



UPPSALA
UNIVERSITET

Institutionen för arkeologi
och antik historia

Animals in burial contexts

An investigation of Norse rituals and human-animal relationships
during the Vendel Period and Viking Age in Uppland, Sweden

Hannah Strehlau

Master's thesis 45 ects in Archaeology
Springterm 2018
Supervisor: Anders Kaliff
Co-supervisor: John Ljungkvist
Campus Uppsala

Abstract

Strehlau, H. (2018) *Animals in burial contexts: an investigation of Norse rituals and human-animal relationships during the Vendel Period and Viking Age in Uppland, Sweden.*

The deposition of animals in graves was an essential aspect of burial practice in Scandinavia during the Vendel Period and Viking Age (550–1050 AD). While this rite occurs in many different regions, it is most clearly observed in the boat-graves from the famous cemeteries in Swedish Uppland, such as Vendel and Valsgärde, as well as in a number of high-status cremation graves. Former studies have tended to interpret faunal remains from burial contexts as food offerings, diplomatic gifts or simply as sacrifices. These explanations place an emphasis on the importance of the human dead and imply that grave assemblages mainly served to accompany the deceased as a provision for the afterlife, or to illustrate power, status and identity among the living.

The master's thesis presented here, comprises an analysis of animal depositions from both cremation and inhumation burials in Uppland. By applying the theory of agency, this study focuses on grave assemblages and human-animal relationships as a means of understanding burial practices. Instead of only paying attention to the type of bones and the animal species, it is equally important to consider the condition of the bones, their placement inside the grave and the placement of artefacts ascribed to certain animals in relation to the human dead. This is not only essential to decoding human-animal relationships as evident in burial practices, but also to understanding the many different processes that culminated in the deposition of animal bones in graves.

Keywords: human-animal relationships, burial ritual, Scandinavia, Vendel Period, Viking Age

Master's thesis in archaeology 45 ects. Supervisor: Anders Kaliff; co-supervisor: John Ljungkvist. Submitted and approved 2018-06-27.

© Hannah Strehlau

Departement of Archaeology and Ancient History, Uppsala University, Box 626, 75126 Uppsala, Sweden.

Preface

Both funerary rituals and human-animal relationships are research fields that are not confined to archaeology, but are discussed in different academic disciplines of the humanities, the social sciences and in osteology. As a student of archaeology, however, I believe that my personal interest in both fields started to emerge with one specific incident:

During the summer of 2013, I participated in a rescue excavation in south-western Germany, documenting settlement structures of the Linear Pottery Culture, the Urnfield Culture and the Hallstatt- and Latène Periods. Unexpectedly, a grave appeared among the settlement remains. It was the very first prehistoric grave that I took part in excavating and that I had seen in general. While previous fieldwork had consisted of sheer enthusiasm for every single piece of rounded ceramic sherds in fingernail-size, this discovery brought my archaeological experience to a whole new level and, moreover, stood in contradiction to all my expectations. We uncovered the fairly well-preserved skeleton of an adult deceased but, when approaching the region around the skull, further bone material emerged from the soil. In the end, it was revealed that the head of the deceased had been bedded on a dog's body.

This was probably the starting point for my interest in funerary rituals and human-animal relationships as an archaeological concern, further motivated by a personal dispute with myself, marked by a periodic urge to vegetarianism and the ongoing search for an understanding of our relations to different animals today and in prehistoric times. Furthermore, as I know now, it was also the probably most fruitful and inspiring birthday present that I ever got.

As an archaeology student engaging with osteological affairs, it took time and effort to become acquainted with the material and methods of this discipline. Therefore, I was dependent on the help by Swedish osteologists and osteology students.

Hence, my thanks go to osteologist Emma Sjöling, who gave good advice and pointed out with what kind of thinking osteologists approach their research question and which aspects need to be taken into consideration. Further thanks go to my study colleagues Chris for stimulating conversations and quick osteological help when it was needed, as well as to Anna who gave important comments on my text. In this context, I also need to thank Jhonny Therus for useful hints on suitable burial grounds in Uppland, Anneli Ekblom for a never-ending methodology class and other members of the department who directly or indirectly contributed to the outcome of this study.

I thank my parents who were a big support and never gave up believing that I would make my way coming to Sweden and completing my master studies here. I also want to thank my roommate, just for being at home, listening to my problems and especially for providing me with food.

Last but not least, my biggest thanks go to my supervisors Anders Kaliff and John Ljungkvist, who turned out to be a perfect combination of teachers, engaging with issues of pre-Christian religion on the one side and with the concrete material on the other.

In addition, it shall be mentioned that material footage and imagery was kindly provided by the *Viking Phenomen Project*.

Innehåll

1. Introduction	6
1.1. Starting point	6
1.2. Purpose and aims.....	8
1.3. Theoretical aspects	9
1.4. Method and Material.....	11
2. Previous Research	14
3. The Database	16
3.1. Explanation of the database.....	16
3.1.1. Requirements and preconditions.....	16
3.1.2. Explanation of tables and their information	16
3.2. Interpretive handling of the grave assemblages.....	17
3.2.1. Dating	17
3.2.2. Status determination	17
3.2.3. Standardization of gender- and sex determination.....	18
3.2.4. Standardization of age determination	19
3.2.5. Burial types.....	20
3.2.6. Degree of disturbance	20
3.2.7. The question of cremation on-site	21
3.3. Source-critical problems	22
3.3.1. Taphonomy and other source-critical aspects.....	22
3.3.2. Critical notes concerning osteology reports.....	23
4. Data Analysis	25
4.1. Statistical Analysis.....	25
4.1.1. Introduction.....	25
4.1.2. Changing numbers of animals in graves.....	25
4.1.3. Frequency of species and animal groups	30
4.1.4. Complete- or incomplete depositions?	35
4.1.5. Body part frequency and bone condition.....	41
4.2. Spatial analysis.....	45
4.2.1. The distribution of bones in- and outside the urn in cremation burials	45
4.2.2. The spatial positions of bridles, halters and dog's collars and -leashes inside inhumation graves – an indication for special perceptions of certain animals?.....	48
4.3. Summary.....	50
5. Interpretation	53

5.1. Interpretation of different kinds of depositions	53
5.1.1. How to recognize an intentional deposition?.....	53
5.1.2. Incomplete depositions.....	54
5.1.3. Complete and almost complete depositions.....	56
5.2. Interpretation of significant animal depositions	57
5.2.1. Depositions with exclusive social restrictions.....	57
5.2.1.1. Dogs and horses.....	57
5.2.1.2. Symbolic depositions of cattle.....	59
5.2.2. Depositions with possible social restriction.....	60
5.2.2.1. Chickens in special placements – a symbolic action with a restriction to female burials?.....	60
5.2.2.2. Completely deposited cattle in male graves of high status.....	62
5.2.2.3. Indications for hunting only in male graves of high status?.....	63
5.3. Conclusion	66
6. Final Discussion.....	68
7. Future Prospects.....	72
Summary.....	74
List of Abbreviations.....	76
Abbreviations in the text and bibliography	76
Abbreviations in the database	77
Tables and Figures.....	78
Sources.....	79
Publications used for the database	79
Primary sources	81
Internet sources	81
Literature.....	82
Appendix 1 Tables.....	90
Appendix 2 The Database.....	92
General information on cremation graves	92
General information on inhumation graves	96
Specific information on animals in cremation graves	98
Specific information on animals in inhumation graves	112

1. Introduction

1.1. Starting point

During the Late Iron Age (400–1050 AD¹), animals were an essential part of human burials in Scandinavia². This is nothing new compared to earlier periods except for the amount and variation of species that increase significantly with the beginning of the Vendel Period (550–750 AD) and continue with the Viking Age (750–1050 AD)³ (Sigvallius 1994: 133; cf. Jennbert 2002: 109f.).

The expression “animals in burial contexts⁴” describes all kinds of faunal remains, that can be identified as intentional depositions. Those animals can be represented by various bones but likewise just by a single tooth. They can show cut marks or other forms of bone manipulation or none of them. In inhumations, their position in situ can tell about how they came in the grave and how the spatial relation is to other elements in the burial. And in cremation graves, there can be burnt bones with a variety of degrees of combustion, and unburnt bones at the same time, indicating a range of different actions and placements on the pyre, both spatially and temporally.

This diversity of animal depositions gives us an impression of the complexity of the “burial ritual” at that time. While this rite occurs in many different regions in Sweden, it is most clearly observed in the boat-graves from the famous cemeteries Vendel and Valsgärde in the historical province Uppland (cf. Arwidsson 1942, 1954, 1977; Stolpe & Arne 1912). However, studies on cremation graves (e.g. Iregren 1972; Sigvallius 1994; Sten & Vretemark 1988), have revealed that an outstanding equipment of animal depositions is not left to boat-graves alone. In addition, they even occur in Viking Age chamber graves, as the well-known site Birka in Stockholm shows (cf. Arbman 1943). To make it even more complicated, animals were also buried in separate graves, which, however, do not occur very frequently in Iron Age Scandinavia (Jennbert 2003) and are not respected in this thesis.

The custom of depositing animals or parts of them, is also known from other contexts. Faunal remains interpreted as ritual depositions, can be found in wetlands as parts of food-gifts, protection- or booty-offerings (Vretemark 2013 b: 52), but also from wells (e.g. Fredengren 2015), post-holes and other settlement contexts (e.g. Ljungkvist 2000: 51; Lucas & Lucas 2013) (*Fig. 1*). Furthermore, the wider archaeological record gives indications of sacrificial acts. Gamla (“Old”) Uppsala, the well-known political and cultic centre in Uppland, which is not least known for its three monumental burial mounds, is mentioned in vivid descriptions in Medieval literature. One of them is the German Christian cleric Adam von Bremen⁵, who writes about the existence of a temple in (Gamla) Uppsala, in which every nine years a festival was held (*Gesta Hammaburg. IV* chapter 27). This should have included the sacrifice of both humans and animals, that were hung

¹ The abbreviation AD for *anno Domini*, originates from Medieval Latin, meaning “in the year of the Lord” and is thereby related to Christianity, others might prefer the term CE for Common Era which is regarded as neutral.

² As an answer to anthropocentrism, some scholars prefer to use the terms “human animals” and “non-human animals”. However, a categorical separation of humans and animals seems in fact more suitable in the context of animal depositions in human burials of a complex society, and is therefore applied in this thesis.

³ An explanation of the dating used in this thesis follows in Chapter 3.2.1.

⁴ The term „burial context“ is in this thesis restricted to human burials, meaning animals in the context of human graves.

⁵ The credibility of Adam von Bremen’s descriptions must be doubted, since his accounts are written from a Christian point of view and therefore most probably religiously biased. Moreover, he has only been to Denmark, but never to Uppsala himself (Hultgård 1997: 9; Näsström 1997: 88).



Figure 1 Example for ritual animal depositions in a posthole of the large Vendel Period hall on the southern plateau in Gamla Uppsala (Foto: Hannah Strehlau, taken in connection with the *Viking Dynasties*-excavations in Gamla Uppsala).

up in trees after they were killed (*idem*).

Animals in burial contexts are commonly interpreted as food offerings, feasting remains, or simply as sacrifices (e.g. Kaliff 2004: 28; Mansrud 2004: 94f.; Vretemark 2013 a: 381). Moreover, especially animals that were deposited completely, receive further explanations, such as companions and pets of the deceased, or status symbols and diplomatic gifts (Jennbert 2011: 69). In fact, an emotional bond seems likely when thinking about the relationships between humans and their pets today, which can even result in the burial of those animals alongside people on the same cemetery (Vatomsky 2017). But at the same time, the ritual killing or sacrificing of an animal, as it was the case in the burials of Iron Age Sweden, seems contradictory to the ethical understanding of emotional care for an animal nowadays.

However, it is possible that the practices of sacrificing may be hard to understand from a modern perspective. Therefore, during the past 30 years, there have been increasing debates on the deeper meaning behind sacrifices, mainly originating in religious studies (cf. Chapter 2.1). There is a tendency to regard sacrificial acts as linked to the cosmological origin (Jennbert 2002: 116; cf. Kaliff 2007; Lincoln 1986; Näsström 2002). This was often supported by the identification of ritual killings in mythological sources. In the founding myth, Odin and his brothers Vili and Vé kill the frost-giant Ymir in order to create the universe (Grimnismál 40-41). His flesh formed the earth, his sweat (or blood) the sea, the mountains were built from his bones, the trees from his hair, the heaven from his skull, his brows formed Midgard (the human realm), and his brain constituted the clouds (*idem*; Lincoln 1986: 1).

This event is interpreted as demonstrating creation through a sacrificial act (Lincoln 1986: 50; Näsström 2002: 253). Parallels to that have been found in the mythologies of various Indo-European cultures, and might point towards a common and even older world of ideas (*eadem*). The need for a constant repetition of sacrifices is then explained by the maintenance of the cosmos (Lincoln 1986: 64).

But does this apply only to sacrifices *per se* or also to animals in human burials? Or rather, are those animal depositions even sacrifices?

1.2. Purpose and aims

Extensive studies of faunal remains from burial contexts from Sweden, have previously been carried out solely by osteologists whose primary focus lies in identifying patterns of depositions from different parts of the Late Iron Age (cf. Chapter 2). Their analyses were limited to single cemeteries or restricted geographic areas and focused on the answering of basic questions, such as the identification of species and body regions as well as the correlation of certain species with the age and gender of the deceased (cf. Iregren 1972; Sigvallius 1994; Chapter 2). Hence, such analyses lack both the separation and a thorough interpretation of different depositions, animals and actions in the burial ritual.

The aim of this thesis, is to discuss the possible functions and meanings of different animals in the funerary ritual and to shed light on the perception of those animals as it existed during the Vendel Period and Viking Age. It is a methodologically challenging task as it, in contrary to most previous studies (see above), evokes the problems of comparing numerous cremation burials analysed and reported in a highly variable degree. In order to identify and discuss general patterns or shifts in ritual practice, it is necessary to incorporate large data sets. But this approach also generates large methodological and source critical challenges due to the varying quality of analyses and published data sets (cf. Chapter 2).

In order to approach this aim, further research questions need to be applied. First of all, the examination of overall patterns in the custom of animal depositions in human graves is important. Subsequently, analyses will include potential pattern shifts, measured at the social factors of the age, gender and the social status of the deceased, as well as at the burial type (cremations and inhumations) and the time-period (Vendel Period and Viking Age). Assuming, that animal depositions are interwoven in the material distinction of social inequality, this study attempts to find out how this principle can be applied to different species or to the number of animals in general. Are there specific animals that only appear among a certain age group, gender or only in high- status graves? And in reverse, are there animals encountered that cannot be connected to those factors at all, can this then be interpreted as an animal that everyone could receive in the burial? Or in other words, is the number or composition of animals an indication for the age, gender or social status of the deceased?

Along with the examination of structures in the ritual custom, goes the endeavour to identify different types of depositions. The supposed varying interpretations of these depositions, promise to lead to different meanings of different animal species in the burial ritual. A central claim in this thesis is, that the way of depositing changes the meaning of the deposition, and thereby the meaning of the animal in this specific context. Therefore, it is relevant to analyse the completeness of the animal bodies, as well as the condition of the skeletal remains. Was the complete animal deposited or only specific parts? Are there cut-marks or other forms of bone manipulation visible, that would indicate defleshing and consumption of the meat before the remains ended up in the archaeological record? And concerning cremation graves, are the bones burnt or unburnt? The degree of burning of the bone would show whether an animal was put on the pyre or if it was deposited in the grave after the cremation. The condition of the bones and the way of depositing, are indications for the treatment of that animal. Repetitions of similar treatments of the same species should, accordingly, give an indication of the meaning of a specific animal in the ritual.

Another important assumption of this study, is that the context and spatial arrangement of the grave assemblage is related to the symbolic meaning and the perception of the animal. This concerns urn graves, asking which bones were found inside- and which outside the urn, and the relation of horse bridles to both the horse itself and to the deceased. The position of the remains can also give an indication for the personal relationship that might have existed between an animal and the deceased during lifetime, respectively the general reputation of an animal in the society. Likewise, however, there might be animals which receive a different symbolic meaning or reputation during the acts related to the burial, compared to their former purpose during lifetime. Moreover, it is relevant to discuss whether and how the appearance and character of an animal could have had an influence on its relation to the human and on its ensuing treatment in the burial

ritual.

While the type of deposition influences the meaning of an animal, it is equally important to analyse the deposition itself. But rather than preparing a precise and detailed description of the whole funeral process, this study prefers to identify the different intentions that underlie the deposition of the animals in particular. Assuming, that faunal remains reflect the tangible traces of these actions, their varying appearances in the archaeological record can lead to the distinction of different reasons and motivations for their presence.

Against this backdrop, previous interpretations of animals in burials will be questioned and discussed critically. Especially the term sacrifice appears as a problematic concept and does not entirely fit to a burial context. This complex of problems does not only influence the perception of animals themselves, but likewise the perception of the burial as a religious concept. The material evidence that serves as a basis for the interpretation, is compiled in a database. It contains not only information on the graves themselves, but also on the animals found in those contexts. Precise information on the preserved body parts, the condition, and their placement inside the grave, constitutes the essential data needed to carry out an analysis which results in the distinction of different kinds of depositions.

In summary, this thesis aims to study the presence of animals in human graves. The study of the roles and functions of animals in the burial ritual, as well as their symbolic meaning and how they are perceived, contribute to an understanding of the pre-Christian society and their religious practices. Against this background, human-animal relationships are investigated as means to understanding the burial practices during the Vendel Period and Viking Age in Uppland. Furthermore, the study contributes to the understanding of the burial practice itself, but is also a starting point for reflections on a broader comprehension of the society, ideology and cosmology at that time.

1.3. Theoretical aspects

During the past 30 years, different trends in zooarchaeological research and interspecies studies have evolved. Due to the fact, that zooarchaeology developed as an independent subject at a time when processualism was a kind of academic spirit of the time or *zeitgeist*, the research interest was at first mainly of taphonomic, paleo-economic and dietary concerns (Hill 2013). Within upcoming post-processual ideas, archaeologists and zooarchaeologists responded to this conventional zooarchaeology in different ways. Whether described as social zooarchaeology (e.g. Morris 2011; Overton & Hamilakis 2013; Russell 2012; Steele 2015) or human-animal relations or -relationships (e.g. Fredengren & Löfqvist 2015; Hill 2013; Jennbert 2003; Salmi *et al.* 2015), the single focus on subsistence and economic uses of animals shifted towards an additional interest in their social and symbolic meanings in noneconomic contexts. That would be, burials and other ritual contexts (e.g. Zachrisson 2009), but also iconography (e.g. Back-Danielsson 2010) and literature (e.g. Jennbert 2006).

