SVERRE CHRISTOFFER GULDBERG

# THE SMITH ON THE EDGE OF WORLDS

*New perspectives on technology and ideology in the Late Norwegian Iron Age*

**Department of Archaeology, Conservation and History**
Faculty of Humanities


MASTER'S THESIS
University of Oslo 2014

«A man can make his own power only by disdaining power over other men […]
he can become more than other men by gaining power over things which are not
men, for thus he goes beyond men»

--Michael Ayrton 1967:20

*Front page illustration: Above left – Migration Period belt buckle from Åker, Norway. After Davidson 1982 [1969]:47. Above middle – Scene from twelfth- or thirteenth century portal at the Hylestad Church in Norway, depicting the scene of Reginn reforging the sword Gramr for Sigurðr. After Grant 1990:107. Above right – Scene from eleventh century rune stone from Uppland, Sweden, depicting the Old Norse god Þorr fighting the World Serpent. After Roesdal and Wilson 1992:146. Below (background) – Tools from the Viking Age tool chest from Mästermyr, Sweden, inclusive of tools for crafting ferrous and non-ferrous metal, as well as for working wood and/or other materials. After Roesdal and Wilson 1992:251. Collage compiled by author.*

## PREFACE

There is a great number of people to whom I owe my thanks for making the writing of this thesis a pleasant (not to say wonderful) experience. First and foremost to my supervisor, Lotte Hedeager, a wholehearted *thank you* for providing a wall of support and for urging me on – perhaps our words were few, but your advice has been much appreciated and taken into careful consideration (quality over quantity!). Secondly, to Unn Pedersen for smiles, support, and always keeping your door open for discussion. I am eternally grateful for your time, and for your ideas. Furthermore, to our little discussion group – Nicolai Eckhoff, Mari Dyrstad Hartvigsen, Jani Causevic and Annette Sand-Eriksen – thank you for listening, for participating with feedback on my thoughts, and for contributing with your own. To Nicolai and Frida Espolin Norstein for being supportive in discussion, and to Eirik Haug Røe and Maria Svendsen for challenging me, contributing to developing my ideas. To Liv Marit Aurdal for being the one to talk to in terms of Norse Mythology and for helping me with Old Norse and Icelandic language barriers. To Knut Ivar Austvoll and Eirin Beenberg for free hugs and beer. And to Per Ditlef Fredriksen – thank you for encouraging me to stand by my views even at times when I seem to stand alone.

To my parents – Lena Kristin Bru Søndervik, Lars Olav Søndervik, and Hans-Jacob Guldberg – and my grandparents – Bjørg and Håkon Olsen – for providing emotional and financial support when times have been tough. To Aleksander Madsen for housing me in Arendal and releasing me in your smithy with good company. To Scott Cooper for proofreading parts, and to Pamela Parry for finding the time to proofread the entire thesis on very short notice. To the sound-and-light technician group, Regimet, at Det Norske Studentersamfund, for never stopping to ask me to come help on the other thing in the world which I love the most (music), yet respecting my situation as a master student. To my employers at The Cultural History Museum (KHM) for the exact same thing. And to all of Blindernveien 11, for never taking life too seriously, and for never allowing me to become completely sane – how dreadfully boring that would have been.

Finally, to Tore Johansen, the consultant at Bergland vgs who once claimed that I was too smart to become a hairdresser. Thank you!

# TABLE OF CONTENTS

# LIST OF FIGURES

# LIST OF TABLES

**ABBREVIATIONS**

BCE – Before Common Era
CE – Common Era

ON – Old Norse
LIA – Late Iron Age
MP – Migration Period
MA – Merovingian Age
VA – Viking Age

*Symbols for graves holding different kinds of tools (Part II)*
0 – Grave containing single non-indicative tool
X – Grave containing a set of tools, but no indicators
M – Grave containing metalworking indicators
W – Grave containing woodworking indicators
S – Grave containing indicators for the working of softer materials (e.g. stone, wood, bone)
MW – Grave containing indicators for both metal- and woodworking
MS – Grave containing indicators for the working of both metal and softer materials

SVERRE CHRISTOFFER GULDBERG

# THE SMITH ON THE EDGE OF WORLDS

*New perspectives on technology and ideology in the Late Norwegian Iron Age*

DEPARTMENT OF ARCHAEOLOGY, CONSERVATION AND HISTORY

Faculty of Humanities

University of Oslo 2014

## 1 INTRODUCTION

The transition period between the Early and Late Iron Ages in Scandinavia, dated to about 500 CE, has brought about a number of conspicuous changes in the archaeological record. At this point in time it is possible to observe an almost complete replacement of technologies and changes to the technology of metalworking have been described as being especially prominent (e.g. Kristoffersen 2000a:62, 2009:157-158; Solberg 2003:177, 197-198, 210-211). The custom of depositing tools in graves was practiced on a modest level during the Early Iron Age, but intensified in the Late Iron Age (Grieg 1922:26; Sjøvold 1962:207-209; Solberg 2003:187). In relation to this, the appearance of the so-called «smiths' graves» has gathered much attention in archaeological research.

These observed changes in grave material are sometimes argued to indicate social and ideological changes within a society where the face of the smith has previously been more or less absent (Grieg 1922:21-30; Petersen 1951:71; Wallander 1979:46). The deposition of tools in lakes, bogs and mountains in the Viking Age speaks of further changes, often linked to the onset of Christianity (Hinton 1998:17, 21; Lund 2009). While tool deposition outside of graves is only very scarcely touched upon in this thesis, all of these elements can be argued to signify that certain smiths have held special positions in society. This tendency must have remained ideologically strong over a period of 500 years, where we are able to directly observe their presence in archaeological and mythological material (e.g. Bøckman 2007; Grieg 1922; Reginsmál; Straume 1986; Volundarkviða; Wallander 1979). The search for signs that can elaborate on smiths' roles within Late Iron Age society will thus be the focal point of this thesis.

The definition of «smiths' graves», as a category of graves identified by the presence of hammers, anvils, files, tongs, and other tools related to the profession of metalsmithing, has been extensively criticised (e.g. Bøckman 2007; Pedersen 2009; Sjøvold 1974:306-307; Wallander 1979). While some question whether the rich goods of many of these graves serve to symbolise actual smiths or some sort of ownership over smiths and smithing, others have turned to questioning the typology of tools. One reason for this can be found in that archaeologists Oluf Rygh (1885), Sigurd Grieg (1922), and Jan Petersen (1951) have all classified certain kinds of objects, like hammers, as smiths' tools regardless of other possible uses. Another reason is that the combination of smiths' and carpenters' tools in both graves and deposited tool chests, like that of the Mästermyr find (Arwidsson and Berg 1983; Lund 2006), has brought about the knowledge that some crafters may have operated within more than one profession (e.g. Axboe 2012). There is, for example, reason to

ask whether the richly ornamented weapons from the Bygland find can indicate a weaponsmith able to decorate the weapons they produced themselves (Blindheim 1963:48-50; Martens 2002:176-177, 2003a:13-14, 18).

New research on mythological material (Carstens 2012) has provided further support for the idea of what, in this thesis, has been named the *multicrafter*. Building upon the problem of definition is the knowledge that the Old Norse word *smiðr*, rather than being exclusive of other crafts, may hold meanings more closely connected to *creating* or *crafter* (e.g. Castens 2012; Helms 2009:150; Motz 1983:81-82; Pedersen 2010:1), and a more precise definition has proven difficult to pin down. Danish archaeologist Lotte Hedeager (2011:13, 145) has explained that our modern western understanding of knowledge cannot unproblematically be related to modern western conceptions, connecting smithing to notions of transformational actions and *skilled craftmanship*, as previously done by American anthropologist Mary Helms (1993). I therefore wish to ask: If the Old Norse word *smiðr* holds so many meanings, why do we keep trying to force it into a box where it is obviously refusing to fit?

I believe these are elements that are interconnected. My opinion is that the deposition of different kinds of artefacts *together* is intentional, and that artefact combinations within «smiths' graves» could hold valuable information on smiths in a larger context. Rather than placing smiths «on the border of society» (e.g. Herbert 1993; Helms 1993:59-60; Motz 1983:13-14; Pedersen 2009:132-133), I wish to reintroduce them on the *inside*, as characters likely to relate to some of the more important constitutional ideas around which the Scandinavian Late Iron Age society must have revolved. A new contextual survey of grave material with a focus on links between artefacts, rather than the division of them into separate entities with separate purposes and areas of use (e.g. Rygh 1886; Grieg 1922; Petersen 1951), could contribute to the development of alternative theories. In order to trace ideology as expressed through grave culture and mythological material, I will make an attempt of approaching the grave material of Jan Petersen (1951) and Jørgen Bøckman (2007), by placing it within the Annales school's perspective of long-term mentality changes (e.g. Bintliff 1991; Hedeager 2011:1-3; Price 2002:35). As such, this thesis should be understood primarily as a survey of underlying ideological patterns as expressed in grave culture, rather than an analysis of buried individuals and their professions.

### 1.1 Main aims

It is the purpose of this thesis to explore the ideological *concept* of the smith as expressed in Late Norwegian Iron Age grave culture. As such, the previous observation of a number of items found in immediate context with these kinds of tools is regarded as to being of uttermost importance. The blurred lines between the crafts of metalsmithing and carpentry, as expressed in the combined presence of their tools in graves and in tool chests, as well as in the ambiguous meaning of the Old Norse word *smiðr* (e.g. Falk and Torp 1992:773; Bjorvand and Lindeman 2000:820-821), will remain subjects of particular scrutiny. It is my claim that these elements are connected and that the forced separation of them is likely to be more damaging to interpretation than clarifying. The aim of this thesis can therefore be said to be formed on grounds of these two observations, summed up in one question:

*To which degree does our conception of the specialised metalsmith conform to the idea of the smith as expressed in Late Iron Age burial practice and Old Norse written sources?*

### 1.2 Definitions and technical specifications

There are a number of definitions in need of being taken into closer consideration before continuing. The ambiguous meaning of the term is part of the framework upon which the discussion of this thesis rests. As such, part of the point is that *smith* should never be understood only as a metalworker, the only exception being in reference to the work of others. Rather, I will adopt the terms of Lydia Carstens (2012), where *smith* and *smithing* must be considered more neutral terms denoting crafters and crafting, regardless of material. When referring to specific work professions and the working of specific materials this will come clear from the text. Similarly, whenever I refer to metal and metalsmithing, this implies all kinds of metal. Modern terminology refers only to iron (Latin *ferrum*) by the chemical element of *Fe*, and all alloys (combining the main constituent, *Fe*. with other chemical elements) are referred to as steel. Among traditional ironsmiths it is, however, more common to denote steel alloys also by the term of iron (Bøckman 2007:5). It is by this more practical approach that I have chosen to go. In this thesis steel will thus technically fall under the term of iron. The term *non-ferrous metal* adheres to all metal that does not consist primarily from *ferrum* and thus includes gold, silver, copper and lead, as well as their alloys, for example niello, bronze and brass. These will mainly be discussed as a group, being non-ferrous metal.

The working of other kinds of materials will also be discussed. Parts of the thesis discuss the

divisions and non-divisions of smiths, and so the term *soft material* has come to be. This refers to chemical qualities rather than to an actual «softness». In solid form all metal has a crystalline structure, meaning that the atoms are arranged in a geometric pattern. Metal atoms hold a special ironic bonding causing the outer electrons to form a diffuse sea of negative charge between the spaces of positively charged metal ions, allowing for a flexibility which is heightened at the application of heat. This makes metal both tough and ductile (Henderson 2000:208; Thålin-Bergman 1979:116; Turner-Walker 2008:23-25, 33). Using the term *soft material* for stone, wood, bone and antler does not mean that are not hard, but that they, due to chemical qualities, can commonly be conceived as more brittle, or more likely to break from smaller amounts of pressure. It also means that these materials can be carved and worked for artistic relief to a larger degree than metal, which – in the case of e.g. oval brooches – are moulded or forged into rough shapes and then worked with files (e.g. Bøckman 2007:57-58) in order to induce similar effects. Whenever I refer to *tools for working soft materials* this thus means that the tool can most likely be used for working leather, bone, antler, wood or soapstone, but *not* ferrous or non-ferrous metal.

### 1.3 Structure of thesis

This thesis has been divided mainly into three parts in order to deal with its different elements as they are presented. Part I holds all the theoretical background information of the thesis. Chapter 2 presents the history of old research on the topic of smiths and smithing, continuing with introducing my own theoretical frameworks in Chapter 3, as coloured by the main aims and theories of mentality and ideology. Chapters 4 and 5 ends Part I by explaining formalities regarding methodology and chronology.

Part II comprises the material analyses of the thesis. As this thesis is mainly based on the works of Jan Petersen (1951) and Jørgen Bøckman (2007), Chapter 6 starts off by introducing details, advantages and limitations to this material. The Chapters 7-9 focus primarily on discussing the functional properties of the tools to be found in the relevant graves, questioning their relevancy to the profession of metalsmithing and the certainty to which they can be assigned to metalworking activity. Chapter 10 then presents the results, explaining to which degree tools for different kinds of crafting activities occur together. Chapter 11 contributes to the contextual analysis by introducing a number of artefact categories which are traditionally regarded to being frequently occurring in «smiths' graves», ending with a survey of which tool categories show the most consistent patterns.

Part III is meant to tie the results of Part II to the theories of Chapter 3 in order to discuss possible interpretations of this grave material in direct relation with notions of ideology and mentality. Chapter 12 explores to which degree it is possible to account for the theory of the multicrafter in myth and saga. Following, Chapter 13 will introduce my own attempt at interpretation, putting metalcrafting in relation to skill and ideological conceptions of knowledge, while Chapter 14 closes the thesis by presentation of conclusions and concluding remarks.

# PART I

THEORETICAL APPROACHES

## 2 HISTORIOGRAPHY

Fluctuations in archaeological interpretation are often explained on grounds of changing paradigms and the bi-polarities of processual and post-processual thinking (Anfinset 2000:203-204; Gansum 2004a:53; Haaland 2004:11; Lund og Melheim 2011:441; Ottaway and Roberts 2008:194). This instability can be explained partly due to the double role played by the archaeological discipline: With one foot in the empirical tradition of natural sciences, and the other within the humanities, archaeology may be particularly susceptible to the input of new ideas. Additionally, archaeology holding tendencies toward either side have been subject to critical scrutiny by the other, which has proven to have both positive and negative effects. On one hand it has resulted in an extensive area of research, covering a wide array of perspectives. On the other side it has also made us very much aware of the degree to which we are coloured by our own contemporary societies, and how this in many instances seems impossible to avoid. This chapter is meant to explain how these elements have become apparent in the archaeological research on smiths over time.

### 2.1 The empirical tradition

The discussion of where and how the smith fits into the ON society is hardly new. In total we can witness an interest in Norwegian Iron- and Viking Age smiths and smithing activity stretching over a period of almost a hundred years. Oluf Rygh's (1885) classification of artefacts, in which objects are sorted into groups and given numbers, marks the careful start of this research (Bøckman 2007:6). Rygh's classifications have stood as a standard reference work for a number of object and tool categories since, although not without mistakes (see Chapter 7.6:Fig 3). Earlier yet, metal and ceramics provided the main elements for the division of European prehistory into Copper-, Bronze- and Iron Ages, following the chronologies of the 17$^{th}$ and 18$^{th}$ centuries (Ottaway and Roberts 2008:193-194). The typological studies of Norwegian archaeologist Sigurd Grieg (1922) on tools believed to have been utilised by prehistoric smiths became a continuation of the artefact oriented tradition of this time, dominated by objective analysis and processual ideas of empirical observation (Ottaway and Roberts 2008:193; Pfaffenberger 1992:491-492). Together with Jan Petersen, who continued Grieg's work with *Vikingetidends Redskaper* («Tools of the Viking Age») in 1951, Grieg set the framework for research on Scandinavian smiths in the years to follow.

Grieg's (1922:92) early analyses introduce the idea of two types of Viking Age smiths. Inspired by his own experience on farms situated in remote regions, he introduces the self sufficient *farmer smith* whose abilities includes that of simple smithing and repairs. In addition, Grieg argues *town*

*smiths* must have worked as expert (specialised) metalworkers, carrying out the more complicated tasks. At this point it is important to stress that the works of Grieg and Petersen are based almost exclusively on studies of grave material. Due to the sparseness of «smiths' tools» in this material, Grieg (1992:92-93) concludes that only town smiths have been buried with their tools. The result suffers from circle argumentation, being an indirect interpretation of his own ideas, and Grieg's arguments have, for this reason, been criticised in later works (i.e. Arwidsson and Berg 1983:33; Petersen 1951:111-113; Pedersen 2009:130-131). The observation that every farmer did not get smiths' tools in their graves is, however, not without value.

In 1951 Petersen pursues Grieg's theories further. While the specialised town smith continues to play the role of the real metal expert whose tools get to follow in death and burial, Petersen (1951:111-114) emphasises the fact that a lot of the occurring grave goods cannot be directly related to the profession of smithing. Other than tools, these «smiths' graves» in many cases seem to hold a particular amount of valuable goods. Petersen interprets this to meaning that many smiths must have been among the richest men of society, planting the idea of smiths as directly connected to elite commissions and elite culture, a concept which has stood strongly in archaeology ever since (i.e. Barndon 2005:366; Helms 1993; Hinton 1998; Kuijpers 2012:139-142; Wallander 1979:60-61). While Petersen comes close to touching several of the issues that have later become prominent in regard to «smiths' graves», it becomes obvious to us that the early archaeologists must have seen it as natural that the person buried was, in fact, a professional smith.

Divisions betweens smiths working in different kinds of materials is largely absent in Norwegian research at this point, and a subject primarily touched by some of the more technically oriented archaeologists like German Horst Ohlhaver and Swede Andreas Oldeberg (Bøckman 2007:7; Oldeberg 1942, 1943, 1966). Grieg (1922:22, 68) only mentions the possible existence of bronze and silver casters in relation to the find at Smiss in Gotland, Sweden (Zachrisson 1962), and to the occurrence of moulds in Norwegian graves. Petersen (1951:92, 104-109) ties certain kinds of artefacts to smiths working in bronze, silver and gold, but do not seem to elaborate on possible specialisations within these. The find of a Viking Age tool chest at Mästermyr in Gotland, Sweden, in 1936 (Arwidsson and Berg 1983), must have stirred some interest in the subject, although evidence for this remains hard to find. The chest contained a «complete set» of tools for blacksmithing, casting of presumably bronze or copper, as well as for carpentry, and has stood as a symbol for the all-round Viking Age craftsman since. The Mästermyr find is later referenced in archaeologist Charlotte Blindheim's (1963:36, 51) article on the «smiths' grave» from Bygland in

Morgedal, Norway. Comparing the finds and making a detailed and critical study of the tools in Bygland brought Blindheim (1963:36, 49) to conclude that the Bygland smith, unlike the Mästermyr smith, must have been a specialist metalworker.

A mention of stone smiths in Harald Andersen's (1963:10) article on smiths from 1963, referring to the sagas, means that the concept of smiths working even in materials other than metal was not completely foreign at this time. When Swedish archaeologist Anders Wallander in 1979 challenges the definition of «smiths' graves» head on by confronting their volume of carpenters' tools, he participates in starting a complex and comprehensive discussion. Firstly, he claims that the term «smiths' graves» in most instances could equally have been changed to «carpenters' graves» or «farmers' graves». Secondly, he argues that certain tools, like files and hammers, are not exclusive of metalsmiths (Wallander 1979:3-6), placing this in relation to the Mästermyr find and ON word *smiðr*, as a definition for both metalsmiths and carpenters.

Eldrid Straume's (1986) revision of some of the problems reoccurring in archaeological discussion seems to hint toward an end for purely empirical studies. Her focus relies largely on what graves *can* tell about professional smiths as opposed to what they *can not*. While her attempt at clarifying the social role of the smiths fails, seemingly bringing us only further into confusing ambiguities, the conclusion that the equivocal material (of the graves) makes it hard to conclude anything at all (Straume 1986:53-55), may have been a valuable step in an alternative direction. Dead ends like these provide an important reason to why researchers started looking for different ways in which to explain archaeological material (as explained by Eliade 1979:7). Straume's (1986:53-55) observation that «smiths' graves» tend to get substantially richer during the transition between the Early and Late Iron Ages should also be considered of important value.

### 2.2 Toward post-processualism

While the early archaeology of Grieg (1922) seems to focus primarily on the tools themselves, Petersen (1951:111) mentions, already in *Vikingetidens Redskaper*, a recurring presence of artefact combinations. In particular, he says, «smiths' tools» in Viking Age graves tend to appear side by side with equipment for hunting and fishing, game pieces, scales, and carpenters' tools. Hence the question is finally asked: Can these tools indicate professional smiths at all, or are they only indications for *connections* between the buried and the profession of smithing? Straume (1986:47) is among those who have suggested that the rich goods of «smiths' graves» seem to indicate status

rather than profession. Yet, neither explanation can reasonably be assigned to the differing volumes of tools in graves in the Early and Late Iron Ages.

When religious historian Mircea Eliade presents *The forge and the crucible* in 1978, he decides to see smiths and smithing from a different angle by focusing on the ritualistic sides of smelting and metalworking. By relating the praxis of the smith to alchemy and a number of worldwide ethnological and mythological examples, he presents an alternative approach to interpreting pre-historical objects. Finding the conclusions of the historians of science and technology invaluable, Eliade's work in many ways comes as a response to their science, seeking «to gain an understanding of the behaviour of primitive societies in relation to Matter and to follow the spiritual adventures in which they found themselves aware of their power to change the mode of being of substances» (Eliade 1978:7). The shift of focus from things to people seems evident, as well as a world view in which human beings are considered to exercise a certain control over their natural surroundings. At the same time Eliade touches the concept of change, or that of transforming nature into culture, which gathered much attention in the realm of post-processualism (e.g. Hedeager 2004:163-164; Helms 1993; Herbert 1993).

Yet, Eliade was not the first to view processualism through a sceptic's lens. Norwegian archaeologist Jørgen Bøckman (2007:7) has pointed out that Ohlhaver already in 1939 started viewing «smiths' graves» and their material as primarily symbolic, comparing them to laws, sagas, legends and myths. Andreas Oldeberg (1942, 1943, 1966) relates smithing primarily to metal other than iron, and is the only early archaeologist taking Ohlhaver's interpretations further, combining them with ethnographic analogies and practical knowledge of metalworking. It thus seems like precious metal is the first to be truly associated with the mythological material, providing a bias in a different direction from the processualists, who primarily chose to focus on «functionalistic ironwork». It is hard to say whether this is a modernistic opinion brought on to interpretations of the prehistoric. In many instances connecting precious metal to myths is possible to explain on the basis of often figuratively rich artefacts. A growing interest in the Scandinavian animal styles and their interpretation as symbolic imagery of identity (e.g. Gansum 2004b:144-147; Hedeager 1996:224-230, 2011; Kristoffersen 2000a, 2000b, 2009), may have contributed to these perceptions. This bias has caused Hedeager (2004:163-164) to warn against the possible misinterpretation of iron as a «neutral» metal in the context of Iron Age society.

One reason for the change from empirical observation to a focus on the ritualistic sides of

metalworking can be assigned to an increased interest in the use of analogies through experience from ethnological fieldwork (e.g. Haaland 2004; Haaland and Haaland 2008; Herbert 1993; Horne 1995; Sofaer 2006). The activities of contemporary, «primitive» African cultures, in which smelting and smithing is still a part of daily life, have been claimed to have much in common with metalworking during the Scandinavian Iron Age (Bøckman 2007:10). The combination of post-processualistic ideas with ethno-archaeological study and examination of the ON myths resulted in the construction of a new smith, whose definition stretched far beyond that of being just a provider of necessary and practical tools. This figure is understood as being in possession of a very special «esoteric» knowledge as well as of certain supernatural powers. Often considered dangerous in character, this smith has commonly been pushed to living «on the border of society» (e.g. Eliade 1978; Fitzpatrick 2009:114-119; Gansum 2004a; Goldhahn 2009; Haaland 2004:11-14; Hedeager 2011:139; Herbert 1993; Helms 1993:59-60; Motz 1983:13-14; Pedersen 2009:132-133; Straume 1986:55; Thålin-Bergman 1979:103-104).

In many instances it seems that the mystery surrounding «smiths' graves» and their confusing, ambiguous grave goods was reflected back to place the smiths themselves into this mysterious light. Post-processual archaeology sought to approach the symbolic meanings behind artefacts and developed old concepts further by applying a layer of human ritualistic belief in the attempt to reach beyond physical necessities. In the eyes of the processualist, the smith was a small figure – just another farmer giving his services to society. Post-processualism in many instances blew their smith out of these proportions to such a degree that this crafter had to be segregated from society altogether. The smith was placed in a liminal position between two worlds, with one foot in practical dwelling and the other within ritualistic practice, a place in which these characters are often still found in archaeological research today.

### 2.3 The return to things

In later years we have experienced an increased awareness of dichotomising elements in archaeological theory, bringing attention to the concepts of context and self-reflection (e.g. Johnsen and Olsen 1992; Olsen 2006:13-15). Definitions of ritualism and rationalism have suffered especially heated debates on grounds of traditional conceptions placing religious praxis within an irrational sphere (e.g. Brück 1999). Processual archaeology was founded on a belief that the objectives and logic of the discipline are more or less the same as those of the natural sciences (Johnsen and Olsen 1992:419). Post-processualism sought to rebel against a concept reducing

human beings to nothing more than passive entities responding to a surrounding world, fighting for a belief in an intentional and free-willed human existence, an idea that was later adopted also into the more intermediately positioned agency theory (Berggren 2000:40-41; Dobres and Robb 2000:4-5, 10-11; Solli et. al. 2011:49-50). These ideas have been of major importance to the theoretical approaches of this thesis.

We have seen an extensive «return to things» in archaeological research as a response to the debate in itself, and as a reaction to what is often considered an unrealistic separation between mind and matter (e.g. Glørstad 2008; Hodder 2012:15-16). Studies of technology have travelled through the sphere of ethno-archaeology and into the *experimental*, in the attempt to combine technique with the magical, best represented by work on the carbonisation of iron by archaeologist Terje Gansum and smith Hans Johnny Hansen (2004; Gansum 2000a, 2000b). The combined theory and method of *chaîne-opératoire* has brought archaeologists to picking apart whole processes into so-called chains of production in order to understand the interrelatedness of technology, transformation of materials into objects, and the *biography of things* (e.g. Dobres 1999; Fredriksen 2006:127-129; Lund 2009). In many ways it seems like the gap between the natural and the humanistic sciences has started to heal. Yet, one of the most central themes of this discussion, the question of which part influences the other more – human beings or nature – is still a matter of debate (e.g. Fahlander 2008; Knappett and Malafouris 2008:ix-xiii).

Norwegian archaeologist Unn Pedersen is among the most prominent figures when it comes to research on Viking Age smiths. Her article from 2009, *Den ideelle og den reelle smed* («The ideal and the real smith»), quite neatly sums up the current status of studies on the subject, presenting a critical review on post-processualistic tendencies to glorify the mythological smith. Central to her work are studies on production sites and workshops (Pedersen 2009, 2010), providing a window to the *human* smith, rather than that of the «religious specialist». Emphasis is placed on the assumption that there is a borderline going between that of production as part of magical-religious praxis and production aimed primarily toward sales activity (Pedersen 2009:135). Because production sites are not among the main material of this thesis, some of these questions will be impossible to answer here.

Either way, I doubt that the matter of smiths and metalworking is simple enough for too clean divisions. If metalwork is as embedded with magical beliefs as has been expressed in much of the literature, then surely this must be part of a deeply rooted belief system, the effects of which have

been argued to being observable into the Middle Ages (Hedeager 1992:129, 2004:165-166). Moreover, as much as any reality must necessarily be related to an ideal (Chapter 3), it seems reasonable that every smith would potentially be reaching for the best possible outcome for their products (skilled crafting) and their own place in society (status). Unless all «real» smiths are the same, and all «ideal» smiths clearly distinguished from these, we should expect to find human smiths at varied points of the scale. Pedersen is, however, right in that we should be careful not to place all smiths in the same category. My point is that variation in smith praxis and religious roles do not necessarily mean that they are not reaching to fulfil an ideal position which may or may not be clearly defined either in myths or archaeological remains. Thus we should take care to heed Hedeager's warning not to interpret materials as neutral, even when they become part of what has been described as Viking Age mass production.

## 3 MENTALITY AND IDEOLOGY

As briefly mentioned above, it is hardly new to claim that prehistory should be analysed on the terms of its own premises, as realities in need of consideration on background of conditions far removed from our own (e.g. Hedeager 1999; Ingold 1999:ix; Lund 2009:37). This is also the basis of the theoretical frameworks presented here. Heated debates on the splitting of rituality from rationality have brought many researchers to realising that even differing world views seem to follow some kind of logical reasoning. Because they do not conform to our modern conceptions of how the world is put together, functionalistic views sometimes give an impression of myths and religious behaviour as purely a result of human imagination (e.g. Gell 1992:41). However, myths – like science – should be considered on background of two most important constituents: observation and explanation (Barber and Barber 2004:3, 27). The interesting situation then occurs when the same worldly phenomena are given different explanations due to differing cultural backgrounds. Chapter 3 comprises the theoretical foundations of this thesis, and is meant to explain how it is possible to account for the existence of a different kind of logical reasoning in the Norwegian Iron Age.

### 3.1 Humans in the world

Ideology relates to cosmology in that it can be explained as holding the theoretical foundations for world order. While cosmology can be described as the actual order of the universe, ideology constitutes the reasoned (theoretical) explanations for these worldly phenomena, as logically accounted for by the followers of world views in context (e.g. Barber and Barber 2004; Levi-Strauss 1966; Lund 2009:41; Hedeager 2011:1; Gräslund 2001:11, 14; Ringstad 1991:141; Solli 2005:22-23; Wiker 2002:118-119). Context is, understood in its simplest matter, the material (physical) and social (cultural) conditions of a society. Psychologically, the concepts of ideology and cosmology can be argued to relate to people's way of getting oriented in their own existence, positioning themselves in a meaningful way within a cosmological whole (Dobres and Hoffman 1994:215; Steinsland 2005:92, 95). Physically, people(s) must be understood as contextually bound by the possibilities and limitations provided also by geography and landscape. An example of this is the availability of materials for artefact production (Dobres and Hoffman 1994:220-221).

Mentality can be described as the way in which the reasoned explanations of ideology manifest inside of people's heads and is reflected in their attitudes and behaviour, often unconsciously (Gräslund 2001:11-13; Hedeager 2011; Steinsland 2005:423-433). Mentality is often considered to

be part of the «everyday» dimension in that it relates more personally to immediate social and material contexts, and thus to the way people communicate with the world on a daily basis. In this way mentality and ideology become important in the shaping of norms and habits (Gräslund 2001:11-12). In effect, this also means that ideologies can often be adapted to different kinds of contexts, resulting in local traditions (Østigård 2006:12-13, 16, 34). Alternatively, undefeated challenges and/or new discoveries (i.e. the introduction of new technologies, the Copernican revolution) can result in the adoption of new concepts and changes to ideologies (Gräslund 2001:11-12; Summers-Effler 2006:151-152). As proven by the long process of Christianisation in Scandinavia (e.g. Gräslund 2001; Steinsland 2005:421-426), transforming ideologies also have their effects on mentality, and changes may occur in either direction. If ideology is then seen as the knowledge of world order as imagined within a specific culture, mentality encompasses how it is practised in accordance with physical and social context. Thus the concepts of reality, cosmology, ideology and mentality should be understood to be overlapping, interrelated and dynamic, rather than separate entities.

*Association* relates to mentality in that it forms the conscious and unconscious mental bonds connecting different physical and psychological elements to each other in an ideological and cosmological whole. Variation in cultural understanding is thus what makes it possible for, for example, the colour white to symbolise life in one culture, and death in another. Association is individual in that it relates to personal experience, yet cultural in that this experience has to be placed within a larger socio-cosmological understanding (see Barber and Barber 2004:97-112). In this way it is related to memory, and on the cultural level also to the production of collective memory, or myth (Hedeager 2011:14-15). An example of Late Iron Age mentality building upon associative relationships as part of collective memory can be found in the kennings of Eddaic poetry. As Barber and Barber (2004:20, 106-107) have pointed out, it appears that Snorri Sturluson was aware of the danger of misinterpretation in his own reproductions of the myths, so he added little explanations to the texts. One such can be found in *Gylfaginning*, where Loki's writhing, causing the earth to shake, is translated by Snorri into earthquakes (Sturluson 2008:83). Such metaphorical elements may have been immediately recognisable by the pre-Christians, but the associative relationships connecting these elements are likely to have been lost over time.

### 3.2 Material correlation

The extent to which it is possible to use the Scandinavian written material in the interpretation of

archaeological material has been a subject of much debate. The majority of the critique has been built around the younger dates of written myths and sagas as opposed to their orally transmitted «originals» and the Christian context in which they were recorded. Counter-arguments often refer to the strict structures of the poetic tradition, explaining its well-defined rules as preservative, keeping its contents largely authentic even as knowledge was passed down orally (e.g. Hedeager 2011:21-26; Price 2002:53-54; Solberg 2003:18; Steinsland 2005:35-38). The poetic nature of the runic inscriptions of the Eggja stone from Sogn og Fjordane, dated to 600 years before the writings of Snorri, and its reference to the ON praxis of *seiðr* (Solli 2005:30-32), seems to support such an argument, confirming some of the elements that have been considered to be crucial also in the younger texts. Other than the (often cryptic) runic accounts on stones, wood and bone – the two latter of which most material must be considered to be lost due to biological decay – there are no primary Scandinavian written sources. All contemporary sources have thus been written by those visiting or being visited by the Norsemen (Hedeager 2011:21-22; Solli 2005:20-22; Steinsland 2005:36-37). However, in regard to the mentality aspect, there is another approach to this material in need of consideration.

