the brothers back to their village where it will either be placed in a hut or at the women’s skull deposit. The widower and daughter will be taken to the crossroads to receive oil and ochre, jewellery and smoked meat by the clown, their mourning officially over. (Barley 1983:108)

INCORPORATION: After an unspecified amount of time the spirits of the recently dead will become restless and dangerous, and a prominent and wealthy man will decide to organise a skull festival. He will invite kin and affines to a beer party to raise the subject and if all agree preparations begin. Large numbers of cattle and goats and substantial quantity of millet is required, and even though the head of the feast will bear the brunt of the cost it is impossible to arrange it without considerable help from kin and in-laws. There will be hundreds of participants, not just relatives and affines, but also friends and acquaintances. Although a specific deceased person will be at the centre of the festivities, all the skulls of the lineage’s deceased which have accumulated since the last feast are included. Preparations involve grinding millet for beer and renewing gateways, especially the main gate where the skulls of killed cattle are displayed. Affines will bring cattle, skins, burial cloth and millet. (Barley 1983:99)

A goat is killed at the men’s skull house and faeces are thrown onto the skulls, and they and the female skulls are brought to the village by the clowns. They are arranged in three groups outside the village: men, women/uncircumcised boys and blacksmiths. The affines will arrive with their gifts, and the women will dance displaying wealth and exotic trade goods. The widows of the dead have prepared the beer, but have spent the night outside the village in a hut, which they now burn down and flee from naked. They dress themselves in leaves and are fed smoked meat and salt at the crossroads by a clown and the dead man’s sister. They now return to the village to welcome their dead husbands’ skulls. (Barley 1983:99f)

Women of the patrilineage who are neither married nor widowed gather under a tree where they put a large water jar on a hearth. All manner of relatives of the dead will approach to pour beer into the jar as they call out the names of the dead. Women will lick it for fertility. Men will have put their jar on the ground under a different tree, but they also fill it with beer and call out the names. This jar, which cannot be viewed by women, will have a plugged hole as well. As the plug is removed beer will run onto the ground, mirroring the myth/lie of the men’s plugged anus. The men will now go to the collections of skulls outside the village, and the skulls will be covered with excrement and blood, then cleaned by the clowns, wrapped in robes and placed in a basket. A very old, non-relative will take the basket on his head and bring it to the cattle gate where the widows will dance together. All through the night there is feasting, dancing and drinking – though the main
organiser must spend the night in the bush. The men’s jar will be smeared with oil and ochre, the women’s with blood. The special mourning attires are taken off and people will now dress in normal clothes. The skulls are smeared with oil and ochre. The men’s skulls and jar will be taken to the skull house, and the women’s skulls and jar to the special skull deposit in the forest. Finally the widows of the primary celebrated dead person will go to the compound of the first wife to be fed smoked meat. Blood is smeared on her hearth, and then the compounds of all the other wives are visited in turn. They will all sleep together in the first wife’s compound and then they will go to the crossroads to have their heads shaved, after which food and clothing restrictions are lifted (Barley 1983:101f).

CONCLUDING REMARKS: The Dowayo mortuary cycle is highly embellished and controlled, but what is striking is also that a few main themes are repeated again and again. Both the body of the dead and the bodies of the mourners will go through similar experiences. Controlled death in terms of animals will blend with that of the humans, the culturally most important products will be highlighted repeatedly: cattle, goats and millet beer. Objects such as pots and bows will act as stand-ins for human bodies, and their openings and contents are given extra attention. There is an almost complete immersion in pollution and impurity, as excrement (that men are supposedly free from) is thrown on the bones of the dead. The succeeding cleaning process highlights their now pure state of existence. The only people who are allowed to regularly approach and deal with the dead (spouses, possessions etc.) are the liminal ‘clowns’ who by their very behaviour draw attention to what is considered normal and appropriate behaviour of a Dowayo – by doing the opposite.

A Dowayo will only accept real kinship with others related through the male line, yet the lineages are at the same time obliged to accept women from another lineage in order to assure continuation. Fertility, however, is not in the hands of these women or their kin, but the patrilineage and the collective of ancestors, who can and will control the right to marry. Just as the bones of the dead control the fertility of people, there are special stones that control the fertility of cattle and which are treated and entreated in the same way with blood, beer and excrement, and buried in pots by the cattle parks (Barley 1983:16). The skulls of cattle are treated similarly to the skulls of people as during the skull festival one man will dance with the human skulls in a basket on his head, and other men will dance with the cattle skulls which are then placed on the main gate (ibid.:20). Affines, whether wife-takers or -givers, must also make an extra effort to show reconciliation and lack of foul play at the event of a death as they are in effect strangers and competitors, and therefore under a cloud of suspicion. Although the ceremonies are similar for men and women, they also repeatedly highlight that there are categorical differences between the sexes and that they should be kept apart from each other. Just as uncircumcised men are categorized as women and blacksmiths are kept apart even in death. The ceremonies call for joint dances, singing and performances of many social groups, men and women apart and together, affines and agnates apart and together, and brothers of circumcision are given prominent tasks to show the interdependence of any man to his age-set of initiates.
Control of the body’s behaviour, appearance, speech, movement and even bodily functions guarantee good moral and ethical conduct, and that one is a true Dowayo.

**TLINGIT, WEST COAST OF CANADA, NORTH AMERICA**

The Tlingit are in many respects very different from the Dowayo. They are matrilineal hierarchical fisher-hunter-gatherers of the far north, though most of their old customs are now only known through ethnographic sources and oral history. The lineages are all connected to clans with a common mythical place of origin. Each village could include several different clans, and these local sub-clans of related lineages were the main political unit controlling the moral rights certain land and water resources. Clan affiliation was only really of importance during certain funeral ceremonies. All clans belonged to one of two possible moieties that were exogamous. In other words, one was always spouse-giver and the other spouse-taker. Marital residence was virilocal however, which meant that although a woman and her children belonged to one lineage, they would live at the house of another lineage. At the age 8-10 boys would move in with their maternal uncle to ensure continuation of the lineage traditions on the male side. (Kan 1989:23f)

The most important ceremony of the Tlingit was the potlatch, a ritual of feasting, gift giving and destruction of goods that have received a great deal of interest and attempts at interpretation by anthropologists. Sergei Kan has made an exhaustive study of the phenomenon among the Tlingit from both historical sources and personal field work, and has pointed out that many previous researchers have missed what the people themselves say is the main purpose of the event: to remember the dead and to ‘finish the body’ (1989:14). To understand the potlatch, one must start in good Hertzian tradition, at the beginning of the sequence of rites: the death of a person.

**SEPARATION:** The dead body is washed, adorned, clothed and placed in a sitting position in the house. Personal possessions, anything from work tools to prestige items, are placed around it. As death is proclaimed in the village all normal activities halt and people go to the house to pay their respect. Those who are most directly affected by the death, house members and close kin, will suspend all mundane activities with fasting and abstaining from sex, their hair is cut or singed and faces painted black. There is an overt outpouring of grief with wailing and mourning songs. Periods of collective mourning are followed by more personal expressions of grief with lamentations, keening and crying – mostly by women, lineage kin as well as affines. The lineage members will each night hold a small feast for their affines and the dead person is also thought to participate in spirit. He or she is remembered in songs and stories. (Kan 1989:33ff)

**TRANSITION:** Between four to eight days after death the body is taken out of the house through a hole in the rear wall. Ashes from the fireplace are thrown after it, as is a dog in order to make the lonely and dangerous spirit take it as a companion to the afterlife instead of another person. The corpse is placed on a pyre and covered with furs and woven blankets, the kindling being covered with seal or fish grease. Personal belongings are also included. Members of both moieties participate at the cremation, and wailing and
sobbing come to a climax as the spouse and matrikin blacken their faces with charcoal from the fire. The female affines collect the bones and ashes and deposit them in a box which is placed on top of poles or in a small house in the cemetery belonging to the lineage. Sometimes the skull was placed in a separate box. A number of memorial feasts will be held during the remainder of the transition period. (Kan 1989:35f, 39)

INCORPORATION: A year or more later the bones and ashes are transferred to a new or rebuilt grave house, which was followed by a memorial potlatch to ‘finish the body’. The scale of the potlatch depended on the social standing of the deceased, and the services had to be performed by the affinal/paternal kin who had to be feasted and publically remunerated. Poorer families could take advantage of more wealthy lineage kin and join their memorial potlatch. Until this event took place the soul of the dead was not at rest, and the matrikin was still in a stage of mourning and liminality with dress and restrictions on activities. At the potlatch the dead person’s names and regalia were ritually returned to the matrilineage, and an infant could get one of the names now available. (Kan 1989:41f)

The details of a potlatch could vary greatly with circumstances, depending both on the dead and the preferences of the living, but all involved feasting, paying the opposite moiety, displaying clan regalia, and reciting origin myths, ancestral songs and performing dances. Accumulating all that was needed could take years and involved both lineage and clan relatives. Affines from considerable distances were actively recruited. The affines would approach the village at an arranged moment with great ceremony and lavish display, and several days of feasting and entertainment. Food and drink was supplied by the hosts, who had put considerable effort into collecting enough for everyone. The affines would be in charge of much of the entertainment and songs and dances from non-Tlingit groups were also performed. (Kan 1989:43f)