Whatever label is used, two different theoretical directions have evolved. One trend understands the study of the meaning of animals in ritual acts, ideology and other social and political contexts *per se* as a critique on conventional zooarchaeology (e.g. DeFrance 2009; Russell 2012). The other trend is for researchers to take a more radical path with a theoretical basis in post-humanism and a strict refusal of anthropocentrism (e.g. Hill 2013; Overton & Hamilakis 2013). The post-humanism direction criticizes other studies on the social and symbolic value of animals, arguing that archaeologists interpret animals in a utilitarian way where they are constructed as objects to serve the benefit of a human (*eadem*). Instead, animals should be perceived as subjects with personhood, sentience and agency just as humans which has been referred to as relational ontology (Hill 2011, 2013) or zoontology (Overton & Hamilakis 2013). These concepts are reactions against the structuralist thinking based on binary oppositions which can be traced back to the ideas of the sociologist Bruno Latour (1993 [1991]) who broke with the subject-object-dualism. About the same time, this led to the ontological turn (e.g. Descola 1996),

ensuing the animal turn in the social sciences (e.g. Andersson Cederholm *et al.* 2014; Weil 2010) which created the theoretical basis for the above mentioned post-humanist approach.

This study seeks to borrow certain thoughts from the two described approaches. It engages with human-animal relationships within what Nerissa Russell (2012: 7–9) defines as social zooarchaeology and Susan DeFrance (2009) as zooarcheology. In addition to that, this work has been inspired by the archaeological and literary studies on human-animal relationships by Kristina Jennbert (e.g. 2002, 2003, 2006). Russell (2012: 7–9) stresses the social and symbolic importance of animals and moreover mentions their role in the construction of gender and social inequality. The latter is also used by DeFrance (2009) who emphasises that animals in complex societies were used to establish social distinctions, to create legitimacy to elite rule and to support social unity through the symbolic manipulation of animals in ritual. She proceeds in a clearly utilitarian way which is based on the notion that complex societies are linked to inequality, hierarchy and rank, in which animals seem to be intertwined (*idem*). Nevertheless, it is possible to consider the posthumanist approach to some extent, namely the question whether some animals might have been perceived differently than others or had a special reputation in the society. This refers to the concept of animal persons by the archaeologist Erica Hill (2013), who claims that certain animals were regarded as persons, which would correlate with the material evidence. Furthermore, this notion entails the acknowledgement that animals have agency (e.g. Hill 2011), which is here described as the use of an animal in the burial ritual, as a consequence of their appearance, acting and character.

The concept of agency⁶ has already been further developed to describe relationships between humans and things, based on the idea that not only humans but even things have person-like qualities, that they act, have agency, personalities, spirits and powers (Hodder 2012: 30). Agency is here not considered in the sense of conscious human intentionality but as a secondary agency given to things by humans (*idem*: 32) which turns the perspective from the human towards the meaning of things and their influence on the individual.

In a similar way as the archaeologist Ian Hodder (2012) tries to entangle the relationship between humans and things, the attempt of this work is to study the relationship of humans and animals. This shift of perspective from the human to the animal and its influence on human actions, is here applied as means to understanding human ritual practice in burial contexts. The aim to find patterns in this ritual practice is accompanied by the attempt to understand how actions differ, how the ritual is transformed by the individual and how shifts in human-animal relationships take part in this process. Therefore, it is important to consider both human- and animal agency and their mutual influence that is regarded as being reflected in the arrangement of the grave assemblage. In this sense, animals do have an influence on human behaviour but a strict posthumanist approach is still not possible to apply for this study because of the opinion that animals are still manipulated (even if in a symbolical way) and used to serve a certain purpose in the burial ritual.

Applying the definition of rituals as religious activities, this study presumes that burials are ritual acts, also called “rites of passage” (Kaliff 2003: 47). Different activities surrounding the funeral culminate in the deposition of animal bones in the grave. Although an interesting topic of discussion, the assessment of those actions as more or less ritualized (cf. Bell 1992; Kreinath *et al.* 2006), is not regarded in this thesis. Instead, they are regarded as part of the burial ritual and are discussed as means to understanding the purpose and meaning of animals in this context.

As opposed to grave-goods, completely deposited animals are commonly interpreted as sacrifices (e.g. Vretemark 2013 a: 381). As mentioned above (cf. Chapter 1.1), sacrifices occur in many different contexts. They express a reciprocity by sacrificing something material to the gods, with the plea to receive something from them (Näsström 2002: 254f.). In the context of a burial ritual, however, this concept reaches its limits, since it is not clear to whom the potential sacrifice

⁶ Since the foundational ideas of this theory by Anthony Giddens (1984) and Pierre Bourdieu (1977), the term has been used in different ways and a general definition practically does not exist. This, and especially the agency of objects, has been criticized by Torill Christine Lindstrøm (2015).

was addressed to, which request it was connected with, and thus who was responsible to fulfill the plea. This issue is discussed in this paper, and the suggestion of an alternative interpretation is presented, which rather puts the animal itself in the centre, instead of the ritual act.

1.4. Method and Material

Initially, this is an archaeological work, but it takes an interdisciplinary approach, using osteological data and applying methodological approaches, borrowed from the work of osteologists. Since the key aspect of this thesis are animal depositions in graves, the results of osteological analyses constitute an important part of the study. Nevertheless, both archaeological and osteological information is essential for answering the research questions presented in Chapter 1.2.

In order to carry out a statistical analysis, a new database was created which contains a selection of cremation- and inhumation graves from different cemeteries. The chosen contexts are chronologically limited to the Vendel Period and the Viking Age, because the archaeological material differs to a large extent from the Migration Period (375–550 AD) and especially the Christian Medieval Period (1050–1520 AD). The geographical delimitation is the province (*landskap*) Uppland. The reason for this restriction is the presumption that there are regional differences in burial rituals and a detailed study of one region is necessary before a comparison can be made. Moreover, Uppland and the region around Lake Mälaren shows a concentrated distribution of Vendel Period-material on the Swedish mainland (Lundström 1980 a: 12). The combination, number and diversity of boat-graves and cremation graves, during the Vendel Period and Viking Age, is unique for the region Uppland (cf. Schönback 1980). The diversity of graves assumedly is linked to a wide range of different social statuses.

Six sites have been chosen from the close surroundings of Uppsala: Prästgården and Valsgårde in Gamla Uppsala Parish, Enbacken in Uppsala Parish, Inhåleskullen in Vaksala Parish, Gnista in Danmark Parish and Ultuna in Bondkyrko Parish. In a radius of c. 17 km outside of Uppsala, the site Tuna in Alsike Parish is situated in the south-east, and the graves from Årby and Tibble in Rasbokil Parish in the north-east. Five other sites are situated north of Stockholm: Grimsta and Odenslunda in Fresta Parish, Brista in Norrsunda Parish, Lilla Ullevi in Bro Parish and Rickeby in Vallentuna Parish. Only the site Vendel in Vendel Parish is situated with a longer distance (c. 35 km) north of Uppsala. In total, 46 cremations and 37 inhumations are included in this study (Fig. 2). The choice of burial grounds happened according to the suitability of the graves and their publications, for the database and the analysis. The inhumation graves, that are mainly of high status, have been chosen as a contrast to the cremation graves, and thus allow an analysis of differences in the burial type and the social status of the individual and the animals buried.

The choice of certain graves also depends on the quality and detail of reporting and publication, and the degree to which the material allowed for the scientific questions of this work to be approached. Especially recent excavation reports from contract archaeology have proved its utility because they often contain detailed reports of osteological analyses⁷. While these reports mainly deal with cremation graves, the well-known boat- and chamber graves from Vendel, Valsgårde and Tuna in Alsike have been excavated at the end of the 19th century⁸ and during the middle of the 20th century⁹, which is also reflected in the quality of their publications when it comes to the osteological analyses¹⁰. But since this study aims to present animal depositions from

⁷ Those are the sites Inhåleskullen (Seiler and Appelgren 2012), Gnista (Hennius *et al.* 2016), Ultuna/Stora logen (Hulth 2014), Grimsta (Jakobsson 2010), Odenslunda (Olausson 2005), Brista (Renck 2009), Lilla Ullevi (Jakobsson & Lindblom 2011) and Enbacken (Sjöling 2006). The latter was excavated in different phases since 1908, but the information has been newly published in combination with the latest partial excavation (*idem*).

⁸ Vendel (Lundström 1980 b; Stolpe & Arne 1912).

⁹ Valsgårde (Arwidsson 1942, 1954, 1977, 1980; Nordahl *in press*), Tuna i Alsike (Arne 1934).

¹⁰ Prästgården (Nordahl 2001), Årby and Tibble (Arbman *et al.* 1993).

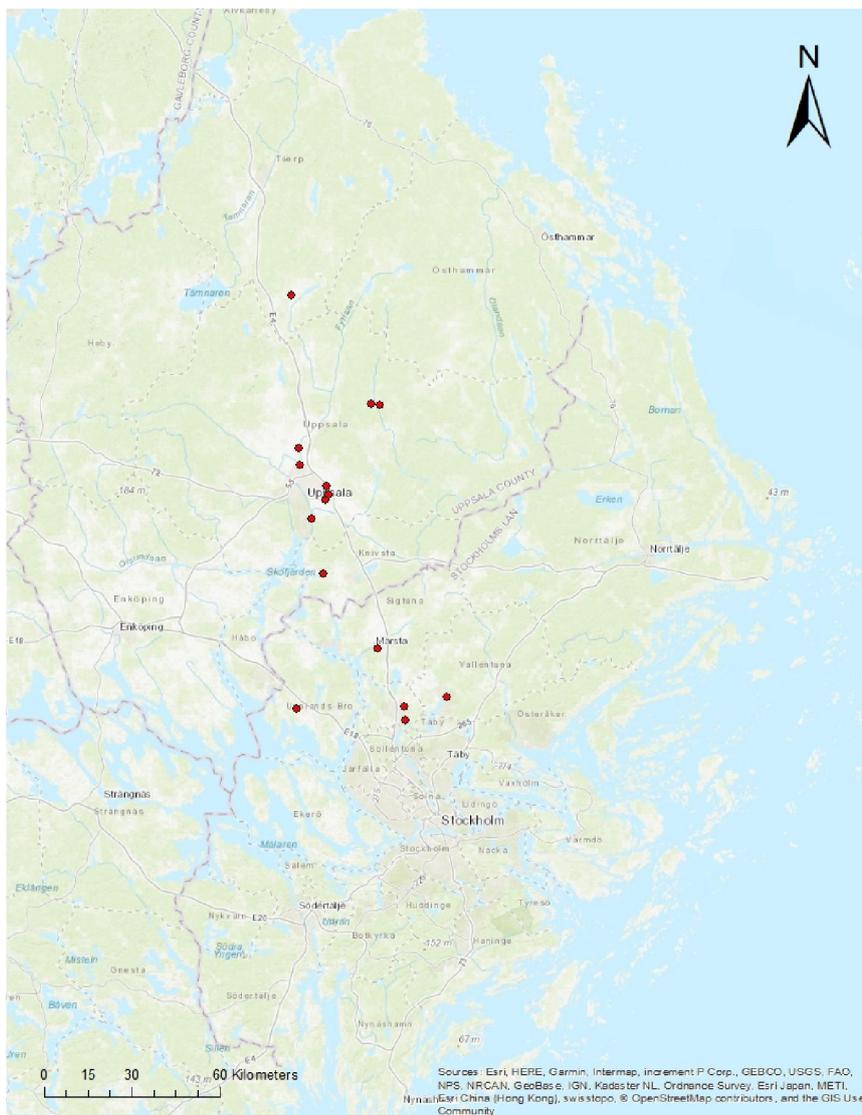
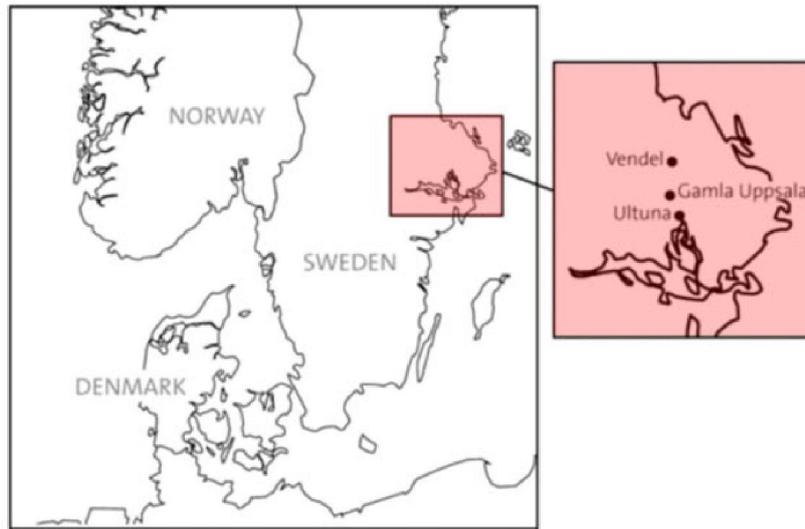


Figure 2 Map over the investigation area. The upper part shows the location of Uppland in Scandinavia, marked as red square (modified after Klevnäs 2015, fig. 1). The lower part shows the selected sites marked by red dots (created with ArcGis).

various kinds of burial types, those sites cannot be excluded. As a consequence, however, not all the graves are suitable for every analysis. A more detailed explanation of the preconditions for the selection of graves follows in Chapter 3.1.

The compiled material in the database is used for both statistical and spatial analyses and represents both a quantitative and a qualitative evaluation. The statistical analysis starts with an investigation on the changing numbers of animals in graves, measured as the minimum number individuals (MNI)¹¹ (Chapter 4.1.2). This is followed by a presentation of the frequent occurrences of certain species and animal groups in graves (Chapter 4.1.3). After this, an investigation on the distribution of complete, almost complete- and incomplete depositions is carried out (Chapter 4.1.4). These analyses contain a sample-size which is large enough to apply measurements at the characteristics of the three social factors, as well as the burial type and the time periods. But, the ensuing calculation of body part frequencies and bone conditions (Chapter 4.1.5), can only be carried out among cremation graves and on a general basis, because the sample-size is too small. The same applies to the following analysis on the spatial distribution of burnt and unburnt bones in urn graves (Chapter 4.2.1). An analysis on the spatial positions of dog and horse equipment inside inhumation graves forms the last contribution to the analysis-part (Chapter 4.2.2).

These analyses comprise the research questions that have been presented in Chapter 1.2. Subsequently, the results are interpreted and discussed in the frame of the previously explained theoretical aspects. The interpretation focuses on explanations of the deposition types and on the symbolic meanings of different species, whereas the discussion deliberates conceptual problems and human-animal relationships.

The following chapters, however, will first present the former research on animal depositions from burial contexts in Sweden. Ensuing, an additional extensive methodology- chapter on the structure of the database and the handling of its material is necessary as an explanatory back-up for the following proceedings.

¹¹ In this thesis, the term MNI only includes animal species, therefore also called *animal MNI*. For more information on the determination of the MNI see Chapter 3.3.2.

2. Previous Research

The engagement with faunal remains from burial contexts, is basically a throughout osteological topic. Therefore, former research on analyses of animal bones in Sweden was carried out by osteologists. In the earliest periods of osteology as an auxiliary science of archaeology, the well-known Swedish zoologist and osteologist Nils-Gustaf Gejvall, in collaboration with the palaeontologist Ove Persson (cf. Gejvall & Persson 1970), carried out an osteological analysis of cremated bones from humans and animals from the Iron Age site “Helgö III” in Stockholm.

While this publication can be regarded as part of an excavation report, Elisabeth Iregren (1972) followed with a more extensive study on cremated bone material of humans and animals from the Iron Age site “Vårby and Vårberg”, situated south-west of Stockholm. Since this is a complementing work to the archaeological investigation of this site (cf. Ferenius 1971), Iregren (1972: 109–112) presents valuable comparisons between the distribution of “slaughter animals” and “sacred animals” from graves and from the settlement context and describes it as balanced. However, the core of this work consists of an analysis of the graves’ character, both concerning humans and animals. The study of faunal remains, focuses on the identification and combination of species, a correlation between the human’s age and/or osteological sex and different animal species, body part frequency of animal bones and the determination of the animals’ age.

As recently as a decade later, the osteologists Sabine Sten and Maria Vretemark (1988) carried out an analysis on 14 cremation graves from the Late Iron Age, mainly located in Uppland and Södermanland. This project focused mainly on the identification of different animal species in high-status graves. It showed, that this social group consisted of men, occasionally in sociality of a buried woman, with additions of a high number of animals of varying species and especially hunting birds are recognized as a marker of social rank.

Another doctoral thesis was written by Berit Sigvallius (1994), who engaged with cremated bones from burial grounds in North Spånga, situated north of Stockholm. Her material dates from the Pre-Roman Iron Age (500–0 BC) to the end of the first millennium AD and compiles 500 burial constructions with all the more graves. This study focuses, similar to Iregren’s (1972) examination, on the identification of the age and sex of the deceased as well as on the identification of different animal species. In addition, Sigvallius (1994) tries to display combinations of different animals that repeatedly occur in graves, as well as an analysis of the completeness of the deposited skeletons, with the human dead as standard.

Apart from these earlier and thorough investigations, the research questions of this thesis are more frequently addressed in the osteological analyses of excavation reports from recent dates (e.g. Gustavsson 2016; Ohlsson 2012; Sjöling & Bäckström 2014 in this study). The symbolical meanings of animals in burial contexts and beyond, in the context of pre-Christian Scandinavia, on the other hand, are particularly reflected by works of the archaeologists Anne-Sofie Gräslund (e.g. 2004, 2006) and Jennbert (e.g. 2003, 2011). They mention animals that exist in sagalitterature and try to draw comparisons to the animals that occur in human graves (*eadem*).