The roots of the Annales paradigm can be traced back to the late 1890s and appeared as a reaction to historical specificity and a call for more generalising methods for studying the past (e.g. Andrén 1998; Bintliff 1991; Hodder 1987; Knapp 1992; Price 2002:35). It was introduced to the archaeological discipline in the 1980s, with a focus on studying cultures from the inside by means of interpreting structures of ideologies, world views and collective systems of belief (Hedeager 2011:1). Structures of societal change were divided into three different categories dependent on their time scales, or durations (*durée*), as general perspectives in which to view historical transformation (Bintliff 1991:6-7). Short-term changes (history of events) deal with narratives on an individual level, and thus relate to a post-processualistic focus on the particular – time caught in moments, events and politics. Changes in world views and ideology, both of which the Annales school considered to be part of peoples' mentalities (*mentalitétes*), is understood as structural history, the changes of which operate on the more generalising level of medium- to long-term time scales. It is such a long-term perspective that is in the interest of this thesis.

While critique can be directed to the long-term approach of the Annales school because it implies that large-scale change must necessarily happen at a slow rate (Hedeager 2011:2), the long-term perspective makes it possible to reduce elements in mythological material and archaeological remains to a web of underlying ideological structures. As such, there are a number of factors in Iron

Age mentality which have seemingly remained consistent over time, as ideas echoed throughout both the archaeological and written record. One of these revolves around belief in the extended mind. Relating to the close relationship between human beings and animals, as expressed in animal art correlated with belief in metamorphosis or shapeshifting, this is an ideological element which seems to be evident from the Migration Period onwards (e.g. Domeij 2004; Hedeager 2011; Kristoffersen 2000b; Price 2002). That these concepts in many cases can also be extended to objects, and especially to objects made from metal (e.g. Hedeager 2011:137-148; Price 2002:354-358; Østigård 2006:22-23), serves to place metalsmiths on the inside of this ideological-cosmological framework. From this perspective it is particularly interesting to view the phenomenon of depositing tools for smithing in graves inside of its very pronounced time context. Quite specifically, the deposition of these tools has been confirmed a number of times to keep almost completely within the frames of the Norwegian Late Iron Age (e.g. Christensen 2005:59; Grieg 1922:71-72; Petersen 1951:71; Sjøvold 1962:208; Solberg 2003:187; Straume 1986).

Stretching from its scarce representations in the Migration Period, the number of tools in graves seems to increase in the Merovingian Age, reaching its climax in the Viking Age, before disappearing altogether sometime during the Christianisation of around year 1000. It seems evident to me that this pattern is correlated with developments in Iron Age ideology, and that smiths and metalsmiths must be viewed as part of the larger picture. As such, one of the main focuses of this thesis revolves around locating smiths *inside* of their respective societies, as opposed to placing them «on the edge». Because I see the written material from the Early Middle Ages as an essential source to understanding pre-Christian mentality, this will be incorporated as part of analysis where it is deemed relevant. This material will be seen as a carrier for prehistoric mentality while always consciously viewed in its paradoxical role as a literate source to orally constituted mythological knowledge.

The literature most commonly used in order to gain insight into ON mythology stems primarily from two sources, as explained by Hedeager (2011:23). *The Poetic Edda* is a collection of ON poetry deriving from the two codexes of *Codex Regius* and *AM748*. While the former has been dated to approximately 1270 CE, the age of the latter has proved harder to decide. A master copy may possibly be dated to about 1200, while the poetry can undoubtedly be decided to belonging to a much older tradition, possibly going as far back as to the sixth century. *The Prose Edda*, or Snorri's *Edda*, is a handbook in skaldic poetry of which Snorri Sturlason has been named the compiler. While Snorri is recorded as to having lived from 1178/79 to 1241, it is unclear whether he is the

actual composer of more than its last section. *Skáldskaparmál* has been argued to, like *The Prose Edda*, possibly originate from the Migration Period (Hedeager 2011:23). In addition to these texts, there are a number of sagas and other written material from the Medieval Ages of Scandinavia and the European continent. These will be introduced as they appear throughout the thesis. For the sake of simplicity I have added an overview of these textual sources, including their dates, in Appendix A.

### 3.3 Blurring the lines

One of the paths to understanding ON religion may possibly be found in its followers' lack of understanding that they were religious (e.g. Price 2002:26; Solli 2005:17-18). Until the word *heiðinn* – heathen (with a likely translation to something like «homely») – appears for the first time in the poetry of the 900s, there seems to have been no actual word for religion (Steinsland 2005:13-14, 423). The word *siðr*, loosely translating to «custom», can be related to cult and tradition, but can be reasonably argued to encompass much more than myths (Price 2002). Similarly, the word *trúa* (relating to modern Norwegian *tro* – belief) is more connected to «trust» than to belief, and it seems apparent that stories and explanations were very much conceived as actual knowledge of reality (Solli 2005:17-18, 21-22). Moreover, the polytheistic characteristics of ON religion open for the conception that there are multiple approaches to a given situation and it can in this way be regarded as more flexible than the Christian notion of following «the right path». The potential for adopting new ideas as well as new deities is illustrated in the Icelandic *Landámnabók*, where a man called Helge (nicknamed «the godless» because he did not follow the custom of *blót*; Solli 2005:17) is described as a follower of Christ, yet as someone who calls on Þorr «at sea and for courageous deeds» (Landámnabók 1997:218, my translation). It must be stressed that the idea of religion as something removed from natural phenomena («reality») seems to have been seeded through a meeting with Christian perspectives of human beings as fundamentally different and separated from nature (also Hedeager 2011:81).

Steinsland (2005:32-33) has described ON religion as a cosmogonical folk religion, as opposed to modern universal, or transcendal, religions. One of the more important differences between these can be found in that folk religions more commonly are ethnically and geographically bound. In the case of ON religion this also means that the world could be divided into different spheres, and that different kinds of creatures can be described as to belonging to either. These borders do not, however, appear to be absolute. There are several cases of *jötnar* (poorly translated into English

«giants») emigrating from *Útgarðar* to join the æsir (gods) of *Ásgarðr*, among them the infamous Loki. This means that it might not have been a problem for the ON population to accept that people from other places would also follow other gods, at least not before one movement claimed to be more right than the other (Gräslund 2001:14; Solli 2005:17-18). The blurring of the soul with physical reality, the blurring of humans and animals, and the possibility of crossing over spheres or dimensions express a lack of absolute borders which can likely be extended also to other conceptions of the ON world. As such, this thesis rests upon an argument that it may be necessary to view also smiths from a perspective where the lines are likely to be blurred.

### 3.4 Smiths in context

Perhaps the most widely criticised matter of subject in archaeological research on smiths and smithing is the definition of «smiths' graves». It is almost thirty-five years since Anders Wallander in 1979 ended the title of his essay, *Smedgravar eller gravar med smides- och snickarverktyg?* («Smiths' graves or graves with smiths' and carpenters' tools?») with a question mark. Still, he was by no means the first to be confused as to how to define the phenomenon of depositing tools in graves. The problem can ultimately be traced all the way back to Oluf Rygh (1885) and encompass the situation of leaving it to one man to sort all archaeological material, from the start of the Norwegian Stone Age until the end of the Late Iron Age. The work of archaeologist and smith Jørgen Bøckman (2007) stands as a critique to the lack of understanding of the actual practical uses of these tools, as displayed also by the repeated use of old typologies over time. Grieg's (1922:27) 157 «smiths' graves» were never properly defined, and his list rather seems to include all graves containing tools whose relation to smiths were primarily made by Rygh. Petersen's (1951:78-108) work can be considered a continuation of Grieg's, and all three of these past archaeologists place certain tools, like hammers, among the tools of the smith without questioning their possible uses in other kinds of crafting (also Bøckman 2007:1-2, 34-43). All in all, archaeological research so far can be described as being rather biased toward metalworking in comparison to other crafts.

As an answer to criticism on «smiths' graves» definitions, there are a number of archaeologists who have participated with suggestions on how to solve this problem. The first Norwegian to question the term was probably archaeologist Thorleif Sjøvold (1974:306-307; Wallander 1979:5). Building from the fact that many of these graves, due to the presence of often otherwise rich and varied grave goods (Barndon 2005:366; Bøckman 2007:7-11; Pedersen 2009:130, 2010:15-16; Straume 1986:46-47; Wallander 1979:1-3), cannot be clearly assigned to an actual smith, there have been attempts of

re-defining the requirements needed in the recognition of the professional metalsmith. Wallander's (1979:3-11) requirements have been criticised by Bøckman (2007:9) for being too strict in that they can only be applied to eight Norwegian graves. Straume (1986:46) defines a «smiths' grave» as one whose goods is dominated by tools for smithing, and decisions are commonly based on a combination of typology and the number of tools present. In order to avoid these problems, Sjøvold's term, *graves containing tools for smithing*, has been much used in later literature (e.g. Bøckman 2007; Pedersen 2010). Yet, the biggest crime may be that the discussion of *which* and *whose* and *how many* tools may have caused a separation of these tools from their actual contexts, building upon modern western ways of categorisation which are unlikely to conform to pre-Christian mentalities. Even Sjøvold's term becomes problematic at the involvement of tools which cannot be surely be placed either within the traditions of metalworking or carpentry. Moreover, if a grave contains tools for both, then which should get precedence? In this way we seem to arrive at the point where we first started, and we find ourselves unable to explain where the smith starts and where the smith ends. The bias toward metalsmithing, as demonstrated by a faulty understanding of the actual uses of tools in crafting, adds to this problem. In order to get closer to a realistic answer it is thus necessary to approach both typology and context.

## 4 METHODOLOGY

Because all details on the material discussed in this thesis are freely available in the internet Collection Portals of the Norwegian University Museums (unimus.no), Appendix B does not hold a complete catalogue. Rather, it includes a list of all graves discussed, and some of their more important aspects, as deemed directly relevant to this thesis. During the initial phases, information on all of Bøckman's (2007, jorgen.bockman.com) 795 tools were examined in detail and organised into computer databases by use of Apache OpenOffice Calc as a way of getting easy access to details on the material. Following, each of the objects were tracked down individually, and examined through the internet sources presented, in correlation with information from the works of Grieg (1922) and Petersen (1951). Due to a number of loose finds, finds with missing information and unreliable find contexts, it has been necessary to exclude some of the material as part of the process. A list of these is provided in Appendix C, so that it should be possible for others to trace them down later.

As the purpose of this thesis is to look for underlying ideological conceptions, it has been necessary to include a very large body of material, widely spread across a period of more than 500 years. The choice of methodology must be understood on grounds of the questions asked and the theoretical approach of long-term mentality changes, and is an approach that should be considered unfit for the closer examination of individual cases. Such an analysis would be valuable on grounds of previously discussed problems on interpreting the practical uses of tools, and the fact that much previous research appears to be biased in one way or another. Rather than to look for the particular, these analyses must be understood as generalising in the search for very clear patterns evident in the material, moving away from any «special cases». These will receive little to no attention here.

The first part of the analysis of Part II concentrates on discussing each tool category in detail in order to divide them into groups according to the certainty to which they can be argued to having been used for metalworking and/or other kinds of crafting activities. While focusing primarily on functionality, all analyses will be supplemented with information from archaeological research, Medieval literature, handbooks on crafting, as well as personal experience. Because modern western society relies on a wide range of machines and specialised tools for production, comprising a wholly different technology from that of the Iron Age, the associative relationships between tools, crafts and objects are likely to differ, and our views on traditional crafts may be biased. Before narrowing down any function I will thus make an attempt to widen the perspective in order to

include other possibilities. As such, the main purpose of this part of the analysis is to gain a perspective on to which degree the tools of Norwegian Late Iron Age grave culture can be assigned to metalworking activity, and the degree to which tools from different crafts appear together. This part of the analysis will rely heavily on the research of Jørgen Bøckman (2007) and other crafters.

It is important to point out here that I do not hold the practical experience of Bøckman and others. My personal experience is limited to a weekend course in general silversmithing at Smykkeskolen in Oslo. In addition, I have played with experimental blacksmithing on a few occasions at the self-made smithy of hobby blacksmith Aleksander Madsen, in his hometown of Arendal. Having a builder for a father means that I also have some lucky insight to the processes of woodworking and building. I have worked with him on a few occasions, and I have been interested in observing from quite a young age. Previous studies in chemistry, conservation, arts and technology have also come in handy.

The second part of the analysis builds upon the first in that it searches to widen perspectives even further in order to explore the associative relationship between tools and objects which are often assigned to other spheres of life in the Late Iron Age. This comprises a statistical analysis of correlation patterns between the tool categories defined throughout the tool analysis and other reoccurring objects in the graves. In this way it is supposed to help create a picture of the grave contexts in which we can expect to find tools, and which other objects are more likely to be found in their immediate proximity. This should serve to shed some light on ideological relationships between crafts and other kinds of activities in the attempt to locate the smith as part of the larger society.

The last part of the thesis will comprise the closing discussion on how results can be interpreted. Literature on the ON myths and mythic universe will gain a major role here, in order to illuminate parts of the culture which may only be partly visible in the archaeological material.

## 5 A NOTE ON CHRONOLOGY

While there is some overlap in the Early and Late Iron Age regarding the appearance of tools for smithing in graves, the general picture appears to be fairly homogeneous. Commonly dated to the mid 500's, the transition from the Migration Period to the Merovingian Age has been recorded to hold comprehensive cultural changes throughout all of Scandinavia and further into Europe (e.g. Kristoffersen 2000a:62; Solberg 2003:177, 197-198, 210-211). Changes in technology are found to be especially prominent, as new approaches seem to have completely replaced previous technological knowledge (e.g. Kristoffersen 2009:157-158). Several archaeologists (e.g. Fredriksen 2006 ; Hedeager 2011; Kristoffersen 2009) have argued that these changes can be traced back to the Migration Period, and the onset of a new ideology. This concurs with the starting appearance of tools in graves at this point, a tendency that becomes much stronger into the Late Iron Age (e.g. Grieg 1922:71-72; Petersen 1951:71; Sjøvold 1962:208; Solberg 2003:187; Straume 1986). It is due to the only very sparse material of Migration Period «smiths' graves» (of which there are only 3 from this thesis' material; Appendix D:Table 1) that this thesis concentrates on the Late Iron Age material.

Building from the above, I believe that the appearance of tools in graves could possibly be seen as a heightened emphasis on crafters and crafting in a changing Iron Age ideology, the start of which can likely be roughly placed in the Migration Period and ending with mentality changes introduced in the process of Christianisation. Because this thesis focuses on long time perspectives rather than specific periods, this very short chapter should be seen as a point of reference rather than a complete overview. From here onwards all periods will be referred to only by their abbreviations. As such, the Norwegian Iron Age can be divided into periods as follows:

| **Iron Ages** | **Iron Age periods** | **Dates** |
|---|---|---|
| Early Iron Age (EIA) | Pre-Roman Iron Age | c. 500 BCE - 0 |
| | Roman Iron Age | 0 – c. 400 CE |
| | Migration Period (MP) | c. 400 – 560/70 |
| Late Iron Age (LIA) | Merovingian Age (MA) | c. 560/70 – 800 |
| | Viking Age (VA) | c. 800 – 1030 |

*Table 1: The division of the Norwegian Iron Age into periods, from the start of the Early Iron Age until the end of the Late Iron Age. Following dates from Solberg 2003. The end of the Viking Age is sometimes also set to 1050 or 1066, and all dates should be considered to be overlapping rather than absolute.*

# PART II

MATERIAL ANALYSIS

## 6 THE GRAVE MATERIAL

Even after detailed examination of Jørgen Bøckman's (2007) 795 tools, involving the filtering out of finds that did not meet the requirements of this thesis, the grave material remains extensive. From what Petersen (1951:71) has claimed to be 375 Norwegian «smiths' graves», 320 have been confirmed, with full or limited contexts, through application of the open access internet research database of the Norwegian University Museums (unimus.no). In addition to the 260 dated graves, there are 57 that remain undated (Appendix D:Table 1). With support in the low number of graves dated to the MP (3), it should be quite safe to consider the majority of these as to being LIA graves. These are counted in general discussion and considered an important part of the material, but have been left out where more specifically dated finds have been necessary. It is important to note that the total number of «smiths' graves» is likely to be higher, as I have not entered the museum archives directly. New finds from after Petersen's publication from 1951 would also add to this number. All these things considered the material used in this thesis should be considered a selection rather than a complete list of «smiths' graves» from the Norwegian Iron Age.

The criteria for entering my list of «smiths' graves» have been far more open than that of previous researchers like Wallander (1979) and Straume (1986). Rather than to follow new definitions, I have chosen to return to Grieg's and Petersen's inclusion of all tools that *could* have been used for smithing, regardless of their numbers in a grave. This is partly because I believe it is important to accept the possible symbolic presence of the smith where these tools have been placed, and because I find it necessary to try to avoid a bias toward very rich grave finds. Furthermore, I will keep using the term «smiths' graves», while keeping the quotation makes as a reminder that the term can, indeed, be highly relative. This is because I find that the term «smiths' graves» to be relevant wherever smiths' tools are present, in the same way that «riders' graves» are often used, quite unproblematically, about graves containing riding equipment. Terms like these are sometimes used in parallel about the same grave (e.g. Bøckman 2007:7; Martens 2003a:19), and the use of either should never exclude the other. Additionally, rather than to exclude graves holding tools that cannot be decided to being certain metalworking indicators, I have decided to keep all 320 graves, as I believe they can all contribute with important information as part of the discussion.

### 6.1 Limitations and advantages

There are several reasons for choosing the old material of Jan Petersen as the main body of material, but it has not been unproblematic. There are clear advantages as well as inconveniences to using

such a well known scope of material. This chapter is meant to explain how these factors may effect the outcome of research.

One of the immediate problems connected to the use of Jan Petersen's material is his lack of a complete finds' list (Bøckman 2007:12; Petersen 1951). Bøckman has explained that only about 40% of the finds in Petersen's statistics are given with find numbers or indications of locality. This makes it likely that some of the finds may have been lost in the process. Furthermore, less than half of the material is expertly excavated (Bøckman 2007:13-14), and all is from before 1951, reflecting the cruder archaeological practices of its time. A major part has been dug up during the 1800s by private persons, many of whom have kept the artefacts as private property before giving them up to museums. As a result there is a prominent amount of graves whose contexts must be regarded as highly uncertain. A number of objects have also been given new find numbers in the internet databases that do not match the numbers provided by Bøckman (2007). Many of these have been possible to trace, but not all. Overall, it is limited and missing information that provides the most extensive problems to work on this material. These are problems that can hopefully be countered by use of generalising methods that focus on the bigger picture rather than on the details.

The advantage to using such a widely known body of material is also of importance. Petersen's work is still widely used in the classification of objects, and a guaranteed familiar publication to other archaeologists working with research on smiths and crafting. In addition, many of the tools were already classified and researched by Sigurd Grieg, in his publication from 1922. Even before Bøckman's (2007) examination of Petersen's archives and private drawings, several of these objects have thus already been thoroughly discussed. Many of the tools have been published with pictures, first in Grieg's work, then in Petersen's. This makes it easier for others to trace typological historiography and recheck the material. Hopefully this can inspire archaeologists to continue the discussion and contribute with potential questions yet unanswered.

### 6.2 Graves by county

The material left behind by the excavators from before 1951 is rather unevenly distributed throughout the country. This may be due to a number of factors. For example are 198 of the 320 graves reported as to having been found in mounds or cairns. This may have its natural explanation in that these are burial monuments that would have been more easily detected by archaeologists and hobby archaeologists in the past (also Sjøvold 1974:184). Building on this, it is possible that

environments in which there are more obvious (external) burial patterns have been explored to a larger degree than burials following less detectable traditions. Only 23 of the graves discussed here are recorded as flat-ground burials. This opens for the possibility that some traditions may be represented to a larger degree than others. It could also serve as a possible explanation for the high number of VA graves along the Mid-Norwegian coast, especially prominent in the counties of Møre og Romsdal and Sogn og Fjordane (Fig 1; for division into periods see Appendix D:Table 1).

Solberg (2003:135) has discussed this problem in regard to the location of excavated MP graves mainly along the western coast, while these appear to be relatively few in the eastern part of Norway. On a general level, MA graves can be considered especially problematic because they show a change toward simpler grave expressions and flat-ground burials, while mounds become more common again at the end of the period. Roughly half of all MA graves from western Norway come from mounds, the rest being flat-ground burials, while the picture in the East is quite different. Only between a fourth and a fifth of all graves are flat burials here, while only a fourth of the graves from the 7$^{th}$ and 8$^{th}$ century in northern Norway come from mounds (Solberg 2003:186). This seems to express clear regional variation in burial custom. The definitely most numerous graves have been dated to the VA, but also these show considerable variation (Sjøvold 1974:182-186; Solberg 2003:222-223). All in all, burial customs throughout the LIA must be considered to show a rather heterogenous expression, also across counties. The topic is comprehensive and will not be pursued any further here.

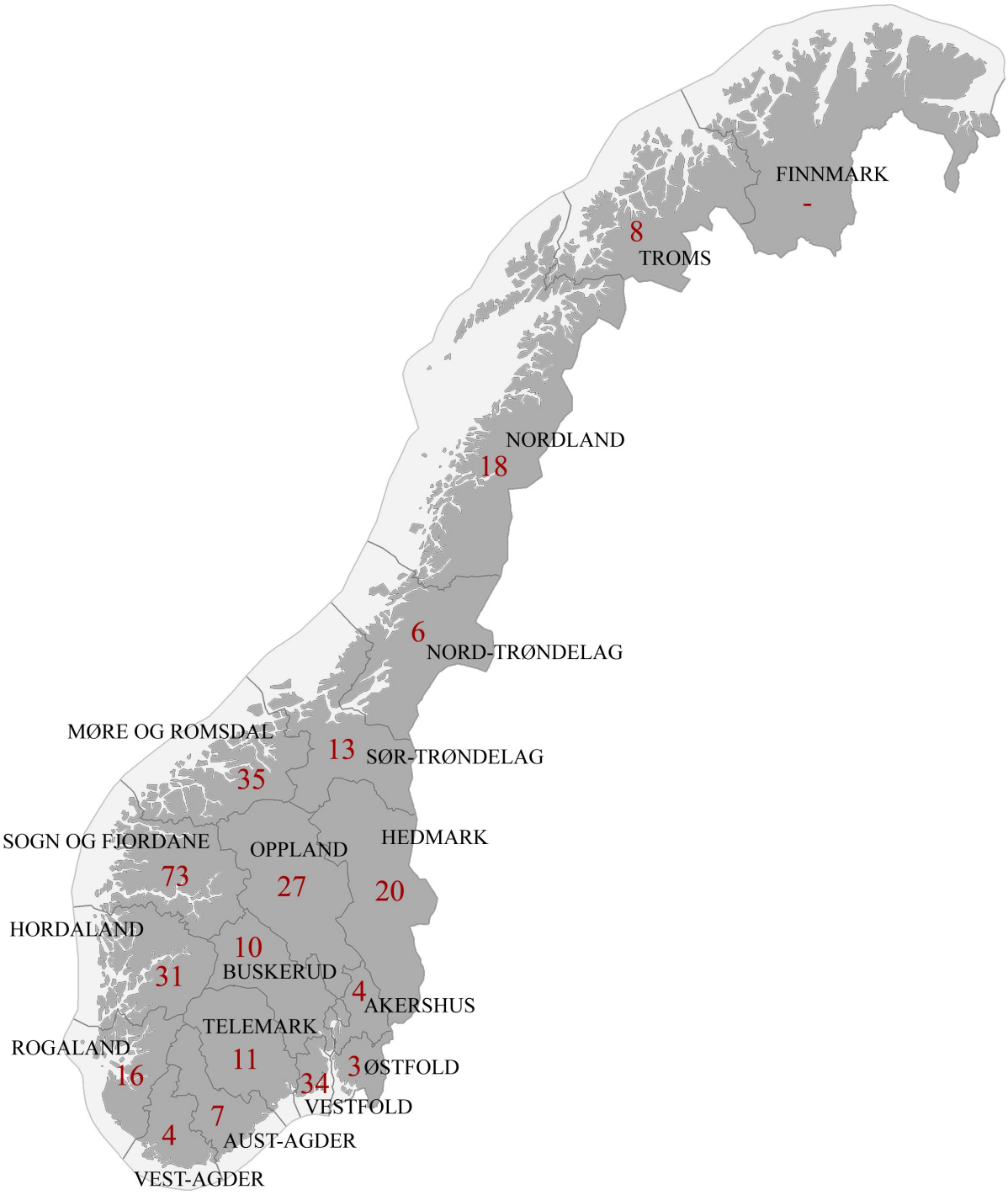


*Fig 1: The distribution of «smiths' graves» in Norway, numbers by county. Map taken from Statens Kartverk and edited by the author.*

## 7 TOOLS FOR METALSMITHING

There is a specific way in which to recognise «smiths' graves» in the archaeological material, and this is through the recognition of certain kinds of tools. This chapter is meant to be an introduction to the range of tools for metalsmithing found in Norwegian grave material, some of their different type variants, as well as their presumed areas of use. Classificational conclusions reached will be used as the basis for further analyses throughout the thesis.

### 7.1 Anvils

The anvil is considered among the elemental tools of the metalsmith, and is commonly made up by a hard piece of material, the top of which constitutes the striking surface against which the raw metal is hammered. Modern anvils for blacksmithing have a recommended weight of at least 90 kg, and are usually found within a weight range of 90 to 150 kg (Pehrson 2009:18). The top of the anvil is called the face, and the breadth, size, and form of the anvil commonly depends on its use (Bergland 2000:36). Anvils from the Iron Age come in considerably smaller sizes (e.g. Petersen 1951:92-93), equivalent to modern anvils for goldsmithing (Bøckman 2007:54), and whether they have actually been used for blacksmithing has been brought to question for this reason.

The smallest Iron Age anvil of the grave material is only about 7,5 cm tall, while the height of the largest is 16 cm. According to Bøckman (2007:52-54) the weight of the smaller anvils of Petersen's material can be no more than 200 – 500 g, while the larger could be about 2,5 – 3,5 kg. This makes it likely that these anvils have been used for the hammering of small items only (Bergland 2000:36; Bøckman 2007:54-55; Petersen 1951:92). Archaeologist Raymond Sauvage (2005:47, 54) has tied the smaller sizes of anvils and hammers to the use of a different kind of smithing technique, and this should be taken into consideration. Rather than creating an object from a single larger piece as is common today, Sauvage explains that research seems to show that Iron Age metalsmiths built their objects from the welding of several smaller pieces of raw material (see also Chapter 9.6). Either way, it is unlikely that the same anvil has been used in the treatment of different kinds of metal, because ironworking is likely to cause notches in the anvil face. These could easily get transferred onto softer metal (Bøckman 2007:55).

Most modern anvils are cast (Bergland 2000:36) and the missing number of larger iron anvils can be partly explained on account of lacks in advancement in the Norwegian Iron Age technology (Bøckman 2007:54). Flat stones marked by heat and hammering, often found close to prehistoric

iron furnaces, give testimony of the use of larger anvils made from alternative materials, at least in the initial treatment of iron after smelting (Thålin-Bergman 1979:110). A probable stone anvil has been found at a fine metalworking site at Dunadd in Argyll, Scotland (Coatsworth and Pinder 2002:44-45). Being approximately 60 cm in diameter, it was found to be finely polished, holding irregular scorings across its face which have been interpreted as signs of contact with hot materials. These factors make it possible that this object was used as an anvil, most likely for working iron rather than precious metal. There is also an account of a stone anvil to be found in the sagas. In *Egils saga* (1989:77) Skalla-Grímr dives into the sea in search for a proper anvil for his smithy, returning with a stone so heavy that four men together are unable to lift it. *Jomsvikinga Saga* (1992:78, 189) tells of a viking getting *killed* from a strike in the head by what is described as a rather sizable anvil: Aslak Holmskalle, who is fighting without a helmet, insusceptible to damage to his hard head by the enemy's swords and axes, is finally put to an end as the horn of an anvil sinks into his skull. Blocks of wood are also known to have been used at different times throughout history (Thålin-Bergman 1979:111), constituting an organic alternative which would be hard to detect in the archaeological material.

The grave material contains a total number of 44 anvils, 18 of them dated to the VA, and 4 dated to the MA. Iron Age anvils are commonly divided into two different types based on Rygh's typology – R392 and R393 (Grieg 1922: 50-56; Petersen 1951:91-93). The main difference between the two is that that R393 comes with a horn, and that R393 tends to be slightly larger (Petersen 1951:94). The grave material includes 18 R392 anvils, 3 of them from the MA. 11 anvils are typed to R393, all from the VA. Both types occasionally come with a hole for fitting additional tools, providing extra opportunities for the smith in forming and shaping the metal during the smithing process (Bergland 2000:36; Bøckman 2007:55; Pehrson 2009:17-18; Sauvage 2005:46). This can also likely be used in the forging of nails by means of a nail iron (Chapter 7.6).

While even small anvils can be considered a relatively safe proof for some sort of metalsmithing activity, evidence for the existence of larger anvils, and the observed weaknesses of smaller anvils seems to point Iron Age anvils in the direction of the working of smaller items. Whether these were made for the working of ferrous or non-ferrous metal is harder to decide, and they could probably have been used for either.

### 7.2 Tongs

Tongs are another type of tool that has a rather safe association to metalsmithing. Like anvils, their forms and sizes depend on their uses, and it is not uncommon even in modern times to alter existent tongs according to purpose rather than to make a new set (Bergland 2000:39). The textbook for metalsmiths (Bergland 2000:39) tells that a good pair of tongs, securing a firm grip on the object, is essential for all ironsmithing. Ideally the piece should go all the way into the jaw, or the tongs should be held diagonally while the iron piece is held flatly against the anvil face (Fig. 2). Flat jaws are mainly for working flat items. Arm and jaw length are also of importance – the longer the arms in proportion to the jaw, the stronger the bite.

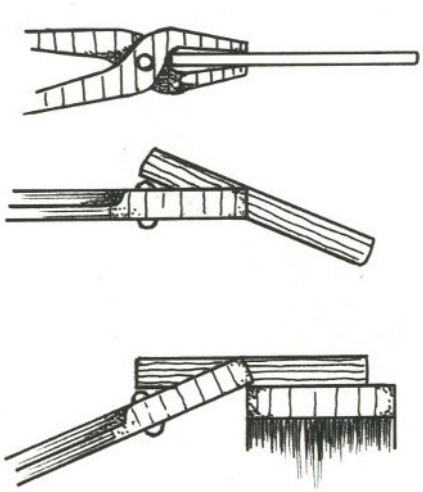

*Fig. 2: How to use a pair of tongs. After Bergland 2000:39, Fig. 3.9.*

Modern tongs come in a variety of specialised shapes (see Bergland 2000:40; Pehrson 2009:25; Pleiner 2006:89), and metalsmiths today tend to hold on to a combination of at least ten different kinds. Iron Age tongs are far more homogeneous in form. These are mainly divided into types based on whether they have curved or straight jaws, and the curved type is considered to be the most common (Bøckman 2007:44; Petersen 1951:85-86; Thålin-Bergman 1979:112). A third type (R391) is recognised by the presence of a chain or hoop for securing its arms. Petersen (1951:85) follows Grieg's (1922:39) division of large and small tongs, based on lengths of more or less than 30 cm. Bøckman (2007:45, 72) has criticised this division on grounds of the fact that many of the larger tongs are thin and fragile, while some of the smaller are of a more solid build. While he considers most of the tongs below 25 cm unsuitable for work in the fire, this is partly dependent on the thickness of the metal, making the further classification of these objects complicated without close examination of the individual artefacts.

The grave material includes a total number of 123 tongs. 28 have been typed to R390 (25 VA, 2 MA), and 38 to R391 (24 VA, 7 MA, 1 MP). Only one of these (Ts980) falls under the category of Bøckman's (2007:46, 51) «especially large tongs», with a length of 73 cm, and must be considered a pair of tongs made primarily for the working of large pieces of iron. This particular example has been found together with an anvil and a delicate pen hammer of 14 cm. Bøckman concludes that most of the tongs above 40 cm would be suited for ironworking, while it cannot be guaranteed that they were not used for heating crucibles. There is also a single find of Rygh's type 389 (VA). The

R389 is a type meant for hard, concentrated bites, and may have been used in metalworking for wrapping metal plate, alternatively for pulling wire or cutting nail points (Bøckman 2007:48-49). I wish to argue that this could also have been used in woodworking for pulling nails and rivets, but because the material holds only one example (T14431), it will have no affect on the overall use definitions of the remaining tongs. It will, however, be considered a possible exception.