The day of the actual potlatch was dominated by the matrilineage and clan, with the hosts dressed in full ancestral regalia. There were a final show of mourning with crying songs, and then the sadness was officially and physically expelled through prolonged audible exhales. Following this the mood became more joyous, feasting continued and the spirits of the ancestors were believed to participate and eat the spirit of the food. Sometimes the food was thrown of the fire to go directly to the spirit realm. Then the guests received gifts from all of the hosts who expressed their love of the departed. The guest would offer comfort, and remember their own dead in turn. The gifts were all given in the name of particular matrilineal ancestors of the main organiser, and these spirits were the recipients of the spirit essence of the gifts. Objects and sometimes slaves were thrown into the fire to be destroyed and go directly to the ancestors. Finally the guest departed laden with food and gifts. (Kan 1989:45f)

CONCLUDING REMARKS: In the course of the memorial, the deceased became increasingly de-individualized into a collective. The things that symbolised the individual were destroyed, both personal possession and the flesh itself. The Tlingit associate dryness and heaviness with longevity and purity. Therefore bodies even in life should try
to become drier and heavier through abstinence of sex, drinking salt water, eating dried food, and scraping the body with stones. Young adolescent women were especially prone to wetness and death and were therefore weighed down with stones in their dresses, and stones were rubbed on their mouth to make them talk less and more slowly. Kan points out that in the perpetually rainy and humid climate on the Northwest coast, water and sea might have been indispensable for life but were also associated with dangers, death and change, whereas land and stable structures such as the houses symbolised safety and continuity (1989:55). Ashes, which were the epitome of dryness, were used to purify many things: houses, the living after polluting activities, the newborn (ibid,107, 111f). It is not difficult to see that the cremation consumed the last of the wetness, flesh, and left only dry durable bones. Flesh was seen as being a mix of both the father's line and the mother's, but bones derived solely from the matrilineage (ibid,67f).

Kan points out that although Hertz's insight that death and mourning are controlled and filtered through culture, we often tend to forget that the grief experienced by the bereaved can still be acute and genuine. The form of expression is cultural, but the emotions can be universal. Also, at any such event, participants will be reminded of their own loss of loved ones, by experiencing the sights, sounds, smells and tastes of a familiar shared ceremony. This is what makes mortuary rituals so socially poignant and potentially powerful. All rituals play on the familiarity of repetition and prescribed behaviour, movement, food, speech. But mortuary events are in a position to draw upon extremely powerful emotions and the definitive occurrence that is death. The experience of collective grief, remembrance and celebration is therefore something that affects the participants in a way that both confirms and creates a sense of identity and unity.

In their collective expression of sorrow, the hosts were strongly unified. They spent a lot of time rehearsing the singing, dancing, and other aspects of the potlatch, so as to act harmoniously and flawlessly in the presence of their dead matrikin and opposites. …the joint expelling of sorrow emphasized the value of matrilineal unity and solidarity.

(Kan 1989:193)

**KHASI, NORTH-EASTERN INDIA, ASIA**

The Khasi are matrilineal, matrilocal slash-and-burn farmers. Inheritance goes from the mother to her youngest daughter (ultimogeniture). The lineage is somewhat less important socio-politically than the village, but it is this aspect of society that is emphasized in mortuary rituals. Each lineage has a mythical female founder, the ancestral mother whose grave is the religious centre of the lineage. The female head of the house will act as the keeper of religion ensuring the good will of the ancestors and through them fertility, by feasting and feeding them. The great burial ceremony where all the bones of the dead are gathered and placed in the lineage grave is the one occasion where the lineage acts as a corporate unit. The bones are considered to contain spiritual essence and the indestructible component inherited through the mother. The flesh in contrast is perishable and derived from the father's side. This means the agnatic link dissolves after
death, and it conforms to the religious image of Man the Creator, Woman the Preserver. Among the Khasi it is the men who are in contact with the corpses, whereas the women must avoid contact at all cost. (Århem 1988:286)

SEPARATION: The corpse is washed and dressed in white clothes in the house. Animals are sacrificed and the dead person is brought food and drink for three days. (Århem 1988:277)

TRANSITION: The body is taken out and cremated. The ceremony involves lineage kin, spouse, children and close friends. More animals are sacrificed and food is thrown on the pyre. The cremated bones are collected and brought to a small cairn by the matrikin, and food is left by the grave. After a few days the house and family members are ritually purified. (Århem 1988:277f)

INCORPORATION: This is in fact a dual event. At such a time as it can be afforded, the bones of the dead are transferred to the main family tomb. This usually involves several deceased of the same sub-lineage, and they are collected and brought to the centre of the most senior of the deceased. The bones are collected and placed in a newly built grave near the main organiser’s house, and food and fermented drinks are placed around it. From now on they will be addressed as a collective and only the name of the senior deceased will be mentioned, acting as a stand-in for the entire group. The participants will also gather and feast. Even more rarely the Great Ceremony takes place, involving the moving of the bones from the collective grave to the main lineage ossuary. This undertaking is so great it has to be decided upon by the ritual heads of all the families involved, and the lineage needs to be in a stage of ritual purity and social harmony.

Village members take part in constructing a large mound where they place the large stones representing both female and male essences. The lineage will hold a feast to repay them for their effort. Bones are collected both from individual and collective graves from a large area, though apparently an effort is made to keep male and female bones apart. Relatives bring rice wine which is poured into a large jar. The lineage members make many animal sacrifices, but the affines also sacrifice animals for their ‘children’ and the food is mixed for the feast. Some of the food is burnt and the bones held over the smoke to receive the offering. Unmarried dead will be ceremoniously married to a wife and a husband respectively, with bawdy jokes and teasing of the two old people acting as stand-in spouses for the dead. Female bones are placed in a pot as far inside the ossuary as possible, whereas the male bones are placed by the opening. (Århem 1988:280ff)

CONCLUDING REMARKS: Several themes are familiar here. The washing and special clothing of both the dead body and the mourners. The fact that the dead body is kept in the house and given food and drink until the time of the cremation. A similar attitude is evidenced among the Dowayo who keep a fire burning by the body. The message implied is that society and its living members decide when a person should stop receiving warmth and sustenance, not biology. Again it is important to keep males and females slightly separated, though not as notably as the Dowayo, although the lineage ossuary is in every sense a collective burial. Controlled fertility is another familiar concept, and the emphasis
that any proper member of society should have been married at least once before becoming an ancestor. The joint effort of the lineage members, symbolised by pooling fermented beverages in a jar, is also familiar, as is the participation and aid of the affines who are shown to be both indispensible to the lineage and apart from it.

**MERINA, MADAGASCAR, AFRICA**

The Merina are rice farmers who live mainly in central Madagascar. Traditionally they were divided into localised kin groups (demes) that lived in clearly defined geographical areas along the river valleys. The association of kin-group and land is very strong, and the notion of ancestral land is practically synonymous with the ancestors themselves who are buried there and who shaped the terraces. The people living there are grown out of this land, and out of the ancestors as ‘hairs growing out of the head’ (Bloch 1982:211). Kinship is complex, inheritance rules generally ensure that all children inherit some land regardless of gender so ideally the demes should be endogamous which would protect the ancestral land from being broken up. The central symbol for the unity of the deme is the massive megalithic tomb, half below and half above ground, where all the dead are collected after death. There are usually several such tombs for each deme, but as they are all placed on the same ancestral land they are viewed as parts of a whole, and are said to be related or even ‘one’. In fact, when a new tomb is constructed a number of bones from other tombs must be brought in before any new individuals can be placed there. Regrouping the dead is the most sacred task of the living, and essential to ensure continued fertility of both land and people (Bloch 1982:212f).

Since endogamy, marriage within the group, is the ideal in theory women are not usually viewed as perpetual outsiders. Something which is highlighted by the fact that the terms for both parent and child are the same regardless of gender (Bloch 1982:212). However, there is still the ‘problem’ of affines, and individual lines of kinship through marriage are often held up in opposition to the undifferentiated kinship of the deme. Kinship through marriage concerns the individual, kinship through descent concerns the collective. In these cases it is women as wives who stand for this conflict of interest, and as a divisive force in the sibling group, and this is often represented by the house which is the abode of the family unit. The house is the woman's territory, and the place of both birth and death. “Women in their aspect as individuating mothers, houses and heat (the symbol of biological birth) are made to stand in opposition to the undifferentiated deme, the tomb, blessing and ancestral fertility, all associated with cold” (Bloch 1982:214). All this is elaborated and focused upon in the mortuary rituals.