Moreover, the close connection of this research interest to religious studies, often resulted in combined investigations on mythology and cosmology, as well as in disputations about the terminology and concepts of sacrifice and ritual. Younger literature on myth and ritual comes i.a. from the archaeologists Jennbert (2002, 2006), Lotte Hedeager (2011), and John Hines (2003), as well as from scholars of religious history, Jens Peter Schjødt (2003) and Britt-Mari Näsström (2002). Basically, these authors try to find parallels between mythological descriptions and rituals that are visible in the archaeological material. A repeated assumption here is that even though myths are fictional, they are based on actual happenings in reality, described as the “allegorical

character of myth” by Hines (2003: 19). Therewith, he states that general truths are expressed in mythic form (*idem*). This shall, however, not imply that mythological texts describe a historical truth, but neither that they are the exact opposite of reality (*idem*). In conclusion, a fictional story can include elements of reality. The story itself can be fictional, but the components of the story might be borrowed from reality. As an example, the funeral of the Norse god Balder, as described in the *Poetic Edda*¹² might be a fictional tale and never happened, but the process of the burial ritual might be described after the model of funeral ceremonies in reality. However, this study avoids mythological texts as a source for rituals and focuses on the material evidence instead.

In archaeological studies focusing on religion, there is a tendency to interpret burial contexts against the backdrop of the society’s cosmological world-view and eschatological beliefs. Among others, such attempts have been made by the scholar of religious studies, Bruce Lincoln (1986), and the archaeologist Anders Kaliff (e.g. 2007), respectively Kaliff and Terje Østigård (2013). These studies stress the importance of terminology, when engaging with concepts of death (cf. Kaliff 2007), and try to understand the need for sacrifices with the help of cosmology (cf. Lincoln 1986). Moreover, a promising attempt to combine archaeological contexts with cosmological ideas, has been made by Andreas Nordberg (2008). He tried to interpret the architectural symbolism of the outer appearance of graves and claims that the grave can be regarded as a door or world axis between the humans’- and the gods’ realm and the underworld (*idem*: 252). The physical traces of this idea would i.a. be reflected in different forms of stone settings on top of the graves (*idem*: 267–269).

In addition, a merely literary engagement with the Old Norse Religion, has been carried out by Thomas A. DuBois (2012), a scholar of Folklore studies, who mainly uses the Nordic saga literature, in order to reach a broader comprehension of animal symbolism. DuBois does not only attempt to understand pre-Christian religious thoughts, but offers valuable links to Sami Culture as well (*idem*). However, critical reactions to the handling and use of historical sources and mythological texts, have already earlier contributed to the academic discussion. The scholar of religious studies and theologian, Anders Hultgård (1993) for example, published a critical dispute on the scientific challenge of studying rituals of the pre-Christian religion, and explicitly warns to take descriptions of the saga literature for granted.

Most relevant for this thesis, are the two studies by Iregren (1972) and Sigvallius (1994) which serve as comparative material for the interpretation. In addition, the archaeological work of Jennbert (2002, 2003, 2006, 2011) and Gräslund (2004, 2006, 2014) will be cited frequently in this study. The here described attempts of religious studies as well as comparisons to saga literature, on the other side, are mainly avoided. The reason for that is the limited scope of this thesis and because it is regarded as a dubious endeavour to compare mythological creatures with the animals deposited in the burials. The animals that appear in saga literature, are often fictional creatures and besides, they occur in various situations, not bound to funeral practices. It is therefore important to distinguish between general symbolical meanings of animals and their symbolical meaning in the burial ritual which might be a different one than in other contexts. In addition, inspirational works by scholars engaging with questions of human-animal relationships, such as Russell (2012), DeFrance (2009) and Hill (2013) have already been mentioned in Chapter 1.3.

¹² The Eddic poems from the *Older-* or *Poetic Edda* and the *Younger-* or *Prose Edda*, were written down by the Icelandic poet Snorri Sturluson (1179–1241) on Iceland during 13th century. Since he was a Christian, the originality and historical value of those literary texts need to be questioned.

3. The Database

3.1. Explanation of the database

3.1.1. Requirements and preconditions

To ensure a certain quality of the database and to make it useful for the specific questions in this study, the graves had to undergo a preliminary selection. However, the low number of inhumation burials and the fact that especially the boat-graves have been excavated at a time when osteology did not exist as an independent academic subject, leads to different requirements for different burial types.

Except for the previously mentioned chronological and geographical limitations, there are other preconditions for including cremation graves in the database. Those are the availability of osteological analyses in the excavation reports, adequate descriptions of single grave contexts with descriptions of layers and finds, and fully excavated graves. Additionally, the inner part of the grave should be intact (Degree 0) or slightly damaged (Degree 1)¹³. There is ongoing research that examines if grave disturbance in form of ancient reopening might be part of an actual funeral ritual (e.g. Klevnäs 2015). But secondarily opened respectively damaged graves, have not been used in the database, because the interpretation of ancient and intentional human disturbances of graves (Degree 2 and 3) needs separate investigations¹⁴. The inhumation graves are an exception: If the damaged contexts amongst inhuman graves were to be excluded, a comparison of cremation and inhumation graves would be impossible because of the low number of inhuman graves.

The selection criteria of availability of osteological analyses has not been applied for inhumation graves for the same reason. The excavations (of boat-graves in particular) happened when osteological analyses were not an essential part of the scientific processing, and these contexts have not been reanalysed archaeologically. In these cases, the textual descriptions in the excavation reports serve as a source of information and the osteological expertise of the excavators must be relied on.

3.1.2. Explanation of tables and their information

The database consists of two different kinds of tables. There are two tables that show general information about a) cremation graves and b) inhumation graves. This division has been made for organisational reasons but also because these contexts show different preservations of archaeological material which results in different research questions. These tables contain geographic information about the burial ground, the character of the context (burial type, dating, condition), and the body(ies) in the grave (the number of bodies, the social status, the archaeological gender and the osteological sex, the age, the position of the dead inside the grave,

¹³ For further information on the degree of disturbance see Chapter 3.2.4. The outer appearance of a grave, such as mounds or stone-settings on top of the actual bone containing layers, are not taken into consideration in this database and their disturbance is not part of the classification. It would be interesting to compare the inner composition of graves with the outer appearance. But due to agriculture and mainly other human activities, the majority of outer grave constructions has most probably been destroyed (cf. Ljungkvist 2006: 136).

¹⁴ Another promising attempt would be to study if there is a relation between reopened graves and the compilation of animal depositions, with respect to the question, whether not only grave goods but animal depositions alike were either removed or added.

in which layer(s) human bones were found). Additional columns show the the animal MNI and whether some bones remained undetermined.

The other type of tables shows detailed information about the faunal remains from the graves. Each grave is represented in a separate table, which differ slightly depending on cremation and inhumation burials. Those tables contain information about the animal species, the MNI of each species, the completeness of the animal(s), the determined body parts, the condition, the layer or position they were found in and objects that can be ascribed to an animal.

Weight information about the bone fragments, as well as their size and detailed degree of combustion, have been left out for the feasibility of the project. This data is not regarded as primarily relevant for a statistical analysis, but is rather important for specific quantitative analysis. As an example, it could serve as evidence for detailed examinations of the process of cremation, indicating the heat of the fire. Likewise, further ritual actions could be revealed. However, it has been mentioned earlier, this study does not aim to explain/reconstruct each single steps of the burial ritual, which is why this information is not discussed further here.

Furthermore, sex-, age- and size determinations of animals occur rarely in the osteological reports and were therefore not used as comparative material. An extensive study of those aspects, would, however, contribute to the understanding of custom of animal depositions in graves and are therefore a promising aim for further research.

3.2. Interpretive handling of the grave assemblages

3.2.1. Dating

Especially among cremation graves, detailed dating is rarely possible, be that because scientific dating methods had not been carried out or because of the lack of datable finds. Besides, this thesis aims to discuss differences between the Vendel Period and Viking Age rather than the development of ritual behaviour within those periods. Therefore, the chronological division is only separated into Vendel Period and Viking Age. The dating of the graves has not been carried out independently but is adopted from the suggestions of the excavators, respectively secondary literature.

The following dating is based on archaeological, not historical developments, and has been applied i.a. by John Ljungkvist (2008: 18, table 1 a, b, 2015) and Birgit Arrhenius (1983: 68). These dates concern the Vendel Period and Viking Age on the Swedish mainland. Other areas in Scandianvia, Gotland for instance, show slightly different dating (at least concerning the Vendel Period) according to the archaeological record (cf. Høilund-Nielsen 1999; Nerman 1969–1975; Nørgård Jørgensen 1999).

Vendel Period: 560/70–750 AD

Viking Age: 750–1050/1100 AD

3.2.2. Status determination

Even though structures of social inequality and rank in a complex society, is a topic that requires separate and extensive analysis, the simple categorization of “high”- and “lower” social status graves are used here. This separation is done to address the question whether the deposition of certain animals is dependent or correlated with social differences. The interpretation of a high-status burial can be difficult when large scale looting occurred. On the other hand, just looting, or rather the reopening of a grave (cf. Klevnäs 2015), could be a sign for a former richly equipped burial. Moreover, the burial ritual changes over time, entailing shifting characteristics for the

determination of a higher status.

The determination of high-status graves has been done on basis of Ljungkvist's (2006: 43–46, fig. 14, 16) classification of burial finds. In this assessment, general characteristics for elite status are exclusive, Scandinavian grave-goods, import goods, riding equipment, birds of prey and a high number of deposited animals inside the grave (*idem*). Moreover, Ljungkvist (*idem*) distinguishes between Vendel Period and Viking Age, between a lower and a higher elite status, and between male and female burials.

The division in lower- and higher elite has not been adopted in this thesis, instead both are summarized under the term high status graves. The classification of lower social status describes here graves with lack of signs for a higher social status, though these graves can represent a range of different expressions of social statuses, they have been summarized in one category. Sten and Vretemark (1988) have connected a high number of animals and the presence of birds of prey to high status burials as well. But, since one aim of the here presented study is to find out how the distribution of animal species is correlated with the social status of the grave, the single presence of a high number of animals is here not regarded as an indication of a high-status burial. Additionally, boat-graves are not automatically treated as high status unless they show the characteristics as defined in Ljungkvist's (2006: 43–46) find classification. As an example, the small row-boat from Årby in Rasbokil Parish did not contain any high-status artefacts at all¹⁵. Hence, the determination of the social status has been carried out only on basis of grave-goods.

3.2.3. Standardization of gender- and sex determination

The database in this study contains both recordings of the social gender and the biological sex. These two classifications depend on different source material – archaeology in case of social gender and osteology in case of biological sex. Determinations of the social gender on basis of find assemblages in graves have a long tradition in archaeology but have been criticized and disproven not only with the rise of gender archaeology and especially in recent years (e.g. Arnold 1991; Gardela 2013; Hedenstierna-Jonson *et al.* 2017). Simultaneously, some scholars argue that the assessment of grave-goods can be an indication for the fallibility of osteological sex determinations (e.g. Petré 1984: 191). Others argue for favouring the archaeological definition over the osteological method in cases of contradictory results (e.g. Sigvallius 1994: 9). It is difficult to define one of the two as the more secure method since both determinations are assailable for critique.

A general problem with gender determination on basis of finds, is the uncertainty whether grave-goods in fact reflect the possessions of the deceased. Especially when biologically determined female graves are furnished with male engendered artefacts, such as weapons, or when they express a certain degree of wealth, the possibility that the grave assemblage represents possessions of the family and not the deceased, is mentioned frequently (e.g. Gardela 2013). Even a swap of grave assemblages in contexts that are placed close to each other has been considered (Seiler & Appelgren 2012: 76). In the end, it is important to keep in mind, that it is not the deceased who bury themselves, but the relatives who choose what is deposited on the pyre respectively inside the grave.

Additionally, it is a problem that many grave contexts are incomplete, be that due to ancient re-openings, historical or modern destruction or simply the fact that the practice of cremation destroys both a large part of the grave assemblage as well as bone material. Therefore, it must be kept in mind that even osteological determinations depend on the condition of the analysed material; the more decomposed the body, the less certain the sex determination (Rundkvist 2003:

¹⁵ However, this grave was looted in ancient times and could originally have contained more items (Arbman *et al.* 1993: 19).

10).

Regardless of the above-mentioned critique and uncertainties, determinations of social gender and biological sex are essential in this study because they contribute to the question of differing burial rituals concerning animal depositions. In the analysis, graves with a conformity of archaeological gender and osteological sex determinations are considered as reliable. If only one of the two is classified, the determination is adopted, but regarded as uncertain. The same is valid for determinations with a question-mark. Those have been adopted but are regarded as uncertain. In cases of contradictory results, the determination indicated as most probable (without a question-mark) has been chosen over the other, but still needs to be seen as an uncertain classification. Contexts with equally contradictory determinations (neither or both have question-marks), must remain unclassified, just as such without any determinations. The division of social gender and biological sex is kept as a critical reference in the database, but summarized as one gender in the analysis.

In general, the gender determinations of the excavators or publishers have been adopted. If archaeological interpretations on the social gender have not been made but are still possible (very seldom), the determination has been carried out independently on the basis of Petré's (1984: 191–200) gender constructions. Weapons, flint for fire making, whetstones, gaming pieces and dices and in some cases single beads, are considered as male indicating artefacts (*idem*: 191–193). By contrast, beads, fibulae, garment needles and other needles, keys, ear spoons, tweezers and tongue scrapers appear in female graves (*idem*: 194–195).

3.2.4. Standardization of age determination

The human age is displayed in the database in the way it has been osteologically determined, or respectively, based on the excavators' or publishers' interpretation of the archaeological record. Notations on age determinations, is kept as a critical reference for the reader. The absence of osteological determinations as well as different methods and classifications of osteologists, lead to varying definitions and complicate the attempt to bring consistency in human age determinations. However, the human age is grouped into six different periods of life in the analysis (*Table 1*).

Table 1 Classification of age groups (Modified after Ohlsson 2012: 113; cf. Sigvallius 1994: 155, app. 4).

Child	0-14 years
Juvenile/Young adult	10-24 years
Adult	18-44 years
Adult/Mature	Between 18-44 and 35-64 years
Mature	35-64 years
Senile	50-89 years

Other osteological studies are based on slightly different classifications (e.g. Gustavsson 2016) if they exist at all. Likewise, the classifications are not always explained in terms of age distribution (e.g. Sjöling & Bäckström 2014; 48–57). In cases of inhumation graves without presence of human remains, only the size of the coffin or grave cavern could give an indication for whether a

child or an adult was buried. This, however, is more difficult to estimate with chamber- and boat-graves because the form of the grave is not conformed with the shape of the human. Here again, the age determination as reported in the archaeological publications has been used.

3.2.5. Burial types

The Younger Iron Age in Scandinavia shows a broad variety of burial types. Even among cremations and inhumations, there are different expressions of burial practices. The analysis uses only a division of cremations, inhumations and urn graves (cf. Chapter 4.2.1). However, the detailed descriptions of the grave constructions are kept in the database. If available, the terms of the excavators have been adopted. Below explanations of the classifications used are explained.

Cremation: A grave that consists of one or several cremation layers. It has not been ascertained if the cremation happened on-site or if the cremations layer represents a secondary action after the actual cremation. Both explanations are possible, and this will be discussed later in Chapter 5.

Cremation pit: A pit containing the remains of a cremation. Most pits are too small to cover a whole funeral pyre, why it clearly seems, that the cremation cannot have taken place on site. The digging of the pit and the deposition of cremation remains were secondary actions in the burial ritual.

Urn grave: A grave that contains one or several urns with additional cremation layer(s) under or around the urn. A bigger problem than the definition of an urn grave, seems to be the definition of the urn itself. Ceramic vessels in cremation graves are often destroyed so that it is difficult to say if bones were originally inside or outside the container. Analyses of organic material have shown that bread and other food offers could be inside the pottery as well (Brista grave 601, Renck 2009: IV:14). Therefore, a ceramic vessel inside a cremation grave does not necessarily have to be an urn, as long as it cannot be proven that it contained human bones in the first place. In this study, only graves with ceramic pots that contained bones are regarded as urn graves.

Inhumation: An inhumation grave without any traces of a coffin.

Coffin burial: An inhumation grave with traces showing that the deceased was buried inside a wooden coffin or related construction. This can be indicated by colour differences in the soil, in-situ laying coffin nails, or, less common, by physical remains of the wood.

Chamber grave: Inhumation graves with a wooden construction that had been erected inside the grave-pit, and which are at least 1,20 m wide (Gräslund 1980: 27).

Boat-grave: Inhumation burials inside a boat or ship as opposed to cremation graves inside boats (Müller-Wille 1978: 262, 265).

3.2.6. Degree of disturbance

Especially during the Late Iron Age, respectively the Early Medieval Period, graves are commonly affected by looting or reopening (Klevnäs 2015). Since many high-status graves would be excluded from the study because of reopening, also disturbed contexts had to be included, as otherwise the sample material would be too small for comparison. However, it makes a great difference for interpretations, especially in question of context and relation between grave-goods and animals, if a grave assemblage is disturbed or undisturbed. Therefore, a classification of the degree of disturbance has been created, in order to evaluate the different contexts from a source critical point of view (*Table 2*).

The classification is based upon the descriptions in the reports. Since the extent of the destruction is usually not thoroughly explained, the categorization is inevitably cursory and

incomplete. Furthermore, the disturbance of classification only concerns the inner parts of a grave, i.e. the cremation layer(s) and bone- or find layers. Damages to the outer part of a grave are not important for the analysis and discussion here. Overlaying or mixing bone containing layers (i.e. due to secondary burials) have been excluded from the start because a mix of grave inventories leads to a distortion of results. However, graves with more than one individual are also taken into consideration in the database, as well as graves with secondary burials, which cremation layers are not mixes. The latter are mentioned as two different graves.

Table 2 Degree of disturbance of the inner parts of a grave, i.e. cremation layer, bone- or find layers.

Degree 0	Undisturbed
Degree 1	Slightly damaged (due to agriculture, secondary recent or ancient action)
Degree 2	Damaged (due to agriculture, secondary recent or ancient action, construction, looting)
Degree 3	Extensive damage (due to agriculture, secondary recent or ancient action, construction, looting)

3.2.7. The question of cremation on-site

The large variety of cremation burials give reason to suppose that there were different funerary rituals (cf. Chapter 3.2.5). Additionally, it can be noticed that these graves seldom contain the full amount of remains that are probable to have been left after the cremation of humans and animals (Sigvallius 1994: 109f.). Apart from possible human actions and taphonomic causes, the question arises, whether the place of cremation and burial were identical. Since this affects the interpretation of animal depositions, the question addressed is whether the faunal remains in the archaeological record represent what was originally put on the pyre, or whether only specific parts have been selected from the pyre and ended up in the grave. This issue will be briefly discussed in this chapter.