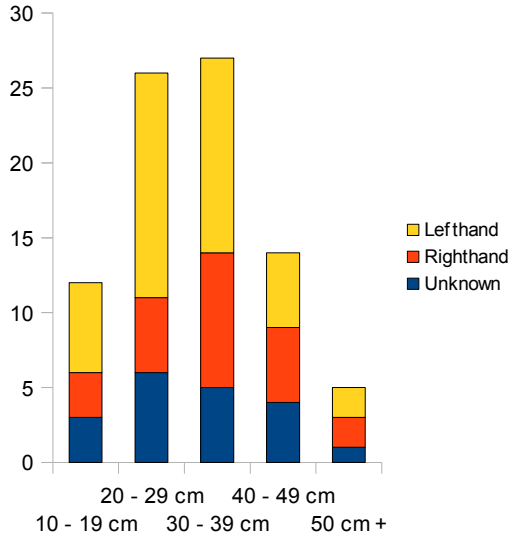


*Fig. 3: Diagram showing the size distribution of 83 tongs with known properties. Note that these are current sizes – most tongs are rusted and/or fragmental and may originally have been larger. Divided into right- and lefthand tongs by Jørgen Bøckman (2007).*

An additional source of possible information is the way in which the tongs' arms are crossed. This can shed light on whether the tongs were made for being used by the left hand (for metalsmithing by a right-handed smith whose right hand would be reserved for a hammer), or in the right hand (e.g. in the heating of crucibles) (see Fig. 3; Bøckman 2007:49). Bøckman (2007:50) argues that Iron Age smiths may not have been aware of this phenomenon, but I would think they were as concerned with comfort back then as crafters are today. At this point it is important to keep in mind that many of the tongs were broken when they were drawn by Petersen, and that he may not have put them together in the right way.

There is no guarantee that smaller metal tongs did not hold a double role as a vice or clamp for holding alternative materials and objects for working, like bone for filing (Bøckman 2007:51). I do, however, find it unlikely that they have been made primarily for this purpose. The harder iron would likely damage the softer material, and examples from finds have usually been made from alternative, less expensive materials like bone or antler (Bøckman 2007:79; Christensen 1986:126-127, 129; Coatsworth and Pinder 2002:59-60, 122; MacGregor 1985:62; Sauvage 2005:51-52; Sjøvold 1974:308-309). An iron clamp found in Hedeby in Denmark has been argued as to having been used for holding pieces of non-ferrous metal during cold treatment (Coatsworth and Pinder 2002:52-53, 59). Yet, the smithing of non-ferrous metal is usually done by cold working and rarely involves tongs at all (e.g. Bøckman 2007:49). This was also the case at the silversmithing course where I attended. For stabilisation while filing, the object was simply held against a bench pin with one hand (see Austin 2004:11), while the other was used for working the file. Thus I conclude, with some uncertainty, that tongs arerelatively safe indicators for metalworking, ferrous or non-ferrous. I

will, however, keep their sizes in mind during contextual analyses.

At this point it is also important to point at a possible symbolical meaning of the tongs in that at least 4 of them have been explained to being deliberately broken before deposition in the graves, a sort of treatment that is most commonly associated with weapons (see Chapters 11.1, 11.8, 12.2). C3884 have, according to unimus.no, had its arms cut off with a chisel before deposition, while B8553e, C26645e and C26739p have all had their arms bent. All of these are dated to the VA, and three of them are left-hand tongs, the smallest measuring 28 cm in length. C26739p is fragmented and cannot be examined in detail. C3884 was the only tool of its grave, while C26645e was found together with a gouge, and C26739 included an auger, a gouge, and a file. C8553 comprises the richest grave, made up also by an anvil, a hammer, a second pair of tongs, a chisel, and a moulding iron, which is often put in relation to boat building (Chapter 8.4). The 3 latter graves hold clear evidence for the working of softer materials. Viewing the deliberately broken tongs from this perspective opens up for symbolic interpretations that will be discussed more in detail in Part III.

### 7.3 Crucibles

A crucible is a tool whose primary function is the use as a container in which to heat metal until it melts, and which is required in metallurgical treatment of non-ferrous metal and in metal casting. Crucibles need to be built from solid materials that can sustain the heat to which they are exposed. This heat treatment often affects the material in a way that makes it brittle, and crucibles have, for this reason, probably been in need of regular replacement (Bøckman 2007:67-68; Coatsworth and Pinder 2002:66; Pedersen 2010:164). The fragility of the used material is also one of the possible reasons for why there are so few crucibles to be found in the grave material.

There are only 2 confirmed crucibles in the grave material, both of them dated to the VA, and coming from the county of Rogaland. One of these is made from soapstone (S3335c), the other from stoneware ceramics (S4066q), representing two main types of crucibles found in Scandinavia (Bøckman 2007:78; Coatsworth and Pinder 2002:66-67). The latter has not been studied by Bøckman (2007), but belongs to a context in which other tools (two hammers and an anvil) have previously been examined. Some crucibles come with a handle, but this is not common in the Norwegian material, and most have likely been handled by the use of tongs (Grieg 1922:71; Pedersen 2010:174). Crucibles are generally regarded as rare in graves (Bøckman 2007:68; Petersen 1951:107-108), and is a testimony of work in non-ferrous metal (Bøckman 2007:78).

There is another aspect that should be considered whenever there are finds of tools made from alternative materials among the metalworker's toolkit. It is common for smiths, even today, to make and alter their own tools dependent on the desired product (e.g. Bergland 2000:39), and it seems likely that this could also have been the case in the the production of tools like crucibles and moulds. Surely, metalsmiths would be the most experienced in knowledge of the tensions that crucibles would have to be subjected to when placed in the fire (see Coatsworth and Pinder 2002:68-69 for technical details). In the case of moulds, which are usually made from the same materials as crucibles – soapstone or stoneware – you would also expect the metalsmith to have some sort of influential effect on the production of motifs, either through close cooperation with other crafters, or because they held the ability to work across different kinds of materials. At this point it is natural to mention the example of Järrestad in Sweden, in which there is evidence for the production of ferrous metal, non-ferrous metal, glass, several kinds of stone, and ceramics, all within the same structure (Söderberg 2006). Tools made from soapstone are not unusual in «smiths' graves», and soapstone is used as a main material also for tuyeres.

### 7.4 Moulds

A mould is an object with a negative design in which to pour the liquid metal of a crucible, thus reshaping it into a desired form as it cools. They have been used in the production of ingots for further metalworking, and as patterns for the production of objects, often jewellery. Moulds are clear indicators for work in non-ferrous metal (Bøckman 2007:66-67; Coatsworth and Pinder 2002:37-38).

There are 5 moulds in the grave material, all of them made from soapstone, resembling Ryghs type 397. At least 4 are dated to the VA. All are moulds for the casting of ingots, one of them (Ts377) including a spade like design (Petersen 1951:105-106). 4 of these moulds (C14873, S3335c, B8038i, C24338i) have been found together with anvils, one of them also with a crucible (S3335c), and another (C24338i) with plate shears (see below). This seems to point these particular graves toward non-ferrous metalworking. However, the presence of large tongs and hammers together with C14873 and Ts377 complicates the matter. C14873 was also found with a small chisel.

### 7.5 Plate shears

Plate shears (Ryghs type 388) are tools for cutting sheet metal or metal in the form of thin rods and

strings. Iron Age plate shears resemble modern scissors, but differ in that both arms curve upwards as to slide along on top of the the metal during cutting. Shears with jaws of over 5 cm can only be used for extra thin and soft plates, and Bøckman (2007:51-52) has argued, on grounds of examination, that most of the shears of Petersen's material must be considered unsuitable for cutting sheet iron with a thickness of more than 1 mm. They can be used for example in the production of cauldrons (Sauvage 2005:48; Thålin-Bergman 1979:113), and are definite indicators of work in non-ferrous metal (Bøckman 2007:52).

There are 6 examples of plate shears in the grave material. 4 of these have been dated to the VA, and one to the MA. Within 2 graves there are clear indications toward possible multicraft activity. C27240 holds a saw with very coarse teeth, earlier put in relation to combmaking (Christensen 1986:124-125), and which would be considered unsuitable for the cutting of metal (Mattsson and Nilsson 2000:119). B5484 includes the find of a gouge.

**7.6 Nail irons**

The nail iron is a tool for making nails and rivets, and usually consists of an oblong piece of metal with two to seven holes along its middle (Fig. 4). The nail iron is commonly flat on one side, while the other holds a small deepening along the holes. Which side is faces up affects the shape of the nail head during smithing. In order to sustain hammering, the nail iron needs to be quite solid, and it should hold a thickness of 1 – 1,5 cm (Bøckman 2007:60). The holes are often concentrated in one end while the other narrows down to a handle. Nails are normally worked freely until they hold the right length and thickness, before they are placed into one of the holes with the thicker end up, at which point a taper causes it to jam. What is left of the nail sticking up through the hole is then hammered in order to form the head (Bøckman 2007:60-61; Coatsworth and Pinder 2002:61). Bøckman (2007:61) considers the nail iron a safe indication for ironworking, because nails and rivets of non-ferrous metal are easier made by casting.

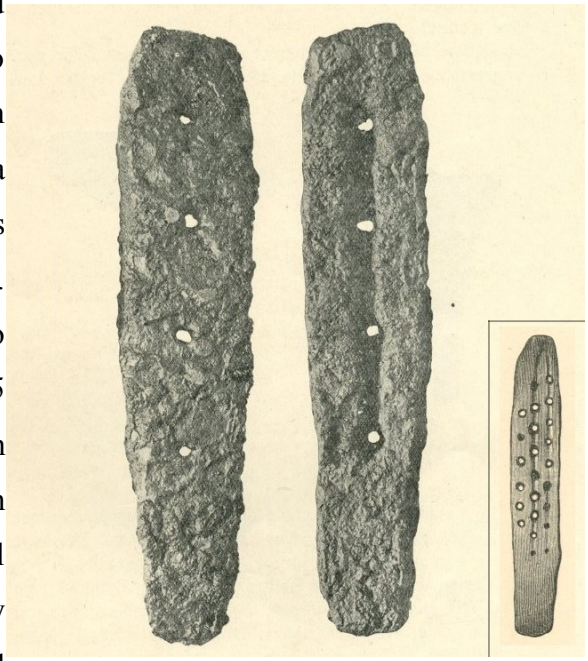

*Fig. 4: Main – nail iron (B6685n) from Eide in Sogn og Fjordane, after Grieg 1922:63, Fig. 36. Corner – Ryghs type 398, a «thread iron» used in weaving, has a history of getting typologically mixed up with the nail iron (Bøckman 2007:61; Grieg 1922:60-61), seemingly also by Petersen (1951:98-99).*

The grave material holds a total number of 16 nail irons. 12 of these have been dated to the VA, and 2 to the MA. 13 have been found together with at least one hammer, and 12 include at least one pair of tongs. The find of an anvil and a mould in C14871 points the tools toward work in non-ferrous metal. S4066 includes an anvil, a crucible, and a drawknife, hinting in a three-way direction inclusive of both ferrous and non-ferrous metalworking, as well as woodworking. S6185 holds a celt of Rygh's type 402 as well as a drawknife, both likely telling of woodworking activity. B6618, B6685 and Ts2278-88 all include augers, showing a tendency toward work in soft materials. B6618 stands out especially with its rich grave goods and the inclusion of a chisel, three augers, a drawknife, a gouge, an anvil, two hammers, two tongs, and three files.

### 7.7 Tuyeres

Tuyeres are ordinarily made from stone or ceramics, and is the object through which the air from the bellows enter into the hearth or furnace. They are often the only remains indicating the use of bellows, as their organic constituents – usually skin and wood – are rarely preserved. Because the primary function of bellows is to heighten the temperature of the fire until it is suitable for softening or melting metal, tuyeres need to be built from a material that can sustain the heat (Bøckman 2007:65-66). The forms of tuyeres vary, ranging from small nozzles to large blocks of stone with a double function as protection from the heat (Bøckman 2007:65; Coatsworth and Pinder 2002:32; Grieg 1922:65; Petersen 1951:103). Tuyeres are required both for the production of glass pearls and for metalworking, and can never surely be linked to either without connecting them to other evidence. It is thus only under doubt that I have placed this particular tool in Chapter 7, after closer examination of the relevant graves.

There are 7 examples of tuyeres in the grave material, 6 made from soapstone and one made from «a shale-like stone type» (Bøckman 2007:65; Petersen 1951:103; my translation). T10100, Ts1172 and Ts2964, 2 of them dated to the VA, are carved into four-sided blocks, possibly in order to fit into larger hearth or furnace constructions (Bøckman 2007:65). T10624, consisting of a 15 cm long tube, differs from the others and may possibly have been used in an underground hearth. Grieg (1922:65) argues that the forms of the tuyeres are determined by the original shapes of the stone pieces, which could be the case of the remaining three examples (Bøckman 2007:65). All of the tuyeres have been found together with at least one object indicating metalworking. Ts2964 contains an adze and a gouge, indicating both metal- and woodworking activity. T10624 contains a celt of

Rygh's type 402.

The only art other than metalworking requiring the use of bellows in order to reach the appropriate heat is the production of glass pearls (Bøckman 2007:66). While no other tools for pearl making have been recognised, 2 of the graves with tuyeres also include pearls (T8492-517 and C27269). Both of these are double graves including a woman, complicating the matter. T8492-517 includes an astonishing amount of 60 pearls, 58 of which are made from glass (2 made from amber), making it the single most pearl rich grave in the material (C20584 comes second with 14 pearls, 12 of which are made from glass). The presence of pearls seemingly exclusively within double graves gives the impression of pearls primarily belonging to a female sphere, and raises the question of whether women also could be pearl makers. This is a question which cannot be answered without more extensive research, and which will not be further discussed in this thesis. Yet, the high number of peals could indicate that the tuyere of this particular grave has been used in pearl production, metalworking, or both.

## 8 TOOLS FOR WOODWORKING

As observed by a number of researchers quite early on, graves containing tools for metalsmithing also often contain tools for carpentry (e.g. Petersen 1951:111; Wallander 1979; Straume 1986:46). Finds of beautifully carved artefacts, like those of the Oseberg ship (e.g. Schetelig 1917), as well as knowledge of the advanced Viking Age ship technology (e.g. Crumlin-Pedersen 2002; Sjøvold 1956), seems to indicate that carpentry and woodcarving must have held a special position in Iron Age society (also Christensen 1982:329). Moreover, it should be pointed out that the complexity and knowledge needed for some of these building operations (see e.g. Cumblin-Pedersen 2002:56-61) could mean that metalworking may not necessarily have been the single most advanced science of the LIA, as is often argued. It is the purpose of this chapter to introduce and explain some of the tools that can surely be related to carpentry, and to gain a perspective on how many of the «smiths' graves» can surely be attributed also to the art of carpentry. A number of the tools that are often related to carpentry may also have been used for working other kinds of materials, like bone or soapstone. These will be presented together with other multitools in Chapter 9.

### 8.1 Axes and adzes

Axes are often considered to be one of those tools that a woodworker cannot be without. Knowing that many axes were also used as weapons during the Late Iron Age does, however, complicate the matter. It is not unlikely that some axes may have held double functions as tools in peaceful times, and as weapons in war and plunder. That 70% of all the «smiths' graves» of this thesis include at least one axe of one form or another, illustrates this matter. Axes are also often counted as one of the constituents needed for the «complete weapons set» of the so-called warrior graves (e.g. Martens 2003b; Solberg 2003:190-192).

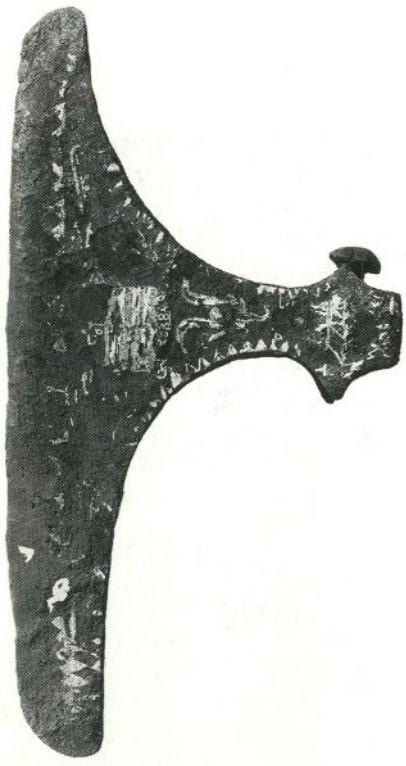

*Fig 5: This large T-axe from Trelleborg, Denmark, can usually be considered a woodworker's type, but has been interpreted as a weapon axe on grounds of its silver decorations. After Roesdal and Wilson 1992:256.*

There have been attempts of dividing axes into tool- and weapon axes (e.g. Petersen 1951:245-250; Solberg 2003:192, 230), but knowledge that Norwegian broad-axes, often given the role of weapons, are used for woodworking also into medieval and modern times (Fig. 5; e.g. Bergland 2000:160-

161; Christensen 1982:327; Petersen 1919:36; see Goodman 1964:27-31 for a discussion on the topic) can easily be used as a counter-argument. Evidence from VA boats seemingly completely without toolmarks from saws (Crumlin-Pedersen 2002:58-59) places further emphasis on axes as tools, but does not remove their possible additional roles as weapons on an individual basis. Axes may also have been used in the butchering and cutting up animals, as well as antlers and bones for further production (MacGregor 1985:55-56). Still, I have concluded that there is at least one sort of axe that can safely be connected to the art of woodworking, and that is the adze.

As a rule, specialised tools tend to follow as the result of specific purposes in crafting (Goodman 1964:8-9), and the adze can be seen as a natural development of the axe. The adze is used for trimming and levelling wood much in the same way as an ordinary axe (e.g. Hodges 1989:115), but provides a more convenient angle for work that can be hard to execute when the axe's handle runs parallel with the blade. In order to solve this problem, the blade of an adze has been oriented horizontally upon a vertical handle. In addition to being used for cutting, adze blades can be drawn along the wood much like a drawknife (e.g. Goodman 1964:39; Chapter 8.3), and have been described as tools of preference for smoothing or hollowing wood in the Middle Ages (Walker 1982:182). It is not unlikely that they have been used for this kind of work also in earlier times.

The grave material contains a total of 16 adzes, 9 dated to the VA, and 2 to the MA. 12 adzes have been found together with at least one other axe, and 12 have been found with at least one hammer. Likewise, 9 have been found together with tongs, 4 of these also holding anvils, giving a total number of 9 – just over half of all finds including adzes – that can be concluded as to belonging to definite multicrafter graves, holding tools for working both wood and metal.

### 8.2 Celts

The problem encountered in the classification of common axes, is mirrored in the classification of celts, the functions of which are often related to both farming and woodworking (Petersen 1951:161). Like adzes, celts have their cutting edge placed horizontally upon a vertical handle, but differ in that the handle is fixed parallel to the blade by means of a forged socket. Consequently, the handle would have to be naturally bent. Common celts (Rygh's type 401) are often considered the predecessors to both ards and shaft-hole axes, and come in a number of variations. They are hard to classify on a general basis, but proof that many must have been used for ploughing (Petersen 1951:157), reduces their relevance as a possible specialised tool for woodworking. Finds of celts in

soapstone quarries also indicate that these tools have been used in the quarrying of and production of soapstone vessels (Skjølsvold 1979).

Petersen's (1951:162, 166-167) reports on 76 out of 486 (16%) celts of Rygh's type 401 coming from ritual depositional sites, serves to immediately complicate any functionalistic distribution of roles. The additional 75 celts reported as loose finds have also been argued as possible additions to this number (Petersen 1951:162, 167). This leaves us with a potential of 31% of Petersen's R401's holding ideological meanings that cannot be interpreted in a functional way. Yet, there is one sort of celt that seems more relevant in the carving of wood than to any other activity. The forms of Rygh's type 402 are far more homogeneous than that of the R401 (Petersen 1951:223), indicating that it may have held a more specific area of use. Only two out of Petersen's (1951:222-224) 61 examples of the R402 have been found outside of grave contexts, strengthening this argument. Even though variants of the R401 are sometimes argued as to having been used for woodworking, their functions remain too uncertain and can only be decided on basis of examination of the individual artefacts. Thus the R401 has been excluded completely as a woodworking indicator.

The celt of Rygh's type 402 comes with a curved blade, corresponding to curved adzes, and reasonably classified by Petersen (1951:222-223) as being tools for hollowing wood, as agreed also by Wallander (1979:47). In effect, the curved celt would work much like a gouge with an axe's handle, its form and size making it suitable for cruder work than the commonly more delicate gouge. Skjølsvold (1979:170) has argued that these may also have been used in the carving of soapstone. However, all of Skjølsvold's examples of celts found in the soapstone quarry (C33153a-b) have, according to unimus.no, been typed to R401. For this reason, I have left the R402 standing as an indicator for woodworking.

I have only been able to confirm a total number of 25 type 402's within the grave material, 17 of which have been dated to the VA, and 4 dated to the MA. T10616 was found together with a pair of medium sized tongs and a tuyere, meaning that that the multicrafter of metal and wood must have been existent also in the MA. Hammers can be found in 17 graves overall, tongs in 11, and anvils in 6. In total 13 of these graves – 12 of them from the VA – can be safely evaluated as to holding tools both for metal- and woodworking. Because many of the celts are left untyped in the internet databases, the total number of R402's is likely to be higher, and this tool category should be considered deficient.

### 8.3 Planes and drawknives

Planes, in their modern form of a square blade encased by a wooden «house», have not been recognised within the Norwegian material of the LIA. This does not necessarily have to mean that these tools were not in use in Scandinavia. Planes have been used by the early Egyptians, and numbers of planes have been found at Roman sites in Germany, France, Switzerland, and Scotland (Goodman 1964:43; Ulrich 2007:41-45). Like much other material (and in tune with conceptions of the European «Dark Ages»), the number of planes in existence seems to have diminished from the Roman Iron Age on the continent and until the end of the VA (Goodman 1964:54). There are no finds of Scandinavian planes from before the 1500's (Norman 1954:17, 61-62). However, toolmarks on VA boats seem to suggest that planes, together with drawknives and other scrapers, have been used in their production (Christensen 1982:331; Crumlin-Pedersen 2002:59). According to William Louis Goodman (1964:41; also Norman 1954:17-19), the famous Vimose deposition site in Denmark, dated to 300-400 CE, holds a possible rounding plane (e.g. for working spear shafts or wheel spokes). This has been suggested as to being part of the Roman warrior equipment for making and repairing weapons during invasion (Norman 1954:20). Another plane from Vimose was found with runes inscribed along its top and sides (Fig. 6; Norman 1954:18-21, 23).

*Fig. 6: Roman plane with carved runes. From the Vimose find, Denmark. After Norman 1954:23.*

When Norwegian grave finds hold a number of drawknives, but no planes, this could be due to a number of reasons. It is not impossible that Norwegian carpenters preferred drawknives because they provide greater freedom of movement (yet also demanding greater skill), as opposed to the rigidity of plane irons with fixed frames (Goodman 1964:39). A possible decision to deny the use of planes could also be culturally constituted – among the Greek there were conflicts going on as to which crafters were allowed to use planes at all. This conflict was once solved by a Spartan called Lykurg, through total prohibition of the use of planes in the building of houses (Norman 1954:36-37). There could also be a possible lack of skill among archaeologists in recognising this particular tool in Scandinavia, as their wooden frames are likely to have deteriorated, leaving the only the plane irons. It is possible that many plane irons may have been sorted with the smaller chisels, and

we should take care not to dismiss their existence completely without taking a closer look at this material. This falls outside of the scope of this thesis, and will not be pursued further here.

Drawknives, like planes, are used for the shaping of wood by removing shavings, and can be used for flattening, reducing the thickness of, and smoothening the surface of wood (Christensen 1982:331; Ulrich 2007:36-37). All of the drawknives discussed in this thesis have handles on each side of a sharp-edged iron blade, so that they are to be used with both hands, corresponding to Rygh's types 410 and 411 (Norman 1954:45-47; Petersen 1951:215-222). Because this kind of work can be done by use of axes and adzes, drawknives should be considered specialised tools developed to fulfil and/or easen specific functions and purposes within woodworking.

The grave material contains a total number of 25 drawknives, 12 of which have been dated to the VA, and 7 of which have been dated to the MA or earlier. About half of these (13) have been found in the county of Sogn og Fjordane. In 4 cases (2 dated to the MA, 2 with uncertain dates) the drawknives seem to come in pairs, which makes a total number of 21 drawknife grave contexts. A total number of 23 hammers have been found within 16 of the same graves, most of them rather small in size. Tongs have been found in 8 graves, with lengths ranging from 27 to 45 cm. 4 graves contain anvils, and 3 hold nail irons. In total this adds up to 9 metal- and woodsmith multicrafter graves – 6 dated to the VA, and one to the MA.

### 8.4 Moulding irons

The last sort of tool which can surely be connected to woodworking is a small metal object often called *båtastrek* in Norwegian. The tool has commonly been used for cutting mouldings along the egdes of planks and timbers of VA boats as exemplified in the Norwegian Oseberg Ship and the Swedish Skudelev Ships (Christensen 1982:331; Goodman 1964:41; Norman 1954:52-54; Petersen 1951:226; Schetelig 1917:330). The tool used on the Skudelev Ships cut two v-incisions and a groove at the same time, at a distance fixed from the edge of the element (Crumlin-Pedersen 2002:59). Some moulding irons have been found with drawknife designs (e.g. Arwidsson and Berg 1983:13, 35). Norwegian archaeologist and historian Haakon Schetelig has described the use of the tool, building upon modern analogies, as follows:

> «The crucial part of the tool is the edge used for scraping; this is divided on the middle by a projection, and each half is filed so that the blade makes out a specific profile. The crafter use the tool by pulling the scrape, pressuring it against the wood; the projection in the middle of the scrape is set on the edge of the worked piece,

and the half of the blade that is lying against the surface cuts the profile into the tree. The other half of the blade is not in use at this time; but arranging the tool like this allows it to be used by pulling in the same direction both on the right and the left side of the piece to be moulded» [Schetelig 1917:330; my translation].

There are only 4 examples of the *båtastrek* in the grave material. B8553 and B7831 (from Hordaland and Sogn og Fjordane), are dated to the VA and contain anvils, and must be interpreted as boatbuilders as well as metalsmiths. B7833 contains an auger, two drawknives, and a file, and does not express this multicrafter tendency. A fourth example (Fig. 7), possibly described in the internet database as «unknown tool» (in which case there are two of them) was discovered in one of Schetelig's illustrations and has been added to the list.

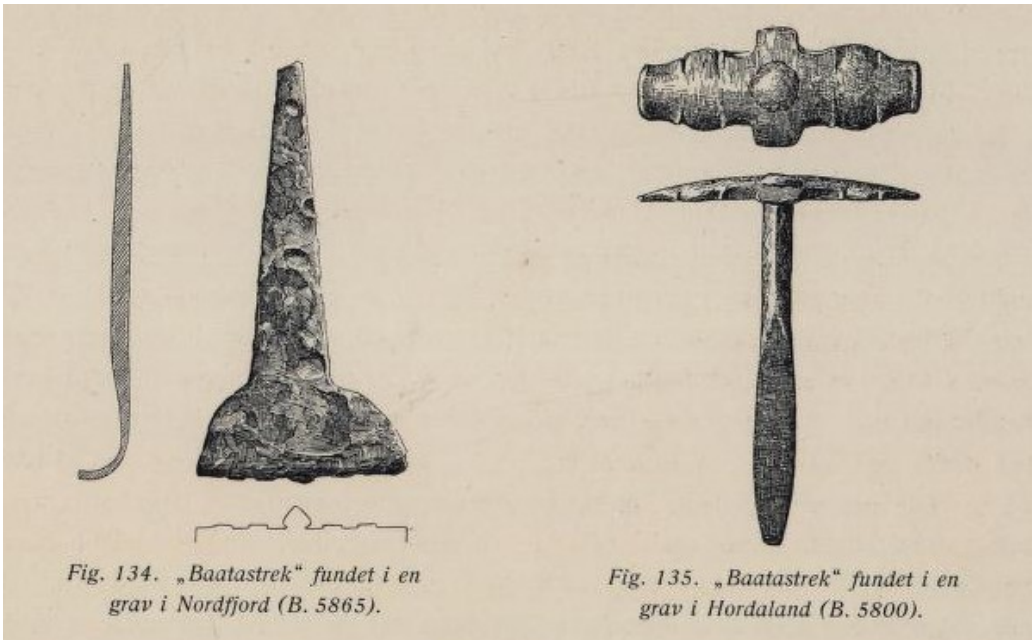


*Fig. 7: Two examples of moulding irons found in graves, with original figure numbers and descriptions by Haakon Schetelig. The B5800 grave find also contains two chisels and a hammer. After Schetelig 1917:330.*

## 9 MULTITOOLS

The final chapter on LIA tools is built around the often quite uncritical assignment of tools to different kinds of crafting – especially metalsmithing – which in many instances may have been used for a number of different purposes. The common axe can be considered a multitool in this way, as discussed in Chapter 8.1. The common, straight knife is another of these universal tools, and part of the argument is built on the fact that even within a given context, these kinds of objects cannot be truly connected to *any* kind of activity, because they *may* have been used for something else. This becomes even more problematic when there is a certain likeliness that a tool may have been readily transferred between different kinds of activities. There should, for example, be no immediate problem to using the same knife for cutting meat, then for carving wood, then for working bone. Consequently, some processes seem to occur as obvious, while other possibilities are sometimes forgotten altogether.

One of the major issues in the archaeology of crafting can be described as the documented observance of activities whose tools have been almost completely ignored. One of these activities is the carving of runes, most likely requiring a hammer and a chisel, both of which are usually considered tools of the metalsmith. Another is the carving of soapstone, a relatively soft material that is possible to work with pretty much the same tools as those used for wood, as observed by anthropologist and philologist Kaj Birket-Smith (1924:82) in his studies of the Eskimos in Greenland: «The further working is in reality the wood technique transferred to the soft stone. The most important implements are the knife, the drill and the file.» Despite research on soapstone quarries and the number of known Iron Age items made out of soapstone (e.g. cauldrons, loom weights, sinkers for fishing), the soapstone carver as a crafter has received minimal attention in the literature. Petersen (1951:349) tells of soapstone vessels being the most common vessel type in the LIA, yet he places all tools that may have been used for making them neatly in the categories of metalsmiths' and carpenters' tools. Skjølsvold (1961:100-107) has argued for the existence of professional stonesmiths, who in some cases seem to have signed their work, much like some of the more famous weaponsmiths.

The purpose of this chapter is to do a short evaluation of tools based on old typological mistakes, by arguing for their multiple possible uses. Many of these crafts can be related through their common tools, and thus also through their common approaches. The multitools discussed here can roughly be divided into two groups: those that may have been used in metalsmithing (Chapters 9.4 through

9.6), and those that can only have been used for the working of softer materials (Chapters 9.1 through 9.3). In this way any combination of the latter group with the metalworking indicators of Chapter 7 can be interpreted as proof for multicrafting activity.

At this point I will also start using a number of symbols as a simplified way of describing which craft indicators are present in the graves discussed. This is mainly because this makes it easier to portray details in the tables that will become more common as the thesis progresses, but these will also be used as abbreviations throughout the main text in order to save space. The symbols and their meanings are as follows:

| | | |
|---|---|---|
| M = Metal | MW = Metal and wood | 0 = Only crafter tool in the grave |
| W= Wood | MS = Metal and soft material | X = More than one multitool |
| S = Soft material | | |

**9.1 Gouges**

Explained in the simplest way, gouges are a variant of knives designed for making scooping cuts for carving or hollowing soft materials (Ulrich 2007:29). They come with varying degrees of curved cutting edges, and many are spoon-like in shape, providing a certain danger for confusion with augers (Chapter 9.2). Some gouges have curved blades that are more bent and less spoon-like, providing opportunities for alternative ways of carving that are otherwise hard to achieve through use of the common straight-edged knife blade. Some look like miniature drawknives, and their forms are heavily dependent on the specialised functions that they were meant to fulfil (e.g. Bergland 2000:124-128). Gouges have not likely been used for metalworking and are indicators of the fine working of softer materials like wood and bone, and possibly also soapstone.

There are at least 37 gouges from 33 contexts (5 were found in the same grave) in the material. In 8 cases these have been found together with indicators for woodworking only, and in 12 cases (3 of these graves whose only tools are gouges) together only with indicators for the working of soft materials. 7 graves contain indicators for woodworking and metalworking both, and the remaining 6 graves with metalworking indicators can be considered soft- and metalworking hybrid graves, due to gouges being the softworking indicators. This leaves us with a total of 13 (39%) confirmed multicrafter graves.

| Tool context | Total | MW | MS | W | S | 0 (S) |
|---|---|---|---|---|---|---|
| **Gauge finds** | 33 | 7 | 6 | 8 | 9 | 3 |

*Table 2: Tool contexts for gouge finds in graves. Abbreviations are explained on p. 50.*

### 9.2 Augers

Augers are drill bits for boring holes, including either a rotating helical screw blade (twist augers; Bergland 2000:137-140), or – more commonly in the Iron Age – a spoon-shaped drill head (Fig 8; Christensen 1982:331; Hodges 1989:116; Goodman 1964:165-167). Flattened tangs sometimes suggest their fastening into hand held wooden handles (e.g. Goodman 1964:165, 169). Alternatively, boatbuilders from the 10th and 11th century are known for the use of breast augers (Goodman 1964:172-173) requiring a slightly different handle construction, but whose metal pieces remain the same. While the former is used by hand power, the latter is held against the chest, making it possible to utilise body weight more effectively.