**SEPARATION:** The event of death is an occasion for great sorrow and grief, and visitors to the body should weep and cry openly. In fact, the behaviour of mourners should be dramatic and intense, and includes expressions of a will to die themselves to mild forms of self mutilation. Bloch points out that the emotions are quite genuine, even if the form of grieving is culturally prescribed. The main female mourners voluntarily make themselves unattractive, the hair is left unkempt and tousled, old clothes are worn
and they sit on dung heaps as they receive the condolences of visitors, and they will also be responsible for washing the corpse. One of the central themes of the funeral is an immersion in pollution and the horror of decomposition, which is openly linked to the category of wetness. The corpse is seen as extremely polluting at this phase, and any contact requires ritual cleaning. Fires burn at the entrances to purify those who return from the funeral, but people also have to wash themselves, and tools used to dig the grave must be thrown away. The willingness of the mourners to take on this pollution is a sign of their devotion, and close mourners are expected to throw themselves on the corpse before the burial. The body is buried in a single grave somewhere on a hillside near the place of death, irrespective of whether it is ancestral land or not. (Bloch 1982:214f)

TRANSITION: At certain intervals the bodies of the dead will be returned to the ancestral burial place. Not just the bones but the powdered remains of the flesh, referred to as earth, are carefully collected and brought under joyous celebration to a home near the selected tomb. This is an occasion of great rejoicing, dancing and playing music, as the dead are about to be returned to the collective. In the house women mourners will watch over the remains of the dead. (Bloch 1982:215f)

INCORPORATION: On the day of the main ceremony the bodies are taken from the house to journey the short distance to the tomb. They are carried on the shoulders of the women who are literally driven forward by the men. Tombs are normally considered extremely dangerous and no one approaches them without proper authority. This fact is emphasised when the men first force the women to take up the corpses, then force them to proceed, and also force them to stop and dance at certain stages of the journey. The atmosphere among the participants is extremely tense, and the fear is not just acted, but actively felt. The procession should arrive at around midday, the time of maximum glory and clarity. The men will now enter the tomb and exhume several bodies already interred, and place them on the shoulders of the women and then drive the women around the tomb several times. At the climax of the ceremony the men will stand on the tomb and make long speeches asking for the blessings of the ancestors and proclaiming how happy the dead are to become part of the group again. They will also declare who among the living have presented the various shrouds in which the corpses will be wrapped before being placed in the burial chamber. The women will dance with the old and new corpses, but now the air is more festive, even bacchanalian, as the fear is subsumed in a somewhat hysterical joy. The wrapped corpses are thrown up and around, and the often brittle bones are broken and destroyed even more, mixed with the dust that was once flesh. Finally the men will take the corpses into the tomb. (Bloch 1982:216f)

CONCLUDING REMARKS: Maurice Bloch has written extensively and insightfully about the Merina mortuary rituals, and the way in which they are used not just to highlight cultural notions of the individual and the kin group, but also in effect to create these sentiments (e.g. Bloch 1982; Bloch & Parry 1982; Bloch 1988). He has especially pointed out the way in which mortuary rituals make use of the natural biological processes after
death, and associate these with ideological constructs to make the latter appear just as naturally and biologically given:

Most generally, therefore, funerary practices are central ideological practices in that they are based on the type of three-stage argument which characterises ideology: 1) they take over certain pre-cultural biological and psychological phenomena in order to represent them, in this case death, sorrow, pollution; 2) this representation then incorporates these phenomena so that they appear homogenous with legitimate authority, the main manifestation of which is fertility; 3) authority is verified by appearing natural because on the one hand it incorporates the evident processes of biology and on the other it corresponds to deeply felt emotions. Ideology feeds on the horror of death by first emphasising it then replacing it by itself.

(Bloch 1982:227, orig. emphasis)

Bloch has also argued convincingly that Western scholars have too often confused expressions of sexuality with fertility. As we have seen repeatedly, sexuality and fertility are pervasive themes in these rituals, either through immersion in symbols and actions associated with them, or by overt abstinence. However, it is important to note that sexuality is often not portrayed as synonymous with fertility, in fact it is often seen as its complete opposite. Fertility is associated with the culturally regulated and condoned, something under the control of the ancestors or other external forces. Sexuality on the other hand is the uncontrolled, chaotic, potentially destructive force that threatens to disintegrate familial bonds and turn humans into animals or worse.

This idea is certainly present in our modern society as well, where popular culture in books and movies continuously distinguish between the proper (often married) sexuality, and the destructive uncontrolled lust/sexuality. The former brings not just children but prosperity and happiness, whereas the latter in the guise of adolescent promiscuity or marital infidelity will result in violence, gruesome death and sexually transmitted disease. The preoccupation with sexuality and carnal lust, or with abstinence and making oneself unattractive, during separation and transition is a way of constructing sexuality as an opposite and contrast to fertility and proper bodily behaviour. In every instance the ancestors are intimately linked with the continued fertility and prosperity of humans, animals and plants. The only way to assure that the ancestors will grant this is to behave in a respectful and proper manner, and the mortuary rituals will show the way not just by making people act ‘right’, but even more by making them act ‘wrong’.

Why should a ritual which acts out victory over death so revel in stressing decomposition, pollution and division as the famadihana clearly does? The answer is that in order to deny that aspect of things emphatically and thereby ‘create’ the victory, the enemy must first be set up in order to be knocked down.

(Bloch 1982:218)

One thing that is elaborately constructed and destroyed during mortuary rituals of the kind presented here is the notion of individuality: the ambitions, bonds and desires of a
transient life. This individuality is very tellingly associated with the flesh, which decomposes and disintegrates after death, leaving only the durable and de-personalised bones. The message could hardly be clearer: upon death the person disappears, but the essence that is shared by the group continues. People die, the kin group is eternal and triumphant. To speak for the ancestors is therefore an extremely powerful way of receiving authority that is at the same time deeply personal as everyone has dead relatives, and profoundly impersonal as the dead blend together and personal desires evaporate (Håkansson 1998).

In such a system, where power is represented as traditional authority, power-holders are legitimised insofar as they appear, not as the makers of their own superiority, but as caretakers of a well-organised world. It is not as individuals that people have legitimate positions in society but because of their position in the eternal order which they temporarily incarnate. In such systems, therefore, individuality is an obstacle and a challenge to power and it has to be elaborately negated.

(Bloch 1982:223)

There are many other cultures in all parts of the world with mortuary rituals that involve complex treatment of the bones, disarticulation, cremation, dispersal and/or reburial (e.g. Hutton 1927; Nicklin 1971; Trigger 1978; Huntington & Metcalf 1979; Gillison 1980; Davenport 1986; Corlin 1988; Waterson 1997; Helms 1998; Wiessner & Tumu 1998; Curry 1999; Pearson 1999; Wiessner 2002). I will not go into any more detail except to give a few additional examples. The Huron are matrilineal Indians of Northeast America who traditionally lived in large villages and practiced slash-and-burn corn farming, supplemented by hunting, fishing and exchange with visiting hunter-gatherer tribes. The deceased was laid out in the house and mourned for three days at the end of which a feast was held at which the spirit of the dead person was thought to participate. The body was then placed on a scaffold or buried in a shrine depending on the manner of death.

After 8-12 years a great Feast of the Dead was organised by the exogamous tribe. Chiefs would meet to decide on the date, and families would start to collect the remains of their dead. Any remaining flesh or soft tissue was burnt off. The bones were wrapped in beaver skins, brought to the villages and feasted. The main event was held at a location away from the village, where a very large pit had been dug. Participants were divided into village, tribe and lineage groups around the pit, and called forward in order to deposit the bones and various gifts that were sometimes deliberately broken. Afterwards the pit was covered by a mound and gifts were given to relatives of the deceased and the organiser. The villages involved all had social ties and alliances that were renewed and reaffirmed during the feast (Trigger 1978:374f, 380; Curry 1999:5).

There are many examples of societies where the skull of the dead is singled out for special treatment, much in the same way as among the Dowayo. The Naga living in north-east India/Myanmar will wrap their dead in leaves and place them under a tree. After a week or two the head is removed, cleaned of remaining soft tissue and placed in a stone receptacle in the village cemetery. Those who wish for children will perform fertility rites
by these stones. However, heads are not collected from those who die a violent death and for those who die of drowning or disease the skull is placed in a pot and buried (Hutton 1927:61ff). The Aoriki farmer-fishers of Melanesia will perform a special mortuary feast for their dead every decade or so. It involves a great effort of the whole community and takes years to plan. Gifts are handed out to neighbouring communities to help re-establish social bonds and reciprocal relationships with them during the feast. The skulls of important people are disinterred and placed in charnel houses and shrines (Davenport 1986:99f).

The Enga of Papua New Guinea, some of which are mainly hunter-gatherers, others practice horticulture and keep pigs, used ancestor rituals as the anchor of society where the ideal relationship between tribal segments were acted out and affirmed. Emphasis was on internal group solidarity, in contrast to the intense personal competition that often existed in other social arenas, but outsiders were actively invited as well.

The collective goodwill and generosity of participants were believed to please the ancestors, while the vitality of a large crowd working toward the welfare and prosperity of the group conveyed a spiritual experience to everyone involved. Together, the awe of the sacred and the power of community effort created a unique atmosphere. (Wiessner & Tumu 1998:211-212)

The Enga have skull houses, but only the skulls of men are included. Patrilineal and virilocal, the women are viewed as outsiders and potential threats to men and the tribe. Settlements are dispersed, so men would travel far with the skulls to deposit them at the joint tribal skull house. When the house was full, the spirits were banished to the realm of the ancestors through a ceremonial cremation of the lot. In addition to the skulls, animal fat and vegetables of every culturally important species were added to the pyre to assure their continued fertility. The animal fat would cause explosions of heat and the skulls would seem to jump out of the pyre trying to escape. Those that managed to roll away were left alone, the rest were cremated. (Wiessner & Tumu 1998:200, 210)

It should be mentioned that secondary mortuary rituals are practiced in Europe as well in both modern and historical times. For instance in north-west Portugal flesh is strongly associated with the sinful person, and bodies are exhumed after three or four years to be cleaned of the last remaining pieces. Among rural Basque communities in Spain the family is strongly linked with the farmstead. A deceased person is buried in a nondescript grave at the cemetery and at the same time the bones of the previously buried person are removed and placed in the family ossuary. Each family has a sepulturie in the village church which is the focus of devotion, and this is where Masses for the dead are said. The connection between farmstead, ossuary and sepulturie is so strong that if a farm is sold the new family will take responsibility for the others as well, and Mass will be held for the collective dead, not just the actual relatives of the new owners (Bloch & Parry 1982:22, 33f). The Ducal Crypt at Vienna has containers with the bodies, hearts and internal organs of several members of the Habsburg dynasty. For several imperial members of the
dynasty the bodies were buried at one place, the heart placed in another crypt, and the internal organs were deposited at a third church. While this was a fairly singular tradition of a royal line, it also brought home the special nature of the Habsburgs as the proclaimed heirs of the Holy Roman Empire (Weiss-Krejci 2001).