Common arguments for a possible cremation on-site are the presence of thick charcoal bits, red burnt soil under the cremation layer (Hennius *et al.* 2016: 119, 139), or the dimension and thickness of the cremation layer (Jakobsson 2010: 15), and the spatial distribution of the inventory (Sjösvärd *et al.* 1983: 136f., 139f.). However, the results of an experiment from the years 2013 and 2014 show, that the remains of a cremation strongly vary depending on technical aspects of the cremation itself (e.g. development of heat), the number and size of cremated bodies, and post-crematorial processes of both human and natural influences (Prata & Sjöling 2017: 203). There was in fact only little charcoal left on the site after the experiment, demonstrating that the amount of charcoal cannot be regarded as a necessary indication for a cremation on-site (*idem*). Likewise, it can be assumed that charcoal bits can just as well end up in a secondary burial deposit when being mixed up with the grave inventory that was moved. Even if a cremation on-site does not leave distinct traces in the ground, there are cases that do indicate such primary contexts. Within the mentioned experiment, a grave is considered as a secure primary deposit, if the remains of the cremated corpse are interpreted as recovered in situ inside the cremation layer (*idem*, fig. 9.1)¹⁶. In addition, traces of heat influences in the soil under or around the cremation layer, and/or distinct physical traces of wooden constructions, interpreted as remains of the former funeral pyre, are regarded as very probable primary deposits (*idem*). The occurrence of thick, loose pieces of charcoal, cannot be regarded as a secure indication for a cremation on-site as discussed above.

¹⁶ The only secure primary deposit in the database of this study is the grave from Rickeby in Vallentuna Parish (cf. Sjösvärd *et al.* 1983: 136f., 139f.).

Charcoal, could also have been moved from the pyre to the burial place with the bones. Moreover, it is important to keep in mind, that a cremation on-site does not necessarily leave any traces in the ground, since the preservation of the context is always dependent on other natural factors as well.

In this study, the question of cremation on-site or not is most important when thinking about whether animals ended up in parts or as a whole on the funeral pyre. If cremation took place away from the burial one needs to be aware of the possibility that a complete animal might have been placed on the pyre but only parts – be that intentionally or not – may have been placed in the urn afterwards. Consequently, animals from secondary contexts with body parts missing, might still have been deposited as a whole on the pyre. Due to the fact, that a high number of graves in the database cannot with certainty be regarded as primary deposits, it cannot be deduced, at the moment, whether a complete- or an incomplete animal had been deposited on the pyre. However, an analysis of body part frequencies among the animal species can still demonstrate the recurrent presence of specific bones that might indicate an intentional selection of specific body parts, either before or after the cremation (cf. Chapter 4.1.5). Moreover, faunal remains in urn graves will be analysed in more detail in Chapter 4.2.1, with the aim of approaching a definition of intentional acts of depositing bones inside the urn.

Not least, there can be many reasons why specific body parts are not preserved or deposited in a grave. For example, it remains unclear how quickly after the cremation the secondary grave has been constructed, respectively for how long the burnt-down funeral pyre remained open and uncovered. If the pyre was exposed over a certain time, it would have been accessible for carnivores and that could be a reason for the loss of bones. Except for the detection of gnawing marks on bones, that, admittedly, also could derive from human feasting activities, this is, however, an intangible aspect that archaeologists can seldom retrace. Other reasons for the loss of bones can be taphonomical causes, which are mentioned in the following chapter.

3.3. Source-critical problems

3.3.1. Taphonomy and other source-critical aspects

When dealing with data from different archaeological sites, one must be aware of the fact, that different investigations are carried out in different ways – both concerning archaeological and osteological methods. The result of an excavation depends on various factors, such as research questions, methods of documentation, weather conditions and the expertise of the excavators. If water sieving for instance was used during field work, it is more likely that small bones, especially from fish and birds, have been saved. Admittedly, sieving can, on the other hand, contribute to a loss of bones up to circa 20 % of the original weight (Goncalves *et al.* 2013: 2f.). Above all, it makes a difference if an osteologist is involved in the field, or if archaeologists excavate and document bone-containing contexts, because the two often have different research questions and methods. An archaeologist would probably collect in situ laying teeth of animalistic origin in one bag, whereas an osteologist separates every tooth in single bags to avoid the loss of identified teeth, because their identification is impeded when being fragmented during transport, storage or analysis.

Apart from intentional selections of specific body parts of animals, there are of course other taphonomic processes that lead to the decomposition of a corpse. Both exterior influences and the consistency and condition of the bones themselves contribute to the resulting quality and quantity of the organic material that is revealed by the excavators (Prata & Sjöling 2017: 206f.). Aspects that affect the preservation of bones are their size, their form and their density which is not only dependent on the species but also on age and body size (*idem*). Consequently, not only specific

species have preconditions for a better preservation but also specific body parts. The degree of preservation is generally higher for larger and middle-sized mammals (e.g. cattle, sheep/goat and pig) than for smaller species like birds and fish (*idem*). However, bigger bones are more likely to fall apart which makes them more difficult to determine than intact bones from smaller animals like dog, sheep/goat and pig (*idem*). Diaphysis fragments for instance, often remain undetermined because they look similar in various species.

This needs to be kept in mind especially when it comes to the analysis of body part frequencies. As an example, it often occurs that only animal teeth are preserved from the cranium. This does not necessarily mean that only teeth have been deposited, but that the rest of the cranium has not been preserved to the same extent. During excavations of unburnt remains, this can be observed by so called “bone-meal” that often surrounds the teeth, representing the traces of the rest of the cranium. In addition, some bones are easier to determine than others (*idem*). Skullcap fragments for instance are identified in 90% of all cremation graves (During 1998: 8).

Beside these biological factors, as well as chemical, geological and hydrological processes, skeletal remains are exposed also to mechanical influences. The weight of a construction above the context can cause damage to the bones inside the find layer (Prata & Sjöling 2017: 206f.). Hence, material from protected contexts, such as an urn or a cremation pit, is usually better preserved than such from cremation layers or outer grave structures (Harvig *et al.* 2012).

3.3.2. Critical notes concerning osteology reports

A frequently occurring problem during the collection of data for this thesis, was the question of Minimum Number Individuals (MNI). Since this value only shows a minimum number of animals, this means that the actual number of species could have been much higher. This is especially valid among cremation burials, due to the fragmentary state of the bones. Moreover, this becomes clear by the fact that a high amount of bone material from cremation graves often cannot be determined, which is illustrated in the column “unspecified bones” in the database. It demonstrates, that in every single cremation grave unspecified bone fragments are present, whereas among inhumations this is only the case in 8 of 37 contexts.

In addition, osteologists analyse faunal remains with different methods and aims. Together with the fact that there is no uniform way of report writing, this leads to individual presentations of results. As an example, reports with detailed osteological analysis contain paragraphs for each grave, concerning the available and analysed bone material, additionally to plain bone lists. Osteologists who are especially interested in animal bones, might even create well-arranged tables, charts and diagrams to show how different bone material and animals are distributed on a cemetery. Moreover, the methods of how to determine the MNI and what problems come along with it, might even be described very carefully. But, as a reader of those reports, the question of what mentioned number represents the MNI in a grave, still occurs frequently. As an example, a table (*Table 3*) that lists the determined species in a grave, shows the following distribution:

Table 3 Example for a table showing information on the determined animals in a grave context. The numbers 1–6 in the upper line represent the body parts 1–6 according to the same classification as applied in this thesis (modified after Ohlsson 2012: 119, own translation).

	Burnt	Number	1	2	3	4	5	6
Dog	Yes	2	x	x	x	x		x
Dog	No	1						x
Cattle	Yes	1		x	x	x		x
Cattle	No	1	x					
Chicken	Yes	1		x	x	x		x
Bird	Yes	1			x			x

The explanations in the report speak about the detection of MNI. However, this table describes the “amount” of animals. It can be suspected that amount means MNI, but when taking a closer look on the table, this suggestion must be questioned. Supposedly “amount” describes the MNI, it seems that it has been determined on the basis of burnt and unburnt bones. Most clearly in the case of the cattle, burnt bones from various body parts but not the cranium on one side but unburnt parts of the cranium on the other are listed. According to the table, two cattle (MNI 2 in total) are calculated. But how is it possible to know that there were two different individuals when the burnt individual misses the cranium? Likewise, the unburnt cranium could have been the missing one from the burnt cattle. Moreover, even a burnt cranium can contain unburnt teeth that were protected from fire inside the cranium, namely the back teeth (oral information Sjöling 2018). It is a similar case with the dog, where it cannot be entirely sure if the single unburnt phalanx is related to one of the two cremated dogs or not. Therefore, burnt and unburnt should not be a criterium for the calculation of MNI but instead age and size of the bones respectively the animal(s).

A comparable problem applies to the bird and the chicken in the grave. The distinctive feature here is not the condition of the bones but the fact that some bones are identified as chicken and the others only generally as bird’s. Since a chicken is a bird as well, the question is, whether the bird’s bones might belong to the chicken. In addition, it is not always clear if all animals of one species are deposited as a whole or only one of them. If in a table, such as the one presented above, two dogs are listed with almost all existing body parts, the question arises whether this is the case for both dogs or whether one of them is only represented with one body part for example. A table like this does not give answers to these questions. Nevertheless, in this study, two whole deposited dogs would be calculated for this context in such a case.

If additional bone lists are attached to the report, it would of course be possible to retrace every single determined bone from one context and check which bones are present twice or more, in order to detect the real MNI. This, however, is not feasible in the frame of the purpose for this thesis and, besides, is a hard job for a non-osteologist. This note shall not be regarded as a denunciation of the report or the osteological effort that has been chosen as an example here. On the contrary, the osteological analysis from the site Inhåleskullen is even one of the most useful ones for the realization of this project. Nevertheless, the necessity of problems of understanding osteological reports must be mentioned here, in order to unfold the methodological issues of this study, as well as the general problems of uniformity and expression in report-writing. That the latter do exist, is supported by similar problems occurring in several other reports.

4. Data Analysis

4.1. Statistical Analysis

4.1.1. Introduction

The data from the earlier presented database, serves as a basis for the in this chapter explicated different analyses. In a way, these examinations are composed from general to more specific knowledge. However, since the starting investigations (Chapter 4.1.2 and 4.1.3) contain a larger sample size, they are more applicable for more detailed studies and can be measured at the burial type, the time-period, and at the social factors of the human age, gender and the social status.

But these aspects are not possible to determine for every single grave, which leads to a continuous change in sample-sizes. Thereby, some investigated groups of graves have a distinctly lower number than others which creates an imbalance of probabilities for these different analysed groups. Regarding the social factors, especially the age groups contain an unequal number of graves. In particular graves with deceased classified as “child” (3x), “juvenile/young adult” (4x), “adult/mature” (5x) and senile (2x) (Cf. Chapter 3.2.4). The same applies to certain animals, especially to cats (*Felis catus*) which only occur three times. Nonetheless, these classifications are part of the analysis as well because they can still serve to show tendencies among the material.

In the following, references to the publications of the sites used in the database are only made when referring to a specific information in the text. Otherwise, the information that is compiled in the database derives from the publications listed in the bibliography.

4.1.2. Changing numbers of animals in graves

A first step in the analysis of the custom of animal depositions, is to look at the changing numbers of species inside the graves, in order to observe a possible general shift in the ritual. This quantitative study calculates the MNI, showing the minimum number of individual animals only, which means that the actual number of animals could in fact have been much higher but cannot be determined¹⁷.

In general, the arithmetic mean of the animal MNI is slightly higher among cremation graves (5,54) compared to inhumation graves (5). However, this does not tell anything about the distribution of the animal MNI, that can reach more significant diversities when measured at the social factors, the burial type and the time-period. The graves are divided in three (almost) equal groups, after the number of different animal MNI, plus a fourth group with no animals at all. Graves with the highest number of animals, group one (G1), have an animal MNI between 20 and 28. Regarded as a relatively high number of animals, group two (G2), are graves with an animal MNI of 10 to 19. The group with a lower number of animals, group three (G3), has an animal MNI between one and nine. At last, graves with no animals at all, group four (G4), are regarded as a separate group, because they have to be seen in a different historical context (see below). This is only a systematic division, but not every single animal MNI is represented in the graves.

It becomes clear that the graves with the highest animal MNI (G1) all date to the Vendel

¹⁷ Source-criticism on the difficulty of determining the MNI has already been mentioned in Chapter 3.4.2.

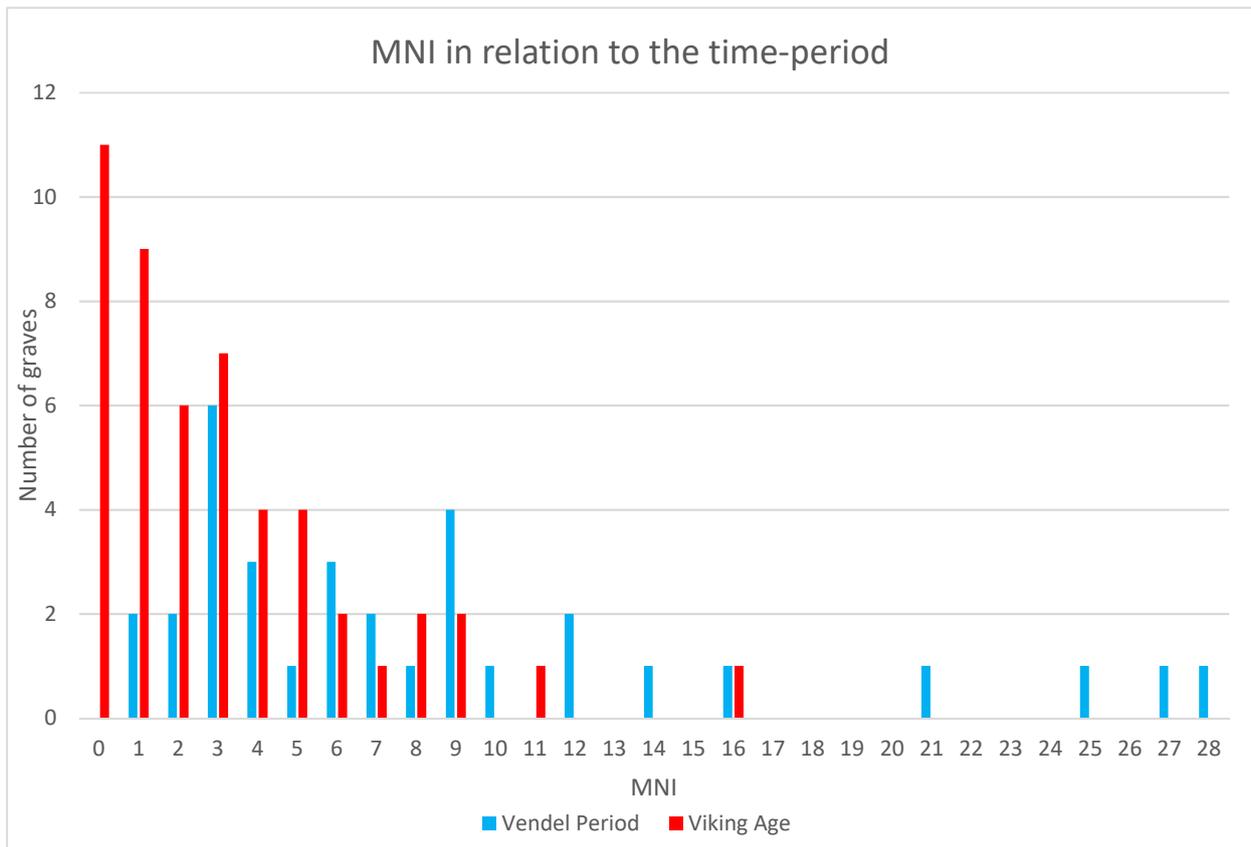


Figure 3 Number of graves with animal MNI during the Vendel Period and Viking Age.

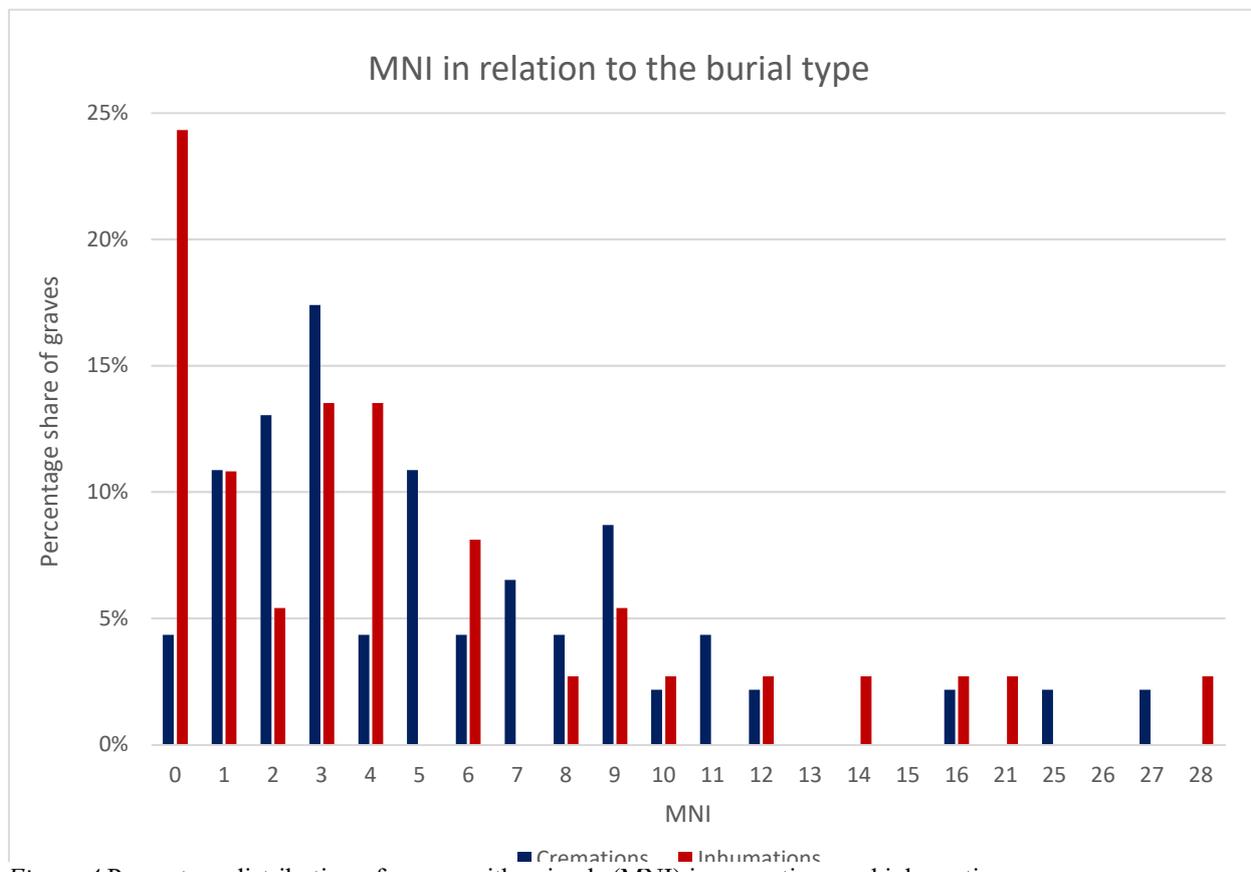


Figure 4 Percentage distribution of graves with animals (MNI) in cremation- and inhumation graves.