Spoon augers leave a conical hole with a rounded apex, which have been detected in the examination of the Skudelev Ships, leaving evidence for the use of spoon-bores in the production of Viking Age boats (Crumlin-Pedersen 2002:57-59). In most cases, holes have been drilled in advance before inserting nails and rivets (also Christensen 1982:331). While augers are not commonly discussed in the production of combs (although occasionally in the discussion of their decoration: e.g. Færden 2007:93-94; MacGregor 1985:59-60), it seems reasonable that holes for riveting must have been drilled beforehand also here. There are also reports for the use of drills in the working of soapstone in Greenland (Birket-Smith 1924:82). In the absence of saws, softer materials (wood, bone, soapstone) can be split by drilling a series of holes close to one another, so that the two parts are easily separated (Birket-Smith 1924:91). Consequently, augers cannot safely be considered indicators for woodworking only. Because the drilling of metal is likely to be more effective by use of awls or chisels, and potentially damaging to the low-carbon iron used for augers (e.g. Bergland 2000:137), these tools can be safely considered outside of what we would call the «pure» metalworker's toolkit.

There are at least 42 augers from 38 graves, 29 dated to the VA and 4 dated to the MA. In 15 of these there are only indicators for softworking, while 6 include indicators for woodworking. This leaves a total of 17 graves (12 VA, 2 MA) also holding tongs, anvils, plate shears, nail irons, or tuyeres, providing a rather high number (45%) of auger multicrafter graves.

| Tool context | Total | MW | MS | W | S | 0 (S) |
|---|---|---|---|---|---|---|
| **Auger finds** | 38 | 9 | 8 | 6 | 15 | 0 |

*Table 3: Tool contexts for auger finds in graves. Abbreviations are explained on p. 50.*

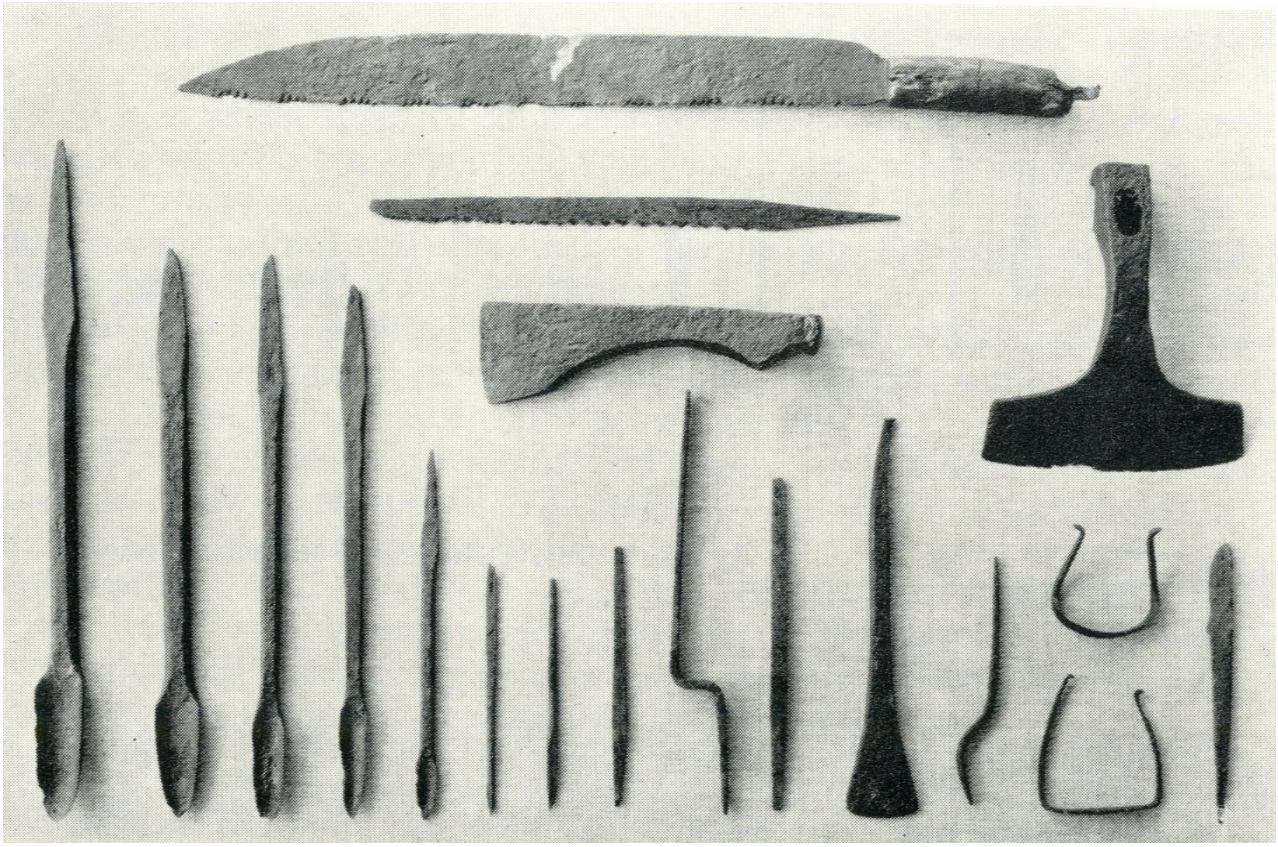

*Fig.8: The Mästermyr chest from Gotland, Sweden, includes a variety of tools for the working of wood and soft materials as well as for metalsmithing. At the bottom left a variety of differently sized augers have been depicted. This specifically photographed selection of tools also includes two saws, an axe, an adze, two drawknives, and a number of files, interpreted by Goodman as to being shipbuilders' tools. After Goodman 1964:123.*

### 9.3 Saws

Saws can be described as flattened lengths of metal with at least one edge holding filed teeth for sawing through a material. Bronze and copper saws are known from the Prehistoric East (Goodman 1964:111-115), but have never been found in Scandinavia, and no saws from this thesis' grave material are dated further back than to the VA. The efficiency of these saws would depend upon the angle at which the teeth were bent out of the plane of the blade, in order to keep it from getting stuck in the material (e.g. Mattsson and Nilsson 2000:119). Additionally, the commonly small design of these saws can be considered as a result of the difficulty in making a solid saw from hammered iron – if hammered too thin, the low-carbon steel available at this time was likely prone

to buckle under pressure (Christensen 1986:128; Goodman 1964:117; Hodges 1989:116; Ulrich 2007:46; Walker 1982:180). Consequently, Iron Age saws tend to be thicker and coarser, often meant to be used with a pulling action, rather than pushing. Alternatively, the problem of buckling could be solved by stretching the blade within a wooden frame, like bucksaws or modern hacksaws (Christensen 1986:124-126; Goodman 1964:118-122; Ulrich 2007:47-49). The saws of the Mästermyr find (Fig. 8), as well as B5730i of the grave material have their teeth filed so that they face away from the handle, which is common on modern saws, serving as evidence that some Scandinavian saws were used by pushing (e.g. Goodman 1964:123).

As mentioned in Chapter 8.1, saws seem not to have been in common use by Viking Age boatbuilders, as illustrated by the lack of sawmarks on all parts of the Skudelev Ships (Crumlin-Pedersen 2002:58). The Bayeux Tapestry, dating to the 11th century, depicting the felling and preparation of timber, as well as the building of the ships for Duke William's invasion, includes a number of different boatbuilding tools (different kinds of axes, an adze, a hammer, and a breast auger), but not a single saw, serving to strengthen this argument (Christensen 1982:327-329; Goodman 1964:122). It is, however, possible that sawmarks from the initial phases of woodworking in many cases have disappeared due to further treatment of the material. Consequently, the only tool marks left for us to observe could be from the final stages of processing (Crumlin-Pedersen 2002:58). This does not, however, explain the absence of saws in the Bayeux Tapestry, and it is likely that the rough shaping of wood was primarily done by axe.

Sawmarks have, in many cases, been found on material from the production of bone combs (Christensen 1986:128; Færden 2007:93; MacGregor 1985:55). Archaeologist Arne Emil Christensen (1986) has argued specifically for the interpretation of graves holding saws as part of their equipment to being combmaker graves. While the article contributes with refreshing ideas, Christensen's conclusions are mainly drawn from combinations of multitools (knives, rasps, R416's, hammers, files), and I do not find them entirely convincing. The existence of adzes, drawknives and celts of Ryghs type 402 in 5 out of the 8 saw graves of my own material seems to suggest that saws may also have been used for woodworking, alternatively that these crafters were combined combmakers and carpenters. This does not contradict Christensen's (1986:124) opinions, in that his observance of «combmakers' tools» together with tools for smithing has already had him suggesting that some crafting activities must have happened across materials.

It is sometimes suggested that framed saws, which are frequently used in modern metalworking,

have been used also in Iron Age metalworking (e.g. Arwidsson and Berg 1983:15, 31, 34). Due to the lower hardness and quality of Iron Age iron, I find it unlikely that these saws would be able to sustain being used to cut metal. The sharpest saws need to be made from thin iron sheets, consequently holding the most fragile blade constructions while they suffer the most tension also through friction, causing heating of the blade (see Austin 2004:10-11; Mattsson and Nilsson 2000:144-145; Ulrich 2007:49-50). Plate shears would in any case be the gentler alternative in that they cut the metal without causing shavings, thus not letting any of the material go to waste. In Bøckman's (2007) thesis on Iron Age smiths' tools, saws have not been mentioned at all. These serve as the main reasons to why saws have been entirely excluded from the Iron Age metalworking toolkit here. Saws are considered as to being indicators for wood and/or boneworking only.

Out of the 8 saws of the grave material, 5 have been dated to the VA and 3 have been left undated. In 2 of these there have only been found indicators for working soft materials. In one there is also an adze, pointing it towards woodworking. One grave contains indicators for both the working soft materials and metal, and 4 hold indicators for both woodworking and metalworking, giving a total of 5 (63%) multicrafter graves.

| **Tool context** | Total | MW | MS | W | S | 0 (S) |
|---|---|---|---|---|---|---|
| **Saw finds** | 8 | 4 | 1 | 1 | 2 | 0 |

*Table 4: Tool contexts for saw finds in graves. Abbreviations are explained on p. 50.*

### 9.4 Awls, punches and chisels

Awls and punches are tools made from a length of metal with one pointed end for penetrating or making grooves in the material, and one flat end for striking or pushing. Punches sometimes differ in that they may hold patterned points for decorative effects (e.g. Hodges 1989:120), but in archaeology these have in many cases disappeared in rust. Awls and punches hold a variety of uses, from drilling wood or punching holes in hot iron, metal sheet, leather, or bone (Coatsworth and Pinder 2002:48-49; Hodges 1989:116), to the decoration of these materials. Because there are no truly typologically distinctive differences between these tools (as argued also by Bøckman 2007:79-80), they have all been grouped together in this chapter. Their varying sizes may be due to work in different kinds of material (e.g. punching through soft leather is likely to require a smaller tool than punching iron or carving stone), but also due to specialisation for different kinds of work in the same material. Chisels often appear with flattened cutting edges, but a high number of chisels with

pointed ends (often used for hollowing soapstone vessels) complicates the typology further (Bøckman 2007:59; Skjølsvold 1961:58-59, 80-81).

Whether or not the tool has a tang or other remains from a handle can help hinting towards possible areas of use. Many of these tools are meant to be struck with a hammer in order to cut, penetrate, mark or decorate, and must be constructed in order to sustain such treatment (Bergland 2000:46; Bøckman 2007:59; Coatsworth and Pinder 2002:48-49; Ulrich 2007:27-28). Consequently, whenever one of these tools are found with tangs or handles, there is a certain likeliness that they are tools for lighter work, and they can in many cases be considered unsuitable for ironworking. The same cannot be said of tools without handles, unless they hold clear signs of rough handling. If the top of a chisel has been hammered out, this could serve as evidence for harder work, for example in the cutting of metal. A possible use for stoneworking (Hodges 1989:109-110; Skjølsvold 1961:58-59, 80-81) or woodworking (Ulrich 2007:26-28; Pleiner 2006:90) can, however, not be ruled out. Additionally, even light work like punching is sometimes done by hammering, meaning that even small punches are regularly found with hammered out striking ends (Coatsworth and Pinder 2002:47).

The obvious problem in recognising chisels for metalworking has previously been discussed by Bøckman (2007:58-60), whose conclusion leaves only 6 (C22324e, C26637k, C14870, B8553h, B6618v and T10618) of the 32 registered chisels of this thesis' grave material as to being *possible*, but uncertain chisels for metalworking. Furthermore, there are some chisels that *may* have been shafted, and some that are *unlikely* to be able to sustain hard hammering, leaving most questions with uncertain answers. Consequently, the only sort of indication that these tools can give, is that there is a certain likeliness for their use in *some* kind of crafting activity, be it for leather, bone, antler, wood, stone, ferrous-, or non-ferrous metal.

From a total of 29 contexts, there are 5 cases where chisels appear as the only crafting tools of their graves. They appear 15 times together with hammers, 11 together with tongs, and 7 with files. Counting also single chisels, there are 9 cases of graves holding no clear indicators. 5 appear together with clear indicators for metalworking only, 3 with tools for woodworking, and 3 with clear indicators for the working of soft materials. In 6 cases chisels appear with clear indicators for both woodworking and metalworking, while 3 cases hold indicators for both metalworking and the working of soft materials. This leaves a total of 9 cases (31%) with multicrafter tendencies.

Out of the 12 examples of tools which have been registered as awls, coming from 11 contexts, 7 have been dated to the VA and 2 to the MA. 9 appear together with at least one hammer, and 6 with at least one file. In 4 cases the awl appears together with a hammer only, but in 2 of these there has also been found slag, possibly tying them to metalworking activity. B7080, Ts1177 and B7011 hold tongs, while C26524 and B5807_II hold drawknives. B1361 holds a gouge and a saw, pointing it towards work in soft materials. None hold obvious indicators for multicrafting. Finds of «smiths' chisels» for fitting onto anvils have been completely excluded from the analysis due to typological difficulties (see Bøckman 2007:62-63).

| **Context** | Total | MW | MS | M | W | S | X | 0 |
|---|---|---|---|---|---|---|---|---|
| **Chisel finds** | 29 | 6 | 3 | 5 | 3 | 3 | 4 | 5 |
| **Awl finds** | 11 | 0 | 0 | 5 | 2 | 1 | 3 | 0 |

*Table 5: Tool contexts for chisel and awl finds in graves. Abbreviations are explained on p. 50.*

### 9.5 Files and rasps

Files are four-sided lengths of metal with filed teeth along at least one of their sides, and sometimes along all (e.g. Petersen 1951:95). They are used for the smoothing of a material by removal of shavings, the fineness of which depend on the coarseness of a file's teeth and the hardness of the material (Mattsson and Nilsson 2000:147). Together with hammers, files can be considered one of the more doubtful categories in their classification as smiths' tools. Being the second most numerous tool category found in graves, they are often found to be single indicators for crafting in grave contexts. As many as 160 out of Petersen's (1951:108) 374 «smiths' graves» have been defined as such on basis of single occurrences of files or hammers. At this point it is important to remember that former conclusions are built upon old definitions and based on old indicators. I find it likely that tools for other kinds of crafting (e.g. adzes, augers, drawknives) have been ignored as part of the toolkit because they did not fit in with current ideas of metalsmiths. Consequently, when the results are presented in Chapter 10 the number of single tools in graves should be considerably lower.

Possible sources of error become very prominent in the consideration of files, which can be considered important constituents within the working of ferrous and non-ferrous metal, but also in woodworking, boneworking, and soapstone carving. Wallander (1979:4) has argued that files may also have been used for the sharpening of arrowheads. While the idea is interesting, I find it more

likely that arrowpoints have been treated by use of whetstones, which seems to be the most regular way of sharpening weapons during the Iron Age. That some files are very small, many of them without traces of teeth at all, complicates the matter further. Bøckman (2007:57) has pointed out that the finer the teeth of the file, the less likely they are to be recognisable after decades of burial. Consequently, many files may be described in the archaeological record as little pins or needles (see Austin 2004:15 for modern needle files). Most of the files of Petersen's material seem to have too coarse teeth for metalworking (Bøckman 2007:57). In many cases it is likely that the finer filing and polishing of metal has been done by use of stone or organic materials (Bøckman 2007:78-79; Lamm 2012:152). Files can, however, be considered indicators for crafting, in the cases that they can be confirmed as to actually being files.

In essence, rasps are the coarser big brothers of the files (e.g. Bird 2004:164; Mattsson and Nilsson 2000:45), although usually not considered as eligible in metalworking as the finer files (Bøckman 2007:56-57; Pleiner 2006:101). A sharp and well maintained rasp act through a mixture of cutting and shaving, and can be worked in order to gain fine surfaces (Christensen 1986:126). Effectively this means that the rasp can be used for more aggressive shaping, smoothing and sculpting than the file (Bird 2004:164, 167). Rasps are for this reason used readily also in modern shaping of wood and soapstone. The rasp has been an important part also of the combmaker's kit (Christensen 1986:126-127). Rasps can thus be considered a tool for working softer materials.

Bøckman (2007:56) has pointed out the problem with telling rasps apart from files in that divisions are made by their degree of coarseness. Some archaeologists (Bøckman mentions Arwidsson and Berg 1983 as well as Petersen 1951) have identified the tools from the forms of Rygh's types 399 and 420, rather than to look at the actual distribution of their teeth. This may be one of the reasons for why the number of registered files (150) of the grave material is so much higher than the number of recognised rasps (6). For this reason I stress that tools that are registered as files and tools that are registered as rasps may be mixed up, and that they in both cases probably can be either. Bøckman (2007:56) explains that Petersen's drawings gives the impression that there is no true recognisable relationship between the sizes of files and the coarseness of their teeth. Consequently, larger files cannot automatically be considered rasps, and the other way around.

Out of 10 registered rasps (4 VA, 5 MA), all from different graves, 2 have been found together with tools for metalworking only, one with tools for softworking, one with tools for woodworking, and one with tools for softworking and metalworking both. Additionally, there are 150 files distributed

in 137 graves. In 37% (51) of these cases they are the only tools of their graves and 10% (14) have been found without other indicators, most of which are coupled with hammers. 21% (29) are found with tools for metalworking only, 11% (15) with tools for woodworking, and 8% (11) with tools for softworking. The graves with indicators for multicrafting make out 12%, 8% (11) holding indicators for both metalworking and woodworking, and 4% (6) with indicators for metalworking and softworking.

| **Tool context** | Total | 0 | X | M | W | S | MW | MS |
|---|---|---|---|---|---|---|---|---|
| **File/rasp finds** | 146 | 54 | 15 | 31 | 16 | 12 | 11 | 7 |

*Table 6: Tool contexts for file and rasp finds in graves. Due to the likely mix-up of types, files and rasps have been grouped together. Abbreviations are explained on p. 50.*

### 9.6 Hammers

In discussing of the tools of the metalsmith, hammers are commonly the first to be introduced, often considered to being the metalsmith's tool per excellence (e.g. Austin 2004:21; Bjørlykke 1949:71; Thålin-Bergman 1979:111). This particular tool will get some extra attention here, both due to its bias toward the craft of metalsmithing, but also due to possible symbolic meanings. Petersen's (1951:78-84) division into hammer types, drawing directly from Grieg's (1922:31-39) typology, has been criticised by Bøckman (2007:34) on grounds of illustrating an extensive lack in understanding of the practical uses of hammers. This is a view that I support. Yet it seems, to some degree, that these past archaeologists have been aware of their own subjectivity in dividing hammers into groups inconsistently based on sizes and forms. In many cases, decisions are based on matters of opinion, as pointed out by Petersen (1951:78) himself. As a consequence, hammers have given the impression of being especially exposed to the danger of getting cut off from their burial contexts, given functionalistic roles based on minor individual features in a way that can hardly be described as realistic from the crafter's perspective (Bøckman 2007:38; Dougherty and Keller 1982).

The «hammer problem» can possibly be divided into two different factions. On one side it can be traced to the traditional explicit understanding of all hammers as belonging to the tools of the metalsmith (Bøckman 2007:2, 38). On the other side, these typological questions have been allowed to spin further to the point where one of the main questions has settled to revolve around the problem of whether it is possible to distinguish hammers for ironsmithing from hammers for working non-ferrous metal. The most problematic point to this discussion is that the objects in many cases seem to have been removed from their find contexts, separated from their Iron Age creators

and given new meanings through modern association. Petersen (1951:108) pointed out already in 1951 that a large amount of these hammers occur on their own. This can be confirmed now, as 29% (53) of the hammers of this thesis occur as the only crafter tools of their graves. Yet, hammers are rarely interpreted independently as agentive symbols in grave context. Commonly, their interpretations rely on other tools present. However, Wallander (1979), Sjøvold (1974:306) and Straume (1986:46) have all argued that such singly occurring tools need not necessarily mean that the buried were metalsmiths.

Even interpretation of mythic material seems to suffer from being under the influence of our own ideas. While the ON god Þorr is never put in direct relation to metalsmithing in the mythological material (all metalsmithing in the godly universe after the initial creation of the world is explicitly described as the work of dwarves: e.g. Hedeager 2011:140-142, 151; Motz 1983:88-98), he is sometimes put in relation to metalsmithing (e.g. Carstens 2012:266-267; Haaland 2005:13-14; Rønne 2002:58, 60; Thålin-Bergman 1979:104). The mistake made here, as I see it, is the interpretation of Þorr as a smith, building upon an interpretation of the hammer as a tool for metalsmithing. The arguments presented here do not mean that I disagree to assigning the hammer a very special status. Quite on the contrary, I believe it should be stressed that the hammer, as pictured in ON mythology as the main weapon of one of its main deities, must hold a very special position. However, I believe this is exactly why we should take considerable care in any interpretation.

Hammers are tools for striking and can, as also suggested by Bøckman (2007:71-72), be roughly divided into four different types based on their forms: (1) hammers with one flat face; (2) hammers with two flat faces; (3) hammers with one flat face and one pen; and (4) hammers with two pens. All of these types are common, with the exception of the fourth, which occur only in rare cases (Bøckman 2007:37). The first type is different in that these usually come with their eye in one end, so that only one side is used for striking. Hence, the first type is sometimes called single-faced. It is uncertain why they have been made with only one face rather than two, but this may be culturally constituted. In fact, the question of which are the best hammerheads for ironsmithing is still under discussion today, and there are a number of variants at play in Europe (Pehrson 2009:40). The traditional pen hammer (with one flat face and one pen) still remains popular in Norway. Lena Thålin-Bergman (1979:112) claims that all known prehistoric hammers from Sweden are of this type. As such, the choice in hammer form often comes down to a question of tradition and preference.

The form of a hammer's head holds the function that it dictates which effect the hammer will have on the material (Pehrson 2009:24, 52). Striking with a flat hammer face can have several outcomes. In metalsmithing this action is used for working the metal, stretching it and causing the atoms to slide around each other. Striking also causes compression of the metallic structure, resulting in increased material hardness (Pehrson 2009:43, 53). Strains caused in the atomic structure can often be reversed through the act of annealing, meaning that the metal is re-heated to a specific temperature (Pehrson 2009:91). Metal hammers are also used in woodworking, for driving metal nails into wood. When all constituents are made from wood, including the use of wooden nails, it is common to use wooden mallets, also into modern times (e.g. Ulrich 2007:51). The main reason can be found in that too hard metal hammer strikes can be potentially damaging to the softer material. In the use of chisels for the removal of pieces of metal, wood, or stone, including the carving of runes and the decoration of non-ferrous metalwork, flat-faced hammers are often used for striking. Hammer sizes would depend on the work required and the material at hand. As a rule, small hammers are better for all kinds of precision work, while larger hammers are mainly used where strength is required (Bøckman 2007:40). Some understand this to meaning that the largest hammers are clear indicators for ironworking.

The pen of a hammer tends to be long and narrow, sometimes like the edge of a knife, or slightly narrowed (Bøckman 2007:35). Striking with a pen hammer causes a different kind of effect, providing concentrated pressures to more specific areas, stretching the metal more effectively while compressing it to a lesser degree than that of a flat hammer face (Pehrson 2009:43; Sauvage 2005:38). Consequently, pen hammers can be used for different kinds of work, and is also used for the stretching and sharpening of scythe blades, also into modern times (Bøckman 2007:36-37). These hammers have been required in woodworking for riveting, because striking with a pen stretches the surface of the metal pieces, effectively forming their heads in the process (Bøckman 2007:42-43; Pehrson 2009:98). Certain pen hammers tend to be very small. Greig has sorted all of these into what he calls «small smiths' hammers» (Grieg 1922:33-34, my translation). Bøckman (2007:42) stresses that even the smaller pen hammers may have been used for riveting small items, like bone combs.

Rather than form and size, Bøckman (2007:40,70) considers weight to be the most important property of the hammer. Because archaeological finds are only very rarely recorded with weight, it is hard to get an impression of hammer weights in Iron Age context. Consequently, it hard to make realistic analyses based on hammer weights. Iron Age hammers are, however, often described as to

generally being smaller than hammers for metalsmithing today (e.g. Bøckman 2007:42-43; Sauvage 2005:40), which are commonly found within a weight range from 500 g to 2 kg (Bøckman 2007:70; Pehrson 2009:24). Sauvage (2005:53-55) has argued that the smaller sizes of both Iron Age hammers and anvils could fit a different metalsmithing technique. Rather than to hammer an object from a larger piece of metal, as is the common way of metalsmithing today, he argues that Iron Age smiths used a technique comprising the building up of objects from a series of smaller iron elements. For this kind of work, explains Sauvage, smaller hammers and anvils should be sufficient.

Standard modern hammers for woodworking are to be found within about the same weight range as the lighter hammers for ironworking. According to Norwegian sales catalogues (biltema.no; byggmakker.no) these hold a common weight of 450 g (16 oz), alternatively slightly heavier at 570 g (20 oz). The handbook for woodworking by Lonnie Bird (2004:30) recommends hammers and mallets no heavier than 450 g, claiming that the heavier types tend to become tiring and awkward over time. Sjur Axel Pehrson's (2009:40) handbook for ironsmithing stresses that technique should be considered to be more important than strength, explaining that ironsmiths in general do not need more than 2-3 extensively used hammers. This point of technique is likely transferable to other work requiring hammering, as adjustments in technique can likely be done in order to get a satisfying outcome. For the ironsmith, using their hammers extensively, even small adjustments could, however, become damaging over time (Bøckman 2007:40), and I find it likely that ironsmiths would be the crafters more likely in need of more than one hammer. An analysis of the material holding more than one hammer, seems to confirm this suspicion. Only 2 cases out of the total 21 held no tool indications for metalworking (Appendix D:Table 2).

Classical archaeologist Roger B. Ulrich (2007:51) has stressed that the heaviest iron hammers, or sledgehammers, were used in Roman times whenever great force was necessary. This includes the stunning of bulls before sacrifice. Considering the high number of sacrificed animals found in graves, as well as knowledge of the custom of *blót* and other kinds of sacrificial activity (e.g. Hedeager 2011:100-103), it does not seem unreasonable to suggest that sledgehammers may have been used for such purposes also in Iron Age Scandinavia. Hammering poles into the ground for building construction and other heavy work can also be expected as to having been done by use of sledgehammers. It is thus possible that even sledgehammers may have held multiple purposes and roles, and their presence alone cannot safely be considered any true indication for metalworking. I would argue that it is this heavy, potentially very dangerous crushing quality that should be considered a main property of the hammer wielding god, Þorr, providing a possible link to VA

warrior ideology (see also Eliade 1978:29-30; Chapters 11.8, 12). Such interpretations demonstrate an interesting ambiguity in the hammer as an instrument for both creation and destruction.

Before ending the chapter, there is another group of hammers that tends to be forgotten, possibly because their organic constituents are rarely preserved. Mallets, briefly mentioned above, are tools for striking which are still customarily entirely made from hardwood and other softer materials (Ulrich 2007:51; for modern examples see Austin 2004:22 and Bird 2004:30). While they are known as tools for woodworking, they are also possible alternatives to the more expensive metal (e.g. Dougherty and Keller 1982:766). Using examples from Sweden, where hammers made from horn and bone have been found, Andreas Oldeberg (1943:10-11, 16, 19) argues for the use of hammers made from bone an wood in metalworking in prehistoric times. At this point it is interesting to note that there were no actual metal hammers in use during the silversmithing course that I attended at Smykkeskolen in Oslo. Most of the hammers used here were modern plastic or rubber mallets, providing a softer surface with which to work silver and copper. A reason for the use of softer alternatives, especially in the working of non-ferrous metal, can be found in the greater hardness of iron and steel. This hardness provides a heightened danger for damaging the softer materials, also in that all unevenness in the striking surfaces of hammers and anvils are transferred to the surface of the softer metal (Austin 2004:22; Bøckman 2007:35). Consequently, these tools are subject to extensive care and polishing before use. As far as I know, there are no Norwegian examples of organic hammers, but these may have been lost due to biological decay.

Conclusively, hammers cannot be used as indicators for either kind of crafting activity, because they, in all crafts, hold too many variables. The presence of a small silver pendant hammer (B8555l) in the material, found together with a pair of tongs as part of the grave goods, implies that the image of tools could hold symbolic meanings that are not immediately detectable to us. Such possible meanings can possibly be seen in relation to the interpretations of Part III.

The material holds a total number of 206 hammers distributed in 181 graves, 120 of which have been dated to the VA, 24 to the MA, and 2 to the MP. A total of 29% (53) have been found as the only tool of their graves, and 9% (16) have been found together with no other indicators. 27% (48) have been found with metalworking indicators only, while 10% (18) have been found together only with woodworking tools, and 8% (15) with tools for softworking. The multicrafter tendency can be found within 17% of the graves, 12% (22) of which holds tools for metalworking and woodworking, and 5% (9) holding indicators for metalworking and soft material working.

| **Tool context** | Total | MW | MS | M | W | S | X | 0 |
|---|---|---|---|---|---|---|---|---|
| **Hammer finds** | 181 | 22 | 9 | 48 | 18 | 15 | 16 | 53 |

*Table 7: Distribution of hammer finds by tool context. Abbreviations are explained on p. 50.*

## 10 TOOL COMBINATIONS

I have previously explained that there is a certain tendency throughout the material that implies that crafters working in one kind of material in many cases may also have worked in other materials, making up what I have called the multicrafter. So far the focus has rested upon the typology and practical uses of specific tools found explicitly in graves for metalsmithing. While the total number of tool indicators for metalsmithing has been reduced in comparsion to earlier typologies, there is still a group of tools that with a high certainty can be tied to metalworking. However, there is also a large group of objects that can not, and which seems to indicate that the hypothesis of the multicrafter may not be too far off the chart. This chapter is meant to sum up the final outcome of the total tool analysis, giving the exact statistical numbers of how many graves can be said to hold which tool indicators. Results are summed up in Table 8.

### 10.1 Metalsmiths

There is a total of 94 M graves, containing indicators for metalworking only. 66 of these have been dated to the VA, 11 to the MA, and one to the MP. 16 hold cases of single tongs, while there are 3 cases of single anvils, 2 cases of single nail irons, one case of a single crucible, and one case of a single mould. The most popular tool combination is tongs with hammers, followed by tongs with files, and variations of these combinations with other tools, often including anvils. There are 3 cases of graves which hold no metalworking indicators in the form of tools. C22785 and C25728 (both holding a hammer and an awl), as well as B8272 (holding a hammer), are graves in which there has also been found slag from smelting, and which are tied to metalworking for this reason. B5510 is the only grave to hold an iron ingot, in combination with tuyere.

### 10.2 Woodsmiths

Before presenting the results regarding tools and tools combinations that can be related to woodworkers, there is one thing in need of being addressed. This thesis has taken an approach using a number of graves which have previously been described as to being smiths' graves, holding tools that have previously been claimed as to being smiths' tools. It is thus natural that M graves will be over-represented. The first reason for this is that there can reasonably be argued to be a number of graves containing carpenters' tools which have not been included here. The only singlecraft woodworking graves of this thesis are graves that have previously been put in relation to smithing, but which I have re-evaluated, based on the indicators of Chapter 8. Consequently, the number

presented here will not be a realistic number of woodworking graves in Norway, but only a selection of woodworking graves previously called smiths' graves by Jan Petersen.

Secondly, there are fewer indicators for woodworking (4) than there are for metalsmithing (7), making it likely that metalworkers' tools are more easily recognised. In fact, many of the tools that could be used for woodworking have ended up in Chapter 9 as tools for working wood, bone, soapstone, or other soft materials, alternatively a combination of them. While it would have been interesting to attempt to trace down a total number of Norwegian woodworker's graves, this is beyond the scope of this thesis. Additionally, about half of the graves summed up in the current woodworker chapter also include multi- and softworking tools like gouges, chisels and files, which may have been used for other kinds of crafts. Consequently, if there are multicrafters in the material working something else than wood, these will not be visible to us. The matters discussed here will also affect the following Chapter 10.3.

A total number of 26 graves hold clear indicators for woodworking only. 13 have been dated to the VA, while 5 have been dated to the MA, and one to the MP. There seem to be no tool combinations evidently more popular than others, while hammers and/or files appear in all but one case. There are no single occurrences of woodworking indicators. This is likely a direct consequence of the fact that Petersen and others, due to the presence of hammers and files, have previously considered these to be the graves of metalworkers.