Destruction of the body can also involve consuming parts of it. Gimi, another group of hunter-gatherers with limited cultivation and pig husbandry on Papua New Guinea practice ritual anthropophagi. When a man dies the women ‘steal’ the corpse and take it away from the compound. The senior women will cut up parts of the body and give them to junior women to cut up further. The parts are then cooked and some of the flesh is consumed, the rest is placed in bags. The act is one of overt and dramatic grief. The women then go to the men’s house which is normally taboo, but due to their consumption they are during this period ‘men’. They are kept there for a few days as the meat they have eaten is digested, and they are not allowed to leave until they have eaten a similar body part of another animal that represents the female/domestic. The men will take possession of the ‘indestructible’ bones and place them in caves, trees and abandoned gardens – the wild realm that is the male sphere. Water from the mountains and animals from the wild will be ingested by the young bride to ensure that she will be able to conceive (Gillison 1980:158f). Another case of endo-cannibalism is found among the Wari’ of Brazil. The mortuary ritual involved dismemberment, roasting and consumption of the bodily remains by its affines. It is a ritual of extreme sorrow and a terrible duty of the affines to in effect consume the grief of the living consanguine relations of the deceased (Conklin 2001).

**CONCLUDING REMARKS**

We will in all likelihood never be able to deduce the specific details and cosmological characteristics of Neolithic rituals, for which we have no historical records. Anthropological research on death rituals shows us that the same basic biological fact can generate such an abundance of practices, beliefs, symbolical systems, cosmological structures and basic human behaviour. There is unfortunately no direct causality between society and mortuary ritual, and the secondary burial practices presented above, a small selection of what has been recorded by anthropologists, show that even such a remarkable tradition can appear in all parts of the world, in almost any kind of society and kinship system. Likewise, similarly organised societies can have mortuary rituals that are very different from the examples discussed here. There is something to be said for the fact that death is the ultimate rite of passage, and that this is often elaborated upon by the living. Such a generalization does not really tell us anything about the specifics of each context in the past, however. For instance, although the dichotomy of flesh and bones is a pervasive idea that exists in most secondary burial traditions, the details are still incredibly varied.

Rather than trying to construct a general set of rules regarding attitudes toward the dead body, it might be more profitable to reverse the question and start with the material remains. The examples above show how when dead bodies are handled, disinterred,
disarticulated, dispersed, collected and destroyed they tend to communicate powerful ideas about society and its members. A mortuary ceremony where dead bones are placed in a collective tomb does not mean the society in question was always collective and egalitarian, but it does show that these ideological ethics were given centre stage at one of the most emotionally charged events in a human’s life. This is an important consideration. The concept of fertility as a blessing to be potentially withheld unless the living conform to traditional norms and values is also pervasive in rituals focused on the dead as ancestors. Again and again we see that separation and gathering, feasting and abstinence, sexuality and fertility are dwelled upon not just symbolically but bodily as well, and that it is the act of doing things and experiencing it through the senses that brings real meaning even to ‘meaningless’ rituals (cf. Staal 1979; Eves 2004; Hornborg 2005).

Every social order systematically takes advantage of the disposition of the body and language to function as depositories of deferred thoughts that can be triggered off at a distance in space and time by the simple effect of replacing the body in an overall posture which *recalls* the associated thoughts and feelings, in one of the inductive states of the body which, as actors know, give rise to states of mind. Thus the attention paid to staging in great collective ceremonies derives not only from the concern to give a solemn representation of the group … but also, as many uses of singing and dancing show, from the less visible intention of ordering thoughts and suggesting feelings through the rigorous marshalling of practices and the orderly disposition of bodies, in particular the bodily expression of emotion, in laughter or tears. (Bourdieu 1990 [1980]:69, orig. emphasis)

We will never be able to make blueprints of rituals which can then be superimposed upon prehistoric remains, but we should to the best of our ability study what was actually done with human bodies, animal bodies, material culture and location. These actions will potentially offer clues about which narrative was constructed by the living at this emotionally charged event.
12.2 Breaking and Making Bodies in the Middle Neolithic

Symbolic power works partly through the control of other people’s bodies and belief that is given by the collectively recognized capacity to act in various ways on deep-rooted linguistic and muscular patterns of behaviour, either neutralizing them or by reactivating them to function mimetically.

(Bourdieu 1990 [1980]:69)

The body is the most common denominator of human experience, and we not only experience the world through its senses and perceptions but we tend to relate to the world with it as our basic measuring-rod (Lakoff & Johnson 1999; Hamilakis et al. 2002). Which, however, is not to say that experience is universal or essentially determined by biological sex or genetic make-up (Haraway 1991). The innate differences that still exist with each individual body, not just in basic physical characteristics, but throughout life as our bodies change, our unique personal experiences, the way the world and people affect us, and the choices we make in the course of our lives guarantee that no one person on this planet will ever be completely predictable. However, we think and talk in bodily terms, and we associate good bodily behaviour with good mental character – and vice versa (Hertz 1960).

Death is both a terrible event where a body ceases to be alive and becomes an object, and an opportunity to truly visualize and dramatize the rules and values society have invested in the bodies of its members. Death is also something to be conquered by denying nature the right to decide when and how death occurs. Corpses are often washed, dressed, given food and warmth until the moment when the living decide a corpse is no longer part of their world. Just as the dead body is altered, both by biology and by cultural intervention, so are the bodies of the living made to undergo changes. Hair, clothes, colours, expressions, sounds and smells can be manipulated. As the living alter, manipulate and interact with the dead bodies, fundamental templates of the cultural ideology are given substance in physical reality. What can we deduce about the value systems communicated to the members of Pitted Ware culture and Battle Axe culture based on this assumption? And can it offer us any insights into the construction and use of the mortuary houses at Bollbacken and Turinge?

Breaking Bodies

Pitted Ware burial ritual is not easy to define. It is not even easy to say if a common mortuary custom existed regionally or at least locally. The cemeteries with inhumation burials found on Gotland and Öland might have existed along the East coast and in the archipelagos as well, only poor preservation of bones have rendered them invisible to us today. However, it is perhaps more likely that the unique circumstances of the large, but
isolated, island of Gotland caused more permanent settlements, and in extension permanent cemeteries, in particular. Certainly, there are no known cemeteries of this kind found in Blekinge where bone preservation is quite good. The remarkable inhumations and rich details found in the Gotlandic burials have occasionally blinded archaeologists to two facts. Firstly, that there are also a large number of settlement layers that include disarticulated human remains, and secondly that several of the inhumation burials also show evidence of removal of body parts, defleshing, mixing and reburials (Larsson 2009a). These ‘broken’ bodies are found on many other Pitted Ware settlements and sites on Åland and all the way along the East coast, from Gästrikland to Skåne. There are also cases of probable burials in settlements, though it is not easy to determine whether the features in question were created during the settlement phase or in connection with its abandonment.

Fig. 12.1. Pitted-ware sherd found at Sittesta, Södermanland. The potter has added a few strokes that resemble a human form, with the pit as its ‘head’. Similar decorations have been found on vessels in Southern Sweden, although not placed beneath a pit impression in such a suggestive manner. (photo: UV Mitt)

The dead have been treated in very complex ways, at times collected or dispersed or burnt or cut or reburied or scattered – or all of the above. The completeness of the individual body was destroyed in death, either by breaking and removing parts, or by adding parts from others, obscuring where one person ended and another began. The phenomenon that so many settlements include at least a few human bones, burnt or unburnt, is interesting. At Bollbacken some features contained only a few selected fragments, whereas others included most of the bodies, but even these were never fully complete. The assemblage at Jettböle also lacked several bone elements. A possible interpretation is that parts were deliberately removed by the living, to be deposited at another location or kept as powerful objects. Pitted Ware culture had a subsistence of mainly marine hunting and fishing, supplemented by gathering and hunting land animals.
Seasonal change, variations in climate and changing migration patterns of the animals probably meant they had to be prepared to move settlement, break up the group or join with others depending on the situation. A possible anchor to continuity both with the land and its resources, and with affines and kin, could be the use of these fragments of the dead. Land/territory is defined not just through land use, but openly as the place where the ancestors dwelled. “...a sacred place where our fathers and mothers are buried” (Hitchcock & Bartram 1998:31).

An elderly Kua woman noted that the eastern Kalahari was a ‘sacred landscape’, since it contained the graves of her ancestors, the remains of camps where they had lived, and ‘special places’ where ceremonies such as initiation rites were held. (Hitchcock & Bartram 1998:37)

Carrying pieces of the dead, leaving pieces behind, and initiating a new site by burying some of these fragments could have been methods to create one great whole out of all these disparate parts. It is difficult to know whether most of the dead were transported in this manner or if most of the body often was disposed of in a manner that leaves us little or no evidence: in the wild, at sea etc. Tibetan burial practices for instance, leave virtually nothing of the body. An effigy of the dead is made out of his or her clothes, then the body is taken to the dismemberment site outside the village by the mourners where the professional ‘body cutter’ chops the body into small enough pieces that they can be devoured by the vultures after everyone leaves. Only one small piece of skull bone is removed and kept. The rest of the mortuary cycle involves mainly the effigy, but also a pot which is dressed in jewellery and headgear and suspended from the roof inside the house. There is a liminal period of 49 days after which a merit making ceremony takes place where the villagers are feasted on food and beer. The consciousness of the dead is transferred from the pot to a piece of paper, and the vessel is taken outside and broken. The effigy is destroyed, and the paper burnt. The ashes of the paper are mixed with the skull bone and tsampa dough or clay, and several small cones are formed from the mix. These are placed in ‘clean places’, such as caves, streams or trees (Corlin 1988:64ff).