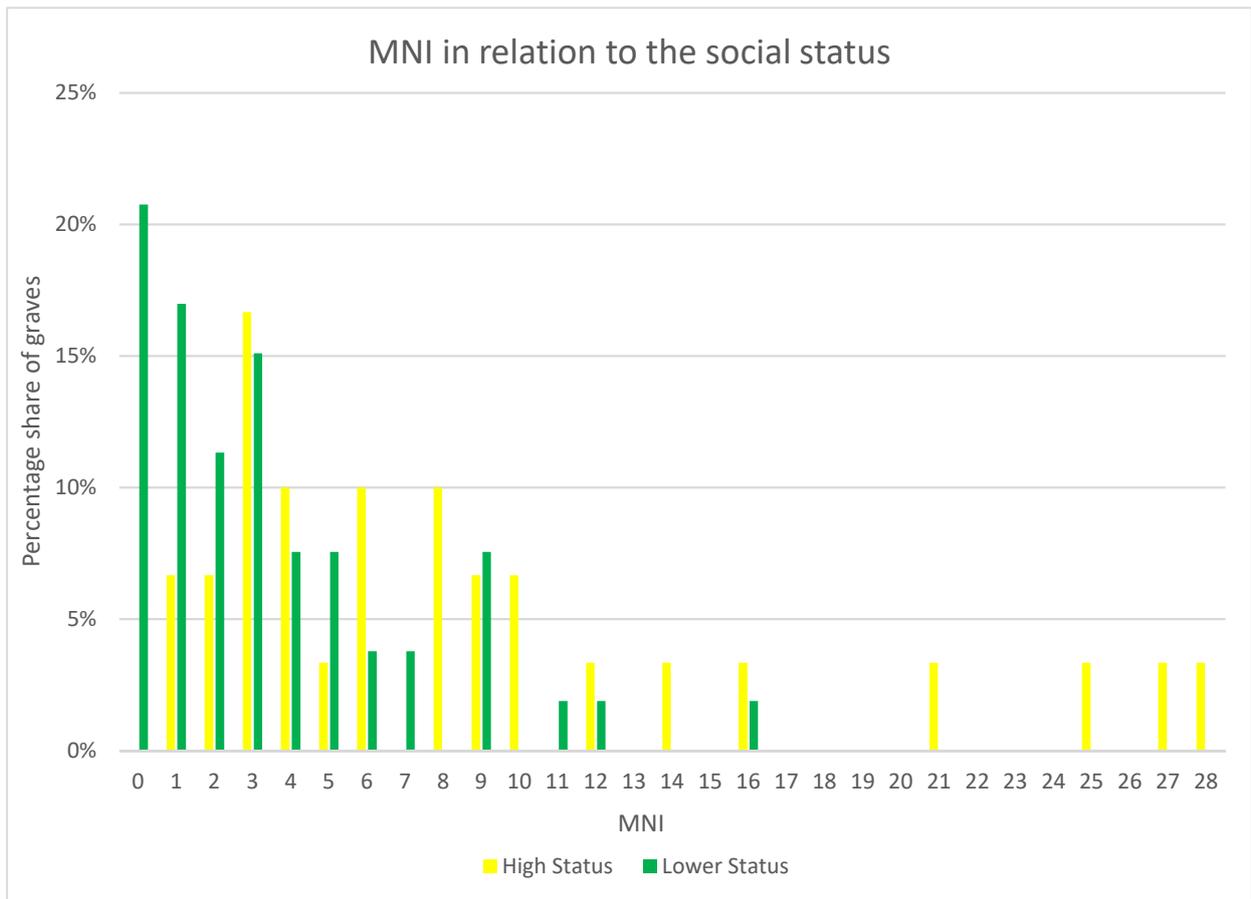


Figure 5 Percentage distribution of graves with animal MNI in relation to the social status of the grave.

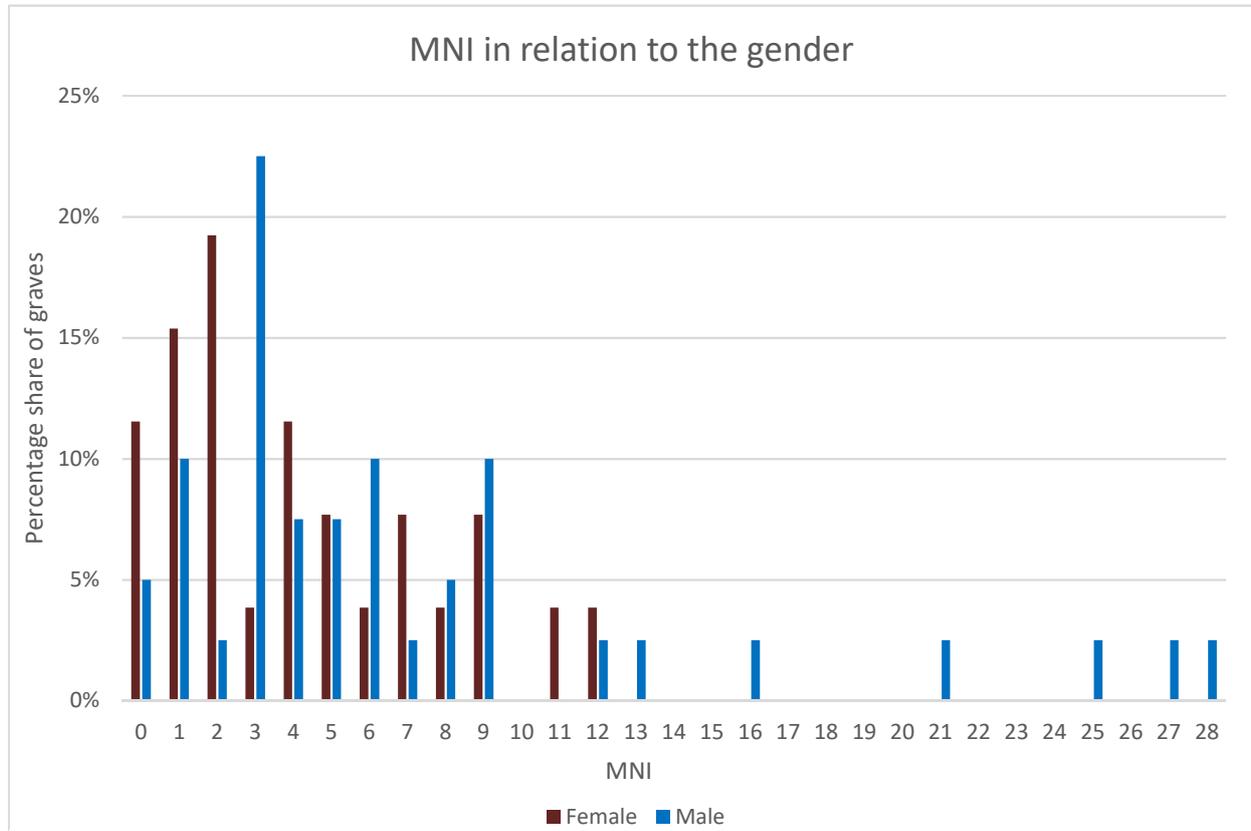


Figure 6 Percentage distribution of graves with animal MNI in relation to the gender of the deceased.

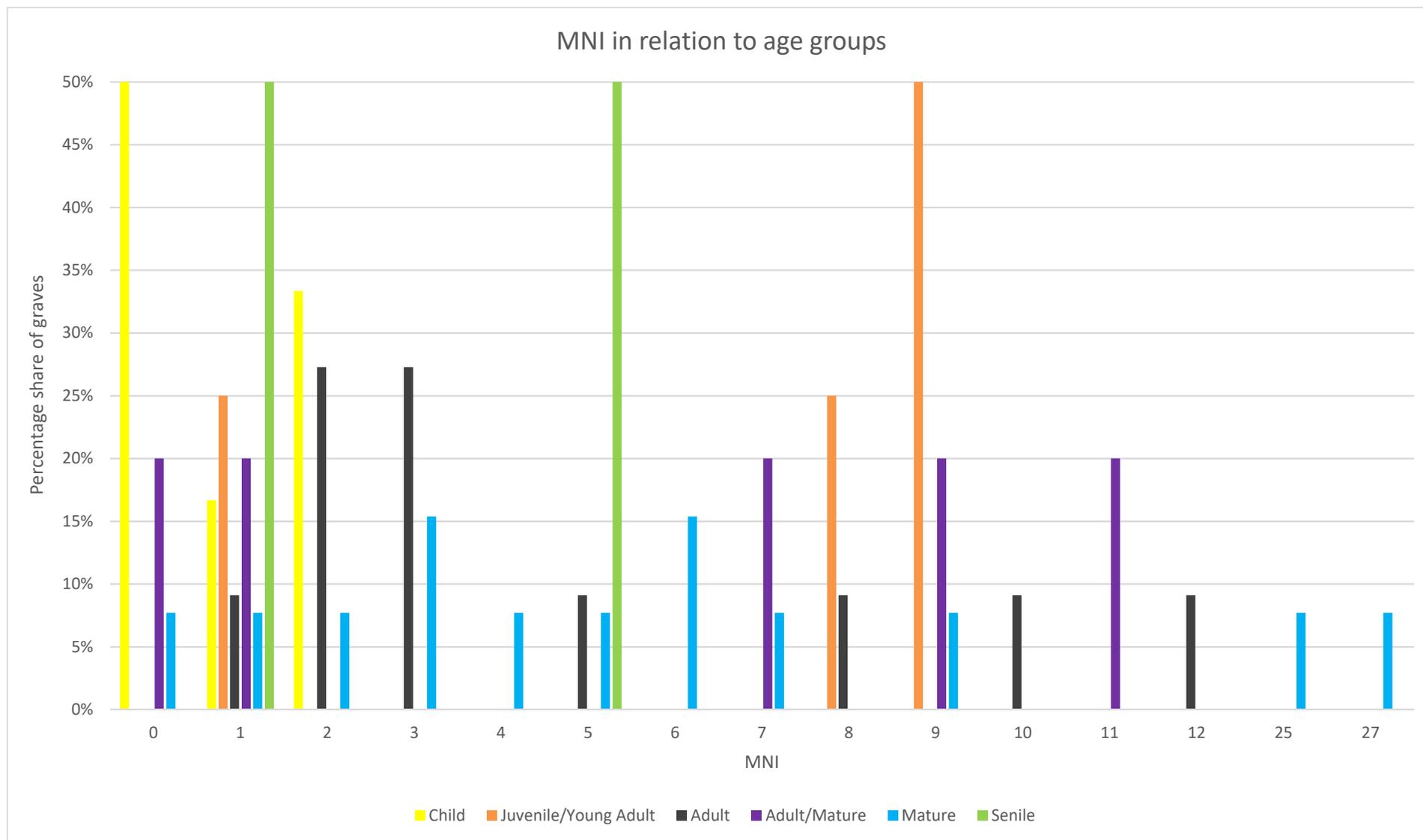


Figure 7 Percentage distribution of graves with animal MNI in relation to different age groups.

Period (*Fig. 3*) and all these graves have previously been classified as high social status burials (cf. *App. 2*). In addition, all the deceased are male and two of them in a mature age (35–64) (*idem*). These are the following graves Gnista 1 (MNI: 25) and Rickeby (MNI: 27). The graves 6 (MNI 21) and 7 (MNI 28) from Valsgårde are archaeologically determined as males, but due to the lack of bones no age determination is possible. These four graves are both cremations and inhumations (*App. 1, Table 4+5*).

A second group of graves with a relatively high animal MNI between 10 and 19 (G2), shows a similar pattern regarding the number of burials that fall into this category, but expresses some variations regarding the social characteristics. Here again, this group contains both cremation- and inhumation burials and the age of the departed shifted towards the classification adult (18–44) but also still contains individuals ranked as “adult or mature” (between 18–44 and 35–64 years) (*Fig. 4+7*). As a novelty, however, there are three out of five cremation graves dating to the Viking Age, whereas the four inhumation graves in this group all date to the Vendel Period (*Fig. 3*). Moreover, three out of five graves are of lower social status graves (*Fig. 5*), and two out of four contain buried women (*Fig. 6*).

The group covering the highest number of graves, includes contexts with a lower animal MNI between one and nine (G3), with an emphasis on the lower half. Interestingly enough, the majority of contexts has an animal MNI of three. The presence of this number of animals is relatively heterogenous in the time-period, at least in relation to the social status and the burial type. But a male dominance stands out amongst those burials with an animal MNI of three, with emphasis on an age group of adult and mature. The second most frequent MNI of animals are one and two. Such graves are almost exclusively dating to the Viking Age, containing both cremations and inhumations and represent all age groups (MNI 1). Moreover, there is a dominance of women and lower social status in this group. Especially regarding the gender distribution, graves with an animal MNI of two, stand in high contrast to such with an animal MNI of three. Contexts with an animal MNI of four, five, six and seven, show varying characteristics but are mainly comparatively heterogenous. Striking is a majority of inhumation graves (MNI 4) and vice versa their absence of animals (MNI 5). Both groups contain more Viking Age graves with a tendency to adult and mature interred men and women. Furthermore, an emphasis on male deceased in a mature age and with a high social status can be observed among graves with an animal MNI of six. The opposite is the case for contexts with an animal MNI of seven where women of a similar age and with a low social status are buried. Finally, only graves with a high social status occur with an animal MNI of eight and show an emphasis on young male and female adults. This pattern continues significantly in graves with an animal MNI of nine but with equal social statuses. In addition, it is remarkable that the group with an animal MNI of nine comprises more graves than such with five, six, seven and eight MNI of animals (*App. 1, Table 4+5*).

Finally, there is one group of graves containing no animals at all (G4). Such graves can be preliminary interpreted as Christian burials which in this case is supported by the fact that they all date to the (i.a. late) Viking Age and that the majority, 11 of 13 graves, are inhumations (*Fig. 3*). Moreover, both men and women are present in this group but women dominate (*Fig. 6*). They also show differing ages with an emphasis on children (*Fig. 7*) and all individuals are buried with sparse grave-goods (*Fig. 5*). Few objects in late Viking age burials is, however, not necessarily an indication of low status as the custom of furnishing burials gradually disappears in the 11th century AD. Nevertheless, the existence of two cremation graves among these contexts without animals, lead to the questions if those are to be considered as Christian in character as well. To answer this, it needs to be asked first if and how the actual process of Christianization can be observed through the burial ritual? It also needs to be inquired if there are cases in which even pre-Christian burials do not contain animal sacrifices. Since the sample size of cremation graves without any faunal remains is too small, these questions cannot be answered within this study and need an individual investigation instead.

This quantitative analysis has shown that there are indeed significant shifts in the pattern of the minimum number of animals to be deposited in graves, depending on the time-period, the burial type and the applied social factors. Most significant are the differences between the characters of graves with the highest and the lowest animal MNI as well as a high number of animals occurring in graves of young male and female adults. In a next step, the analysis goes deeper and aims to find out which species are involved in the burial ritual and how frequently they are distributed.

4.1.3. Frequency of species and animal groups

After looking at the characters of contexts with different MNI, this analysis aims to go a step further and demonstrates the occurrence of species respectively animal groups, in relation to the same five factors discussed above. The comparatively broad distribution of domestic animals, induces investigations on each species (dog, horse, pig, sheep/goat, cattle, chicken). Moreover, the rarely present domestic cat (3x) is part of the analysis as well. Even though sheep (*Ovis aries*) and goats (*Capra hircus*) have been distinguished in a few osteological analyses, separations are too rare to display them separately. Besides, it is striking that the identification of sheep versus goat appears predominantly among investigations from inhumation graves, illustrating that osteological results are dependent on the condition of the bones. In order to maintain the comparability of cremation and inhumation graves, sheep and goats are therefore not separated here. Worth mentioning, however, is that the classification of sheep occurs in 16 graves, whereas the goat is only determined in one case. Nevertheless, 20 graves remain with the indistinct classification “sheep or goat”, of which 18 appear in cremation- and two in inhumation graves. In contrast to that, a consideration of birds (*Aves*) apart from chicken (*Gallus domesticus*) is necessary because of the assumption that there is a high number of undetermined chicken hiding among the animals only classified as “birds”.

A combination of the seldom occurrence, a proposed common symbolic meaning of certain animals, and the affiliation to one species, led to unite several species into categories, here called animal groups. This refers to fish, rodents, wild mammals, wild birds and hunting birds. Rodents have not been excluded from the start, in respect of the possibility that animals such as mice, rats and squirrels did not necessarily end up in graves by accident but could have had an intentional meaning in the ritual as well.

This analysis does not calculate the definite number of one species but only shows the presence of certain species or animal groups in graves. The distribution of MNI for each species is considered in the following analysis. Moreover, contexts without faunal remains are not included in this investigation. The aim with this analysis is to find out how certain species and animal groups are frequently distributed and whether they show restrictions to the burial type, the time-period or to the social factors of the human age, gender and social status.