### 10.3 Soft-material smiths

A group that cannot be assigned to any specific craft, but which obviously contains tools for other kinds of crafting than metalworking, is the group that I have called tools for soft-material smithing, or softsmithing tools for short. With the exception of the saw, which I doubt could sustain work in soapstone for reasons discussed in Chapter 9.3, these tools can be considered as to having most likely been used either in the working of wood, bone, antler, or soapstone. This contains one or more of the tools discussed in the Chapters 9.1 throughout 9.3. Because the material was originally chosen on grounds of Petersen's definitions of «smiths' tools» all of the elements discussed in Chapter 10.2 are legitimate also here.

There is a total number of 27 graves holding only tools for working softer materials, 24 of which have been dated to the VA, and 2 dated to the MA. The most common combinations are an auger

and/or gouge together with a file or hammer, which is a plausible explanation for why they have ended up as «smiths' graves» by old definitions. There are 3 cases of single gouges, but no other cases have tools appearing on their own. C22996 and B1361-92 hold saws.

### 10.4 Multicrafters

There is a total of 41 multicrafter graves in the material. These have been divided into two categories based on their specific indicators. Category one holds a total of 29 graves with indicators for metalworking and woodworking (MW), 12 of which also include softworking indicators which may or may not have been used for woodworking. 22 have been dated to the VA and 2 to the MA. Category two holds a total of 12 graves with a combination of indicators for metalworking and softworking (MS). 9 have been dated to the VA, and one to the MA. In total this leaves 31 VA multicrafter graves and 3 MA graves, giving the impression of the multicrafters concept being a VA phenomenon. At this point it is, however, important to remember that the VA graves are over-represented, and that these results could present a faulty picture.

The multicrafter graves shows a clear tendency toward very rich grave goods in terms of tools. 25 of the graves (18 MW and 7 MS) hold a total number of 5 or more tools for crafting. The remaining 16 graves hold two to four tools each. Closer examination revealed a general higher percentage in most, but not all, artefact categories in graves holding a higher number of tools, showing a correlation between high numbers of tools and high numbers of other kinds of grave goods in the graves (Appendix D:Table 3-4). While the MW graves hold no immediately recognisable tool patterns, the MS graves are mainly variants of combinations involving gouges and tongs.

### 10.5 Summary

Petersen (1951:108) recorded 160 single files and hammers, 26 single tongs, 9 single anvils, and 8 single chisels. This gives a total of 203 single tools which have been used for naming graves «smiths' graves». Many of these have been reunited with tools for other kinds of crafting during Chapter 10. Still, there are 114 singly occurring tools to be found in the grave material. In 55 cases these have turned out to be hammers, in 52 cases they are files, 6 are single chisels, while one is a single rasp. There are also 18 cases where multitools have been combined with other multitools (the X category), so that none of them can be surely assigned a specific craft. This means that there is still a total of 132 graves in the grave material which has not been assigned any profession on basis of tools and tool combinations.

From the 320 starting graves there are 188 which have been assigned to one or more crafts, while 132 cannot be more closely specified on grounds of the indicators of this thesis. From these 188 there were 94 which could be decided as to holding indicators for metalworking only, and 26 to holding only indicators for woodworking. A total of 27 graves hold indicators for the working of the softer materials, while a total of 41 graves hold clear signs of multicrafter activity. 29 of these include indicators for metal- and woodworking both, 12 of which also hold unspecified soft-material indicators. The remaining multicrafter graves combine tools for metalworking and tools for the working of softer materials. Multicrafter graves show a heightened tendency in the VA (Appendix D:Table 5). All in all, the tools are distributed as follows:

| **Tools** | **Total** | **VA** | **Undated** | **MA** | **MP** | **%** |
|---|---|---|---|---|---|---|
| 0 | 114 | 73 | 24 | 16 | 1 | 36 |
| X | 18 | 12 | 2 | 4 | 0 | 6 |
| M | 94 | 66 | 16 | 11 | 1 | 29 |
| W | 26 | 13 | 8 | 5 | 1 | 8 |
| S | 27 | 24 | 1 | 2 | 0 | 8 |
| MW | 29 | 22 | 5 | 2 | 0 | 9 |
| MS | 12 | 9 | 2 | 1 | 0 | 4 |
| Total | 320 | 219 | 58 | 41 | 3 | 100 |

*Table 8: The total distribution of tool indicators in the 320 graves of the material, sorted by tool context and Iron Age period. Abbreviations are explained on p. 50.*

## 11 CONTEXTUAL ANALYSIS

Thus far in the thesis, it is the relationship between tools and different kinds of crafting that has been the matter of focus. From here on the analysis will concentrate on other elements of the graves discussed. Due to the limited space of the thesis, the analysis of Chapter 11 rest upon a group of selected object categories. Choices have been made primarily on basis of previous discussions in the archaeology on smiths and «smiths' graves». As mentioned in Chapter 2, there are a number of objects that said to be frequently reoccurring in graves together with tools for crafting. Due to what has been argued as to being very rich grave material, «smiths' graves» have often been put in relation to kings and the elite, and tools have been argued as to being status indicators rather than the tools of actual smiths. While it is not the purpose to reach any conclusions as to who the buried were, I believe that recurring tendencies in the grave material can help us to trace which other spheres of life the craft of smithing relates to ideologically, and thus to where we can expect to find «crossovers» between social roles. Moreover, if there are any differences between crafter groups, this should become evident here. As such, special attention will be paid to any potential differences between singlecrafter and multicrafter graves. It should be noted that, as explained in the previous chapter, that the picture of W and S graves is lacking, and it is only the remaining graves that can realistically be analysed.

### 11.1 Inhumation, cremation and boat graves

A total of 156 graves can be decided as to being either inhumation or cremation graves, the former represented by 107 examples and the latter by 49. All inhumation graves are registered in the internet databases as finds including unburnt human skeletal remains. Not all the cremation graves discussed here have been registered as being so in these databases. A number have been placed in this group independently by me, primarily based on two criteria: The first is the presence of burnt bones in combination with the absence of unburnt human remains. The second is the presence of oxide scale on metal objects (a chemical reaction on the metal surface caused by exposure to fire) found in the grave, preferably found in combination also with burnt bone.

Rather than following customs based on crafters or kinds of crafting (Appendix D:Tables 6-7), it seems obvious from the material that cremation and inhumation burial customs to a larger degree follow geography (Appendix D:Figs. 1-2). While inhumation graves dominate the country in all the counties from Nord-Trøndelag northwards, cremation graves dominate in mid-Norway, before inhumation again becomes prominent in the southern counties of Rogaland, Aust-Agder and

Telemark. It should be noted that the number of graves in the Agder counties as well as in Telemark is very low, and that this picture should be considered incomplete. While there are no immediately recognisable patterns regarding craft indicators, there is a very obvious trait in regard to the purposive destruction of objects before deposition, commonly through the bending and breaking of swords and other weapons (e.g. Kaliff 1992:106). In 35 out of 36 detectable cases, this practice follows cremation burial, 3 of which are graves holding the deliberately broken tongs mentioned in Chapter 7.3. While cremation burials are usually considered heathen praxis, inhumation burials are harder to decide on an ideological scale. For example must boat graves, while commonly not burnt, be considered a pre-Christian custom (Gräslund 2001:46). That 2 of the 3 graves dated to the MP have been described as being inhumation graves (the last undecided) seems to illustrate this matter. It should, however, be pointed out that, while there is a rather even distribution of cremation (13) and inhumation (11) graves in the MA, cremation graves seems to be taking over in the VA (79, as opposed to 30 inhumation graves).

The 13 cases of graves registered to be boat graves in the material are hard to relate to generalising patterns in crafts and crafters due to their low number. In these there are 5 cases of tool combinations relating to metalworking (2 M, 3 multicrafter), while 5 are graves holding single non-indiators, and 3 hold S indicators. In any case, the burial customs of the crafter graves appear to be more bound to local tradition than defined by craft and crafters. The uneven distribution of the discussed material throughout the country (Chapter 6) opens for the possibility that local traditions of, for example, Sogn og Fjordane, may be dominating the material. Because it is not the aim of this thesis to find the periodical variation of burial customs, the topic will be largely abandoned here. In order to reach more specific conclusions it would be necessary to take a closer look at a larger amount of material. The picture proves to be complicated and mixed in nature, and it has not been possible to draw any clear conclusions here.

### 11.2 Cauldrons

A survey of cauldrons and vessels registered in the graves was done in order to see whether there were any patterns to be recognised in regard to cauldron material and tool indicators. A total of 70 vessels made from recognisable materials have been registered as part of the finds, of which soapstone and iron vessels are the most popular with 27 and 32 examples. Vessels made from bronze or ceramics represent only 5 and 6 examples respectively, and these overall low numbers make it hard to spot any generalising patterns. Only bronze vessels seem to be somewhat

concentrated in that 4 out of 5 are found with M indicators (see also Lund 2009:85-86). Other than this there were no immediate patterns to be recognised in regard to vessels as part of the material.

### 11.3 Equipment for farming

A number of archaeologists have pointed out that there is a certain occurrence also of tools for farming in graves holding tools for smithing (e.g. Grieg 1922; Martens 2002:176; Petersen 1951; Wallander 1979). Because the celts of Rygh's type 401 in many cases have been discussed to alternatively serving as hoes and axes (Chapter 8.2), they are considered possible multi-purpose objects here, and have been excluded entirely as indicators for farming. Connections between crafts and farming have been decided on basis of the presence of sickles, scythes, ards and/or billhooks, among the grave goods.

The resulting numbers turned out to be varied, with the lowest percentage in M graves, and the highest percentage in W graves (Appendix D:Table 8). This is an interesting result considering that 29 (21%) of the graves with metalworking indicators also hold indicators for woodworking. Multicrafter graves have been considered separately and the number of farmers' tools in these is substantially higher. Counting all of the multicrafter graves, this reaches a total percentage of 61, showing a closer association between tools for farming with multicrafter graves than in M graves considered separately, at 28%. This seems to indicate a closer relationship between the activities of farming with woodworking.

Could a lower number of farmers' tools on a general basis in metalworkers' graves indicate a more prominent specialisation within metalworking than within other kinds of crafts? Before jumping to such conclusions it needs to be added that the 0, S and M categories are the only categories in which there are cases of singly occurring tools – all other categories hold more than one tool, and thus consist of what we would call a «richer» tool and/or grave material. Upon closer research, it can be concluded that farmers' tools in M graves follow a pattern where they are commonly present only in graves holding more than one crafter tool (Appendix D:Table 9). This is the case in 21 out of the 26 M graves holding tools for farming. Hence, the pattern could follow a general «richness», rather than an actual connection between the professions of farming and metalsmithing. Yet, by exclusion of all M graves with singly occuring tools, M graves with tools for farming rise no higher than to 30%, showing a low affiliation to farmers' tools compared to their numbers in multicrafter graves. Such a pattern, if consistent also in other categories, could support interpretations of high quantities

of grave goods as to indicate social status. There do not seem to be any immediately detectable differences between distribution in the different chronological periods of the Norwegian Iron Age (Appendix D:Table 10).

### 11.4 Equipment for riding

Equipment for riding is another find category that has previously been claimed to be frequent in «smiths' graves» (e.g. Petersen 1951:113-114), and which, in turn, is supposed to be occurring frequently together also with tools for farming (e.g. Wallander 1979:47). There are 104 (33%) cases in which the grave material has been reported to also hold equipment for riding, 63 (61%) of which also hold tools for farming, showing a rather high affiliation between these two categories in «smiths' graves». In general, equipment for riding seems is more frequently occurring in the W category, as well as in the MS category (Table 9). These are also the categories in which equipment for farming and equipment for riding is most frequently occuring together (Appendix D:Table 11).

| **Tools** | **Total** | **All periods** | **VA** | **IA** | **MA** | **%** |
|---|---|---|---|---|---|---|
| 0 | 114 | 30 | 19 | 5 | 6 | 26 |
| X | 18 | 6 | 5 | 1 | - | 33 |
| M | 94 | 23 | 16 | 4 | 3 | 25 |
| W | 26 | 17 | 9 | 4 | 4 | 65 |
| S | 27 | 11 | 11 | - | - | 41 |
| MW | 29 | 10 | 6 | 3 | 1 | 34 |
| MS | 12 | 7 | 7 | - | - | 58 |
| **Total** | **320** | **104** | **73** | **17** | **14** | **33** |
| % | - | 33 | 33 | 30 | 34 | - |

*Table 9: Distribution of equipment for riding in tool graves, by tool indicator category. Note the low percentage in the pure metalsmithing category (M). Abbreviations are explained on p. 50.*

Focusing only on graves with possible metalworker tools, the picture from Chapter 11.3 seems to repeat to some degree, in that the multicrafter graves seems to hold a greater number of equipment for riding compared to M graves. It is also interesting to note the low percentage M graves in comparison to the other categories. This time there is, however, a much more clear concentration of equipment in multicrafter graves, while even this appears low compared to the W graves (Appendix D:Table 12).

There are also 10 cases of finds with rattles, all of which are found in graves holding equipment for riding, and all of which have been dated to the VA. While 3 were found without tool indicators, 2 were found in M graves, 3 in W graves, and 2 in MW graves.

### 11.5 Bells, scales and gaming pieces

There are 5 cases of finds in which there have been found bells, 4 of which have been dated to the VA, and one to the MA. The only find with tool indicators is undated, and in this case the bell is in an M grave. There were no visible patterns to be found in this material.

The 16 cases of finds with scales shows a surprisingly homogeneous distribution in graves holding tools for metalworking. A striking 12 of these have been found together with indicators for metalsmithing, 4 of them being MW graves. The remaining 4 consist of 3 finds without indicators, and one with tools for woodworking. The most frequently occurring tools in these finds turned out to be tongs (in 12 graves) and hammers (in 11). All scales found have been made from copper alloy, and in 4 graves there were also finds of silver. 2 were found with scale weights made from iron and lead. These results seem to show a high affiliation between scales and tools for metalworking. 9 additional finds of scale weights (made from stone, iron or lead), all dated to the VA, seem to support these observations:

| **Tool context** | Total | 0 | X | W | M | MW | MS |
|---|---|---|---|---|---|---|---|
| **Scale finds** | 16 | 1 | 2 | 1 | 8 | 4 | 0 |
| **Weight finds** | 9 | 4 | 1 | 0 | 2 | 1 | 1 |

*Table 10: Tool contexts for finds of scales and scale weights in graves. Abbreviations are explained on p. 50.*

In the examination of game pieces in graves, the above pattern seems to repeat. Again there is only one case that can be definitely decided not to hold tools for metalworking. Out of the 15 cases recorded, 11 have been dated to the VA and one to the MA. Hammers (11 cases) and tongs (8 cases) are the most frequently occurring tools, but there is a varied display of tools also for working other materials (Table 11). In 2 cases there are finds of dices made out of walrus bone or teeth in VA graves. There is one case of a singly occurring dice made from green stone and dated to the MA.

| **Tools** | Total | 0 | X | S | M | MW | MS |
|---|---|---|---|---|---|---|---|
| **Pieces** | 15 | 3 | 1 | 1 | 6 | 3 | 1 |

*Table 11: Tool contexts for finds of gaming pieces in graves. Abbreviations are explained on p. 50.*

### 11.6 Non-ferrous metal

Non-ferrous metal in the form of gold, silver and/or copper alloy was found in 33% of the graves of the material. These come in the form of different kinds of jewellery, as belonging to riding equipment, as scales and scale weights, and as decoration on weapons. It is important to remember the uncertainties in find conditions here, and the knowledge that some graves are double graves, while some appear to be double graves while not registered as to being so. Some hold oval brooches, commonly related to female graves, and some hold jewellery that cannot be gendered to the same degree, like finger rings. I have left out the 4 cases where oval brooches were the only non-ferrous constituents of a grave. The analysis of this chapter is based on the remaining 106 cases of graves holding non-ferrous metal.

The distribution of non-ferrous metal in graves proves to be fairly evenly divided between the different groups of crafter tools, with its highest peak in the X group and the MW multicrafter group (see Appendix D:Table 13). It should be noted that some of the graves discussed here hold more than one kind of non-ferrous metal. All over, gold can be found in about 3% (10) of the graves, silver in 11% (35), and copper alloy in 28% (91).

The observance of an especially high degree of silver used in sword decoration, had me do a separate analysis of the occurrence of non-ferrous metal used in weapon decorations (Appendix D:Table 14). This must be considered in connection with the analysis of Chapter 11.8. The pattern turned out to be especially frequent in silver, as 26 out 34 cases (76%) of all silver finds included sword decorations. This could imply a special connection between silver and weapons. Yet, in this thesis these tendencies can only be considered as so in relation to «smiths' graves». The overall percentages turned out to be fairly even, with slightly higher peaks in M and S graves. The X category reached the extreme high of 90%. This category explicitly holds varying combinations of files, hammers, and chisels/awls.

### 11.7 Axes

Axes have been discussed extensively in Chapter 8.1 and will not be discussed more in detail here.

As a rule, the multiple possible purposes of the axe has served to place it within an ambiguous position which makes it impossible to decide the primary function of this tool. No adzes or celts have been included in this section.

All in all, there are no results below 61%, meaning that there is a significant relationship between this type of object with all the tool categories of this thesis (Appendix D:Table 15). It should, however, be noted that the percentage rises to between 80 and 90 in W graves, which seems to confirm that the axe has indeed been used as a tool. On the other hand, if the axe is seen as a weapon, then metal- and woodworking indicators could be seen to relate to weapons and possibly to warrior ideology, and any interpretation of this category should be seen in close relation to the results of the following Chapter 11.8.

### 11.8 Weapons

Admittably, one of the defining factors to what this thesis came to be was the observance of a very high number of weapons from quite early on. The definition of weapons is here based on tools which must primarily have been used for warfare or hunting, and includes swords, spears, shield bosses, as well as arrows. Axes, as possible multi-purpose objects have been excluded as indicators, but is analysed in correlation to weapons in order to gain some sort of perspective on whether it is possible to regard them mainly as either. Either way, the tool-weapon relationship in graves turned out to be very high, in that a total of 91% (290) of all the graves discussed in the thesis could be concluded as to including at least one of the weapons mentioned above:

| | **Total** | **Weapon graves** | **VA** | **Undated** | **MA** | **MP** | **%** |
|---|---|---|---|---|---|---|---|
| 0 | 114 | 101 | 65 | 19 | 16 | 1 | 89 |
| X | 18 | 18 | 12 | 2 | 4 | - | 100 |
| M | 94 | 82 | 60 | 12 | 10 | - | 87 |
| W | 26 | 26 | 13 | 7 | 5 | 1 | 100 |
| S | 27 | 24 | 21 | 1 | 2 | - | 89 |
| MW | 29 | 29 | 22 | 5 | 2 | - | 100 |
| MS | 12 | 10 | 9 | - | 1 | - | 83 |
| Total | 320 | 290 | 202 | 46 | 40 | 2 | 91 |
| % | - | - | 92 | 81 | 98 | 67 | - |

*Table 12: Distribution of weapons in «smiths' graves» throughout the archaeological periods. Abbreviations are*

*explained on p. 50.*

The relationship between different kinds of weapons, while relatively high on most point, show a particular tendency toward swords, which have an average occurrence of 75%. This find is interesting when put in relation to the special status that is often assigned to swords, as a weapon requiring high technical skill in its production, but also because of its relation to the concept of the extended soul (Chapter 12.2). Consequently, swords are often considered to being elite weapons (e.g. Martens 2003b, 2006:222). In 11 cases there were finds of pattern welded weapons. One of these hold two examples of swords signed VLFBERN (C16380 and C16382), while another grave hold a pattern welded sword of the signature INGERIHFECIT (T13145c). 2 hold pattern welded spears (C24333b and T7265). These weapons are spread across crafter groups, showing no detectable pattern, although it must be specified that most of them (6) occur in graves together with the singly occurring tools of hammers or files. Several of these swords show signs of having been deliberately broken before deposition. 11 cases out of 320 (3%) is not a very high number, and the relationship between pattern-welded weapons and tools should probably not be exaggerated.

It it is the unspecified tool combination category (X) that shows the highest affiliation with swords, while their distribution in the rest of the categories is fairly even, with a slight rise in the W and multi-W categories (Fig. 9). Most of the weapons reach a low at the M category, although it should be pointed out that their general weapon percentage of 87% is by no means a low number. The association between metalsmithing tools with weapons should for this reason still be considered significant. The distribution of spears is fairly even, although showing some favouritism toward the multicrafter categories, as well as the X category. Shields, on the other hand, reach their lowest points in graves with metalworking indicators, a pattern which can also be seen in the case of arrows. It should be pointed out at this point that the M and 0 categories seem to show the most variation in regard to weapon combinations (Appendix D:Table 16).

### 11.9 Summary

The analyses of Chapter 13 have contributed with a number of patterns which can be used to shed light on the role of smiths from a societal perspective, as illustrated by Fig. 10. A significant relationship has been proven between tools for crafting with weapons on a general basis, which occur in these graves at a total percentage of 91. A survey of weapon categories (Fig. 9) shows that swords are the most common, with an average percentage of 75. Equipment for farming and

equipment for riding does not give the impression of being very common. The former is more so, reaching above 50% in the categories of X, MW, MS and W, the latter reaching above 50% only in the categories of MS and W. The pattern of axes seems to follow weapons almost exactly, but is heightened in the categories holding woodworking indicators.

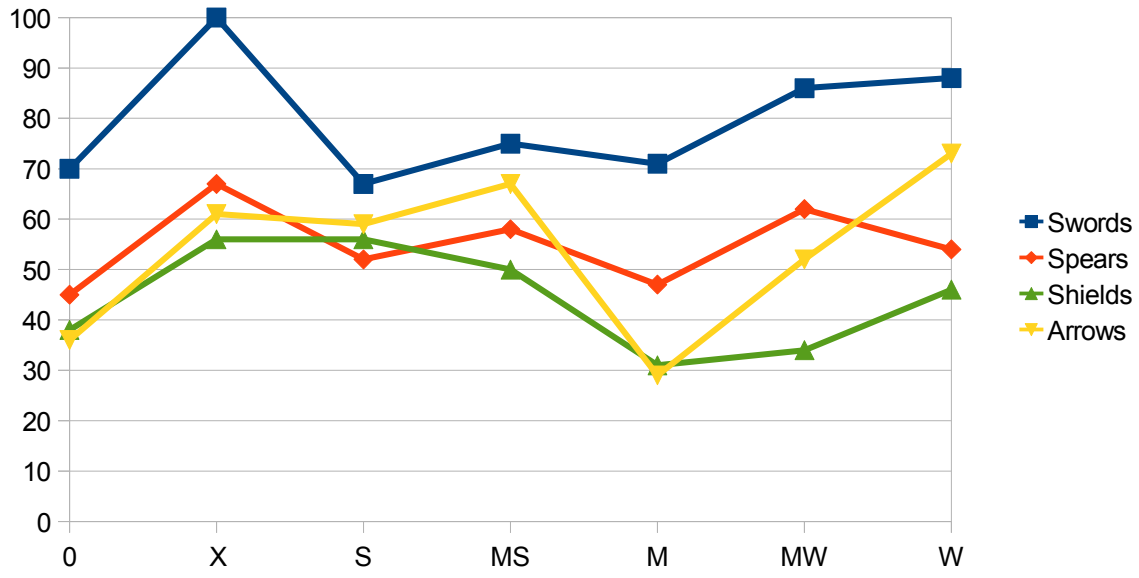


*Fig. 9: The relationship between weapons, in percentage, by tool category. Abbreviations are explained on p. 50.*

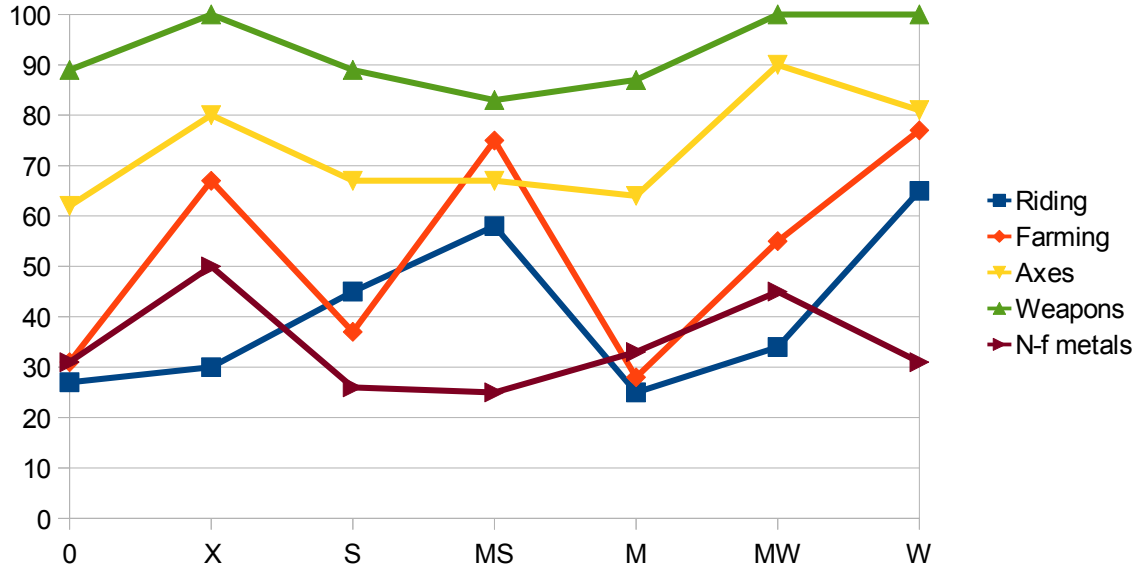


*Fig. 10: The relationship between the different crafter categories with equipment for riding, equipment for farming, axes, weapons, and non-ferrous metal, by percentage. Note that axes seem to follow weapons, but has a higher common appearance in woodworker graves. Abbreviations are explained on p. 50.*

Among all the categories it is the M and the 0 category that shows the most internal diversity. The concentration of scales and game pieces around metalworkers seems to indicate a certain «richness» at least to some of these graves, and these are patterns that could be used to argue in favour of the itinerant merchant metalsmith. In regard to indicators for the working of non-ferrous metal, there are only 10 graves which can be clearly pointed in this direction. Rather than to show any distinguished differences, they seem to repeat ambiguous patterns already noted in regard to M graves. Other than their tools C18527 and Ts374-77 hold no goods at all, while S3335 sports a sword, and Ts2278-88 holds two. C23404 holds no weapons, but a celt and an ard. The remaining finds give a more typical impression, inclusive of weapons, axes and some equipment for farming and riding, while the definitely richest grave (C11317-24/C13219) is also the only multicrafter grave (MS). This serves as an example on the difficulty of interpreting many of these metalworker graves and and I find it possible that this could be due to actual divisions between specialist and common farmer smiths. A general lower tendency for all tool categories (except non-ferrous metal), as illustrated in Fig. 11, could indeed point in the direction of metalworking specialisation, if the objects of the grave are interpreted as indicating profession, or even the skills, of the buried.

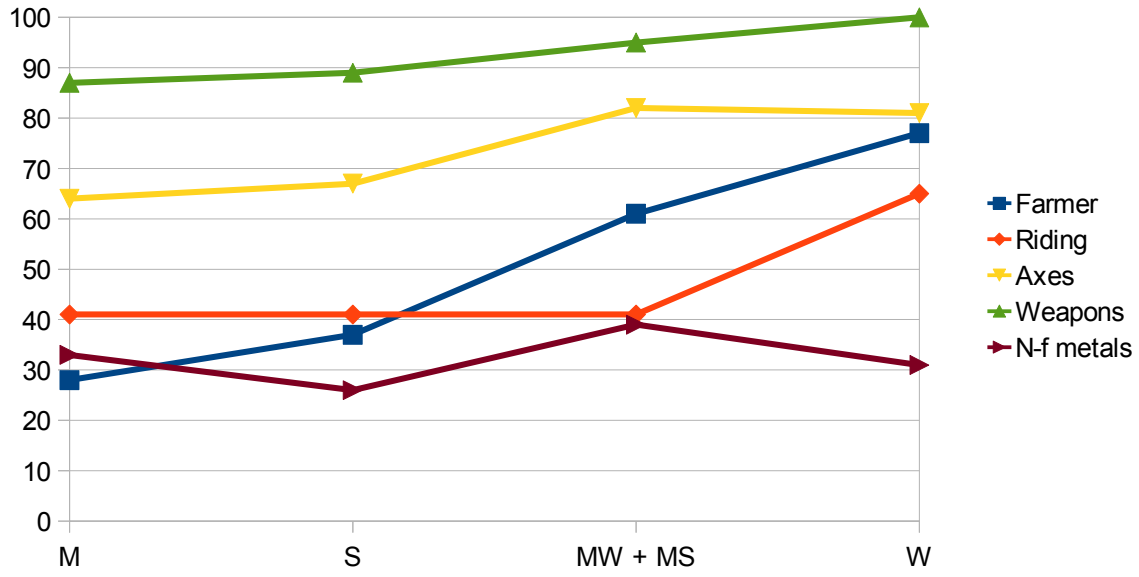


*Fig. 11: Simplified diagram of the distribution of goods in graves, by percentages per material category. Abbreviations are explained on p. 50.*

# PART III

DEFINING SMITHS

## 12 MULTICRAFTERS IN MYTH AND SAGA

Despite the limited nature of the contextual analyses presented, there are some traits to these graves that must be considered essential. Among these are the relationships between different kinds of crafting, as illustrated by the fact that 30% of all graves with tools for metalworking contain tools for at least one other sort of handicraft. A total 91% of the graves are also confirmed to holding at least one kind of weapon, not counting axes. Due to size limitations it is primarily these two findings that will gain attention at the closing of this thesis. It is the purpose of Part III to discuss the results in light of possible meanings, and to present an outline for further research on the subject. As a part of this, Chapter 12 is meant to explore these concepts as illuminated by the ON written sources. Emphasis is placed on the question of to which degree these sources can be said to support the findings of the material analyses.

### 12.1 The etymological approach

Among the more confusing elements in regard to research on smiths and smithing are the ambiguous meanings of the word itself. While etymological dictionaries have explained the term as previously inclusive also of the craft of carpentry (e.g. Falk and Torp 1992:773; Bjorvand and Lindeman 2000:820-821), the concept of the multicrafter has received minimal attention in archaeological research, with only few exceptions (see Helms 2009; Carstens 2012). Most archaeologists seem to be aware that the meaning of the ON word *smiðr* differs from modern understanding, yet the topic is commonly abandoned already as it is introduced (e.g. Blindheim 1963:36; Bøckman 2007:3; Eliade 1978:98-99; Motz 1983:156; Pedersen 2010:1; Thörn 2004:255; Thålin-Bergman 1979:99; Wallander 1979:5). I suspect that these are matters that can be directly related to previously discussed problems to defining «smiths' graves» (Chapter 3.4) as built around modern western connotations of smithing and specialisation. Rather than to limit use of the word to metalworking, the written sources make it clear that also the verb *smiðar* can be used in a number of different contexts, relating it more closely to acts of creation. Austrian-American scholar Lotte Motz has pointed to how Icelandic, even in modern times, hold a different use of the word *smiðr*. Often considered the language most closely related to ON, Icelandic is known for being well preserved, with little influence from other languages:

> Icelandic preserves more strongly than other Germanic dialects the meaning of «creating» in noun and verb: *skó-smiðr* is here a shoe-maker, *himna smiðr* means «creator of heaven», *skip smiðr* is a «maker of ships», *ljoða smiðr* – poet, *höfyð smiðr* is the chief workman, *bölva smiðr* - «one who creates evil», *frum smiðr* is a

«beginner-»; *smiða höggid* is the «master stroke» [Motz 1983:81-82].

German archaeologist and runologist Lydia Carstens (2012:247) has presented a list of similar examples from ON texts. Among (but not limited to) these we find *Króka-Refs saga*, where Ref forges (*smiðar*) a boat; *Gylfaginning*, where the gods *smiðar* heaven; *Vilmundar saga viðutan*, where the dwarves *smiðar* magic shoes; and *Fjótsdæla saga*, where Helgi Ásbjarnason even *smiðar* a child. When Hǫgni in *Atlakviða 24* is named *kumblrsmiðr*, *kumblr* being a word for grave mound or special monument, Carstens (2012:247) claims this has nothing to do with crafting. Considering the use of the word *smiðr* for carpenters and builders, and Carsten's own example from *Hákonar saga Hárekssonar* (see below), I am inclined to disagree. Yet, if *kumblrsmiðr* is to be understood as a kenning for someone who caused the death of many men, thus relating the creation of *kumblr* to the actions of a great warrior, the meaning changes.