The Pitted Ware funeral rituals have much in common with the examples of secondary mortuary practices in chapter 12.1. Bones of fish and seal appear in many of the features with human bones, and alternatively people seem to be buried at or near large slaughter or preparation sites. Fish and seal are economically important animals to the Pitted Ware people, and their behaviour is seasonally determined. Including them in the mortuary context might have been part of an effort to keep the cycle moving and ensure bountiful game. It would also have linked this renewed fertility to the ancestral collective. Dogs have been singled out for special treatment similar but not identical to that of humans, acting either as stand-ins to prevent further deaths, or as guides/guardians of the dead. Ostentatiously revelling in death, decay of soft tissue and the resulting bones could have been a way to display the impermanence of individuals and their personal preoccupations, and the permanence and continuity of the group.
Considering this, I think that in this case cremation or not cremation should not be seen as significant differences in Pitted Ware mortuary practices. Burning the flesh off the bones is analogous to letting it decay, or scraping and cleaning the bones by hand, which also seems to have been practiced.

This is precisely the meaning of cremation: far from destroying the body of the deceased, it recreates it and makes it capable of entering a new life; it thus achieves the same result as the temporary exposure, but in a much faster way.

(Hertz 1960 [1907]:46)

Whether or not to cremate a dead person can have great symbolic potency (cf. Oestigaard 2000a; b; Kaliff & Oestigaard 2004), but in this case I think it should mainly be seen as just another variation allowed within Pitted Ware mortuary custom. A quite mundane explanation is also possible: the manner of disposal might have depended on the season of death. A death in winter time meant that the body could only be buried in the ground with considerable difficulty. Alternatively a death in the warm summer would quickly cause any body left above ground to become putrefied. Cremation could have been used to ensure quick disposal either in the winter or in the summer. In time, and within certain regions, cremation rather than inhumation may of course have developed into something much more ideologically charged.

It is interesting that the treatment of the pottery seems to mirror the treatment of bodies. The vessels are also broken up and dispersed, certain significant pieces such as the bases occasionally deposited upside-down in a deliberate manner. The pottery we find in the flat-earth graves is mainly in the form of fragments: sherds and bases. Miniature vessels and cups are found in burials also, but they seem deposited more in the filling than actually placed as gifts to the dead. Most of the pottery is deposited in settlement layers, and interestingly enough we often find the remains of the dead here as well. Since unburnt bones rarely survive on the mainland it is difficult to know how common this practice was, but a substantial amount of Pitted Ware sites, on Gotland as well as on the mainland, have yielded human remains. The ‘grave’, as we tend to define it, was probably far less important than the bones and body parts themselves. It was in many cases just a temporary resting place before removal and dispersal of body parts. The site itself, the settlement, was the real focus and the fragmented, de-individualized bones of the ancestors as well as the fragmented, de-individualized vessels marked and inaugurated the place for the living. Through this there was a sense of stability and belonging created despite the mobile life-style.

Clay was probably associated with flesh and life, considering the making of clay figurines, so temper could therefore be associated with the skeleton which creates structure and durability. It is tempting to interpret the use of actual bones as temper in these pots as evidence for a very conscious and deliberate connection between human beings and pottery vessels. Unfortunately it is not possible at this time to ascertain whether the cremated and crushed bones came from animals or humans. It is an alluring
thought, that the dead were given new life in the vessels which their descendants used to make food or keep water in. A caveat is that the use of bone temper seems quite regionally specific, and that it was far more common to use calcite. It could simply be that (animal) bones were considered a suitable alternative to lime stone, having similar characteristics. Apparently, some used crushed sea shells as temper as well (Brorsson 2008b). It is still possible that the association between the white stone, the white sea shells, and the white bones was openly acknowledged and consciously played upon (bones of the earth, bones of the sea, bones of the people). The abrupt stop of calcareous temper materials in the Late Neolithic pottery suggests the use was not seen as wholly functional. In the end, the vessels met the same fate as the people who made them: broken, mixed, sorted, dispersed

Making Bodies

If Pitted Ware burial is a study in fragmentation and blurring the lines between individuals, Battle Axe burials display an obsession with the body as a whole. The single burials of the Corded Ware culture complex have often been referred to as individualized, and as evidence that a culture supporting the idea of the individual replaced the collective ideology of the megalithic passage graves. There might be some truth in that, as it is certainly striking how burial customs change at around 2900 BC. However, closer scrutiny of the graves reveal something different: a strictly regulated and controlled burial where neither position, orientation, burial gifts or their placement seem to be allowed much variation. Although the details vary between parts of Europe, on a regional level there is always remarkable consistency.

Malmer registered 217 Battle Axe burials in his two main works, not counting the atypical Gotlandic graves, which are better designated as Pitted Ware burials with a few Corded Ware culture items, and the megaliths (Malmer 1962; 1975). I have details regarding another 34 Battle Axe burials excavated after 1975 which brings the total up to 251 registered burials, but the list is not complete. Unfortunately, most of these lack skeletal remains and a great deal of them were never excavated professionally. Of these, 79 are examined and documented in such a way that the orientation of the burial pit can be ascertained. Twelve were in a predominately east-west orientation, and the remaining 67 in mainly north-south orientation. Several of the east-west graves had a decidedly late date based on the burial gifts. In north-south graves where there were still human remains, or where traces of the body could be discerned, it is clear that the body is either placed on its left side with the head to the north, or on its right side with the head to the south. The dead were therefore invariably facing in a generally eastern direction. Battle-axes are, as far as can be told, only found in the northern end of the burial. This, combined with the modest number of actual osteologically examined bones suggests that men were placed on their left side and women on their right, which interestingly enough is the opposite of prevailing burial customs of the continental Corded Ware cultures.
Poor source material notwithstanding, the general set of burial gifts is often remarkably consistent. The most common objects are work axes made out of either flint or ground-stone. These are often hollow-edged (adzes), and often in a set of two: one thicker and one thinner. Battle axes are the second most common burial gift, with beakers a close third. It should be pointed out that since a great deal of these burials are known only through salvaged artefacts from gravel pits and similar places, the small and easily fragmented beakers are probably severely underrepresented, and the battle axes overrepresented. In professionally excavated graves, pottery occurs in far greater quantities than battle-axes. Another artefact that is very common is the flint blade knife, and when bones are preserved there is also often a bone awl present. These two items regularly occur in many Corded Ware burials as well. What is doubly interesting, considering many researchers have drawn much attention to the apparent gender differentiation of Battle Axe burials, is that ‘male’ and ‘female’ burials (as I will refer to them from now on) contain strikingly similar sets of gifts. The work axes are just as likely to occur in a female grave as a male one, as are the blade knife and the pottery. It is possible that a set of two or more beakers occurs more regularly in female graves than male, but since so many lack proper descriptions this cannot be determined. The only major difference between ‘male’ and ‘female’ burials, apart from the orientation, seem to be type of ornaments such as bone and amber rings and beads, and the battle axe. It must be remembered that not all male burials contain a battle-axe.

Undoubtedly the battle-axe was a highly charged prestige item, and the fact that it does not appear with women as far as we know should certainly be noted. But what is more striking is that the burial custom is so similar between the genders. They come across as barely differing mirror images of each other, with more things in common than not. This becomes even more obvious when we look at the double burials of the Battle Axe culture. In Denmark and on the continent, double burials often involve the dead bodies being placed next to each other, front to back. In Sweden there are at least five known double burials and another three likely ones. In only one, found at Ingelstorp in Skåne, are the two dead individuals placed with their heads in the same direction (north). This grave included a battle-axe made of diorite, an unusual and possibly foreign raw material. No known double burial in Sweden contains two battle-axes.

Burial 52 of Lilla Bedinge parish, Skåne contained two individuals placed foot to foot, in the standard crouched position facing south-east, one with head to the north-east the other to the south-west (Fig. 12.2a). The grave contained over a hundred amber beads, the northern individual had a small beaker by the hand and a larger one by the feet, the southern individual had a large and small beaker placed by the feet. Both had flint axes and flint blades. Malmer interpreted the southern individual as a female, based on the position and on the fact that this individual had a piece of copper jewellery, and a tooth stamp made from bone. However, two subsequent osteological analyses came to the conclusion that the southern individual was a male, whereas the northern one was too poorly preserved to determine. Both individuals were young adults, probably in their early
teens, the northern one being the youngest (During 1989:139ff; Svensson 2003). Either this burial has inverted the gender positions, or there are two young males placed in complimentary positions.

Another poorly preserved double burial was excavated at Åraslöv, Nosaby parish, Skåne. Only the southern individual, accompanied by a flint axe, three beakers, two flint blades and two bone awls, could be osteologically analysed. The result in this case, based on the pelvic bone and skull, was that it was a fully adult male (Svensson 2003:34). To complicate things further, the well preserved double grave at Linköping, Östergötland was oriented east-west and contained the crouched bodies of a man and a woman, osteologically analysed, as well as a very young infant placed between the legs of a dog behind the woman’s back (Fig. 12.2:b). The woman lay on her left side and the man on his right, both facing south. The woman had two beakers placed by her head, as well as a flint adze, a flint chisel, a groundstone axe, a dagger made of deer antler, copper ornaments, flint blades, bone awl, amber and bone ornaments. The man had a battle-axe (C:1b) under his chin, an antler weapon and a flint blade (Lindahl & Gejvall 1955; Malmer 1962:930; Janzon 1986:fig 3).