Dogs (*Canis familiaris*) (62x) and horses (*Equus caballus*) (51x) occur most frequently in the graves of this study, followed by sheep or goats (36x), cattle (*Bos taurus*) (34x), pigs (*Sus domesticus*) (33x), birds (24x) and chickens (15x). Fish (*Pisces*) (13x) and wild birds (11x) appear almost as often as chickens, unless a number of chickens is among the group of undetermined birds, meaning that the number of chickens was originally higher. Finally, rodents (*Rodentia*) (8x), wild mammals (7x), hunting birds (5x) and cats (3x) occur in the lowest numbers (cf. App. 2). This distribution shows that there is a clear emphasis on domestic animals (but excluding cats).

Dogs occur slightly more often during the Vendel Period (*Fig. 8*) and are somewhat more frequent among male burials (*Fig. 11*). However, the occurrence of dogs is not bound to a specific social status or burial type (*Fig. 9+10*). Besides, they occur in all age groups and, here again, are present in all graves with individuals classified as mature and “adult or mature” (*Fig. 12*).

Concerning horses, the picture becomes more varied. Horses occur in almost all high-status burials (*Fig. 10*), which is why there is also a dominance of horses in inhumation graves (*Fig. 9*),

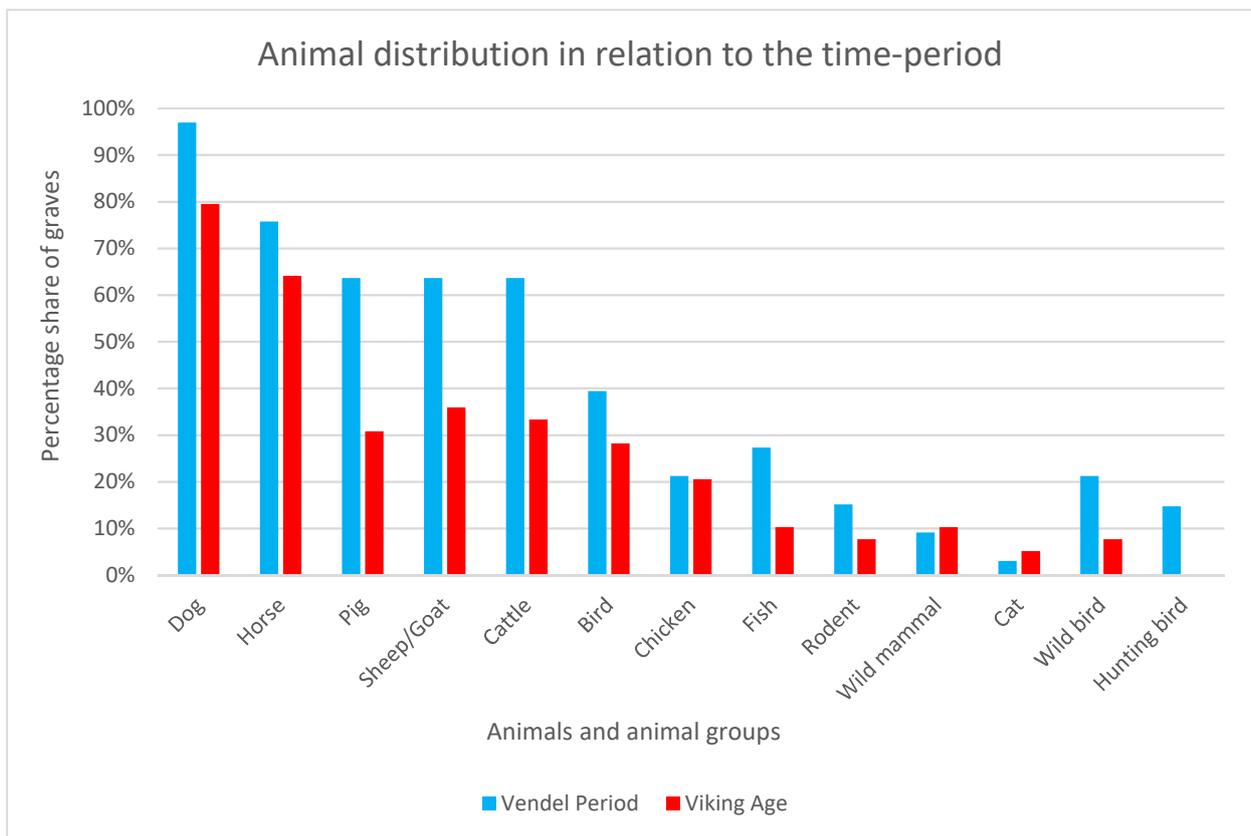


Figure 8 The general occurrence of animals and animal groups in different graves during the Vendel Period and Viking Age.

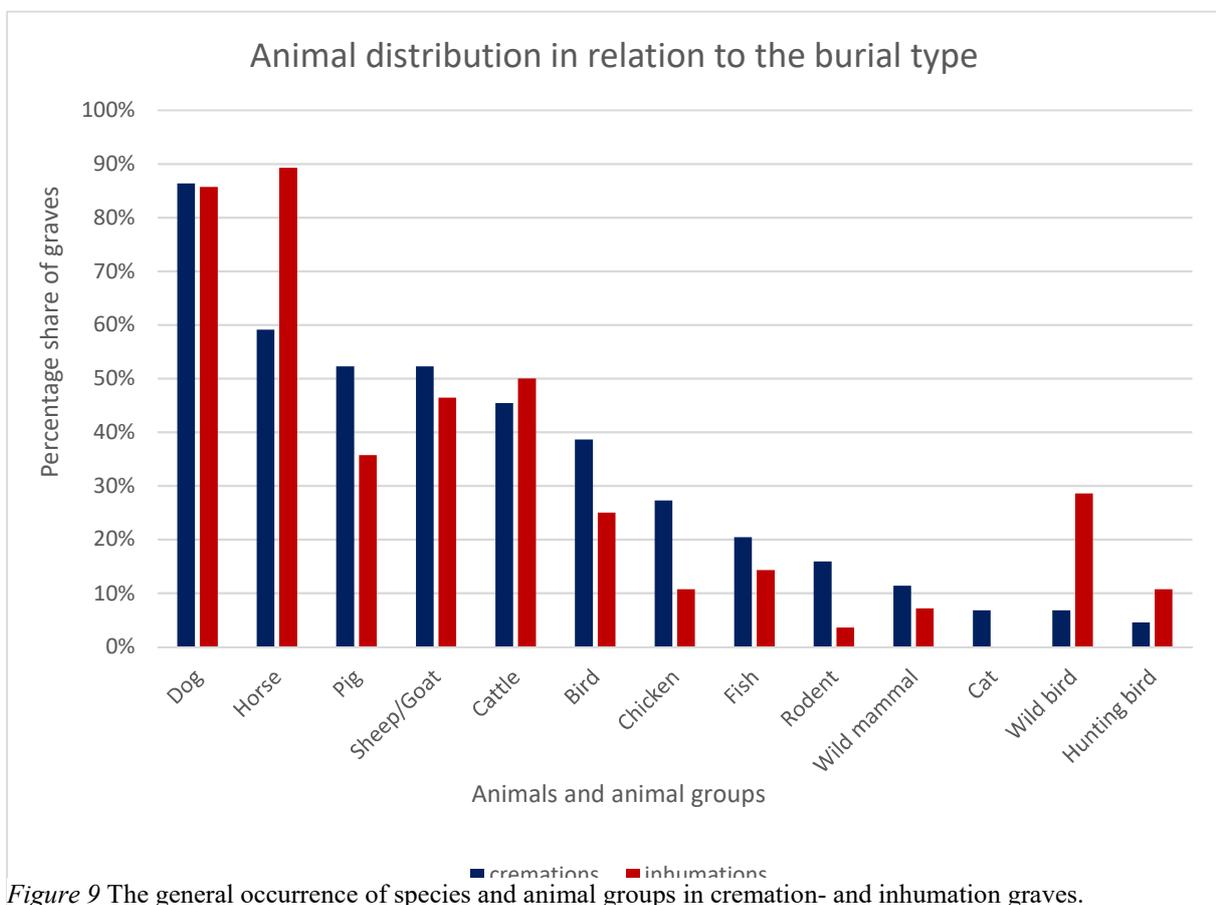


Figure 9 The general occurrence of species and animal groups in cremation- and inhumation graves.

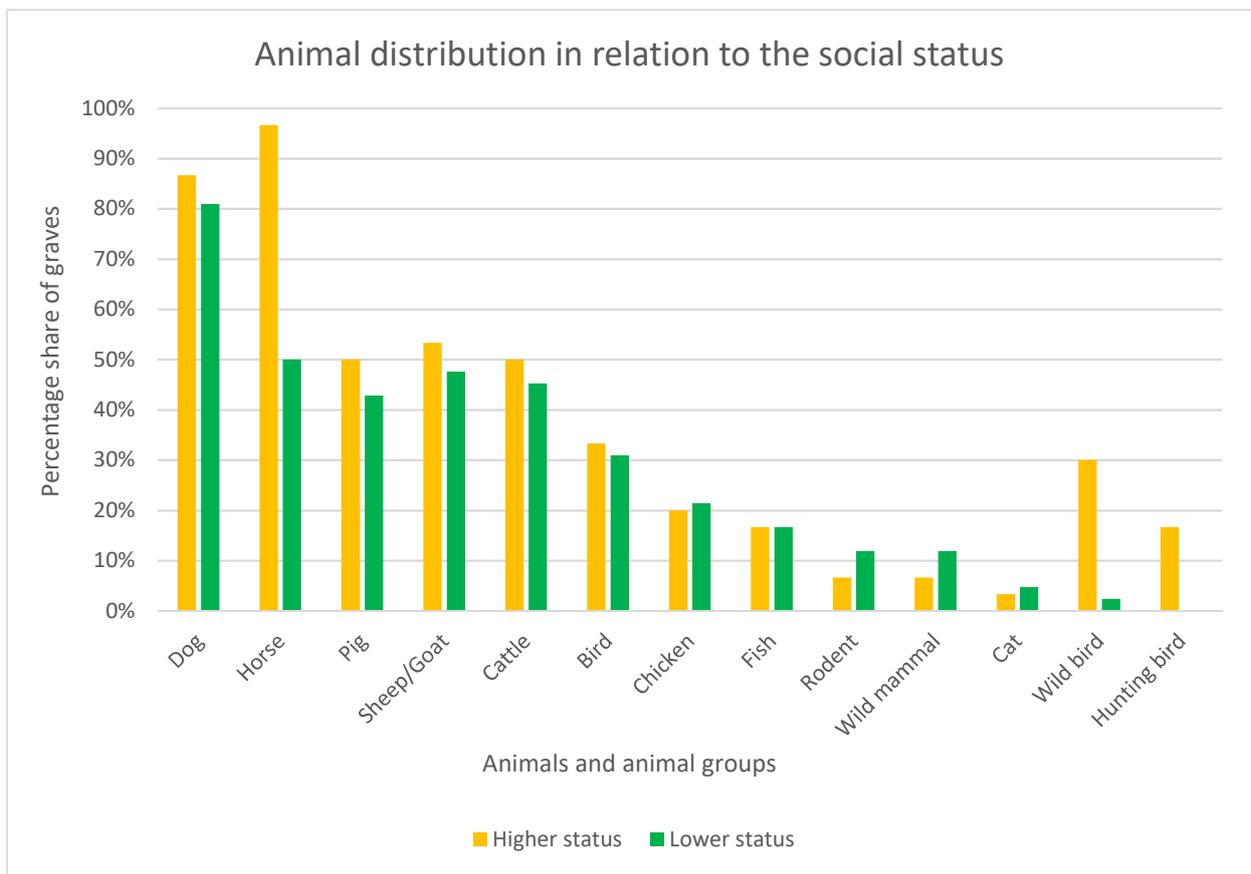
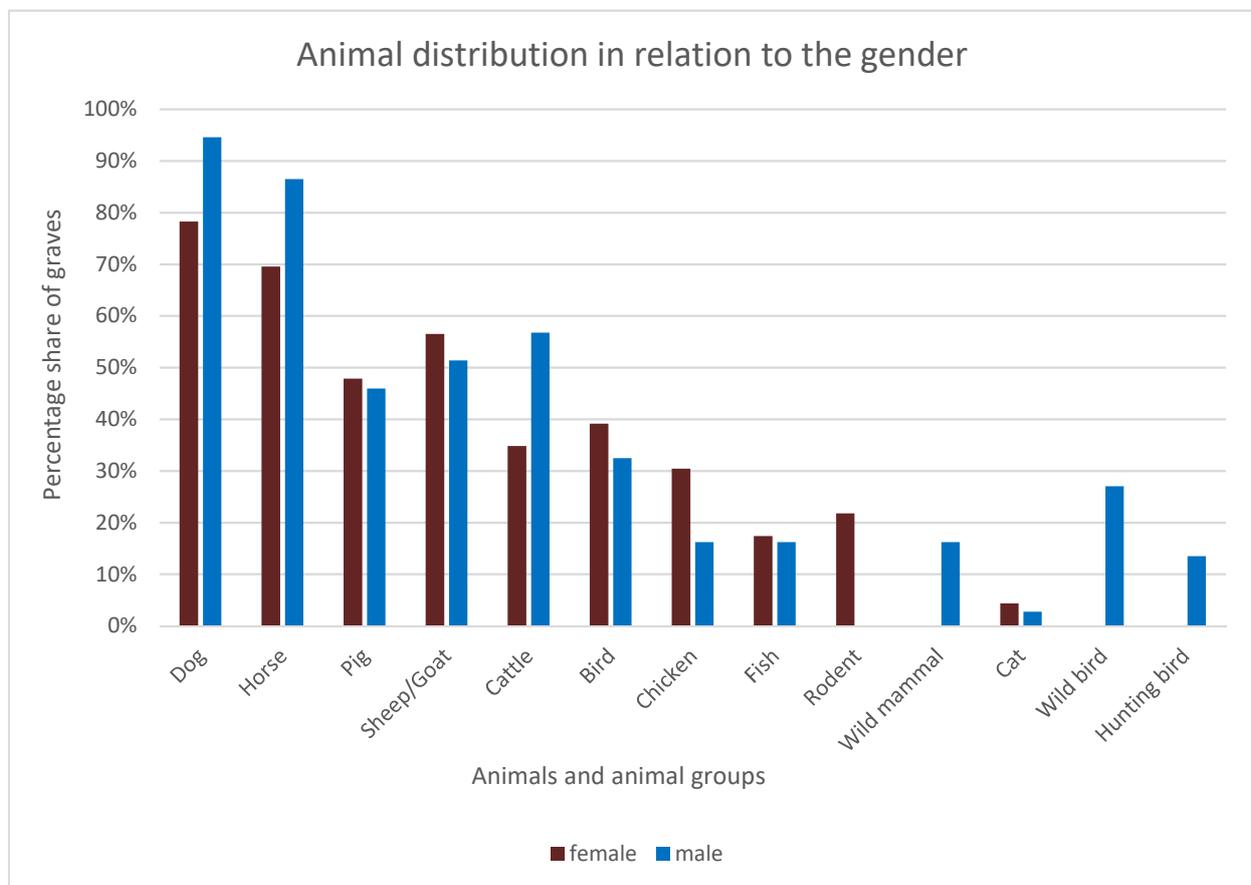


Figure 10 The general occurrence of species and animal groups in graves with high- and lower status.



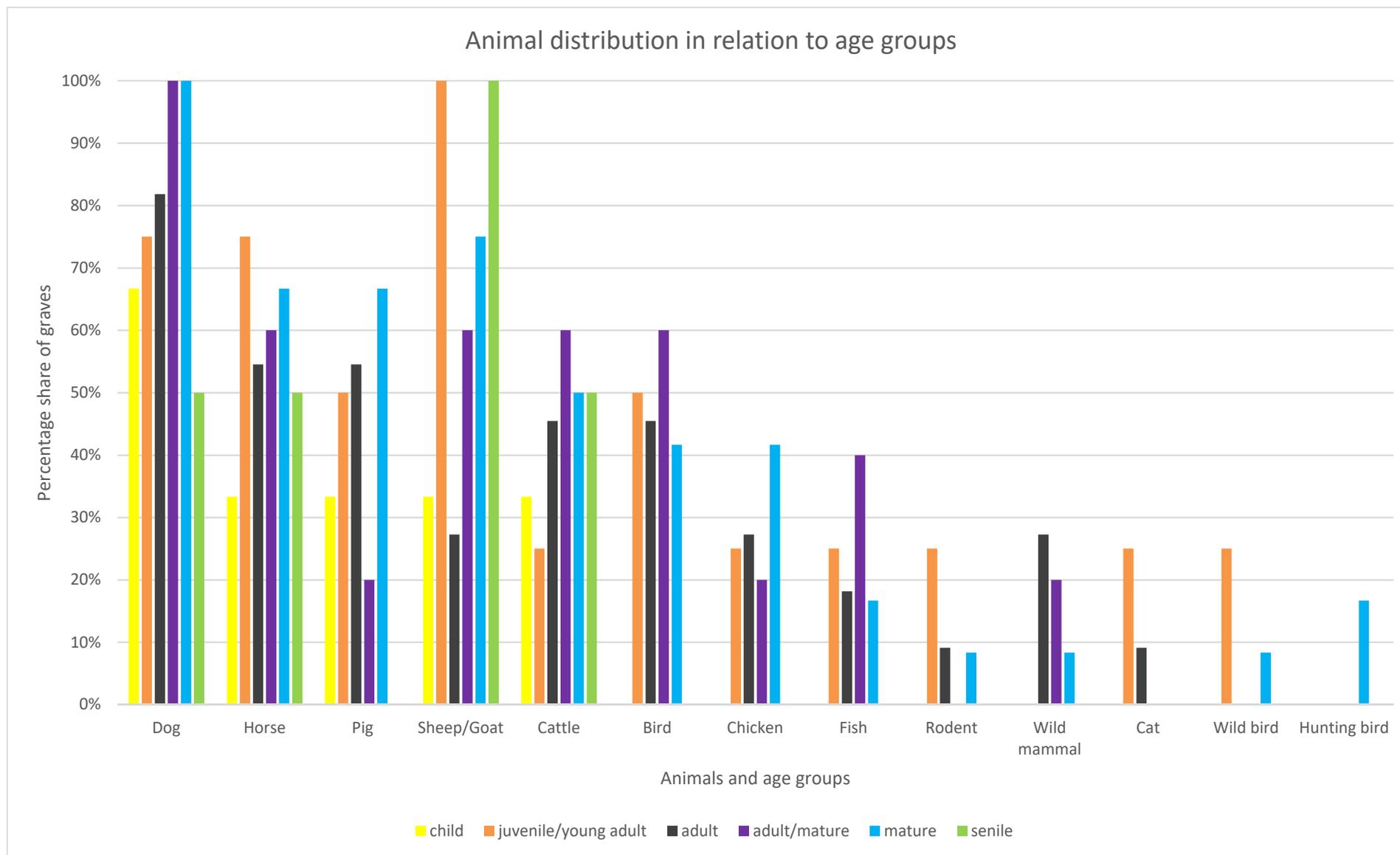


Figure 12 The general occurrence of species and animal groups in graves with deceased of different age groups.

and a slightly higher frequency among male burials (*Fig. 11*). Horses are also a somewhat better represented in graves dated to the Vendel Period (*Fig. 8*). But, even though horses appear in many high-status graves, they also are found in exactly half of the lower social status graves as well. This means, that horses cannot be automatically regarded as an indication for a high-status burial without other markers. Moreover, horses appear most frequently among graves with “juveniles or young adults”, but are also present in all age groups (*Fig. 12*).