Carstens' article from 2012, *Might and Magic: the smith in the Old Norse literature*, starts out as a deliberate search for the goldsmith in the ON written sources. Because most archaeologists choose to focus on the famous mythic smiths, Vǫlundr and Reginn, Carstens (2012:243-244) considers it could be rewarding to bring some of the less discussed smiths into the light. By tracing the use of the word *smiðr* she does, however, not find what she is looking for. Among her examples of actual goldsmiths is Vigfús from *Hákonar saga Háreksonar.* One of the first things noted by Carstens (2012:247) is that, even in the case of metalsmiths, it is hard to find a smith working only in one kind of material, and Vigfús is no exception. Rather, the story is about a Norwegian farmer travelling the courts of the kings of Denmark and England in order to regain former wealth. At the court of King Sveinn Estridsen he starts training as a smith, and within only a year he has become the best ironsmith of the country (Overgaard 2009:2). The king then sends him to a silversmith for four months, and later to a goldsmith. His final lesson is to train as a stonemason (*steinsmidar*), and the story's climax is that of Vigfús building a stone hall for the king of England (Carstens 2012:249-250; Overgaard 2009:2-3). Also my own research has brought up a number of examples. *Laxdæla saga* alone presents three kinds: in chapter 29 Ólafur lets build a guesthouse (*eldhús*) «better than anyone had ever seen», described as following: «There were famous tales depicted on the wainscot and on the ceiling. These were so well done [*smiðað*] that people thought the hall even more handsome when no tapestries were hung» (Laxdæla saga 1934:79, 1964:69). Chapter 35 tells of Þorðar, who is busied smithing a sleeping hall (Laxdæla saga 1934:97, 1964:87), and in chapter 74 there is even the smithing of a church (Laxdæla saga 1934:217, 1964:184). *Egils saga* (1989:194, 2003:149) mentions a «beer-smith» (*ǫlsmiðr*).

From these examples there are several things to be noted. Firstly, that *smithing* was understood as the working of different kinds of materials also into Christian times, as formerly argued by Motz (1983:82). Secondly, that the translation of *smith* and *smithing* into metalworker and metalworking is faulty, and that it may be a cause of extensive misinterpretation, simply because the word does not translate without losing some of its meaning. Etymologically, the ON word *smiðr* must be understood as to holding several meanings, and is dependent on a defining noun in order to be specific in terms of material. This is not unique to ON language, but is also found in Old English and Old High German. In Old English it is perhaps particularly interesting to see the word used in *lársmiþ* - «wise man, counsellor», and in *wígsmiþ* - «warrior». Old High German's *rodehouven und ander smidwerg*, translating to «clearing the forest and other smith's work», refers to smiths working in wood as one of several activities (Motz 1983:80). Even Latin holds its own term for the worker of «hard materials» (i.e. wood, stone, metal and ore) in *faber*. Its meaning is related to that of the expert artisian or creator of objects, and is exemplified in the Latin title for God as *Deus faber* – God the creator (Helms 2009:150; Ulrich 2007:8). Yet, we do not need to look further than to Snorri Sturlason's *Gylfaginning* in order to find some of the more crucial examples. After the creation of the universe, the gods created their hall and their smithy as the place in which all tools were made. Then the gods *smíðuðu þeir málm ok stein ok tré* – they smithed their metal, stone and wood (Carstens 2012:246; Sturluson 2008:37).

### 12.2 When objects strike back

An important constituent to understanding the relationship between smiths and warriors, and between smiths and what has popularly been termed «esoteric knowledge», is likely to be found in the nature of the objects themselves. While assignation of names and abilities is not restricted to weapons, as illustrated in the ON sources for example in the cases of Oðinn's ring Draupnir, Þórr's hammer Mjǫlnir, Freyja's necklace Brísingamen, and Freyr's ship Skiðblaðnir, the ability of objects to act on their own is most commonly associated with weapons, and particularly with swords. This ability has, in turn, sometimes been put in relation with belief in magic and seiðr, but rarely discussed in terms of a direct relationship between warriors and smiths. Among the weapons worthy of mention is the sword Skofnung from *Kormáks saga*, which complains loudly whenever it is not treated right, and which, as a consequence, causes its wielder to lose his fight. There are several elements to be noted in this story: (1) that a good weapon would likely require a technically skilled smith for its creation, a skill which has (2) caused this sword to come with a particular «magical»

potency. In turn, its special qualities have (3) caused people to give the sword a name, and (4) caused it to gain a the status of «Skegge's name-sought rune-sword» (Kormáks saga 1989:323, my translation). Furthermore, that this very good sword will (5) only work right if treated right and that (6) it is ultimately Kormáks impatience and lack of knowledge which causes the sword to lose its «luck» (Kormáks saga 1989:319). Other examples of named and agentive swords from Snorri's Edda and Saxo Grammaticus include Tyrfing, Kvernbit, Gramr, Fetbreid, Bastard, Skrep and Kongsgave (Gansum 2004a:49-50; Hedeager 2011:140; Lund 2009:103-106).

While a testimony of the invisible ideas of sacrificial activity, the presence of tools for metal- and woodworking deposited together with weapons in Vimose and Illerup Ådal (e.g. Christensen 2005; Jensen 2003:536-537), can be interpreted to meaning that crafters were part of the warrior structure of the European MP (Norman 1954:20). The previously mentioned plane of the Vimose find (Chapter 8.3) could express an army's need to produce new shafts for their weapons while on the move. It does not seem unreasonable to claim that weaponsmiths and weapons repairmen would be essential for any group of soldiers on the march. The observation of Alexandra Pesch (2012:43) that illustrative art almost exclusively tends to depict smiths and warriors could be of value from this perspective, placing (metal)smiths and warriors in the same worldly sphere. It is even possible that warriors were expected to hold some knowledge of how to take care of their own weapons, as is common army praxis also today.

Another link between the (metal)smith and the warrior may be found in the treatment of tools and weapons before deposition in graves. Further linked to conceptions of the extended soul, the deliberate destruction of objects is commonly associated with weapons, and particularly with swords (e.g. Kaliff 1992:106). This should be seen in relation with the example from *Kormáks saga*. *Gísla saga Súrssonar* holds an account of what can be conceived as the «death» of one such sword (Furan 2009:60-61; see also Lund 2009:36-49). The owner of the sword Grásiða is a thrall called Kol, who borrows the sword to Gísli for a duel. When Gísli leaves the duel as the champion, he decides he wants to keep the sword, and makes an attempt of buying it from Kol. As an answer to Gísli's refusal of returning Grásiða, Kol attacks him, and the fight ends violently: «Gísli answers by striking Kol so hard in the head with Grásíða that the sword breaks and the skull is crushed. In this way they both receive their death blows» (Gísla saga Súrssonar 1989:262, my translation). I want to point to two elements of this story: firstly, that the sword is described explicitly as being alive and, secondly, that the fates of the sword and its (true) owner seem to be bound together. Another example, mentioned by Carstens (2012:253), can be found in *Egils saga einhanda ok Ásmundar*

*berserkjabana*. In this saga one-handed Egill, as a reward for saving a dwarf child, is given a sword that can be fastened to his elbow and function like an extension of his arm. Effectively, this makes Egill into what can be interpreted as a human-sword hybrid, a concept which may be extendable also to conceptions of the warrior on a more general level. Moreover, the 4 cases of deliberately broken tongs from Chapter 7.2, as tools which have had their arms bent and/or cut off, can be argued to place also metalsmiths on the inside of such conceptions. If deliberately broken swords, in light of *Gísla saga Súrssonar*, can be interpreted as fundamental parts of their owners to such a degree that their souls had to be ritually killed in order to follow their humans in death and burial, this might be legitimate also in the case of the tongs. As such, the weapon must be perceived as part of the warrior, and the tool as part of the smith, making it unreasonably to separate them by ON notions. Ideological connections between tools and weapons can be supported by the concurring occurrence of both as a particularly Norwegian LIA phenomenon (Grieg 1922; Martens 2003b; Straume 1986:51; Thålin-Bergman 1979:110; Wallander 1979). Martens (2003b:57) has argued that the Norwegian weapon production must have been decentralised, bearing witness of a major capability for obtaining weapons throughout the entire country. Societal conditions like these could explain the development of very clear associations connecting metalsmiths particularly to weapons.

*The Gulathing Law* (GL 309; Martens 2003b:53; Stylegar 2005:30), from which we have sources dating to the 1200s, tells that all free men must hold a certain set of weapons, but also that these weapons must be of a certain standard. *Hávamál* (stanza 126) refers to the strength of being self-sufficient, with direct reference to the making (smithing) of shoes and shafts, and the risks of leaving these tasks to others. These arguments back up old theories by Grieg (1922:92) on self-sufficient farmer smiths. Relevant to this is also the find of an Anglo-Saxon calendar, dating to the sixth century, giving insight to how metalsmithing was part of the household activities on the British Isles. Following after the harvest, October is here described as the month set aside for working iron (Motz 1983:17-18). Carsten (2012:259) has emphasised that the ON written sources express that a good farmer had to have at least some knowledge about the craft of metalsmithing. Rather than to be the work of specialists, there are many signs pointing toward the skill of metalsmithing and other crafts as skills expected from people in certain positions. Furthermore, examples from «simple farms» point in the direction of a more general category of what can likely be considered as being «knowledgeable individuals».

### 12.3 Poet, magician, king

It is no unknown phenomenon that prominent men in the sagas liked to brag about their skills. Earl Rognvald Kali Kolsson (Orkneyinga Saga 1981:108) is described as «a man of more than average ability», bragging of his nine arts. Among these we find chess championship, rune carving, reading and writing, skiing, shooting, sculling, music and verse. Similarly, Gísli from *Gísla saga Súrssonar* is described as «a man of more than average ability and skilled in all ways» (Gísla saga Súrssonar 1989:271, my translation). In addition to being a craftsman, he is a farmer and a warrior. In fact, it seems only very few of the smiths of the written sources dwell only with smithing. Þórgríma from *Harðar saga* is the only *smiðkona*, or female smith, to be mentioned by Carstens (2012:255-256) in regard to the written sources. After her husband's death, Þórgríma becomes wealthy and powerful, and she is described explicitly as being a sorceress. *Landnamabók* present the men Vémundr and Molda-Gnúpr as great fighters and blacksmiths, connecting them to concepts of the above chapter, while several smiths are described to being poets (Carstens 2012:258). Yet, among the most interesting examples from the Icelandic sagas stands Skalla-Grímr Kveldulfsson from *Egils saga*.

Introduced as «a good man at work, good with his hands, either he was working iron or wood, and he was a remarkably good smith» (Egils saga 1989:28, my translation), Skalla-Grímr provides a good example for the skilled multicrafter. That the title of *smith* is separated from the acts of working iron and wood both, provides valuable support for Carsten's (2012:267) argument that the word *smith* should be understood as an indicator of status, unlike the more neutral *smithing*. It is possible that the separation of these elements is conscious, and that *smith* in such a context should be understood as a reference to both – together. Instead of someone excluded from society, Carstens (2012:259) describes the (multiple) skills of the smith as something that must have been well respected, worthy of the title of the master craftsman. Yet, Skalla-Grímr's skills do not stop here – he is also described as a master at building boats, a smelter of iron ore, and a composer of poetry, the latter which is also recorded as an activity happening in the smithy. Further still, Skalla-Grímr holds the role of the chieftain and farmer (Egils saga 1989:73-78). *Egils saga* also provides the only known written account of someone getting buried with their tools (Carstens 2012:256). Skalla-Grímr's son, Egil, raises a mound at his father's death, in which Skalla-Grímr is laid together with his horse, his weapons, and his smiths' tools, while the saga provides no further specification. That «nothing is said of other valuables laid in the mound with him» (Egils saga 1989:146, my translation), inclines that these objects may be understood as being of a certain value.

A somewhat surprising parallel to the ON sources can be found in the Celtic mythological material,

written sometimes between the 700s and 1100s in Christianised Britain (Rekdal et. al. 2006:ix-xii). In the myth of *The Battle of Magh Tuireadh* (Rekdal et. al. 2006:19-20; MacCana 1970:28) the god Lugh is described as the «master of all crafts». Under the pseudonym of *Samildánach* («posessing, or skilled, in many arts – together») Lugh makes an attempt at entering the feast at the royal court of Tara, where nobody is allowed who possesses no art. In addition to being a smith, he is described as a carpenter (carpentry is mentioned before smithing), warrior champion, harpist, poet and historian, sorcerer, medicine man, cup-bearer, and brazier. An important feature to the story is that Lugh is denied entrance at first, because there are already skilled men present of all professions. He is, however, let in on grounds of being the only one in possession of all these skills simultaneously. Returning to ON poetry, mythic Reginn is described as a multi-metal and possible general multicrafter, as quoted in Chapter 14 of the *Vǫlsunga saga* (2000:127): «I knew how to work iron, silver, and gold, and could make something useful out of anything». Reginn's skills are linked to wisdom and knowledge through his relationship with Sigurðr, to which he acts as a foster father and teacher (Carstens 2012:248, 250; Vǫlsunga saga 2000:123). Among the skills that Sigurðr gets to learn are sports, chess, runes, smithing, as well as several languages – «skills deemed proper for kings' sons at that time». Many of these examples are transferable to concepts of Oðinic wisdom, opening for the interpretation of tool deposition in graves as a display of status through knowledge.

## 13 THE TREE OF KNOWLEDGE: AN ATTEMPT AT INTERPRETATION

Modern western society tends to define knowledge as something academical, as an understanding developed through years of (theoretical) research. We learn through observation, and thus our knowledge has become something passive. As such, the verb «to know» is described in The Concise Oxford Dictionary of Current English (1990:665-666) as to «have in mind; have learnt; be able to recall». Hedeager (2011:13-17) has argued how our own conceptions of knowledge and wisdom, and our separation of human beings from nature and things, differ from ON understandings. On the topic of the extended mind, Oðinn himself provides one of the better examples. His mind is expanded by means of his ravens, Huginn and Muninn («thought» and «memory»), and his conscious view by his seat, Lidskjalf (Sturluson 2008:34, 43, 60-61). As a god of wisdom, these objects and beings are crucial to the understanding of how Oðinn collects his knowledge, and how he is able to stay updated on all things happenings in the world. Moreover, Oðinn is extended by the power of his own objects, exemplified by the spear Gungnir, and the ring Draupnir. While the former provides him with a warrior strength that can be interpreted as an ideal of the chieftain, the qualities of the latter to reproduce its gold can be tied directly to notions of keeping loyal warriors by means of interaction and payment (e.g. Domeij 2004:152; Hedeager 1992:122, 2011:13, 88).

Central to the understanding of Oðinn as ruler of the ON pantheon is also the story of how he gained wisdom and the runes through self-sacrifice by giving his eye to the well of the wise Mimir, and/or by hanging himself in the World Tree. I wish to focus on these stories as portraying *action* as the way in which to gain knowledge about the world. The situation as described in *The Book of Genesis* must be understood as fundamentally different, primarily because it revolves around a passive gain of internal knowledge, as related to modern western views as defined above. Because *The Book of Genesis* can be traced in other *Books of the Pentateuch* (The Oxford Dictionary of the Christian Church 1984:554-555), dating further back than Christianity itself, it can be regarded as reliable to interpretations of Christianity also in the LIA. The story tells of the very start of Man, as surrounded by, and as a part of nature – «they were naked, both the man and his wife, but they were not ashamed» (Genesis 2:25, my translation). It is the forbidden *act* of eating from the fruit of the Tree of Knowledge of good and evil that causes them to become different (Genesis 3:10-11), and from this day onward humans must suffer the punishment of sin.

The story of Oðinn, primarily known from *Hávamál* (stanzas 138-139), seems to express that it is only through the most intimate interaction *with* the world, that he is able to reach his prize. As such,

there are several points to the Oðinn myth and other parts of the ON mythology in need of taking into careful consideration. Firstly, the tree of Yggdrasil, the «roots of which noone knows the end» (Hávamál stanza 138, my translation) must be considered as a powerful and living element in itself, and a primary medium through which knowledge can be gained. Secondly, Oðinn's ritual sacrifice «of himself, to himself» requires an engagement with this tree in a very physically intimate way, also by means of physical suffering. Thirdly, the element of wisdom, as mainly represented by the Oðinn myths, goes as a leitmotif throughout the mythological material, to such a degree that it can, in many cases, be regarded as downright greedy (e.g. Steinsland 2005:171). Finally, that the order in which this knowledge is gained requires a process of sacrifice, endurance and insight, the latter which can alternatively be termed «outsight» because it engages with a sphere that is most definitely beyond that of the character himself. The Oðinistic approach seems to encourage action as a medium for reaching new horizons as portrayed also by the cosmogonical view in which human beings are in actual power to influence the gods (e.g. Østigård 2006:12). But how can this be related to the smith?

I have still not found any direct relations between the character of Oðinn and the activity of metalworking, with the exception at the start of *Gylfaginning* (Sturluson 2008:37) and *Voluspá* (stanza 7) where the gods act as their own smiths, and the fact that Oðinn acts as a living multi-hybrid with animals and objects alike. Yet, Oðinn must be understood as a creator, and it may be of value to note that he and his brothers created the first human beings from parts of wood (Hávamál stanza 17-18; Sturluson 2008:33-34). In terms of mentality there are, however, plenty of elements which can be argued to place the smith in the image of the ruler of the ON pantheon, relating to other chieftains, and to what can be conceived as human ideals. A number of examples have already related smiths to builders and halls (also Hedeager 2011:160), which should serve to place them among the more important pieces of the ON society. Smiths as pictured in myth and saga also give the impression of being linked to concepts of skaldic poetry, as maintainers and producers of collective memory, either because they act as poets themselves, or because their work is related to the illustrative arts. In metal these are expressed in the imagery of animal art, but the example from *Laxdæla saga* also gives insight to the role of woodcarvings as carriers of historical elements. Carstens (2012:259-266) is among those who have already suggested a link between smiths and the carvers of runes, which can likely be viewed in this same light. From this perspective, the description of Skofnung as a «rune-sword» (Kormáks saga 1989:323) could hold connotations to knowledge also through its runes.

### 13.1 The smith on the edge of worlds

Many archaeologists have related metalsmiths to transformational powers, dwarves and magic (Chapter 2), concepts which are further relatable to terms of knowledge, be it esoteric or scientific. I have largely avoided these topics, not because I consider them to be without value, but because I consider them to being possible maintainers of the dichotomies separating what we have termed religious rituality from the more practical «daily life». I would argue that «esoteric knowledge» may not be «hidden» in the way that we understand it from modern notions. Pedersen (2009) has previously argued against this «invisible practice» of the ritualistic metalsmith, as illustrated by the presence of production debris from what must be considered rather visible environments. Building upon her arguments, I am inclined to argue that knowledge in the form of *action*, as related to other conception in ON context, is in need of more attention in archaeological research on the Norwegian LIA.

Helms (1993) has connected notions of skilled crafting to kingly ideals and knowledge about the outside world, and her arguments show clear similarities to the approaches taken here. In ancient Greek thought skilled blacksmiths, carpenters, weavers, hunters, shipbuilders and navigators, were considered to holding an exceptional cunning intelligence on level with physicians, sophists and politicians (Helms 1993:76-77). The point that I want to make is that many of these concepts can be more or less translated directly to what we would call science, put inside the frames of ON cosmological understandings. As such, skilled smiths may possibly have been understood as holding especially powerful positions because they would be in possessing of the ability of predicting and/or shaping the elements of nature (possibly relating to divination and seiðr) in collaboration with their chemical and physical characteristics. This must be understood (*by ON conceptions)* as a combined agency of humans and nature: by interaction with the natural elements of the surrounding world, smiths actively become human-nature hybrids (Chapter 3; see also Ingold 2011; Knappett and Malafouris 2008; Latour 2005), in a way which may have been considered ideal (although perhaps dangerous) in the LIA. Moreover, these unities between humans and gods, humans and nature, humans and animals, and humans and things, may have been understood as sources to wisdom about the world as directly connected to notions of action in, and communication with, the world.

While portraying the human freedom of acting in the world, the moral of the Christian story is that God will always have the final say. The domination of internally focused concepts such as sin and forgiveness almost exclusively within the frames of human-human and human-God relationships

therefore place Christianity, and Modernity alike, on the inside of an anthropocentric tradition. As such, the process of Christianisation may have introduced the belief of human beings as fundamentally different from all other living things, cosmologically positioning them in the center of the world (Hedeager 2011:81, 96; Steinsland 2005:84-84, 436-443). This approach must be considered to be in direct conflict with ON belief. *So to which degree does our conception of the specialised metalsmith conform to the idea of the smith as expressed in Late Iron Age burial practice and Old Norse written sources?*

The answer to the question must be understood as multilayered. In terms of language, modern western definitions are lacking in that language developments have caused a translation of smithing into forging, forming very clear associations between smiths and metalworkers. A survey of the written sources has made it clear that such translations may be forcing meanings onto the material which may be damaging to interpretation in ON context. On discussion of the smith as an ON concept, there are signs pointing in the direction that the title denotes the master craftsman in disregard of material, and ideally with skills in more than one kind of craft. I have put these skills in relation to knowledge about the world as an external quality, defined by action rather than by internal thinking, as illustrated by the cult of Oðinn. These concepts can likely be extended also to observed relationships between smiths and halls (and boats) as structures of power, but because this thesis has been centred around problems concerning the ideological conception of metalsmiths, there are many questions which still remain unanswered. On the occurrence of tools in graves, these can possibly be understood as a display or legitimation of skill to be seen by humans and gods alike, as directly connected to ideals of the knowledgeable human. This conforms to the deposition of such tools in «rich» graves as well as in «poor»: while you did not have to be a king in order to be knowledgeable, (– ideally –) you had to be knowledgeable in order to be a king.

As a closing example I want to introduce a grave from Gausel in Rogaland (Fig. 12), as presented by Ragnar Børsheim (2002:194-211), and previously argued to illustrate the conceptual separation of tools for blacksmithing from tools from the smithing of non-ferrous metal (Pedersen 2010:19). While this interpretation may be completely legitimate, I wish only to plant the seeds to ideas for an alternative approach to viewing the goods of such graves in light of the material findings of this thesis. Could the immediate proximity between weapons (sword, axe, arrows) with tools for blacksmithing (hammer, large tongs) be understood to depicting an association between these objects? Could the placement of tools for the smithing of non-ferrous metal (small tongs, plate shears, crucibles), together with tools for woodworking/soft-material working (auger, gouges) point

to closer associations between these as decorative and/or pictorial arts? Moreover, do the presence of these objects and tools in the same grave more clearly denote their separation or their interconnectedness?

*Fig. 12: Boat grave from Gausel, Rogaland, depicting the respective positions of the grave goods, and inclusive of tools for blacksmithing, the smithing of non-ferrous metal, as well as tools for the working of soft materials. Note also the high number of weapons. Illustration from fornminner.no.*

## 14 CONCLUDING REMARKS

This thesis has treated the topic of the smith from a perspective seeking to locate the conception of the crafter in a wider ideo-cosmological context. Because our understanding of specialised craft relates to the archaeological use of the old tool typologies of Rygh (1885), Grieg (1922) and Petersen (1951), it has been necessary to review the relevant tools from a critical angle where the practical experience of Bøckman (2007) and other craftsmen has been considered to being of particular value. In order to place LIA crafters in a wider social context it has been necessary to take a look also at other recurring elements in graves in the attempt to spot overlying patterns in the material. As a result, links have been established between tools and weapons, as well as between several kinds of crafts, as displayed by the correlated presence of their indicators in graves. Examination of the ON written material seems to support these findings to a high degree.

Building from the examination of previous research in comparison with material findings, it has been claimed that research on smiths and smithing has been too focused on specialised professions, and that the placement of tools in graves, as tied to ON conceptions of wisdom, can possibly be understood ideologically as a display of knowledge and skill. Rather than to necessary denote specialist craftsmen, tools in LIA graves should be understood as components of a bigger picture, and as an element coloured by religious understandings linking life among the living to a life continued in death. The multicrafter – the smith working in more than one material – which has been demonstrated to holding a particular tendency toward the presence of more and richer grave goods in comparison to other categories, can be considered to possibly displaying an ideal master craftsman. A number of «pure» metalworker graves give the impression of favouritism toward the presence of non-ferrous metal, scales, and game pieces, while showing a lower tendency toward other object categories, and can be interpreted to portraying itinerant merchant metalworkers. It should, however, be remembered that grave goods usually give the impression of being consciously selected by the bereaved, and that parts of the crafter tool kits in most cases are likely to be missing.

An interesting, yet largely unexplored element, is the general high occurrence of all object categories in what can be conceived as to being woodworkers' graves. There are signs pointing in the direction that, even more so than metalworkers, woodworkers could be holding some of the more important positions in LIA society. This find has, in the closing of this thesis, been briefly put in relation to boat- and hallbuilders, as well as to woodcarvers, as important maintainers of warrior culture and re-producers of history and myth. Further research on newer and better documented

material should help shed more light on all elements presented here.

# REFERENCES

## PRIMARY SOURCES


Atlakviða

See *The Poetic Edda*.

The Battle of Magh Tuireadh

In *Keltiske Myter*, a selection of Celtic Myths translated by Jenny Graver, Mads Haga and Jan Erik Rekdal, edited and with an introduction by Jan Erik Rekdal, pp. 1-43. De Norske Bokklubbene AS, Oslo 2006.

The Book of Genesis

*Den Hellige Skrift Bibelen: Det gamle og det nye testamente*. Det Norske Bibelselskap, Oslo 1990.

Egils saga

In *Nørrøn Saga 1*, translated to Norwegian by Hallvard Lie and with an introduction by Vera Henriksen, pp. 25-224. Aschehoug, Oslo 1989.

Gísla saga Súrssonar

In Norrøn Saga 3, translated to Norwegian by Vera Henriksen, pp. 259-329. Aschehoug, Oslo 1989.

Gylfaginning

See Snorri Sturluson: *Edda*.

Hákonar saga Hárekssonar

*Editiones Arnamagnæanæ, Series B, vol. 32*. Issued by Mariane Overgaard, in accordance with preliminary work by Mirjam Lanjala. Museum Tusculanum Press, Copenhagen 2009.

Háttatal

See Snorri Sturluson: *Edda*.

Hávamál

See *The Poetic Edda*.

Jomsvikinga Saga

*Soga om Jomsvikingane*, edited by Stein Ugelvik Larsen. Hareid Historielag 1992: Årgang nr. 18. Hareid, 1992.

Kormáks saga

In *Nørrøn Saga 1*, translated to Norwegian by Sigrid Undset and with an introduction by Vera Henriksen, pp. 297-358. Aschehoug, Oslo 1989.

Landámnabók

*Landåmsboken: beretninger om landnåmet på Island ca. 870-930*. By Sturla Þorðarson, translated to Norwegian by Liv Kjørsvik Schei, with an introduction and notes by Hermann Pálsson. Thorleif Dahs Kulturbibliotek. Aschehoug, Oslo 1997.

Laxdæla saga

*Laxdæla saga: Halldórs Þættir Snorrasonar Stúfs Þáttr*. Íslenzk fornrit, vol. 5. Translated to Icelandic by Einar Ól. Sveinsson. Hið Íslenzka Fornitafélag, Reykjavík, 1934.

*The Laxdoela Saga*. Translated to English and with an introduction and notes by A. Margaret Arent. University of Washington Press, Seattle and New York 1964.

Orkneyinga Saga

*Orkneyinga Saga: The History of the Earls of Orkney*. Translated to English and with an introduction by Hermann Pálsson and Paul Edwards. Penguin books, London 1981.

The Poetic Edda

In *Edda: Den eldre Edda, Den yngre Edda*. Translated to Norwegian by Ivar Mortensson-Egnund, with an introduction by Per Tylden. Second edition, Det norske samlaget, Oslo 2002.

Prose Edda

See Snorri Sturluson: *Edda*.

Reginsmál

See *The Poetic Edda*.

Snorri Sturluson

*Edda*. Edited by Asbjørn Aarnes and translated to Norwegian by Anne Holtsmark, with an introduction by Jon Gunnar Jørgensen and epilogue by Gro Steinsland. Vidarforlaget AS, Oslo 2008.

Voluspá

See *The Poetic Edda*.

Vǫlsunga saga

*The saga of the Volsungs: the Norse epic of Sigurd the Dragon Slayer*. Translated to English and with an introduction by Jesse L. Byock.. University of California Press, Berkeley 1990.

**BIBLIOGRAPHY**

Andersen, Harald

1963 Smeden fra Lejre. *Skalk* 1:8-10.

Andrén, Anders

1998 *Between Artifacts and Texts: Historical Archaeology in Global Perspective*. Plenum Press, New York.

Anfinset, N.

2000 Copper Technology in Contemporary Western Nepal: A Discussion of its Form, Function and Context. In Olausen, D. and H. Vanhilde (eds.), *Form, Function and Context: Material Culture Studies in Scandinavian Archaeology*, pp. 203-212. Acta Archaeologica Ludensia 31. Almquist & Wiksell, Lund.

Arwidsson, Greta and Gösta Berg

1983 *The Mästermyr Find: A Viking Age tool chest from Gotland*. Almqvist & Wiksell International, Stockholm.

Austin, Alex P.

2004 *The craft of silversmithing: techniques, projects, inspiration*. Lark Books, Sterling Publishing, New York.

Axboe, Morten

2012 Late Roman and Migration Period sites in southern Scandinavia with archaeological evidence of the activity of gold and silver smiths. In Pesch, A. and R. Blankenfeldt, *Goldsmith mysteries: Archaeological, pictorial and documentary evidence from the 1st millennium AD in northern Europe*, pp. 123-142. Wachholtz Verlag, Neumünster.

Ayrton, Michael

1967 *The Maze Maker*. Holt, Rinehart & Winston, New York.

Barber, Elizabeth Wayland and Paul T. Barber

2004 *When They Severed Earth from Sky: How the Human Mind Shapes Myth*. Princeton University Press, Princeton and Oxford.

Barndon, Randi

2005 Håndverk, kunst og kunnskap – noen komparative perspektiver på smedens sosiale identitet i jernalderen. In Bergsvik, K. A. and A. Engevik Jr. (eds.), *Fra funn til samfunn: Jernalderstudier tilegnet Bergljot Solberg på 70-årsdagen*, pp. 357-376. UBAS - Universitetet i Bergen Arkeologiske Skrifter, Nordisk 1. University of Bergen.

Berggren, Karin

2000 The Knowledge-Able Agent? On the paradoxes of power. In Holtorf, C. and H. Karlsson (eds.), *Philosophy and Archaeological Practice: Perspectives for the 21st Century*, pp. 39-46. Bricoleur Press, Göteborg.

Bergland, Håvard

2000 *Kunsten å smi: Teknikk og tradisjon*. Gyldendal, Oslo.

Bintliff, John

1991 The constribution of an Annaliste/ structural history approach to archaeology. In Bintliff, J. (ed.), *The Annales School and Archaeology*, pp.1-33. Leicester University Press, Leicester and London.

Bird, Lonnie

2004 *Tauton's complete illustrated guide to using woodworking tools*. The Tauton Press, Newtown.

Birket-Smith, Kaj

1924 Industries and Arts. In Birket-Smith, K., *Ethnography of the Egedesminde District with aspects of the general culture of West Greenland*, pp. 74-128. Bianco Lunos Bogtrykkeri, København.

Bjorvand, Harald and Fredrik Otto Lindeman

2000 *Våre Arveord: Emytologisk Ordbok*. Instituttet for sammenlignende kulturforskning, Novus forlag, Oslo.

Bjørlykke, Per

1949 *Yrkeslære for smeder*. Yrkesopplæringsrådet for håndverk og industri, Oslo.

Blindheim, Charlotte

1963 Smedgraven fra Bygland i Morgedal. *Viking 1962* XXVI:25-80.

Brück, Joanna

1999 Ritual and rationality: Some problems of interpretation in European archaeology. *Journal of Archaeology* 2 (3):313-344.

Bøckman, Jørgen

2007 *«Smedverktøy» fra norske jernaldergraver*. Unpublished Master's thesis of Archaeology, IAKH, University of Oslo. With complete finds list on http://jorgen.bockman.no/hovedoppgave/

Børsheim, Ragnar L.

2002 Gravene på Gausel. In Børsheim, R. and C.-E. Soltvedt with contribution from G. A. Bårdseth and C. Borgarp, *Gausel – utgavingene 1997-2000*, pp. 177-236. AmS-Varia 39. Museum of Archaeology, Stavanger.

Carstens, Lydia

2012 Might and Magic: the smith in Old Norse literature. In Pesch, A. and R. Blankenfeldt (eds.), *Goldsmith Mysteries: Archaeological, pictorial and documentary evidence*

*from the 1st millennium AD in northern Europe*, pp. 243-269. Wachholtz Verlag, Neumünster.

Christensen, Arne Emil

1982 Viking Age Boatbuilding Tools. In McGrail, S. (ed.), *Woodworking Techniques before A.D. 1500*, pp. 327-337. National Maritime Museum, Greenwich, Archaeological Series No. 7. BAR International Series 129, Oxford.

1986 Reinjeger og kammaker, en forhistorisk yrkeskombinasjon? *Viking 1985/86: Norsk Arkeologisk Selskap 50 år 1936-1986* XLIX:113-133.

2005 The Roman Iron Age Tools from Vimose, Demark. *Acta Archaeologica* vol. 76:59-86.

Coatsworth, Elizabeth and Michael Pinder

2002 *The Art of the Anglo-Saxon Goldsmith*. The Boydell Press, Woodbridge.

The Concise Oxford Dictionary of Current English

1990 Edited by Allen, R. E., eight edition. Clarendon Press, Oxford.

Crumlin-Pedersen, Ole

2002 Documentation, analysis and dating. In Crumlin-Pedersen, O. and O. Olsen (eds.), *The Skudelev Ships I: Topography, Archaeology, History, Conservation and Display*, pp. 49-62. Ships and Boats of the North, Volume 4.1. Viking Ship Museum, Roskilde.