Placing the dead in complimentary positions, disregarding the biological sex, shows that the supposedly strict gender division of the Battle Axe culture is somewhat more complicated than generally assumed. Either we are dealing with individuals who were categorised differently from what their biological sex would suggest, or the act of making a double burial was a special event that inverted many cultural rules on purpose. Another possible explanation was that if two deaths occurred close to each other in time the deceased were to be buried together. In such an event one of the dead bodies must assume the ‘male’ position and the other the ‘female’ to ensure a form of cosmological balance. Many aspects of Battle Axe culture hints at a preoccupation with balance, order, control, complementarity. This is certainly visualised in the treatment of the dead bodies that are made into idealised images of the perfect member of society. There is little to no ‘individuality’ in these graves in the way we understand the term today. Everything is organised according to a rigid set of rules, and even gender differences are at the most presented as mirror images of each other, indispensable parts of a whole.

The same preoccupation with completeness and tradition is found in the pottery. Although there are broken vessels and sherds on the settlements, these are very few. Beakers in the most case seem destined either for burial with the dead, or to be grinded down and used to make new beakers. The use of grog as temper became less prominent at the end of the Middle Neolithic, yet even if the beakers were tempered mainly with crushed rock, a small amount of grog was still added until the very end. Just as with bone temper, this craft tradition was abandoned in the Late Neolithic, which strongly indicates it was associated with cultural and possibly religious values and customs.
Fig. 12.2. a.) Grave S2 (alt. XII), a double burial at Lilla Bedinge line cemetery in Skåne. Contrary to what is perceived to be the standard practice of the Battle Axe culture mortuary customs, the southern individual is male. The sex of the northern individual is not determined. b.) Double grave found at Linköping, Östergötland. Both bodies have been osteologically determined and the positions are inverted here as well, with the woman on her left side and the man on his right. Finding the battle axe in the south part of a burial is extremely rare in Sweden, though cf. the mortuary house at Turrence. (after Malmer 1962:abb 556; Janzon 1986:fig 3)
This fixation on completeness, the past, and continued existence is a fundamental ideological aspect of Battle Axe society, deeply associated with the identity of both individuals and the group as a whole. If the beakers were used for drinking ceremonies, then this was in all probability part of practices aimed at creating a sense of unity and belonging for the participants. If that beverage was fermented, then another interesting aspect of grog temper can be suggested. In order to start a fermentation process, yeast is needed. Chewing malted grains and using spit is one way of doing this, but it is even better to take a part of the yeast created during the process and keep it for the next batch. This way each new set of beer contains in it a piece of every other brew that has been made, just as every new planting of cereals came from the last harvest.

The continuous link back through time is certainly a powerful concept, and it is unlikely that it was missed by the people. Just as the beakers and vessels were made of pieces of the old pots, the beverage was made with parts from previous brews. Nothing was made ‘new’. Changes in pottery decoration, battle axes and burial practices were slow and careful, building upon what was already established, never losing the connection with the past. The dead were often given single graves, but they were buried in accordance with an ideal concept of person. In life personal attitudes, ambitions and agendas might have been pursued, but in death the perfect member of society was created, signalling important messages to the living what they should aspire to. If drinking ceremonies were part of the mortuary practice, as would seem likely, joint partaking in drink made from the preserved yeast, drunk from beakers made from old beakers, must surely have helped create a strong sense of belonging and unity in the living. The individual may perish, but still continued to be a part of the group.

Ritual and Change: the mortuary houses

Seen in the light of these disparate ways of treating the dead bodies, how do we understand the seemingly similar mortuary houses of Bollbacken and Turinge? They are fascinating not only because they are so rare and well preserved, but also because they are nearly contemporary. Looking first at the obvious similarities, they have similar construction details with the ditch surrounding a plank built wall, and both are associated with cremations. In both cases the dead have been mixed together, and probably sorted as well. Both houses are situated very close to the sea. This is hardly surprising for a Pitted Ware structure, but more uncommon for Battle Axe sites, which tend to be a bit more removed from shore. Interestingly, Prästgårdskulle in Halland was also placed very close to the contemporary shoreline. The houses are both demarcated from their respective regular settlement: the Bollbacken house by a semi-circular row of posts, the Turinge house more decisively by being placed on a small peninsula where you have to cross a small depression in the ground to reach the main part of the island. Both structures show some evidence of being deliberately destroyed or at least damaged.
These similarities are important, and they should definitely be understood as the result of common beliefs and purpose, a shared ritual. However, because of this the differences are even more telling. At Bollbacken only a small portion of the bones were found in the ditch, the majority being deposited in pits outside the house. Considering the type of bone elements found in the ditch and inside the house (hand and foot bones, fragments of long bones), it is likely that more of the cremated bones were initially deposited here only to be disinterred and re-deposited. The entire area gives the impression of being used on several occasions, interring and disinterring, creating additional pits and features etc. Demarcation notwithstanding, the mortuary area is located right next to the dwellings of the Pitted Ware people. The house and the area is mainly exposed to the west and south-west, with its ‘back’ to the east and north. Apart from the human bones there were the remains of dogs, in one case a virtually complete cremated dog, and what looks like deliberately burnt food remains of seal. Fish bones, albeit very few, were also present. As for artefacts, there was very little pottery found in bone pits, especially compared to the rest of the settlement. One large pottery deposit was found right next to the bone pit 1106, but not together with the bones. This is in keeping with Pitted Ware tradition that pottery is only included in graves in the form of a few selected sherds or miniature vessels. Apart from this there were no real finds of burial gifts, except for a few knapped quartzes that may have been included accidentally as the pit was filled, and maybe a piece of a bone harpoon or a dress ornament.

Turinge mortuary house, in contrast, is remarkably organised and structured. All the human bones were found in pits in the ditch, no other bone deposits were found on the rest of the excavated surface. There are few if any indications of repeated activities at this site; the whole structure and deposit seem to be the result of a singular event. As with Pitted Ware deposits, there was apparently some sorting of the cremated bones, but in a formally structured manner. Firstly, most of the pits contain bones from two individuals as far as we can tell, though only a small portion of the bodies of those people. As Jonathan Lindström points out, cranial bones dominate in the northern and north-eastern part of the ditch, and post-cranial bones in the southern and south-eastern part. In fact most of the bones are found in the ditch that runs along the eastern long wall, whereas only a few deposits are found in the western. The few animal bones found in the house came from sheep/goat.

Lindström has interpreted the house, convincingly in my opinion, as a collective grave stylised as a regular Battle Axe grave, oriented north-south with ‘head’ in the north, ‘feet’ in the south and ‘facing’ east. The multitude of bodies have formed one great body together. There is only one battle-axe deposited, despite the fact that the ditch probably contains more than one male. Although there are something like seventeen individuals there are only five work axes (hollow-edged adzes), that seem to have been portioned out in different parts of the ditch, and which were mostly made of different raw materials as well. The northern adze is the only one made of flint, while the other four are made in various kinds of groundstone. One of the adzes seems to have been deliberately
destroyed, whereas the others are mostly whole and unburnt. The flint scraper, struck from a polished flint axe originally, is partly burnt. A small blade made from ‘kristianstad flint’ was also found and a few flakes from flint, quartz and quartzite. This reads more as the symbolic inclusion of the standard tool set for one or two individuals, not the personal belongings of seventeen. In the light of the double burials discussed above, it is striking that the battle axe was placed in the southern end of the house, and that the pits generally contained bones from two individuals.

The one thing that was deposited in abundance was pottery – beakers. However, in only one pit were these beakers deposited intact as one would expect of a Battle Axe burial. Three beakers were found in pit 18. Pot 1, which was more like a bowl than a beaker, was nesting the smaller but identically decorated pot 4, as well as the ‘third group’ pit decorated beaker discussed in chapter 11.2. The rest of the pottery comprised some sixteen vessels which were deposited in a fragmented state, something more in accordance with Pitted Ware traditions than Battle Axe custom, apart from the fact that they were found with the human remains.

SAME, SAME BUT DIFFERENT

The cults provided a counterpoint of opposing ideals – ones of equality, sharing, and cooperation within and across boundaries that limited or structured the growing competition. They rewove the fabric of society when it was torn by competition, in order to reestablish continuity and balance in relation to the past, for the present, and to lead into the future.

(Wiessner & Tumu 1998:213)

The mortuary house at Bolbacken is a fairly unique structure so far in Pitted Ware culture, but the much earlier similar construction at Häggsa and the common occurrence of disarticulated and mixed human bodies, cremated or unburnt, on settlements indicate that it might be part of a long tradition of burial customs. There are also cases of the dead being buried beneath possibly abandoned huts on the Pitted Ware sites. Nothing in the layout of the Bolbacken mortuary area is therefore inherently contradictory to the traditional Pitted Ware ritual practices. Whether its unusually clear structuring owes more to providential preservation and the excavation method, or a novel form of ritual practice within the existing framework, cannot be determined at this point.