In contrast to dogs and horses, the characteristic distribution of pigs, sheep or goats and cattle are very similar. All these animals are more common during the Vendel Period, especially pigs that can be observed twice as often during that time compared to the Viking Age (*Fig. 8*). These animals also appear in graves regardless the social status of the deceased and in cases of pigs and sheep or goats regardless the human gender as well (*Fig. 10+11*). Only cattle show an emphasis on male burials with a circa 20 % higher occurrence. In return, pigs are slightly more frequent among cremation graves whereas sheep or goat and cattle are not bound to a specific burial type (*Fig. 9*).

All age groups are represented in graves with these three animals. In addition, depositions of sheep or goat occur in every single grave where a young adult or a senile deceased is buried (*Fig. 12*). In contrast to cattle, chickens are almost twice as common among female graves in this study (*Fig. 11*). Besides, they appear significantly more often among cremation graves but are neither bound to a specific time-period nor to social status. Regarding the distribution of age-groups it is striking that children and seniles do not have any depositions of chicken (*Fig. 12*). However, these two groups only contain three respectively two investigated burials. Almost the same characteristics are valid for birds which, again, is an indication that there might be a high number of chickens among this group.

Fish and rodents have similar distributions compared with each other. They are more common among cremations from the Vendel Period and are not social status-related (*Fig. 8+10*). However, more bones from fish and rodents occur in contexts with lower social status regarding the occurrence of rodents. Together with the fact that such animals only appear in female graves (*Fig. 11*), this suggests the assumption that the publishers of the as male declared high-status burials, mainly from Valsgårde and Vendel, might not have mentioned rodents in the grave reports or publications and that this is the reason for this distribution.

The group of wild mammals includes the animals bear (*Ursus arctos*), wild boar (*Sus scrofa*), red deer (*Cervus elaphus*) and lynx (*Lynx lynx*). In this study, these species are only found in graves with male deceased (*Fig. 11*). The same applies to wild birds and hunting birds. The group of wild birds contains geese (*Anserinae*), ducks (*Anatidae*), black grouse (*Tetrao tetrix*), crane (*Grus grus*), capercaillie (*Tetrao urogallus*) and hazel grouse (*Tetrastes bonasia*). These animals are more common among inhumations from the Vendel Period and derive from almost exclusively high-status burials (*Fig. 8–10*). The group of hunting birds consists of owls (*Bubo bubo*, *Bubo scandiacus*), falcons (*Falco peregrinus*, *Falco columbarius*) and hawks (*Accipiter gentilis*, *Accipiter nisus*). Similar to wild birds, these species appear more frequently in inhumations, with a restriction to high-status contexts dating to the Vendel Period (*Fig. 8–10*). However, whereas wild birds occur in graves of both mature and juvenile deceased, hunting birds are depositions for mature males only (*Fig. 12*). The sample size for cats (3) is too small for a detailed analysis. Nevertheless, it can be pointed out that they only occur in cremation graves (*Fig. 9*).

This analysis has shown that certain species and animal groups are in fact distributed differently and in some cases, are associated to specific individuals or social characteristics, the time period or the burial type. The main insight here is that dogs and horses appear generally most frequently, followed by the other domestic animals. A striking parallel to the previous study (Chapter 4.1.2), is the fact that horses are most common among the burials of juveniles or young adults. Following

on from this subchapter, the next analysis goes again a step further and takes a closer look on the way certain species have been deposited – as complete or incomplete depositions.

4.1.4. Complete- or incomplete depositions?

A central aspect for the interpretation of faunal remains in human graves, is the question whether an animal has been deposited as a whole or in parts. Among cremation graves, however, it might occur that the remains show a certain number of body parts that neither seems to fit to an interpretation as a complete nor an incomplete deposition. Possible reasons for this phenomenon, that would be taphonomic causes or the fact that not all parts of the animal ended up in the grave after removing the remains from the funeral pyre (be that intentional or not), have already been mentioned in Chapter 3.2.7 and 3.3.1. Therefore, three instead of two different categories are used in this particular analysis: “complete-“, “almost complete-“ and “incomplete depositions”. The anatomical separation of body parts is adopted from the osteological report of the excavations from the site Inhåleskullen, because this report fits best to the research questions of this thesis (Table 6).

The body is regarded as complete when the following criteria are fulfilled:

- a) All body parts are identified
- b) The skull (1) and four other parts are represented (2; 3; 4; 5; 6)

The reason for why the head must be present, is that even among cremation graves there are always parts of it left, namely the teeth. By contrast, the body is regarded as “almost complete” when four and as “incomplete” when less than four body parts are present.

Table 6 Anatomical distribution of body regions (after Ohlsson 2012: 114, Table 13, own translation).

1	Cranium	All cranial parts, mandibula, single teeth, atlas, axis
2	Trunk	Vertebrae (without atlas, axis and tailbones), sternum, ribs
3	Front extremities, upper and lower	Scapula, humerus, radius, ulna
4	Hind extremities, upper	Coxae, sacrum, femur
5	Hind extremities, lower	Tibia, fibula, malleolus, patella
6	Feet (and hands), tail	All bones in hands and feet: carpi, tarsi, mesopodium, metacarp, metatarsi, metapodier, phalanx i-iii, sesame bone. Tailbones

This division is based on the idea that there is a higher probability that originally a complete animal has been deposited on the pyre or in the grave when four body regions are present and less likely when only three parts are present. A more restricted classification is suggested by Sigvallius (1994: 145, 162) who uses a division of the body in seven regions. However, in this study only the head is regarded as a significant body part. Since at least the teeth should always be preserved, it would be an indication for an incomplete animal deposition if no traces of a skull are left. In cases where body parts or single bones are not mentioned in the publication material, the descriptions of the grave assemblages have been used to decide whether it was a complete or a partly deposition. Otherwise almost only cremation graves would have been part of this analysis.

The reason for a strikingly low number of “almost complete” classified animal depositions (Fig. 13) is thereby explained by the fact that the requirement for this category is the existence of precise osteological data. Those are usually missing in publications of the old excavations but can also be absent among recent excavation reports and individual analysis. In addition, the probability of a determination of a deposition as “almost complete” is statistically lower since this only happens if four body parts are present. The two other categories can be applied if two (complete) respectively three (incomplete) different numbers of body parts are existent. Nevertheless, the

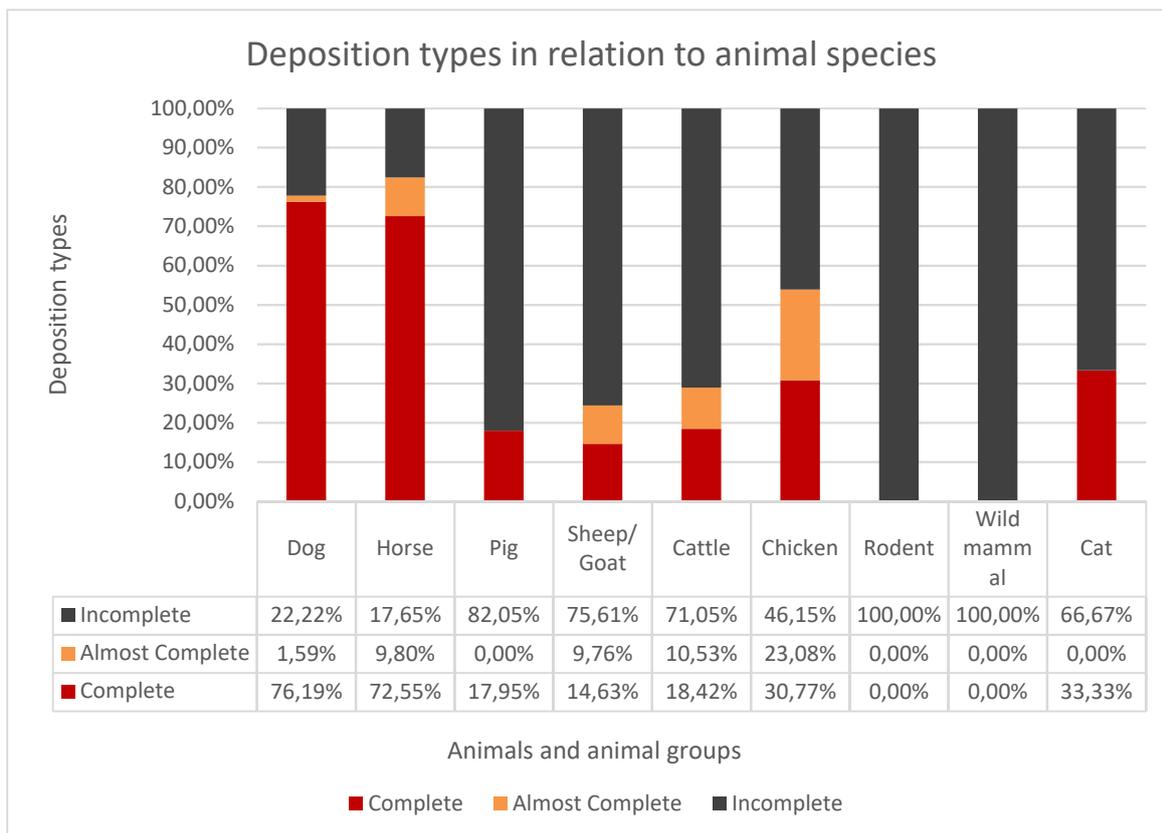


Figure 13 General occurrence of complete-, almost-complete- and incomplete depositions of different species and animal groups.

existence of only three body parts is here rather considered as an incomplete deposition with higher probability of an intentional act in relation to the “almost complete”- deposition.

The aim of this analysis is to find out how many and which of the graves contain complete, almost complete and incomplete depositions of the different species and animal groups. Therefore, the animal MNI is not regarded here but only the simple presence measured at the number of graves. Except for chickens, birds are not part of this study because their skeleton has a different structure which complicates the classification of body parts due to its high degree of fragmentation. Nevertheless, chickens are considered here, with the purpose of detecting possible tendencies. Furthermore, fish are only found as incomplete depositions but since the skeleton is very delicate, it is possible that some parts decomposed more easily than others, respectively that archaeologists have not documented all fragments. Concerning hunting birds however, it can be noted in a few cases that these animals came into the graves as complete depositions; this is the case in Rickeby in Vallentuna and possibly in Valsgårde grave 7 as well. Rodents and wild mammals exclusively appear incompletely in the graves and are therefore not investigated further in this particularly study. Of all three cats, one of them has been deposited as a whole and the others as incomplete depositions. Since this sample size is very small, cats are also not regarded further in this analysis (*Fig. 13*). The following detailed analysis is thereby only taken out among the domestic animals, excluding cats.

When taking a closer look on the domesticated animals, it becomes clear that there are significant variations between different species. Dogs and horses are to 76 % and to 72 % deposited as complete animals, whereas the other domesticated species are not even reaching half of it (*Fig. 13*). Nevertheless, there are striking distinctions between complete depositions of dogs and horses. Complete dogs are equally common in all different kinds of graves whereas complete horses appear slightly more often among male inhumations with a high social status (*Fig. 14+15*). This tendency probably derives from the relatively high number of boat-graves and other high-

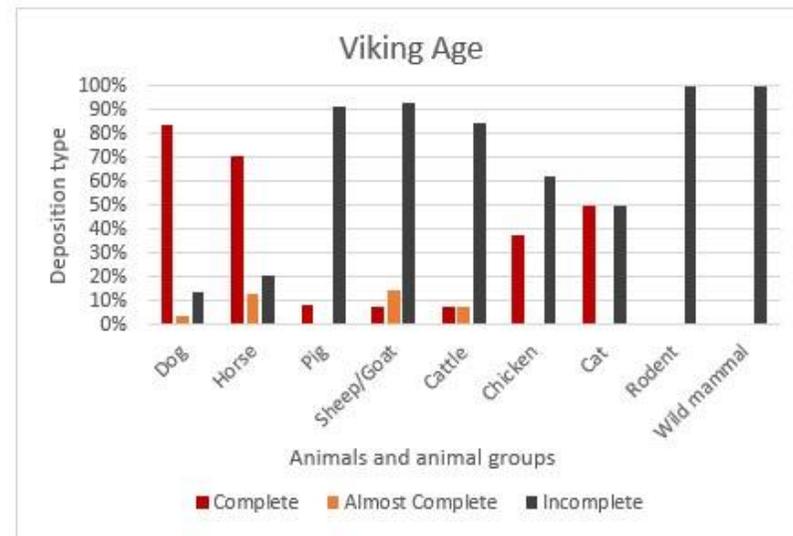
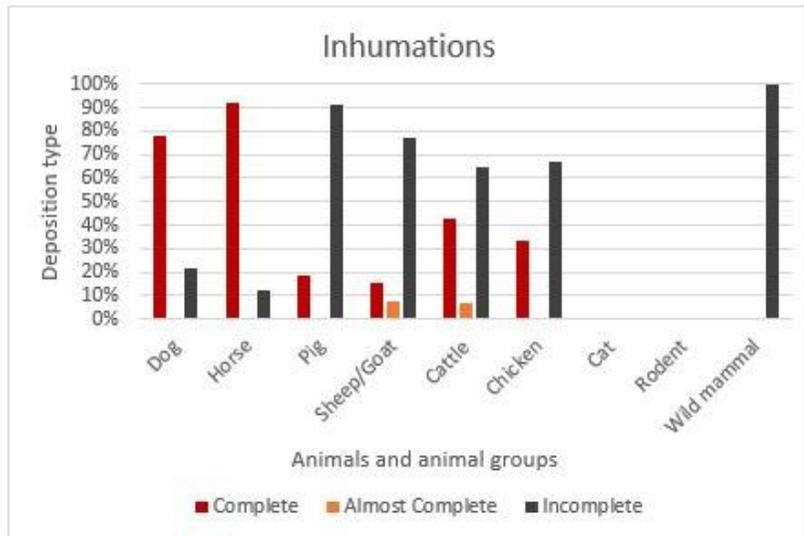
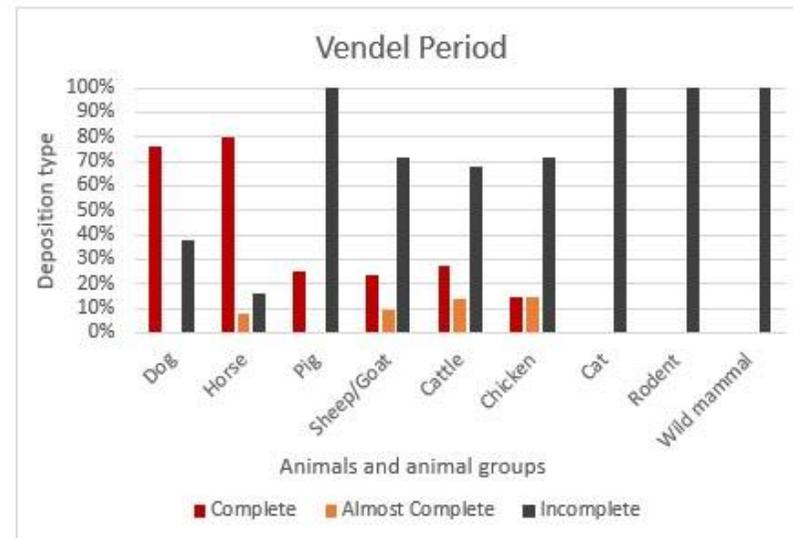
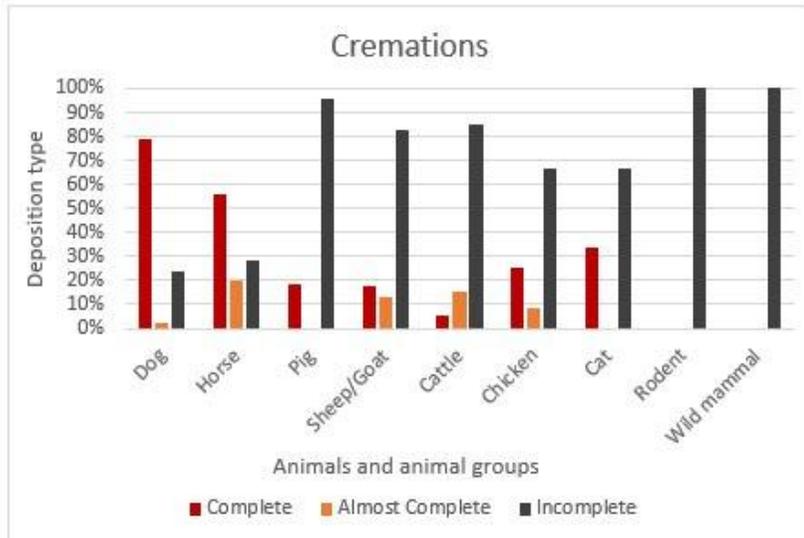


Figure 14 The frequent occurrence of complete-, almost complete- and incomplete depositions of different species and animal groups in graves, in relation to the burial type and the time-period.