Davidson, H. R. Ellis

1982 *Scandinavian Mythology*. First published 1969, revised edition. Hamlyn, London.

Dobres, Marcia-Anne

1999 Technology's Links and Chaînes: The Processual Unforlding of Technique and Technician. In Dobres, M.-A. and C. R. Hoffman (eds.), *The Social Dynamics of Technology: Practice, Politics and World Views*, pp. 124-146. Smithsonian Institution Press, Washington and London.

Dobres, Marcia-Anne and Christopher R. Hoffman

1994 Social Agency and the Dynamics of Prehistoric Technology. *Journal of Archaeological Method and Theory* Vol. 1 (3):211-258.

Dobres, Macia-Anne and John E. Robb

2000 Agency in archaeology: Paradigm or platitude? In Dobres, M.-A. and J. E. Robb (eds.), *Agency in Archaeology*, pp. 3-17. Routledge, London and New York.

Domeij, Maria

2004 Det bundna – djurornamentik och skaldediktning i övergången mellan förkristen och

kristen tid. *Götlandskt arkiv* 2004/2005:146-154.

Dougherty, Janet W. D. and Charles M. Keller

1982 Taskonomy: A practical approach to knowledge. *American Ethnologist Vol 9 (4)*, *Symbolism and Cognition* II:763-774.

Eliade, Mircea

1978 *The Forge and the Crucible: The Origins and Structures of Alchemy*. The University of Chicago Press, Chicago.

Fahlander, Fredrik

2008 Differences that matter: Materialities, material culture and social practice. In Glørstad, H. and L. Hedeager, *Materiality: Six Essays on the Materiality of Society and Culture*, pp. 127-154. Bricoleur Press, Lindome.

Falk, Hjalmar and Alf Torp

1992 *Etymologisk Ordbog over det norske og det danske sprog*. Bjørn Ringstrøms Antikvariat, Oslo.

Fitzpatrick, A.

2009 In his hands and in his head: The Amesbury Archer as a metalworker. In Clark, P. (ed.), *Bronze Age Connections: Cultural Contact in Prehistoric Europe*, pp. 176-188. Oxbow Books, Oxford.

Fredriksen, Per Ditlef

2006 Moving Closer to the Fire: Heat Transformation and Bucket-Shaped Pots in Burials. *Norwegian Archaeological Review* 39 (2):126-137.

Furan, Nora P. F.

2009 *Våpnenes biografier – en fruktbar tilnærming til våpengraver i vikingtid?* Unpublished Master's Thesis in Archaeology. IAKH, University of Oslo.

Færden, Gerd

2007 Hesteutstyr og redskaper. In Weber, B. (ed.), *Vesle Hjerkinn: Kongens gård og sælehus*, pp. 89-100. Norske oldfunn XXI, Universitetets kulturhistoriske museer, Oslo.

Gansum, Terje

2004a Role the bones – from iron to steel. *Norwegian Archaeological Review* 37 (1):41-57.

2004b Jernets fødsel og dødens stål: Rituell bruk av bein. In Berggren, Å., S. Arvidsson and A.-M. H. Stenholm (eds.), *Minne och myt: Konsten att skapa det förflutna*, pp. 121-155. Nordic Academic Press, Lund.

Gansum, Terje and Hans Johnny Hansen

2004 Fra jern til stål. In Melheim, L, L. Hedeager and K. Oma (eds.), *Mellom himmel og jord: Foredrag fra et seminar om religionsarkeologi, Isegran 31. januar – 2. februar 2002*, pp. 344-376. Oslo Archaeological Series Nr. 2, University of Oslo. Nordberg Aksidenstrykkeri AS, Oslo.

Gell, Alfred

1992 The technology of enchantment and the enchantment of technology. In Cooter, J. and S. Shelton (eds.), *Anthropology, Art and Aesthetics*, pp. 40-63. Claredon Press, Oxford.

Glørstad, Håkon

2008 Celebrating Materiality – The Antarctic Lesson. In Glørstad, H. and L. Hedeager (eds.), *Materiality: Six Essays on the Materiality of Society and Culture*, pp. 173-211. Bricoleur Press, Lindome.

Goldhahn, Joakim

2009 Smeden som kosmolog och kosmograf: Några tankar om bronsålderns hantverk och produktion. In Lund, J. and L. Melheim (eds.), *Håndverk og produksjon: Et møte mellom ulike perspektiver*, pp. 163-196. Oslo Archaeological Series Vol. 12. Unipub forlag, Oslo.

Goodman, William Louis

1964 *The History of Woodworking Tools.* G. Bell and Sons Ltd, London.

Grant, John

1990 *An introduction to Viking Mythology.* Cartwell Books Inc, New Jersey.

Gräslund, Anne-Sofie

2001 *Ideologi och Mentalitet: Om religionsskiftet i Skandinavien från en arkeologisk horisont*. Institutionen för Arkeologi och Antik historia, Uppsala universitet, Uppsala.

Grieg, Sigurd

1922 Smedverktøi i norske gravfund. Offprint of *Oldtiden tidsskrift for norsk forhistorie bind 9*, 1920, pp. 22-95, Oslo.

Haaland, Randi

2004 Technology, transformation and symbolism: Ethnographic perspectives on European iron working. *Norwegian Archaeological Review* 37 (1):1-19.

Haaland, Randi and Gunnar Haaland

2008 Craft specialization, caste identities and political centralization: On the use of Anthropological perspectives in reconstructing archaic forms of economic organization. In Chilidis, K., J. Lund and C. Prescott (eds.), *Facets of Archaeology:*

*Essays in honour of Lotte Hedeager on her 60th birthday*, pp. 155-168. Oslo Archaeological Series Vol. 10. Unipub forlag, Oslo.

Hedeager, Lotte

1992 The Creation of Germanic Identity: A European Origin-Myth. In Brun, P., S. van der Leeuv and C. R. Whittaker (eds.), *Frotières D'empire: Nature et signification des frontières romanies*, pp. 121-131. Actes de la Table Ronde Internationale de Nemours 1992.

1996 Myter og materiel kultur: Den nordiske oprindelsesmyte i det tidlige kristne Europa. *Tor* Vol. 28 1996:217-234.

1999 *Skygger av en annen virkelighet: Oldnordiske myter*. Pax Forlag A/S, Oslo.

2004 Åsgård rekonstruert? In Melheim, L, L. Hedeager and K. Oma (eds.), *Mellom himmel og jord: Foredrag fra et seminar om religionsarkeologi, Isegran 31. januar – 2. februar 2002*, pp. 156-183. Oslo Archaeological Series Nr. 2, University of Oslo. Nordberg Aksidenstrykkeri AS, Oslo.

2011 *Iron Age Myth and Materiality: An Archaeology of Scandinavia AD 400-1000*. Routledge, London.

Helms, Mary W.

1993 *Craft and the Kingly Ideal: Art, trade and power*. University of Texas Press, Austin.

2009 The master(y) of hard materials: Thoughts on technology, materiality, and ideology occasioned by the Dover boat. In Clark, P. (ed.), *Bronze Age Connections: Cultural Contact in Pehistoric Europe*, pp.149-158. Oxbow Books, Oxford and Oakville.

Henderson, Julian

2000 *The Science and Archaeology of Materials: An investigation of inorganic materials*. Routledge, London.

Herbert, Eugenia W.

1993 *Iron, Gender and Power: Rituals of Transformation in African Societies*. Indiana University Press, Bloomington.

Hinton, David A.

1998 Anglo-Saxon Smiths and Myths. Reprint from the *Bulletin of the John Rylands University Library of Manchester* Vol. 80/1.

Hodder, Ian

1987 *Archaeology as Long-Term History*. Cambridge University Press, Cambridge.

2012 *Entangled: An archaeology of the relationships between humans and things*. John Wiley and Sons, Chichester.

Hodges, Henry

1989 *Artifacts: An introduction to early materials and technology*. Duckworth, London.

Horne, Lee

1995 Itinerant Brasscasters of Easterns India. In Allchin, B. (ed.), *Living Traditions: Studies in Ethnoarchaeology of South Asia*, pp. 265-280. Oxbow Books, Oxford.

Ingold, Tim

1999 Foreword. In Dobres, M.-A. and C. R. Hoffman, *The Social Dynamics of Technology: Practice, Politics, and World Views*, pp. vii-xi. Smithsonian Institution Press, Washington and London.

2011 *Being Alive: Essays on movement, knowledge and description*. Routledge, London and New York.

Jensen, Jørgen

2003 *Danmarks Oldtid: Ældre Jernalder 500 f.Kr.-400 e.Kr.* Gyldendal, København.

Johnsen, Harald and Bjørnar Olsen

1992 Hermenuetics and Archaeology: On the philosophy of contextual archaeology. *American Antiquity* 57 (3):419-436.

Kaliff, Anders

1992 *Brandgravskick och föreställningsvärld: En religionsarkeologisk diskussion*. Societas Archaeologica Upsalensis, Uppsala.

Knapp, A. Bernard (ed.)

1992 *Archaeology, Annales and Ethnohistory*. Cambridge University Press, Cambridge.

Knappett, Carl and Lambros Malafouris

2008 Material and Nonhuman Agency: An Introduction. In Malafouis, L. and C. Knappett (eds.), *Material Agency: Towards a Non-Anthropocentric Approach*, pp. ix-xix. Springer, New York.

Kristoffersen, Siv

2000a *Sverd og spenne: Dyreornamentikk og sosial kontekst*. Høyskoleforlaget AS – Norwegian Academic Press, Kristiansand.

2000b Expressive objects. In Olausen, D. and H. Vanhilde (eds.), *Form, Function and Context: Material Culture Studies in Scandinavian Archaeology*, pp. 265-274. Acta Archaeological Ludensia 31. Almquist & Wiksell, Lund.

2009 Kunsthåndverk og produksjon: Dyreornamentikk og spannformete leirkar. In Lund, J. and L. Melheim (eds.), *Håndverk og produksjon: Et møte mellom ulike perspektiver*, pp. 147-162. Oslo Archaeological Series Vol. 12. Unipub forlag, Oslo.

Kuijpers, Maikel

2012 The sound of fire, taste of copper, feel of bronze, and colour of the cast: sensory aspects of metalworking technology. In Rebay-Salisbury, K. and M. L. Stig Sørensen (eds.), *Embodied Knowledge: Historical Perspectives on Belief and Technology*, pp. 137-150. Oxbow books, Oxford.

Lamm, Kristina

2012 Helgö as a goldsmiths' workshop in Migration Period Sweden. In Pesch, A. and R. Blankenfeldt (eds.), *Goldsmith Mysteries: Archaeological, pictorial and documentary evidence from the 1st millennium AD in northern Europe*, pp. 143-156. Wachholtz Verlag, Neumünster.

Latour, Bruno

2005 *Reassembling the Social: An Introduction to Actor-Network-Theory*. Oxford University Press, Oxford.

Lévi-Strauss, Claude

1966 *The Savage Mind*. The University of Chicago Press, Chicago.

Lund, Julie

2006 Vikingetidens værktøjskister i landskab og mytologi. *Fornvännen* 5:323-431.

2009 *Åsted og vadested: Deponeringer, gjenstandsbiografier og rumlig strukturering som kilde til vikingetidens kognitive landskaber*. Acta Humaniora 389, Ph.D. Thesis, University of Oslo.

Lund, Julie and Lene Melheim

2011 Heads and Tails – Minds and Bodies: Reconsidering the Late Bronze Age Vestby Hoard in Light of Symbolist and Body Perspectives. *European Journal of Archaeology* 15:441-464.

MacCana, Proinsias

1970 *Celtic Mythology*. The Hamlyn Publishing Group Limited, London.

MacGregor, Arthur

1985 B*one, Antler, Ivory & Horn: The Technology of Skeletal Materials Since the Roman Period*. Croom Helm, London and Barnes & Noble Books, Totowa.

Martens, Irmelin

2002 Smeden og hans produkter i norsk vikingtid. In Høigård Hofset, E. (ed.), *UKM – En mangfoldig forskningsinstitusjon*, pp. 173-185. University Museum of Cultural Heritage, Occarional Papers vol. 1, University of Oslo, Oslo.

2003a Mestersmeden fra By: Gammelt funn i ny sammenheng. In *Lautin 2003:*

*Lokalhistorisk årbok for Løten*, pp. 9-20. Løten historielag.

2003b Tusenvis av sverd: Hvorfor har Norge mange flere vikingtidsvåpen enn noe annet europeisk land? *Collegium Medievale* Vol. 16:51-66.

2006 Karolingisk eller norsk? Noen iakttakelser og spørsmål om vikingtidens våpenproduksjon i Norge. In Glørstad, H., B. Skar and D. Skre (eds.), *Historien i Forhistorien: Festskrift til Einar Østmo på 60-årsdagen*, pp. 221-228. Kulturhistorisk museum, Skrifter 4, University of Oslo, Oslo.

Mattsson, Anders and Staffan Nilsson

2000 *Tre og metall: Materialer, verktøy, metoder*. Translated to Norwegian by Kjersti Lundemo. Landbruksforlaget, Oslo.

Motz, Lotte

1983 *The wise one of the mountain: Form, function and significance of the subterranean smith – a study in folklore*. Kümmerle Verlag, Göppingen.

Norman, G. A.

1954 *Høvelens historie*. De Sandvigske Samlingers Skrifter II, Lillehammer.

Oldeberg, Andreas

1942 *Metallteknik under Förhistorisk Tid: Del I*. Håkan Ohlssons Boktryckeri, Lund.

1943 *Metallteknik under Förhistorisk Tid: Del II*. Håkan Ohlssons Boktryckeri, Lund.

1966 *Metallteknik under Vikingatid och Medeltid*. Victor Pettersons Bokindustri AB, Stockholm.

Olsen, Bjørnar

2006 Ting-mennesker-samfunn: Introduksjon til en symmetrisk arkeologi. *Arkæologisk Forum* 14:13-18.

Ottaway, B. S. and B. Roberts

2008 The Emergence of Metalworking. In Jones, A. (ed.), *Prehistoric Europe: Theory and Practice*, pp. 193-225. Blackwell Publishing, Oxford.

The Oxford Dictionary of the Christian Church

1983 Cross, F. L. and E. A. Livingstone, second edition [1974], reprinted with corrections. Oxford University Press, New York.

Pehrson, Sjur Axel

2009 *Smedarbeid*. Yrkeslitteratur AS, Oslo.

Pedersen, Unn

2009 Den ideelle og den reelle smed. In Lund, J. and L. Melheim (eds.), *Håndverk og produksjon: Et møte mellom ulike perspektiver*, pp. 129-146. Unipub forlag, Oslo.

2010 *I Smeltedigelen: Finsmedene i vikingtidsbyen kaupang*. Ph.D. Thesis, University of Oslo.

Petersen, Jan

1919 *De Norske Vikingesverd: En typologisk-kronologisk studie over vikingetidens vaaben*. A. W. Brøggers Boktrykkeri A/S, Kristiania.

1951 *Vikingetidens redskaper*. Dybwad, Oslo.

Pesch, Alexandra

2012 The goldsmith, his appretice and the gods: A fairy tale. In Pesch, A. and R. Blankenfeldt (eds.), *Goldsmith Mysteries: Archaeological, pictorial and documentary evidence from the 1st millennium AD in northern Europe*, pp. 37-55. Wachholtz Verlag, Neumünster.

Pfaffenberger, Bryan

1992 Social Anthropology of Technology. *Annual Review of Anthropology* 21:491-516.

Pleiner, Radomír

2006 *Iron in Archaeology: Early European Blacksmiths*. Archeologický Ústav AV ČR, Praha.

Price, Neil S.

2002 *The Viking Way: Religion and War in Late Iron Age Scandinavia*. Aun 31, Department of Archaeology and Ancient History, Uppsala.

Rekdal, Jan Erik, Jenny Graver and Mads Haga

2006 *Keltiske Myter*. Verdens Hellige Skrifter, De norske Bokklubbene, Oslo.

Ringstad, Bjørn

1991 Graver og ideologi: Implikasjoner fra vestnorsk folkevandringstid. In Fabech, C. And J. Ringtved (eds.), *Samfundsorganisation og Regional Variation: Norden i romersk jernalder og folkevandringstid*, pp. 141-149. Beretning fra 1. nordiske jernaldersymposium på Sanbjerg Slot 11-15. april 1989. Jyst Arkæologisk Selskabs Skrifter XXVII. Aarhus Universitetsforlag, Højbjerg.

Roesdal, Else and David M. Wilson

1992 *From Viking to Crusader: The Scandinavians and Europe 800-1200*. Rizzoli, New York.

Rygh, Oluf

1885 *Norske oldsager*. Alb. Cammermeyer, Oslo.

Rønne, Ola

2002 Smeden i jernalderen – ildens hersker. *Primitive tider* 5:55-63. Oslo.

Sauvage, Raymond

2005 *Jern, smie og smed: Jernhåndverkere og jernhåndverk i Midt-Norge ca 600-1100 e.Kr.* Unpublished Master's Thesis, NTNU, Trondheim.

Schetelig, Haakon

1917 Skibet: Skibets tilstand, optagelse og restaurering. In Brøgger, A. W., Hj. Falk and H. Schetelig (eds.), *Osebergfundet 1*, pp. 283-366. Universitetets Oldsaksamling, Oslo.

Sjøvold, Thorleif

1956 *Vikingskipene: En kort orientering om Vikingskipsfunnene*. Dreyers forlag, Oslo.

1962 *The Iron Age Settlement of Arctic Norway: A study in the expansion of European Iron Age culture within the Arctic Cricle, Part I*. Tromsø Museums Skrifter Vol X (1). Norwegian Universities Press, Tromsø/Oslo.

1974 *The Iron Age Settlement of Arctic Norway: A study in the expansion of European Iron Age culture within the Arctic Circle, Part II*. Tromsø Museums Skrifter Vol. X (2). Norwegian Universities Press, Tromsø/Oslo/Bergen.

Skjølsvold, Arne

1961 *Klebersteinsindustrien i vikingetiden*. Universitetsforlaget, Oslo.

1979 Redskaper fra forhistorisk klebersteinsindustri. In Martens, I. and E. Mikkelsen (eds.), *Universitetets Oldsaksamling 150 år: Jubileumsårbok 1979*, pp. 165-172. Universitetets Oldsaksamling, Oslo.

Sofaer, Joanna

2006 Pots, Houses and Metal: Technological Relations at the Bronze Age tell at Százhalombatta, Hungary. *Oxford Journal of Archaeology* 25 (2):127-147.

Solberg, Bergljot

2003 *Jernalderen i Norge: Ca. 500 f.Kr.–1030 e.Kr.* Second edition, Cappelen Akademisk Forlag, Oslo.

Solli, Brit

2005 Norrøn sed og skikk. In Amundsen, A. B. (ed.), *Norges Religionshistorie*, pp. 16-62. Universitetsforlaget, Oslo.

Solli, Brit, Mats Burström, Ewa Domaska, Matt Edgeworth, Alfredo González-Ruibal, Cornelius Holtorf, Gavin Lucas, Terje Østigaard, Laurajane Smith and Christopher Witmore

2011 Some Reflections on Heritage and Archaeology in the Anthropocene. *Norwegian Archaeological Review* 44 (1):40-88.

Steinsland, Gro

2005 *Norrøn religion: Myter, riter, samfunn*. Pax Forlag A/S, Oslo.

Straume, Eldrid

1986 Smeden i jernalderen, bofast – ikke bofast, høy eller lav status. In *Universitetets Oldsaksamling: Årbok 1984/1985*, pp. 45-58, Oslo.

Stylegar, Frans-Arne Hedlund

2005 Stormenn og bønder – sverd og øks: Våpengravene i Rogalands Vikingtid. *Frá Haug ok Heiðni* I:30-37.

Summers-Effler, Erika

2006 Ritual Theory. In Stets, J. E. and J. H. Turner (eds.), *Handbook of the Sociology of Emotions*, pp. 135-154. Springer, New York.

Söderberg, Bengt

2006 Några perspektiv på kulten i en härskarmiljö – Järrestad under yngre järnålder. In Anglert, M., M. Artursson and F. Svanberg (eds.), *Kulthus & Dödshus: Det ritualiserande rummets teori och praktik*, pp. 154-164. Riksantikvarieämbetet, Stockholm.

Thörn, Raimond

2004 Med Turid i centrum: Några tankar om Eik i Sokndal kommun, Rogaland fylke, Norge. In Melheim, L, L. Hedeager and K. Oma (eds.), *Mellom himmel og jord: Foredrag fra et seminar om religionsarkeologi, Isegran 31. januar – 2. februar 2002*, pp. 240-261. Oslo Archaeological Series Nr. 2, University of Oslo. Nordberg Aksidenstrykkeri AS, Oslo.

Thålin-Bergman, Lena

1979 Blacksmithing in Prehistoric Sweden. In Clarke, H. (ed.), *Iron and Man in Prehistoric Sweden*, pp. 99-133. Jernkontoret, Stockholm.

Turner-Walker, G.

2008 The nature and Properties of Metals & Working With Metals. In *A Practical Guide to the Care and Conservation of Metals*, pp. 23-28. Headquarters Administration of Cultural Heritage, Council for Cultural Affairs, Taiwan.

Ulrich, Roger B.

2007 *Roman Woodworking*. Yale University Press, New Haven and London.

Walker, Philip

1982 The Making of Panels: History of Relevant Woodworking Tools and Techniques. In McGail, S. (ed.), *Woodworking techniqes before A.D. 1500*, pp. 178-185. National Maritime Museum, Greenwich, Archaeological Series No. 7. BAR International Series 129, Oxford.

Wallander, Anders

1979 Smedgravar eller gravar med smides- och snickarverktyg? Genomgång av definitioner och redskapskombinationer. Essay for C/20 P Archaeology, especially Northern European, Uppsala.

Wiker, Gry

2002 Tanker om menneskets verdensbilde på 500-tallet: Fra asosial til sosial dialog med det guddommelige. In Melheim, L, L. Hedeager and K. Oma (eds.), *Mellom himmel og jord: Foredrag fra et seminar om religionsarkeologi, Isegran 31. januar – 2. februar 2002*, pp. 114-154. Oslo Archaeological Series Nr. 2, University of Oslo.

Zachrisson, Inger

1962 Smedsfyndet från Smiss. *Tor* Vol. VIII, 1962:201-228.

Østigård, Terje

2006 Lik og ulik – introduksjon til variasjon i gravskikk. In Østigård, T. (ed.) *Lik og ulike: Tilnærminger til variasjon i gravskikk*, pp. 9-44. UBAS - Universitetet i Bergen Arkeologiske Skrifter, Nordisk 2. University of Bergen.

*Internet sources*

Archaeological Museum of Stavanger and Rogaland

Directory for cultural monuments in the county of Rogaland, http://www.fornminner.no/Fylkeskommunen/33-gausel/batgravene.htm, accessed 29. April 2014.

Biltema

Distributor of tools and other things, http://www.biltema.no/, accessed 30. March 2014.

Byggmakker

Distributor of tools and other things, http://www.byggmakker.no/, accessed 30. March 2014.

Norwegian University Museums

Collection Portals, http://www.unimus.no/arkeologi/forskning/index.php, accessed continuously from September 2013 until May 2014.

Statens Kartverk

Map of Norway separated into counties, http://www.norgeskart.no, accessed 29. April 2014.

# APPENDIX A

DATING OF THE PRIMARY SOURCES

*These dates refer to written evidence and not to oral originals.*

Fornaldersaga – 1200 onwards (Carstens 2012:253; Hedeager 2011:28):

*Egils saga einhanda ok Ásmundar berserkjabana (1300s)*

*Vǫlsunga saga (1400s)*

Islendingasǫgur – between 1200 and 1400 (Carstens 2012:254; Hedeager 2011:27):

*Egils saga*

*Fljótsdæla saga*

*Gísla saga Súrsonar*

*Harðar saga*

*Kormáks saga*

*Króka-Refs saga*

*Landámnabók*

*Laxdæla Saga*

Riddarasǫgur:

*Vilmundar saga viðutan* – Medieval Age (Carstens 2012:244, 253-254)

The Battle of Magh Tuireadh – between 700 and 1100 (Rekdal et. al. 2006:19-20)

Hákonar saga Hárekssonar – 1300s (Carstens 2012:249)

The Poetic Edda – 1200s (Carstens 2012:245; Hedeager 2011:23)

Prose Edda/Snorri Edda – 1200s (Carstens 2012:245; Hedeager 2011:24)

# APPENDIX B

LIST OF FINDS

*Abbreviations for tool contexts are explained on p. 47.*

**AKERSHUS**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| B1361-92 | VA | S | x | - | x | Ag |
| C1044a-g | VA | 0 | x | - | x | - |
| C12102-8 | VA | 0 | x | - | x | - |
| C24901a-k | VA | M | x | - | - | - |

Total: 4

**AUST-AGDER**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C13950-59 | VA | M | x | - | - | Cu alloy |
| C14864-80 | VA | MW | x | x | - | Cu alloy |
| C19161-65 | VA | 0 | (axe) | - | - | - |
| C21119a-b | VA | M | - | - | - | - |
| C30423a-c | VA | M | x | - | - | - |
| C30506a-m | VA | M | x | - | - | - |
| C30317a-g | VA | 0 | - | - | - | Pb |

Total: 7

**BUSKERUD**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C14496-506 | VA | W | x | x | - | - |
| C20519a-n | VA | W | x | x | - | - |
| C21668a-i | VA | 0 | x | - | x | - |
| C22720a-x, C21796, C22059 | VA | 0 | x | x | x | - |
| C24333a-l, C24262 | VA | W | x | x | x | - |
| C25093a-m | VA | MW | x | x | - | - |
| C25576a-iii | VA | W | x | x | x | Cu alloy |
| C8331-37 | VA | 0 | x | x | - | - |
| C4397-4407 | IA | 0 | x | x | x | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| C22237a-s | MA | M | x | x | x | - |

Total: 10

**HEDMARK**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C10165-79 | VA | 0 | - | - | - | Cu alloy |
| C10662-75 | VA | X | x | x | x | - |
| C16023-30 | VA | 0 | x | - | x | Cu alloy |
| C1998-2002 | VA | M | x | x | - | - |
| C22324a-r | VA | M | x | x | x | Cu alloy |
| C22538a-f | VA | 0 | x | - | - | - |
| C22541a-g | VA | 0 | x | - | - | - |
| C23020a-d | VA | 0 | - | - | - | - |
| C24010a-h | VA | 0 | x | - | x | - |
| C24887a-o | VA | S | x | - | - | Ag, Cu alloy |
| C245-54 | VA | M | x | - | x | Cu alloy |
| C26389a-h | VA | 0 | x | x | - | - |
| C3858-65 | VA | 0 | x | - | x | - |
| C3877-85 | VA | M | x | x | - | - |
| C7565-73 | VA | M | x | x | - | Cu alloy |
| C9489-95 | VA | 0 | x | - | - | - |
| C11317-24, C13219 | IA | M | x | - | x | Ag, Cu alloy |
| C1977-94 | IA | 0 | x | - | x | Ag, Cu alloy |
| C4979-99 | IA | M | x | - | x | Ag |
| C23971a-l | MA | X | x | - | - | - |

Total: 20

**HORDALAND**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| B4472a-m | VA | S | (axe) | - | - | - |
| B5510a-c | VA | M | (axe) | - | - | - |
| B5580a-d | VA | M | x | - | - | - |
| B5884a-h | VA | 0 | - | - | - | Cu alloy |
| B5927a-r | VA | 0 | x | x | x | Cu alloy, Pb |
| B6192a-e | VA | 0 | x | - | x | - |
| B6612a-e | VA | 0 | x | - | - | - |
| B7080a-p | VA | M | x | - | x | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| B7293a-q | VA | MS | x | x | x | - |
| B7534a-r | VA | M | x | - | - | Cu alloy |
| B7880a-o | VA | M | x | - | x | - |
| B7902a-k | VA | 0 | x | x | - | - |
| B8553a-r | VA | MW | x | x | - | Cu alloy |
| B8555a-u | VA | MW | x | - | - | Ag, Cu alloy |
| B8652a-d | VA | M | x | - | - | - |
| C2140-43 | VA | M | x | - | - | - |
| C8726-31 | VA | M | x | - | - | - |
| B1741-47 | IA | M | x | - | - | Cu alloy |
| B2651-55 | IA | 0 | (axe) | - | - | - |
| B2755-62 | IA | M | x | - | x | - |
| B4424a-p | IA | 0 | x | x | x | - |
| B4830a-å | IA | W | x | x | x | Ag, Cu alloy |
| B486 | IA | M | x | - | - | Ag, Cu alloy |
| B4950a-h | IA | 0 | x | - | - | - |
| B454, B526-32 | IA | 0 | x | - | - | Au, Ag, Cu alloy |
| B5582a-f | IA | 0 | (axe) | - | - | Cu alloy |
| B5800a-hh | IA | W | x | x | x | Au, Ag, Cu alloy |
| B1481-82 | IA | 0 | x | - | - | Au, Ag, Cu alloy |
| B3987a-ff | MA | M | x | - | x | Cu alloy |
| B7713a-g | MA | 0 | x | x | - | - |
| B8109a-h | MA | W | x | x | x | - |

Total: 31

**MØRE OG ROMSDAL**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| B1154-63 | VA | 0 | x | - | x | - |
| B2912-21 | VA | M | x | - | - | - |
| B4294a-g | VA | 0 | x | x | - | - |
| B5110a-o | VA | M | x | - | - | Ag, Cu alloy |
| B766-79 | VA | MW | x | - | - | - |
| B8265 Ia-q | VA | W | x | - | x | Cu alloy |
| B8384a-i | VA | MW | x | - | x | Ag, Cu alloy |

| | | | | | | |
|---|---|---|---|---|---|---|
| C3945-52 | VA | M | x | x | - | - |
| C5413-16 | VA | 0 | x | - | - | - |
| B5627-29 | VA | M | x | - | - | - |
| C6148-65 | VA | X | x | x | x | Ag |
| C9889-95 | VA | 0 | x | - | - | Pb |
| T10096-10100 | VA | M | x | - | - | - |
| T10101-07 | VA | M | x | - | x | - |
| T11940a-o | VA | 0 | x | - | - | Cu alloy |
| T12559a-f | VA | M | x | - | - | - |
| T13145a-p | VA | 0 | x | x | - | Cu alloy |
| T14040a-o | VA | 0 | x | x | - | Ag, Cu alloy |
| T14208a-l | VA | 0 | x | - | - | Ag |
| T14271a-e | VA | 0 | - | - | - | - |
| T4134-44 | VA | 0 | x | x | x | Cu alloy |
| Å1542a-g | VA | 0 | x | x | x | - |
| C5424-28 | VA | 0 | x | x | - | Cu alloy |
| T6549-62 | VA | W | x | x | x | - |
| B3131-35 | IA | 0 | x | - | - | - |
| B3179a-g | IA | M | x | - | - | Cu alloy |
| B5497a-f | IA | 0 | x | - | - | - |
| T4874-76 | IA | 0 | x | - | - | - |
| T7310-11 | IA | 0 | x | - | - | - |
| B4219a-g | MA | M | x | x | - | - |
| B7219a-e, B7436a-e | MA | 0 | x | x | x | - |
| T10613-27 | MA | MW | x | - | - | - |
| T14900a-w | MA | W | x | x | x | Cu alloy |
| T15454a-i | MA | 0 | x | x | - | - |
| B6949a-g | MP | M | (axe) | - | - | - |

Total: 35

**NORDLAND**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C20317a-m | VA | X | x | x | - | Ag, Cu alloy |
| C5611-20 | VA | M | x | - | - | Cu alloy |
| T15139a-i | VA | X | x | - | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| Ts2962-84 | VA | MW | x | - | x | Cu alloy |
| B3181a-f | IA | M | x | - | - | - |
| B5161a-q | IA | M | x | x | - | Ag, Cu alloy, niello |
| Ts1168-81 | IA | M | - | x | x | - |
| Ts1464-69 | IA | X | x | - | - | - |
| Ts1809-15 | IA | 0 | x | - | - | Cu alloy |
| Ts374-77 | IA | M | - | - | - | - |
| T11906a-k | MA | X | x | x | - | Ag |
| T2882-84 | MA | 0 | x | - | - | - |
| Ts1224-33, Ts702-3 | MA | 0 | x | - | - | - |
| Ts1636-45 | MA | M | x | x | - | - |
| Ts1717-25 | MA | 0 | x | x | x | - |
| Ts2919-27 | MA | M | x | - | - | - |
| Ts3025-27 | MA | 0 | x | - | - | - |
| Ts3496a-i | MA | M | x | - | - | Cu alloy |

Total: 18

**NORD-TRØNDELAG**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| T10654-69 | VA | M | x | x | - | Cu alloy |
| T14431a-n | VA | M | x | x | - | Cu alloy |
| T15248a-c | VA | 0 | x | - | - | - |
| T2188-94 | VA | 0 | x | - | - | - |
| T2370-77 | MA | M | - | - | - | - |
| T6149-55 | MA | 0 | x | - | - | - |