The Turinge house on the other hand represents something quite novel in the Battle Axe burial tradition, which has shown very limited tendency for variation up to this point. There are a few multiple burials with unusual positions of the dead found in Skåne typically dated to the end of the period, as well as the Kverrestad site with scattered remains of cremated human bones. But the Turinge structure is undeniably similar to that of Bolbacken, and the collective cremations are still unique in Battle Axe contexts. Whereas Bolbacken mortuary house shows little or no obvious influence from Battle Axe culture, the battle-axe beakers and cord-and-pit decorated vessels being found mainly in another section of the settlement, Turinge is an interesting mix of both cultures. The
multitude of vessels deposited fragmented, use of cremation, mixing of body parts, and
the pit-decorated beaker are all aspects more familiar in Pitted Ware contexts. However,
the house is evidently not a ‘copy’ of a Pitted Ware mortuary custom, it is an
interpretation through a filter of Battle Axe cultural values. The dead are turned into a
single ideal individual, the pits are miniature ‘double burials’, the set of burial gifts
conform to the rigid standard present in single and double burials, etc. Whereas the
Bollbacken human bones are accompanied by seal and dog bones, the symbolically and
economically most important animals in their cosmology, the Turinge people are
accompanied by sheep bones, their most precious resource.

We tend to think of rituals as profoundly stable and unchanging systematised
practices, whose whole authority tend to rest upon the fact that they were prescribed by
ancestral or divine beings in mythical times. Active change and innovation should be
difficult or near impossible under these circumstances, barring natural disasters, social
breakdown or evangelical missionaries. While there is some truth to this perspective, as
rituals are often practices whose origin and even meaning seem lost in time, it is also
inaccurate (Bell 1997:210f). Change can be accepted if it is proposed by people who are
considered holy or in touch with the spirit world, acting as conduits. Alternatively rituals
can be borrowed or even bought from ‘exotic’ groups who by their ‘otherness’ are
considered naturally closer to the mystical world. In order to gain access to this mystical
knowledge and rituals, as well as exchange partners in general, there is often intermarriage
between the groups. Another alternative would be to create fictional kinship ties through
adoption or oaths, or to borrow and reimburse the other group’s ritual experts to oversee
the proceedings (Turnbull 1961:184f; Wood 1974:10f; Guenther 1975; Bahuchet &

In their detailed study of historical change among the Enga communities of Papua
New Guinea, Polly Wiessner and Akii Tumu show how both individuals and groups
actively seek and introduce novel rituals, cults and ceremonies for a variety of reasons.
New rituals are sought from other groups, including other linguistic groups, in very much
the same way that exotic materials are imported to show the extent of networks and
contacts.

Both importers and exporters stood to benefit: those exporting a cult or elements of it
established points in common with recipients, opening the way for further interaction.
(Wiessner & Tumu 1998:195)

Not all imports are successful, it depends on the historical and cultural context, whether
they resonate with other members of the community, and the pervasiveness and charisma
of the importers. Sometimes only certain segments of the rituals are adopted, and joined
to already existing cult cycles. (Wiessner & Tumu 1998:180, 195f; Wiessner 2002)

In fact, rituals can be the very event where change can be introduced and accepted.
Wiessner and Tumu point out that these rituals and cults are actually the principal means
of social change in Enga society, introducing new ways to organise subsistence, warfare,
trade, alliances, gender relations, age relations and cultural interaction. The Enga are by no means the only example of people actively seeking innovation in rituals.

There is a great variety of reburial rites in the Eastern Solomons, which seems to be the result of innovations introduced in the context of –murina [the great mortuary feast]. One important goal of a –murina is to make a lasting impression on other communities, and one way of doing this is to innovate in some way.

(Davenport 1986:101)

For the Tlingit the potlatch memorial was the only event where new names, songs and clan crests could be introduced. Some of the songs were imported from other non-Tlingit groups (Kan 1989:195).

I believe the mortuary house at Turinge was the result of a deliberate borrowing of a Battle Axe group from Pitted Ware customs. The move to alter the mortuary practice in such a fundamental way was probably aided by already existing affinal ties between the groups. The presence of parents, cousins and in-laws who had grown up in different cultural settings would not just be aware of different practices and be able to act as mediators, but might also supply their own pressure for change internally. Contact and affines in themselves do not automatically mean change, society and its institutions must be open to the idea of alteration and compromise as well. Most importantly, change was not something imposed as a package, it was renegotiated through the needs and preferences of the members of society. The result was something betwixt and between two world views, perhaps as an attempt to find common ground.

Earlier in chapter 12.1 it was shown that the values expressed most prominently in the secondary mortuary practices are ones of unity and solidarity within the group, as well as cooperation and reciprocity with one’s affines. These ethics were imposed by elevating the dead into an ancestral collective – the demands placed on the living came not from other living members, but from the weight of tradition made real through the physical presence of the bones of the dead. Failing to live up to the expectations of those who had passed on meant risking the order of the world and the renewal of life through a loss of fertility. If people felt that society needed to change, the time and place to make that case could not be better than at the moment when everything was held in balance: the funeral. The introduction of secondary mortuary practices meant that feasts and assemblies could be planned, favours and obligations called upon, and people from many different settlements would have a reason to meet and socialise, reaffirming and renegotiating the social bonds. Sharing a similar mortuary ritual cycle, even if the details varied, would help bind the two groups even more closely together. A common narrative was created, and the result would be that already existing social ties were strengthened which could in time change the whole inter-group relationship.
The Middle Neolithic in Sweden poses some interesting challenges to archaeologists, with the great diversity of artefacts and styles, burial practices and settlements. The perpetual question of what does material culture signify socially, culturally, politically and individually comes into stark focus. Traditionally, archaeologists have identified two cultures during the Middle Neolithic B (c. 2800-2300 BC): The coastal Pitted Ware culture and the inland Battle Axe culture. The material remains found at these sites differ, as do the burial customs, but there are also many examples of shared artefact types. Battle Axe settlements have proven to be notoriously difficult to identify, just as Pitted Ware burials on the mainland have been elusive. Defining just what is and is not Pitted Ware culture has been another source of controversy.

The approach chosen in this dissertation is to focus on embodied practice and behaviour towards dead bodies. Identity comes into being in the relations between people, in daily practices that are partly subconscious, and during special occasions where ideological values are connected to emotionally charged experiences. Differences in style and design need not necessarily translate as differences in social and cultural background. Analysing the chaîne opératoire of the pottery crafts reveals attitudes toward authority, innovation and variation transmitted in the teaching of crafts. The way living and dead bodies were controlled and what ideals they were made to communicate to the living, also affect the way people see themselves. I have tried to show that the differences between the two cultures were real. The following chapter sums up my interpretation of the Middle Neolithic.
Chapter 13

Pitted Ware Culture

At the start of the Early Neolithic, the Funnel Beaker culture (TRB) became established in Eastern Central Sweden, probably through being adopted by local groups who were part of a larger marriage and contact network with Southern Sweden, Denmark and the continent. Pottery craft was introduced in the region for the first time, and new domestic species, both crops and animals, were brought in. The pottery was very similar to the funnel-beakers produced in other regions, and the craft was fairly homogenous. The people in Eastern Central Sweden were still in extensive contact with other groups to the north and east who were not part of the Funnel Beaker culture. Slate objects from North Sweden appear on the sites and certain regional peculiarities in the pottery seem to be influenced by the contemporary Comb Ware culture on Åland and in Finland. These variations were minor, and there is no doubt that the people in Eastern Central Sweden shared the same general practices as, and identified themselves with, the Funnel Beaker societies in Southern and Western Sweden.

At around 3500-3300 BC several changes were introduced in South Sweden, as megalithic tombs were being constructed and new forms of pottery appeared, probably in association with changed ceremonies involving these new vessels. In Eastern Central Sweden these changes are never really adopted. The alterations that can be seen in the pottery is mostly gradual and superficial, though there is an introduction of new vertical patterns that seem to imitate those seen on megalithic pottery. The settlement distribution and economy changes, as sites are now found almost exclusively by the shore or at water courses, places which had been used before but on a more seasonal basis. Evidence of agriculture and animal husbandry notably declining, being replaced by a more hunting-gathering economy. The network with Southern and Western Sweden seems to be growing weaker – flint tools become much rarer on the settlements.

New traits in the pottery include patterns such as broad cross-hatching and ‘chess-mannered pits’, and new ways of fashioning the rim making it thicker, angled inwards and bevelled. These hint at reinforced relations with groups across the Baltic Sea. Patterns can be imitated, but the motor habits involved in making rims are usually taught at a young age and subconscious routine for the adult potter. Clay figurines and zoomorphic stone artefact also hint at closer cultural connections with the neighbouring Slate and Comb Ware cultures. At the same time, the pottery and artefacts associated with this early Middle Neolithic culture in Eastern Central Sweden are firmly established on sites further north and east than the Funnel Beaker culture: Åland, Gästrikland and the Dala River.

Contact in itself does not necessarily cause social or material change. Relations do, and which kind of change depends upon which kind of relationships exist between people. There is no doubt that there was contact, interaction, exchange and probably even intermarriage between the Funnel Beaker people in Eastern Central Sweden and their close neighbours to the north and east for several centuries before the Middle Neolithic. Culturally they associated themselves with another group however, people with whom
they shared traditions, customs, practices and myths. Despite this the changes associated with the megalithic tombs, and what this meant socially and ideologically, did not translate well in this northern region. Faced with social changes partly beyond their control, the communities in Eastern Sweden could either accept them or resist them. In Eastern Central Sweden the former was choice was the most common one, and as a result other networks and alliances were given an elevated social significance. Over the course of generations, this probably meant more intensive and continuous contacts, more socially important relationships, and more extensive intermarriage. This in turn led to changed practices, customs and religious concepts as rituals and ceremonies were shared between them.