Total: 6

**OPPLAND**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C11350-55 | VA | 0 | x | x | x | - |
| C11465-70 | VA | 0 | x | - | - | Ag, Cu alloy |
| C1292-97 | VA | 0 | x | - | x | - |
| C14535-52, C19408-15 | VA | X | x | x | x | - |
| C1522-23, C1623-27 | VA | 0 | x | x | - | Cu alloy |
| C18182-85 | VA | 0 | x | - | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| C20188a-q | VA | W | x | x | - | - |
| C21866a-e | VA | 0 | x | x | - | - |
| C22785a-o | VA | M | x | - | x | - |
| C22994a-o | VA | W | x | x | x | - |
| C23363a-u | VA | W | x | - | x | - |
| C23404a-e | VA | M | - | x | - | - |
| C23525a-l | VA | M | x | - | - | - |
| C24427a-n | VA | M | x | - | - | - |
| C27240a-v | VA | MS | x | x | x | Cu alloy |
| C2764-79 | VA | MS | x | x | x | - |
| C36714a-o | VA | M | x | x | x | - |
| C3934-43 | VA | S | x | - | x | - |
| C8632-60 | VA | MS | x | x | x | - |
| C9861-66 | VA | 0 | x | - | - | - |
| B2810-24 | IA | 0 | x | - | - | - |
| C23047a-c | IA | W | x | - | - | - |
| C16002-16 | MA | 0 | x | x | x | - |
| C18196-212 | MA | S | x | - | - | - |
| C24607a-i | MA | S | x | - | - | - |
| C25712a-e | MA | X | x | - | - | - |
| C26524a-o | MA | W | x | x | - | - |

Total: 27

**ROGALAND**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| B4468a-d, B4438, B6056 | VA | 0 | - | - | - | Au, Pb |
| S2453a-r | VA | X | x | x | - | Cu alloy |
| S2502a-i | VA | 0 | x | x | - | - |
| S3335a-f | VA | M | x | - | - | - |
| S336-50 | VA | 0 | x | x | x | Cu alloy |
| S4066a-v | VA | MW | x | - | - | - |
| S4228a-f | VA | M | x | - | - | Cu alloy |
| S4860a-k | VA | 0 | x | - | - | - |
| S5768a-x | VA | M | x | x | x | - |
| S6185a-rr | VA | MW | x | x | x | Ag |

| | | | | | | |
|---|---|---|---|---|---|---|
| S6752a-g | VA | M | x | - | - | - |
| S6782a-hh | VA | M | x | - | - | Ag, Cu alloy, Pb |
| S8435a-q | VA | X | x | x | x | Ag |
| B1217-18 | IA | 0 | x | - | - | - |
| S2660a-r | MA | MW | x | x | x | - |
| S6358a-c | MA | M | x | - | - | - |

Total: 16

**SOGN OG FJORDANE**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| B1164-77 | VA | 0 | x | x | x | Cu alloy |
| B1193-1202 | VA | S | x | x | x | - |
| B1242-1265 | VA | MW | x | - | - | - |
| B461-2, B1335-41 | VA | S | x | - | - | Cu alloy |
| B2151-60 | VA | 0 | x | - | - | Au, Ag |
| B3106-19 | VA | MS | x | - | - | - |
| B3149a-l | VA | MW | x | - | - | - |
| B3459a-m | VA | W | x | - | x | - |
| B5592a-l | VA | M | x | x | - | Cu alloy |
| B5794a-c | VA | M | x | - | - | Ag, Cu alloy |
| B5801a-g | VA | 0 | x | - | - | Cu alloy |
| B6069a-ii | VA | MW | x | x | - | - |
| B6167a-d | VA | 0 | x | - | - | - |
| B6432a-k | VA | 0 | x | - | - | - |
| B6500a-w | VA | S | x | x | - | Au, Cu alloy |
| B6515a-g | VA | S | x | - | - | - |
| B6616a-i | VA | 0 | x | x | - | Cu alloy |
| B6618a-ff, B6688 | VA | MW | x | x | - | Cu alloy |
| B6655a-g | VA | 0 | x | - | x | - |
| B6661a-g | VA | 0 | x | - | - | - |
| B6685a-u | VA | MS | x | - | - | Cu alloy |
| B6735a-gg | VA | MS | x | x | x | Cu alloy |
| B6845a-q | VA | S | x | x | x | - |
| B6951a-s | VA | MW | x | x | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| B7011a-g | VA | M | x | - | - | - |
| B7229a-k | VA | S | x | - | - | - |
| B7239a-g | VA | M | - | x | - | - |
| B7345a-i | VA | M | x | - | - | - |
| B7346a-o | VA | S | x | x | x | - |
| B7375a-d | VA | MW | x | x | - | - |
| B7554a-q | VA | M | x | x | - | - |
| B762-65, B1895 | VA | MW | x | - | - | Au |
| B7640a-r | VA | MS | x | x | x | Pb |
| B7831a-l | VA | MW | x | - | - | Pb |
| B8036a-n | VA | S | x | - | - | - |
| B8038a-i | VA | M | x | x | - | - |
| B8107a-e | VA | 0 | x | x | - | - |
| B8135a-o | VA | S | x | - | x | - |
| B8821a-u | VA | X | x | x | - | Cu alloy |
| B8976a-e | VA | M | x | - | - | Cu alloy |
| B8994a-e | VA | M | x | - | - | Cu alloy |
| B9008a-x | VA | W | x | x | - | Cu alloy |
| B9063a-q | VA | 0 | x | x | - | Cu alloy |
| B9203a-l | VA | M | x | - | - | - |
| B23588a-n, B7347 | VA | S | x | x | x | - |
| B8272a-l | VA | M | x | - | - | Pb |
| B1068-89 | IA | M | x | x | - | - |
| B3064-81 | IA | MW | x | x | - | Cu alloy |
| B3968a-q | IA | 0 | x | x | x | - |
| B4372a-h | IA | 0 | x | x | x | - |
| B4394a-d | IA | W | x | x | - | - |
| B4584a-v | IA | MW | x | x | x | - |
| B4756a-ø | IA | MW | x | x | x | Cu alloy |
| B4943a-o | IA | S | x | - | - | Cu alloy |
| B5526a-r | IA | X | x | x | x | - |
| B5730a-y | IA | W | x | x | - | Cu alloy |
| B5786a-z | IA | MW | x | - | x | Cu alloy |
| B5807 I_a-n | IA | 0 | x | x | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| B5807 II_aa-ø | IA | W | x | x | x | - |
| B638-40 | IA | MW | x | - | - | - |
| B7809a-i | IA | 0 | x | - | - | - |
| B7833a-z, B7678 | IA | W | x | x | x | Cu alloy |
| B946-53 | IA | 0 | x | - | - | - |
| B5474a-g | IA | M | x | - | - | - |
| B3321 | IA | MS | - | x | - | - |
| B5145a-v | MA | W | x | - | x | - |
| B7007a-d | MA | 0 | x | - | - | - |
| B7809a-i | MA | 0 | x | - | x | - |
| B7810 I_a-k | MA | 0 | x | - | - | - |
| B78941a-x | MA | 0 | x | - | x | - |
| B8653a-t | MA | W | x | x | x | - |
| B5555a-h | MP | 0 | x | - | x | - |
| B6580a-l | MP | W | x | x | - | - |

Total: 73

**SØR-TRØNDELAG**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C22996a-k | VA | S | x | - | - | Cu alloy |
| T11880a-g | VA | X | x | x | - | Ag |
| T12372a-m | VA | X | x | x | - | Cu alloy |
| T1405-35 | VA | M | x | x | x | - |
| T1441-46 | VA | 0 | x | x | - | Cu alloy |
| T15260a-d | VA | 0 | x | - | - | Cu alloy |
| T8413-24 | VA | M | x | - | - | - |
| T8727-36 | VA | X | x | - | - | Ag, Cu alloy |
| T5143-47, T5615-21 | VA | S | x | - | - | - |
| T3982-83 | IA | 0 | x | - | - | - |
| T6678-83 | MA | X | x | - | - | - |
| T7263-76 | MA | 0 | x | x | - | - |
| T8492-517 | MA | MS | x | x | - | - |

Total: 13

**TELEMARK**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C10894-96 | VA | M | - | - | - | - |
| C1163-78 | VA | W | x | x | x | - |
| C11992-12001 | VA | MW | x | x | - | - |
| C1878-86 | VA | M | x | x | x | - |
| C20584a-y | VA | W | x | - | x | - |
| C24305a-l | VA | 0 | x | - | x | - |
| C25335a-h | VA | 0 | x | - | - | Cu alloy |
| C26637a-t | VA | M | x | - | - | - |
| C3379-90 | VA | 0 | x | - | x | Cu alloy |
| B5725a-f | IA | M | x | - | - | - |
| C26399a-p | MA | 0 | x | x | - | - |

Total: 11

**TROMS**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| Ts207 | IA | M | (axe) | - | - | Cu alloy |
| Ts2519-25 | IA | M | - | - | - | - |
| Ts528-35 | IA | 0 | x | - | - | - |
| Ts907-15 | IA | 0 | (axe) | - | - | - |
| Ts975-83 | IA | M | x | - | - | - |
| Ts2278-88 | MA | M | x | - | - | - |
| Ts2899-2911 | MA | M | x | x | - | Au, Cu alloy |
| Ts3639a-g | MA | X | x | - | - | - |

Total: 8

**VESTFOLD**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C11182-84 | VA | 0 | x | - | - | Cu alloy |
| C11883-95 | VA | 0 | x | x | - | Cu alloy |
| C12009-19 | VA | M | x | x | x | Ag |
| C12046-59 | VA | S | x | - | - | Cu alloy |
| C12659-68 | VA | M | x | x | x | Au, Cu alloy, Pb |
| C13458-78 | VA | M | x | - | x | Cu alloy |
| C13698-715 | VA | X | x | x | x | Ag, Cu alloy |

| | | | | | | |
|---|---|---|---|---|---|---|
| C14078-90 | VA | 0 | x | - | - | Ag, Cu alloy |
| C14286-98 | VA | MW | x | - | x | - |
| C15040a-e | VA | M | x | - | - | - |
| C15104-16, C15120 | VA | MW | x | x | - | Cu alloy |
| C16477-82 | VA | M | x | x | x | Ag, Cu alloy, Ph |
| C16483-92 | VA | MW | x | x | x | Cu alloy |
| C17147-50 | VA | 0 | x | - | - | - |
| C18188-91 | VA | 0 | x | - | - | - |
| C19837-39 | VA | 0 | - | - | - | - |
| C20566a-h | VA | M | x | - | - | - |
| C22443a-ee | VA | S | x | x | x | Pb |
| C22444a-o | VA | 0 | x | x | - | - |
| C22459a-r | VA | S | x | x | x | - |
| C22462a-s | VA | S | x | x | x | - |
| C22649a-f | VA | M | x | - | - | - |
| C24338a-u | VA | M | x | - | - | - |
| C24454a-k | VA | M | x | - | x | Cu alloy |
| C26645a-m | VA | MS | x | x | x | - |
| C26739a-r | VA | MW | x | x | x | - |
| C4291-92 | VA | 0 | - | - | - | - |
| C5046-49 | VA | M | x | - | - | Cu alloy |
| C6037a-c | VA | 0 | x | - | - | - |
| C7422-31 | VA | S | x | x | - | - |
| C8894-95 | VA | 0 | x | - | - | Ag |
| C9065-82 | VA | X | x | x | - | - |
| C17819-21 | IA | 0 | - | - | - | - |
| C5251a-b | IA | MS | (axe) | - | - | - |

Total: 34

**VEST-AGDER**

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C22805a-x | VA | S | (axe) | x | x | - |
| C27269a-w | VA | M | x | - | x | Au, Ag, Cu alloy |
| C6618-23, C6789 | VA | S | x | - | - | - |

| | | | | | | |
|---|---|---|---|---|---|---|
| C25728g-ee | MA | M | x | - | x | - |

Total: 4

ØSTFOLD

| Find number | Period | Tool context | Weapons | Farming eq. | Riding eq. | Non-f. metal |
|---|---|---|---|---|---|---|
| C16380-90 | VA | 0 | x | - | - | Ag |
| C18352a-d | VA | S | - | - | - | - |
| C18527 | VA | M | - | - | - | - |

Total: 3

# APPENDIX C

EXCLUDED MATERIAL

*All the material of this thesis is found through Jørgen Bøckman's (2007) revision of Jan Petersen's (1951) finds list, freely available on jorgen.bockman.no. The list of excluded material as presented below is meant as a help toward further research. All excluded finds of this thesis have been left out due to one of the following: Missing information / mixed context / problems with typology / registered as loose find / find not registered in the online unimus.no databases / find not confirmed by unimus.no. It is likely that information on these finds can be found by searching the physical museum archives directly.*

| **County** | **Find numbers** |
|---|---|
| Akershus | C6414 |
| Aust-Agder | C11135, C7818-23, C7843, T(?)334e |
| Buskerud | C32242, C3033, C17950-54 |
| Hedmark | C19685, C19686, C10711, C10718, C10720, C10721, C10757, C25936b, C4723, C5391, C24773a, C9544, C9545, C9546, C9547, C9548, C9549, C9551, C9552, C9553, C9557, C9591, C9611, C22138, C26936 |
| Hordaland | B5731k, B878-80, B8198c, B6470f, B1047, B243ff, B2811, B4155 |
| Møre og Romsdal | C6176, C6177, C6178, C11608f, 33308, C11919, T6753 |
| Nordland | Ts1762, Ts1762, Ts276, Ts277, Ts282, Ts283, Ts285, Ts2918, Ts3654e, Ts552, Ts766, Ts641 |
| Nord-Trøndelag | T1221, T2193, T2194, T639 |
| Oppland | C24807d, C16395-6, C16397-8, C16399, C16400-1, C21120a-b, C24193, C24811, C10188n, C22120j |
| Rogaland | S2290, B3972, C7216, C7216, S4918h |
| Sogn og Fjordane | B698, B699, B702, B705b, B706, B1433-35, B5405f, B5405g, B7649b, B752-54 |
| Sør-Trøndelag | C3668, C5255-74, T1723, T1964, T1968, T3243, T3620, T4079, T4297, T4438, T4439, T4446, T6298-302, T6311, B2688-94, C1066-72, T8677 |
| Telemark | C13935, C23951a-f |
| Troms | C5493-5505, Ts880 |
| Vest-Agder | C22273, C27277, B5787 |
| Vestfold | C12521, C4321, B809, C19720b, C22649e, C6472-75, C6900 |

| | |
|---|---|
| Østfold | C15875 |

# APPENDIX D

TABLES AND FIGURES

*Abbreviations for tool contexts are explained on p. 50.*

**Chapter 6.2 – Graves by county**

| County | Total | Viking Age | Merovingian Age | Migration Period |
|---|---|---|---|---|
| Østfold | 3 | 3 | - | - |
| Akershus | 4 | 4 | - | - |
| Hedmark | 20 | 16 | 1 | - |
| Oppland | 27 | 20 | 5 | - |
| Buskerud | 10 | 8 | 1 | - |
| Vestfold | 34 | 32 | - | - |
| Telemark | 11 | 9 | 1 | - |
| Aust-Agder | 7 | 7 | - | - |
| Vest-Agder | 4 | 3 | 1 | - |
| Rogaland | 16 | 13 | 2 | - |
| Hordaland | 31 | 17 | 3 | - |
| Sogn og Fjordane | 73 | 46 | 6 | 2 |
| Møre og Romsdal | 35 | 24 | 5 | 1 |
| Sør-Trøndelag | 13 | 9 | 3 | - |
| Nord-Trøndelag | 6 | 4 | 2 | - |
| Nordland | 18 | 4 | 8 | - |
| Troms | 8 | - | 3 | - |
| Finnmark | - | - | - | - |
| **Total numbers** | **320** | **219** | **41** | **3** |

*Table 1: Distribution of «smiths' graves» by county and time period, sorted from East to South to West to North. Note that many of the graves are undated.*

**Chapter 9.6 – Hammers**

| **Tool context** | Total | MW | MS | M | W | S | X | 0 |
|---|---|---|---|---|---|---|---|---|
| **VA** | 12 | 5 | 3 | 3 | 0 | 0 | 1 | 0 |
| **Undated** | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 |
| **MA** | 7 | 3 | 1 | 3 | 0 | 0 | 0 | 0 |

*Table 2: 21 finds holding more than one hammer, by tool context and divided into VA, MA, and undated finds.*

**Chapter 10.4 – Multicrafters**

| Number of tools | Total number of graves | Swords | Spears | Shields | Arrows |
|---|---|---|---|---|---|
| 5 or more | 25 | 92 | 68 | 44 | 64 |
| 2 to 4 | 16 | 69 | 50 | 31 | 44 |

*Table 3: Differences in weapon percentages between multicrafter graves holding low and high numbers of tools.*

| Number of tools | Total number of graves | Axes | Equipment for farming | Equipement for riding | Non-ferrous metal |
|---|---|---|---|---|---|
| 5 or more | 25 | 84 | 64 | 40 | 48 |
| 2 to 4 | 16 | 88 | 56 | 44 | 25 |

*Table 4: Differences in percentages of grave goods in multicrafter graves holding low and high numbers of tools.*

**Chapter 10.5 – Summary**

| Tools | VA | MA | MP | Total |
|---|---|---|---|---|
| Total | 97 | 14 | 1 | 112 |
| M | 66 | 11 | 1 | 78 |
| MW + MS | 31 | 3 | 0 | 34 |
| % M | 68 | 79 | 100 | 70 |
| % MW + MS | 32 | 21 | 0 | 30 |

*Table 5: Periodical variation of graves holding metalworking indicators, showing a heightened tendency for multicrafter graves in the VA. Undated finds are excluded.*

**Chapter 11.1 – Inhumation, cremation and boat graves**

| Cremation | Total | VA | IA | MA | % |
|---|---|---|---|---|---|
| 0 | 30 | 24 | 2 | 4 | 28 |
| X | 7 | 4 | 1 | 2 | 7 |
| M | 26 | 21 | 3 | 2 | 24 |
| W | 16 | 8 | 5 | 3 | 15 |
| S | 12 | 9 | 1 | 2 | 11 |
| MW | 12 | 9 | 3 | 0 | 11 |
| MS | 4 | 4 | 0 | 0 | 4 |
| Total | 107 | 79 | 15 | 13 | 100 |

*Table 6: The distribution of cremation graves by tool indicator category.*

| Inhumation | Total | VA | IA | MA | MP | % |
|---|---|---|---|---|---|---|
| 0 | 15 | 10 | 3 | 2 | 0 | 32 |
| X | 4 | 2 | 0 | 2 | 0 | 9 |
| M | 16 | 8 | 3 | 4 | 1 | 34 |
| W | 2 | 1 | 0 | 0 | 1 | 4 |

| | | | | | | |
|---|---|---|---|---|---|---|
| S | 3 | 3 | 0 | 0 | 0 | 6 |
| MW | 6 | 4 | 0 | 2 | 0 | 13 |
| MS | 1 | 1 | 0 | 0 | 0 | 2 |
| Total | 47 | 29 | 6 | 10 | 2 | 100 |

*Table 7: The distribution of inhumation graves by tool indicator category.*

## Chapter 11.3 – Equipment for Farming

| Material indicators | Number of graves with craft indicators | Number with farming indicators | Percentage with farming indicators |
|---|---|---|---|
| 0 | 114 | 36 | 32 |
| X | 18 | 12 | 67 |
| M | 94 | 26 | 28 |
| W | 26 | 20 | 77 |
| S | 27 | 10 | 37 |
| MW | 29 | 16 | 55 |
| MS | 12 | 9 | 75 |
| **Total numbers** | **320** | **129** | **40** |

*Table 8: Distribution of equipment for farming in crafter graves, by tool category. Note the low percentage of the pure metalworker category (M).*

| Material indicators | Number of graves with craft indicators | Number with farming indicators | Percentage with farming indicators |
|---|---|---|---|
| 0 | 114 | 35 | 31 |
| X | 18 | 12 | 67 |
| M | 94 | 26 | 28 |
| MW, MS | 41 | 25 | 61 |

*Table 9*: *The results as presented when including only graves with tools that may have been used for metalworking. Note that the categories with more than one tool (X, MW, MS) show a higher overall percentage compared to the categories in which there are occurences of single tools (0, M).*

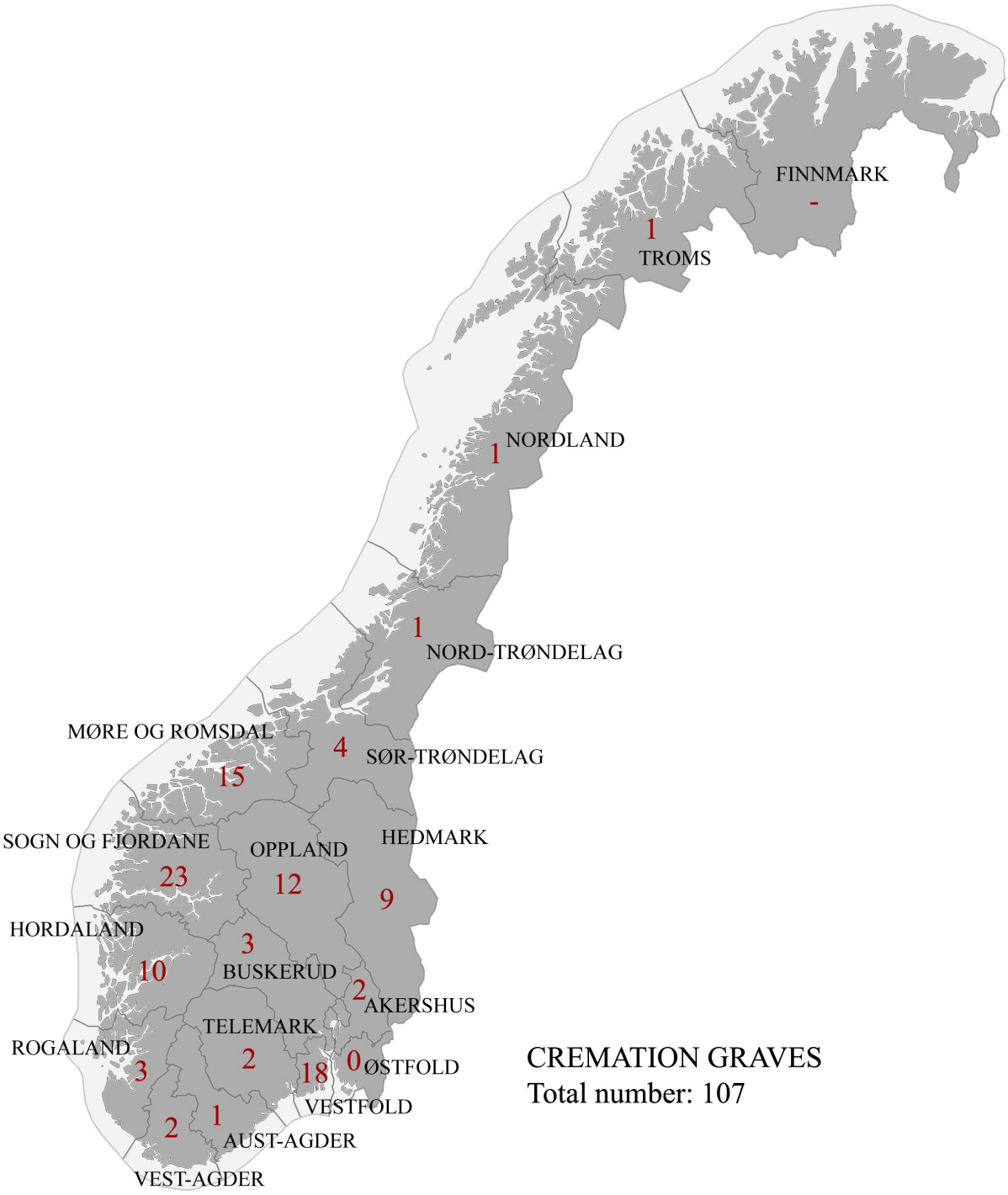


*Fig. 1: Distribution of cremation graves in Norway, by county. Map taken from Statens Kartverk and edited by the author.*

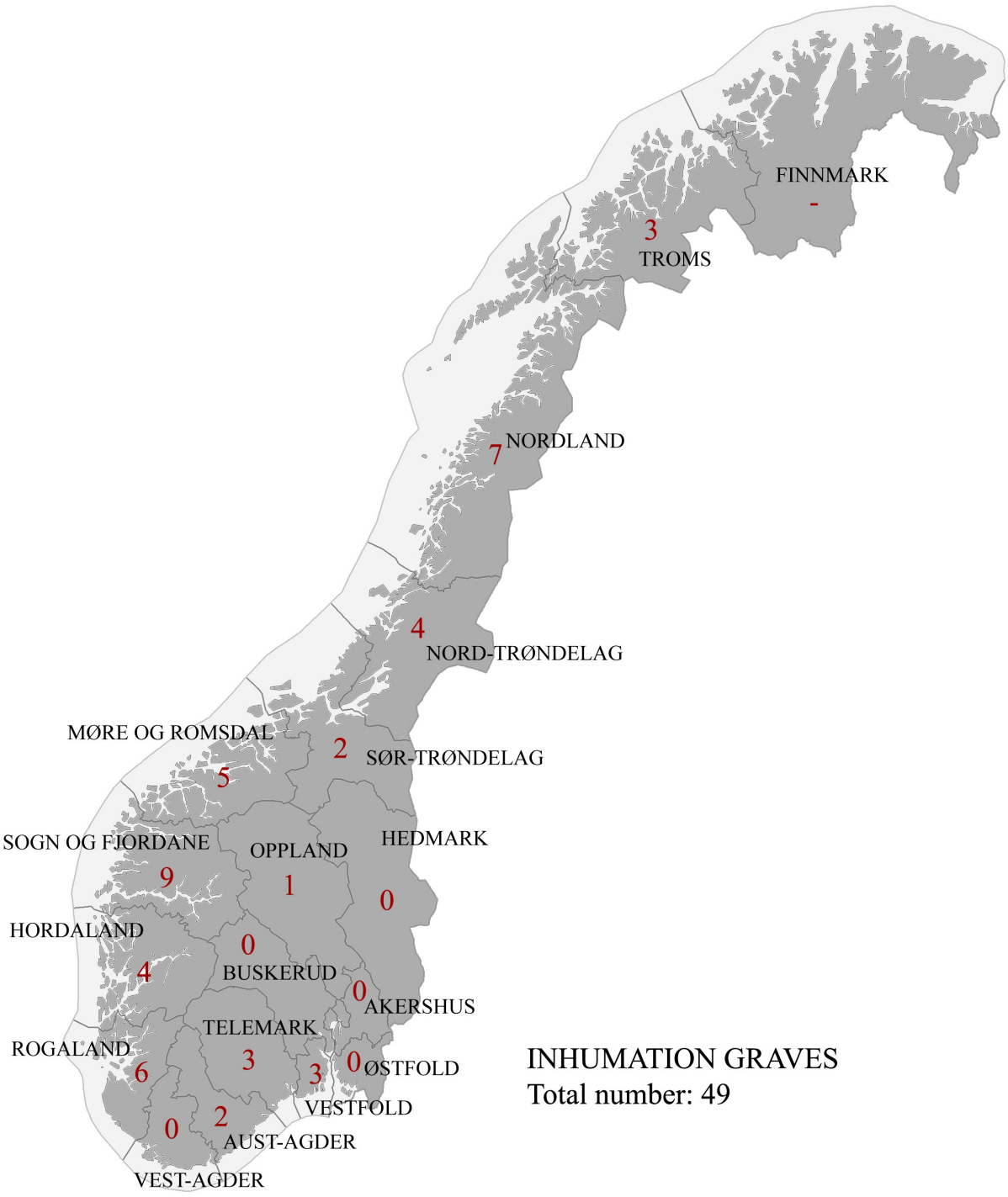


*Fig. 2: Distrubution of inhumation graves in Norway, by county. Map taken from Statens Kartverk and edited by the author.*

| | Total | All periods | VA | IA | MA | MP | % |
|---|---|---|---|---|---|---|---|
| 0 | 114 | 35 | 23 | 5 | 7 | 0 | 31 |
| X | 18 | 12 | 10 | 1 | 1 | 0 | 67 |
| M | 94 | 26 | 19 | 3 | 4 | 0 | 28 |
| W | 26 | 20 | 9 | 6 | 4 | 1 | 77 |
| S | 27 | 10 | 10 | 0 | 0 | 0 | 37 |
| MW | 29 | 16 | 12 | 3 | 1 | 0 | 55 |
| MS | 12 | 9 | 7 | 1 | 1 | 0 | 75 |
| Total | 320 | 128 | 90 | 19 | 18 | 1 | 40 |
| % (320) | 100 | 40 | 41 | 33 | 44 | 33 | - |

*Table 10: The distribution of equipment for farming in crafter graves, by tool indicator category, showing a stable distribution of between 33-44 percentages throughout the Late Iron Age.*

## Chapter 11.4 – Equipment for riding

| | Total | All periods | VA | IA | MA | % |
|---|---|---|---|---|---|---|
| 0 | 114 | 14 | 7 | 4 | 3 | 13 |
| X | 18 | 6 | 5 | 1 | 0 | 30 |
| M | 94 | 10 | 8 | 1 | 1 | 11 |
| W | 26 | 12 | 5 | 4 | 3 | 46 |
| S | 27 | 8 | 8 | 0 | 0 | 30 |
| MW | 29 | 6 | 3 | 2 | 1 | 21 |
| MS | 12 | 7 | 7 | 0 | 0 | 58 |
| **Total** | **320** | 63 | 43 | 12 | 8 | 20 |
| % | - | 20 | 20 | 21 | 20 | - |

*Table 11: The relationship between equipment for riding and equipment for farming. The distribution of graves containing both.*

| **Material indicators** | **Number of graves with craft indicators** | **Number with riding equipment** | **Percentage with riding equipment** |
|---|---|---|---|
| M | 94 | 23 | 25 |
| 0 | 114 | 30 | 26 |
| X | 18 | 6 | 33 |
| MW, MS | 41 | 17 | 41 |
| W | 26 | 17 | 65 |

*Table 12: Graves with equipment which may have been used for metalsmithing (M, 0, X, MW, MS) compared with graves with woodworking tools only (W), sorted from lowest to highest percentage.*

## Chapter 11.6 – Non-ferrous metal

| Material indicators | Total number of graves | Graves with non-ferrous metal | Gold | Silver | Copper alloy | Total percentages |
|---|---|---|---|---|---|---|
| 0 | 114 | 35 | 4 | 10 | 29 | **31** |
| X | 18 | 9 | - | 7 | 5 | **50** |
| M | 94 | 31 | 3 | 11 | 29 | **33** |
| W | 26 | 8 | 1 | 2 | 8 | **31** |
| S | 27 | 7 | 1 | 2 | 6 | **26** |
| MW | 29 | 13 | 1 | 3 | 11 | **45** |
| MS | 12 | 3 | - | - | 3 | **25** |
| **Total** | **320** | **106** | **10** | **35** | **91** | **33** |

*Table 13: Distribution of non-ferrous metal in graves.*

| Tool context | Graves with non-ferrous metal | Decorated weapons | Gold | Silver | Copper alloy | Total percentages |
|---|---|---|---|---|---|---|
| 0 | 34 | 10 | 1 | 6 | 7 | 29 |
| X | 10 | 9 | - | 7 | 4 | 90 |
| M | 31 | 12 | 1 | 8 | 6 | 39 |
| W | 8 | 2 | - | 1 | 2 | 25 |
| S | 7 | 3 | - | 1 | 3 | 43 |
| MW | 13 | 4 | - | 2 | 2 | 31 |
| MS | 3 | 1 | - | 1 | 1 | 33 |
| **Total** | **106** | **41** | **2** | **26** | **25** | **39** |

*Table 14: The distribution of weapon decorations in graves, sorted by tool context. Note that some weapons hold decorations made from several kinds of metal, e.g. both bronze and silver. Percentages from total number of cases of non-ferrous metal in graves.*

### Chapter 11.7 – Axes

| Tool context | Total number of graves | Number of graves with axes | Percentage of graves with axes |
|---|---|---|---|
| 0 | 114 | 70 | 61 |
| X | 18 | 15 | 83 |
| M | 94 | 60 | 64 |
| W | 26 | 21 | 81 |
| S | 27 | 18 | 67 |
| MW | 29 | 26 | 90 |
| MS | 12 | 8 | 67 |

| | | | |
|---|---|---|---|
| **Total numbers** | **320** | **218** | **68** |

*Table 15: Distribution of axes by tool context.*

## Chapter 11.8 – Weapons in graves

| Weapons | Total | 0 | X | M | W | S | MW | MS | % |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 30 | 13 | 0 | 12 | 0 | 3 | 0 | 2 | 9 |
| 1 | 83 | 32 | 3 | 29 | 5 | 5 | 9 | 0 | 26 |
| 2 | 85 | 32 | 5 | 27 | 8 | 3 | 8 | 2 | 27 |
| 3 | 81 | 28 | 4 | 20 | 5 | 12 | 6 | 6 | 25 |
| 4 | 41 | 9 | 6 | 6 | 8 | 4 | 6 | 2 | 13 |
| Total | 320 | 114 | 18 | 94 | 26 | 27 | 29 | 12 | 100 |

*Table 16: Distribution of weapons in graves from no weapons (0) to the inclusion of all four (4) weapon categories (swords, spears, shields and arrows).*