Around 3300-3200 BC the changes become more visible to us materially. The pottery has developed into a specific new type that although it still carries traits of the funnel-beakers is clearly influenced by the comb-ware pottery as well. This pottery is increasingly common on coastal sites, including the great islands of Gotland and Öland, along the East coast. More importantly, it seems to have been used and deposited in a similar manner, zoomorphic clay figurines and miniature vessels also being made and used. The stone tools are also fairly similar. What is striking is the apparent variation in the pottery both stylistically and technologically. In very general terms, shape and composition, it is remarkably consistent from Gästrikland to Skåne. However, not only are patterns and decorations and application techniques mixed in many different novel ways within and between sites, but the technology is now also quite varied compared to previous periods. A greater variety of temper materials are used than before, and they are mixed and combined in many ways. There seems to be little in the way of a common craft, and no ideological enforcing of a right way of doing things. Appearances matter, but not the embodied practices.

Two major groups can be discerned: a northern and a southern. The northern involves an increasing preference for various types of calcareous temper (calcite, burnt bones, sea shells) and comb stamp decoration, and the flat rims are often decorated. The southern group uses comb stamp more rarely and calcareous temper hardly at all. Also, the pit decoration is often applied with more oval or irregularly shaped tools. The boundary between these two groups is not sharp, and this is a common theme of pitted-ware pottery craft: differences are gradual rather than abrupt. It is possible that the material pattern represents primary networks of intermarriage, and perhaps more importantly of important social relationships, joint undertakings etc. In the ethnoarchaeological literature about pottery craft in traditional societies it is clear that it is not so much blood ties as social ties that define change and tradition. In each region previously established craft traditions also seem to continue to a certain degree in the pitted-ware pottery, suggesting that the transmission of craft technology was mostly superficial and allowed for personal preferences.

The people of the Pitted Ware communities were part of a wide network around the Baltic Sea. Finding their sustenance mainly through that sea they depended upon it and on
Chapter 13

the seasonal behaviour of seals and fish. Their settlement patterns included a certain level of mobility within the coastal landscape, but probably also in the inland on minor hunting and gathering expeditions as osteological remains of boar and elk on the settlements show. Pitted Ware groups had to be prepared to alter their patterns to accommodate the way these seasons played out, and where the game appeared in sea as well as on land each year. Much in the way of Pitted Ware life was in a state of constant change. Constancy was found in shared practices and customs, such as the production, use and deposit of pottery. Durable connection to places and to the past was also created through the mortuary rituals. The dead stopped being persons and were returned to the collective whole, the de-personalised ancestral group where gender, age, social status, ambitions and agendas were destroyed. This was made possible by removal, sorting and dispersal of body parts, depositing bodies and parts of bodies on the settlements. The undeniable biological reality of decomposition and decay of the flesh was connected with the ideological concept of the common substance, as seen in the bones. The grave as a resting place was less important than the presence of the remains of the dead at or near the settlement. The pottery vessels were fragmented, deposited and dispersed at the sites as well, in far greater quantities than in the primary grave.

BATTLE AXE CULTURE

At the beginning of the third millennium BC the Pitted Ware people along the East coast of Sweden were in continuous contact with other groups around the Baltic Sea region. In Eastern Central Sweden a very important network was established with south-western Finland especially. At this time the Corded Ware complex starts to appear across many regions in northern, eastern and central Europe, with new types of battle axes, pottery and burial practices. In Sweden this new material culture appears first and foremost along the East coast. In Eastern Central Sweden these early sites with A-, D- and E-pottery as well as the A- and B- battle axes are found mainly in Närke and the western part of Södermanland, on light sandy soils. In Skåne most of the early sites are found in the north-eastern part where there was already a strong presence of Pitted Ware sites.

What is remarkable is not so much the new artefacts, or even the new burial practice, but the fact that the early beakers were made with a completely different operational sequence compared to any other Neolithic pottery tradition in Sweden at that time: they were tempered with grog, shaped through pinching, with carefully smoothed or brushed surfaces depending on the type of vessel, fired in a reduced atmosphere, and left to cool in open air. The beakers are remarkably consistently made and decorated from the very beginning. The most likely explanation is that they were made by a small group of relocated potters that had initially been taught and trained elsewhere. Since the Swedish beakers are so dissimilar from the continental types, but remarkably similar to certain Finnish corded-ware pottery the most likely explanation is that the potters originally came from this region. The earliest Battle Axe phase is well established in Eastern Central
Sweden through settlements, burials and stray finds. This is also the region in continuous and intensive contact with south-western Finland. 

There is really no indication that there was a completely new population bringing Corded Ware culture to Sweden. Firstly, the stone technology is still decidedly local and regional and does not involve anything new at this early stage. Remarkably, the sites in Södermanland and Närke are almost invariably found on locations where there were Early Neolithic Funnel Beaker settlements. Chronologically there is a gap of perhaps 500 years between them. An hypothesis is that these abandoned inland sites were still kept in the memory of the Pitted Ware people moving through the landscape. Initially they would have stood out against the rest of the forest as they had been cleared and farmed, and animals had been kept there. Perhaps wildlife such as deer and feral pigs kept returning to the sites to graze and feed, and people hunting for game would have made good use of this. In the soil the material remains of the previous inhabitants could be found: the battle axes, the cord decorated pottery. Histories, memories, myths may have been told as small groups revisited these places.

My interpretation is that the first people to adopt a Battle Axe identity in Sweden, for whatever reason, had been born into local Pitted Ware communities in Eastern Central Sweden. Supposedly, most of them were men and the still existing European network involving the make and use of battle axes probably played a part in who decided to break away from the Pitted Ware communities. However, to adopt this new identity and become a part of the Corded Ware network, it took more than making a battle axe and establishing an inland settlement. Practices, customs, traditions, esoteric knowledge and ritual know-how was needed. The fastest and easiest way to create relationships between people and groups is to exchange marriage partners. What they needed was more than wives however, they needed potters and the knowledge and social position these potters were in possession of. It is likely that the potters did not just know how to make the beakers, they knew what this process of making them meant ideologically, they knew how to use them, and maybe they even knew how to make the beverage to be drunk from them.

Battle Axe culture extended through Eastern Central Sweden in an east to west direction into Western Sweden and southern Norway. The spread to Southern Sweden should probably not be seen as a gradual movement southwards, the coast is an entire zone of contact with the Baltic Sea region. I still find it likely that the earliest Battle Axe settlers in these parts came predominately from the local Pitted Ware groups, supplemented by a few relocated potters from Eastern Central Sweden or Finland. Within a generation wife takers would become wife givers in order to uphold the network. It would take a couple of generations for Battle Axe culture to be generally adopted by communities in the whole of South Sweden. For these first few communities, contact with and support from other Battle Axe and Corded Ware groups must have been vitally important. After a couple of generations the new cultural and social identity was firmly established in South Sweden and more effort was directed at developing a common
regional identity a united front and this continued with very little alteration over the centuries. Swedish Battle Axe culture is for the most part remarkably cohesive, changes to battle axe design in general, and in pottery decoration especially, tend to affect most of the region, not just certain local parts. Flint artefacts start appearing with greater frequency on sites in Eastern Sweden, which also reveals the presence of a network.

Control over identity was mirrored and maintained in the control over bodies – dead and alive. There was a right way of doing things, from spinning thread to placing burial gifts, that was not to be trifled with. Authority and tradition ruled most aspects of society. Battle Axe culture is remarkable because there has rarely been a society so obsessed with its own identity and with proclaiming that identity to others.

**THE END, THE BEGINNING**

At around 2500-2400 BC there is an increasing presence of variation and experimentation in material culture on both sides. Pottery technology and style which have been distinctly different in almost every respect up until then, started to show a blurring of norms and techniques. Battle Axe burials display a greater variation in construction and gifts. At Pitted Ware sites battle axes and beakers start appearing with increasing frequency. Finally, there is the appearance of beakers with a decidedly hybrid appearance in terms of both technology and style in Eastern Central Sweden where both cultures are strongly represented. The pottery craft and its organisation certainly seems to go through some radical changes at this time.

Change was happening in the continental Corded Ware complex, of which the Battle Axe culture was a part. At this time the two groups had lived in close proximity to each other for several centuries. There would be a long history of affinal ties and networks that had become part of the very structure. However, up until this time that contact and those interactions had not been allowed to influence material culture in any fundamental way. The mortuary houses at Bollbacken and Turinge reveal an attempt to find a common ground through shared ritual activities. These events were important not just because they involved associating the dead and their bodies with certain ideological concepts. They were perhaps even more important as shared events where people from both groups could come together during emotionally poignant circumstances, reaffirming relationships and spelling out their interdependence in ritual practice. Just as the mortuary rituals of the Pitted Ware group affected the Battle Axe society, the former probably adopted the drinking ceremonies of the latter, evidence of which can be seen in the increasing use of beakers on Pitted Ware sites. Both these occasions helped create and define group identity, relationships, interdependence and connections not just with the present participants, but also with previous generations. By controlling the bodies of both the dead and the living, the people involved tried to map out, steer and negotiate the social and cultural changes taking place around them.

At the start of the Late Neolithic, around 2400-2300 BC, the dichotomy in material culture disappears from South Sweden. The island hunting sites are mostly abandoned.
and the inland presence intensifies. Burials are either in flat-earth graves or in collective stone cists, occasionally with cremated remains. The groundstone shaft-hole axes (now ‘simple’) are still deposited in burials and as offerings, but the flint dagger and flint sickle replace the battle axes and the blade knives as primary prestige items. The pottery is no longer elaborate, or deposited in large quantities at the settlements, or included as important burial gifts. The contrast is striking compared to just a few generations earlier. Perhaps nothing communicates the social importance of the potters in the Middle Neolithic more than their apparent absence from the front stage in the Late Neolithic. No longer is there a clear connection between the making of a pot and the making of a body.
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