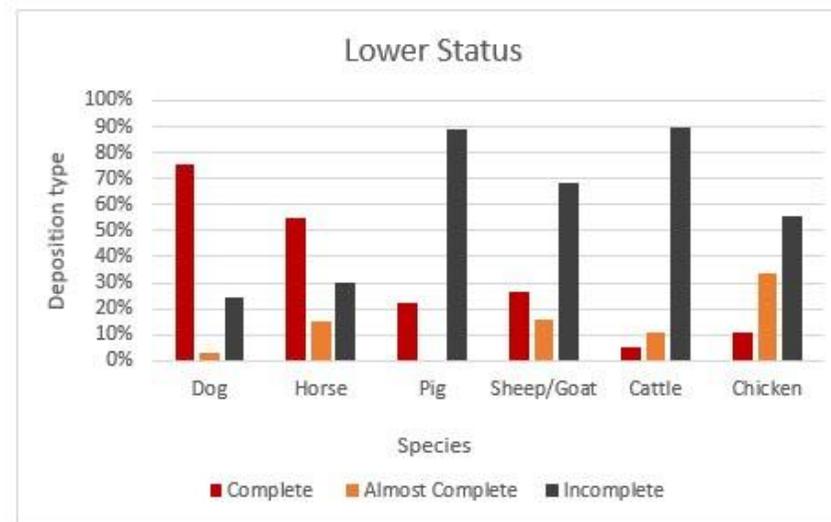
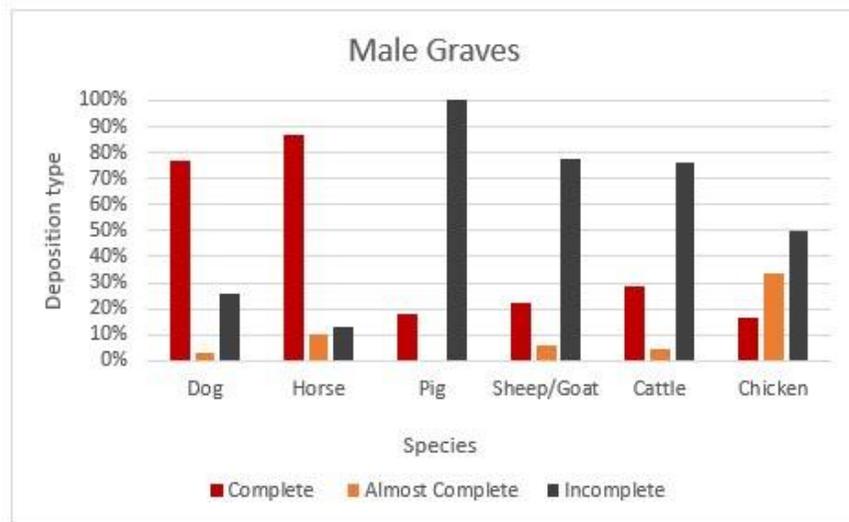
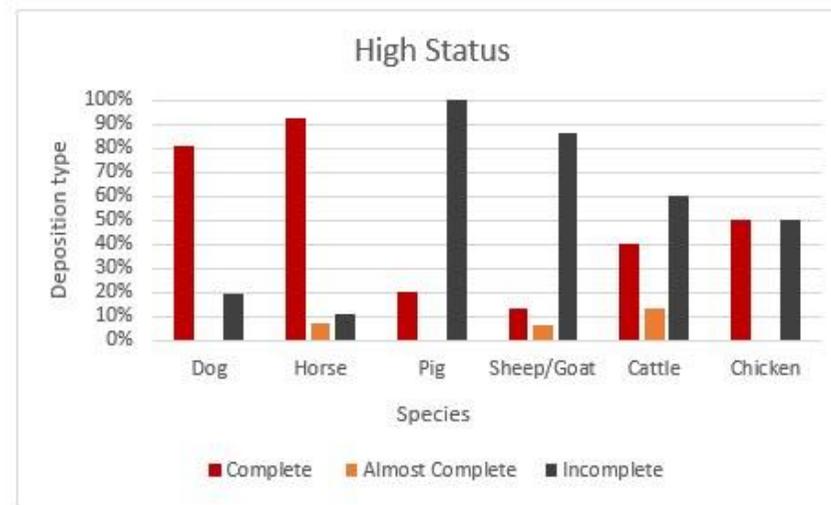
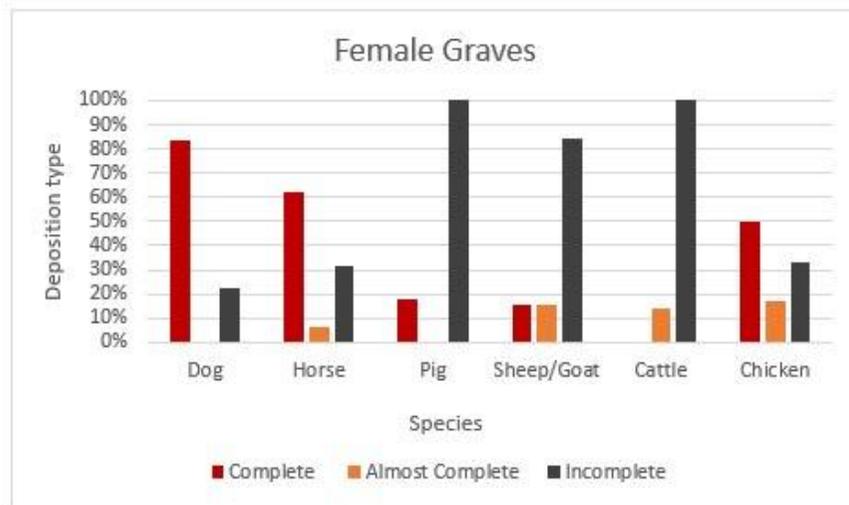


Figure 15 The frequent occurrence of complete-, almost complete- and incomplete depositions of different species and animal groups in graves, in relation to the gender and the social status of the deceased.

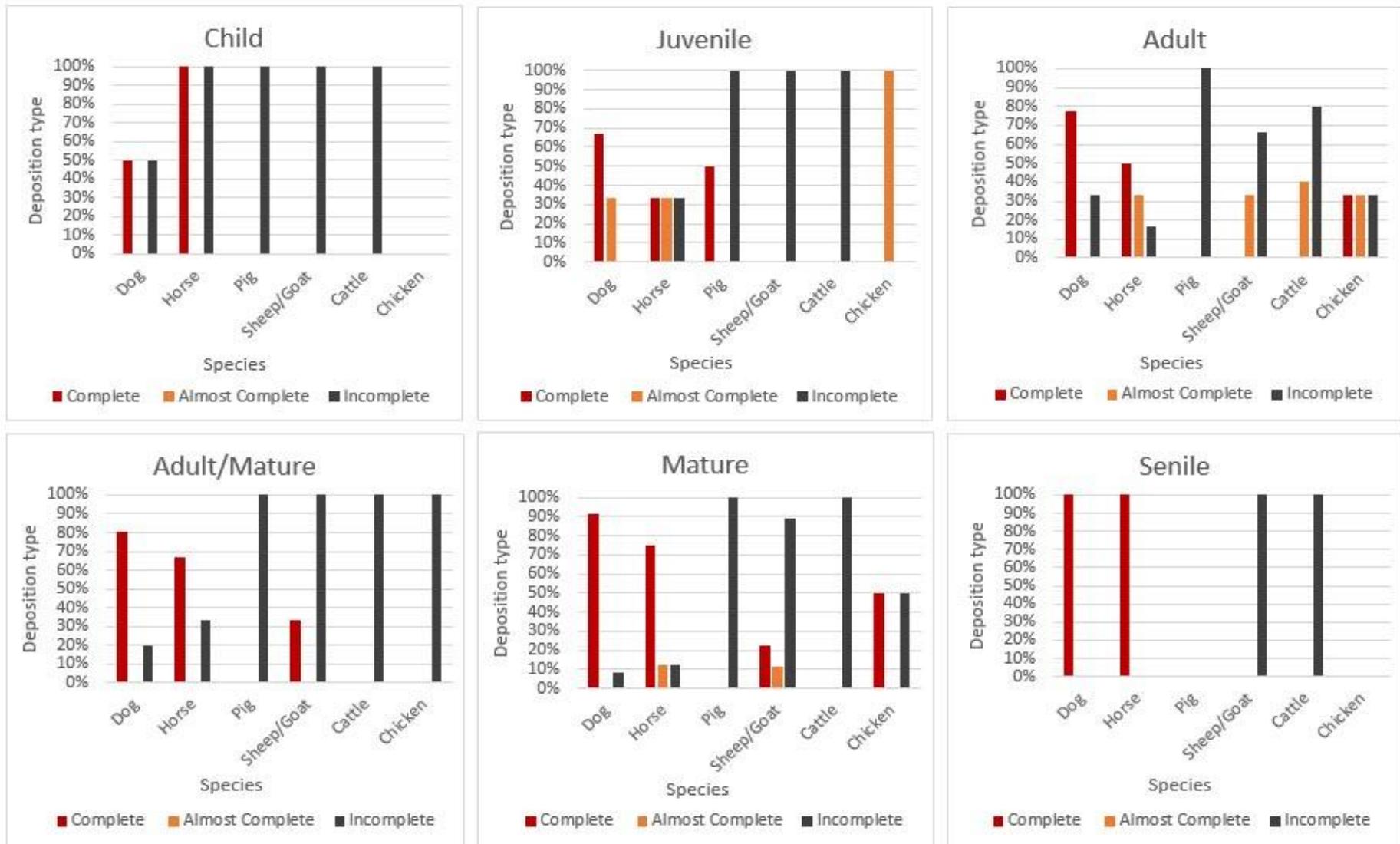


Figure 16 The frequent occurrence of complete-, almost complete- and incomplete depositions of different species and animal groups in graves, in relation to the age groups of the deceased.

status inhumations in the database that are (often without osteological analysis) declared as male burials. But in contrast to that, depositions of complete horses are present in graves of all age groups and occur in every single grave that contain either a child or a senile deceased (*Fig. 16*). In addition, these kinds of remains even appear to 55 % among burials with lower social status which means that complete horses are no definite indication for a high-status grave (*Fig. 15*).

Pigs, sheep or goats, cattle and chickens show varying types of depositions which demonstrates that those animals received different treatments in the burial ritual. Consequently, this could mean that they also had different symbolic meanings, depending on the way of the deposition. Admittedly, there are also cases in which dogs and horses have been deposited incompletely, but the distribution of dogs and horses on the one side and pigs, sheep or goats, cattle and chicken on the other, is almost exactly the opposite when it comes to complete and incomplete depositions (*Fig. 13*).

The classifications as “almost complete deposition” occurs most commonly among chickens (23 %) (*Fig. 13*). This share is identified by graves of adult, mature and mainly juvenile deceased of lower status, yet complete depositions derive from high-status burials as well and are dominant in female graves (*Fig. 15+16*). In combination with the fact that also complete chickens are more present than whole depositions of pig, sheep or goats and cattle, it seems likely that this species could have had a different symbolic meaning in the burial ritual (cf. Chapter 5.2.2.1). Moreover, the occurrence of a relatively high number of almost complete- depositions among chicken might be a consequence of the delicate bone structure of these animals which leads to an easier deficiency of certain body parts. Thereby, chickens might seem as almost complete depositions in the archaeological record, but likewise could originally have been complete depositions as well.

Pigs do not show any almost complete depositions at all which could also be an indication for different meanings in the burial ritual, compared to sheep or goat and cattle which apparently received a similar treatment (*Fig. 13*). Depositions of complete pigs (7) are not restricted to the age, the gender or the social status of the deceased except for the fact that they only occur among the graves of juvenile and mature dead, with a higher percentage in juvenile¹⁸ (*Fig. 15+16*). Depositions of complete cattle, on the other hand, appear only in male inhumations, mainly during the Vendel Period and almost exclusively in high status burials (*Fig. 14+15*). The only exception is a very uncommon cremation grave (Ultuna 4206), which does not only contain one complete and unburnt cattle, but also two complete and unburnt pigs and two almost complete and unburnt sheep. The latter is a very important fact because it weakens the earlier thought that almost complete animals could originally have been complete depositions after the moving of the remains on the funeral pyre. Instead it shows, that also unburnt animals ended up almost completely in graves, indicating that the fragmentary state of the body might have been an intentional act from the beginning. However, interpretations for reasons for that remain speculative.

Furthermore, this grave is the only case in which completely or almost completely deposited unburnt cattle, pigs and sheep or goats occur, whereas the other unburnt bones all originate from incomplete depositions¹⁹. Worth mentioning is that also the as complete calculated cattle and the two pigs are missing one body region each. One possibility could be that the missing parts of these animals have been eaten during the feasting meal and what was not eaten was deposited on the grave. This grave has no indications of a higher status grave at all which demonstrates that complete cattle were not exceptionally reserved for burials of the higher society, but still distinctively more common among those.

Because of calculating with percentage inside each species, it is almost exactly the opposite with incomplete depositions. Consequently, the highest share of incomplete depositions among

¹⁸ However only 4 juvenile graves have been determined and only one of two graves with pigs contains a complete deposition.

¹⁹ More information on unburnt depositions follows in the next chapters.

domestic animals in this category is to be found among pigs, sheep or goat and cattle, chickens are deposited partially to 46 % of the cases (*Fig. 13*). An increase of incomplete dog depositions exists during the Vendel Period, whereas this applies to sheep or goat and cattle during the Viking Age. While complete horses and cattle appear slightly more often in male inhumation graves of high status, there are more incomplete depositions of the two species in female and lower status graves. However, the opposite applies to incomplete chickens, that are more common in male burials but to the same extent among both social statuses (*Fig. 15*).

As a conclusion, it can be said that the results of this analysis support the ones from the previous investigation on the one side (cf. Chapter 4.1.3), and give more detailed information about the kinds of depositions and their distribution on different graves on the other. Most clearly, a division in three groups can be observed: dogs and horses with the highest percentage of complete depositions, pigs, sheep or goats and cattle with a generally similar distribution of deposition types and dominance of incomplete skeletal remains, and chickens as an outlier with a comparably higher fraction of complete depositions and the highest percentage of almost complete depositions. These results can of course be influenced by the fact that even disturbed graves have been used in this specific study. But it is relevant to see tendencies within the whole database and include the high-status burials that mainly suffered from destruction – in this case ancient grave-reopening. The following chapter connects to this analysis as it focuses on the body part frequencies of mainly incomplete depositions while considering the condition of these bones as well.

4.1.5. Body part frequency and bone condition

The previous analysis has already demonstrated that there are different types of depositions, partially dependent on the species as well as certain characteristics of the burial. This investigation goes a step further and tries to find patterns inside these depositions by analysing the body part frequency²⁰ and the bone condition of domestic species. The aim of this specific study is to create empirical data that can support the hypothesis that different ways of depositing change the meaning of an animal in the burial ritual.

Due to the varying characters of publications and osteological reports (if present at all), it is not possible to find out about the single body parts of every individual. In cases of old excavations such as Vendel, Valsgårde and Tuna in Alsike, the determinations of complete and incomplete animal depositions have been carried out only on basis of the grave descriptions. Since those

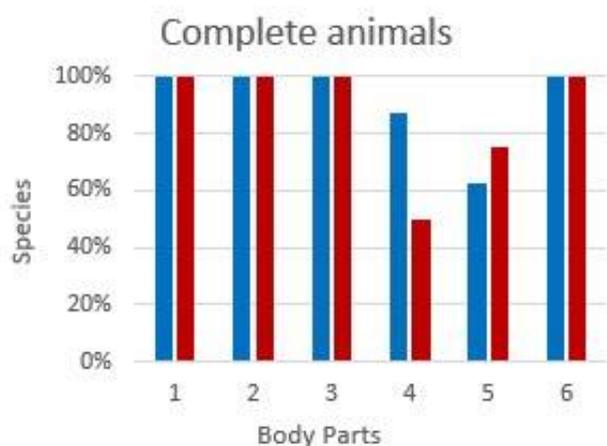


Figure 17 Body part frequency among completely deposited dogs and horses (burnt remains from cremation graves).

contain unscientific terms such as “left side ham” or “steak” for instance (e.g. Stolpe & Arne 1912: 53), this information has been noted in the database but cannot be used for the analysis of body part frequencies. In other cases, osteological reports are available but incomplete when searching for body parts of every single individual. The analysed cremation graves from Valsgårde e.g., only show the body parts of incomplete animals, whereas complete animals are described as “all body parts present”. The same applies to other reports as well (e.g. Ultuna and Grimsta) but since it is not specified what kind of division of body parts

²⁰ The anatomical separation of body parts has already been explained in the previous chapter within *Table 6*.

is used, it is not possible to just expect that the in this study used 6 body parts are all present.

Furthermore, the analysis of body part frequencies only contains cremation graves, because of the sparse mentioning of present body regions among inhumation graves. Moreover, the study is carried out individually inside the two categories “complete”, and “incomplete”. “Almost complete depositions” have a too few sample size and are therefore not part of this analysis.

The division is essential for the reason of unequal mentions of body parts of complete and incomplete animal depositions which would falsify the results. Because after all, it is possible that there are body parts occurring among whole animal depositions but not among the partly deposits or vice versa. Another separation is made between burnt and unburnt bones in order to compare the two different types of depositions. Since there is a risk that especially unburnt bones originate from younger cultural layers and thereby do not belong to the actions of the the burial ritual, these are only taken into account when deposited inside a cremation layer. In addition, only intact graves²¹ are used for this specific analysis because, as opposed to the previous general studies, not only the single presence of certain species is to be identified, but single parts. If one body part is missing due to destruction of a grave, that would change the whole result of the analysis, whereas it does not make a difference when only looking for the presence of certain animals.

Apart from this methodological proceeding, the calculations are measured regardless the animal MNI, same as in the previous analysis, yet for another reason. Here, only one animal is calculated instead of multiplying the number of body parts with the declared number of animal MNI because of the dubiety about whether the body parts mentioned in the osteological reports count for every individual or only specific ones among the stated animal MNI. This, however, will not harm the total outcome of the analyses, because a general analysis on the development of the animal MNI has already been carried out earlier in this work (cf. Chapter 4.1.2). Since the restrictions for an inclusion in the investigation of body part frequencies are very high, this analysis can only be done on a general scale because the sample size would shrink even more if additional divisions such as the human age or gender would be used. Moreover, only the domestic animals take part in this specific study, excluding all kinds of birds and cats. The reason for that has already been explained in the previous chapter.

A comparison of body part frequencies among complete and burnt dog- and horse depositions shows, that both animals are missing number four and five of the body parts, representing the upper respectively the lower hind leg, in up to 50 % of the cases (Fig. 17). Admittedly, the number of calculated entries for dogs participating in this study is eight, and among horses only four were chosen. Due to this low participation it is not possible to estimate whether the distribution of missing body parts 4 and 5 results from taphonomical causes or if a specific custom could be the reason. The possibility of depositing the missing body

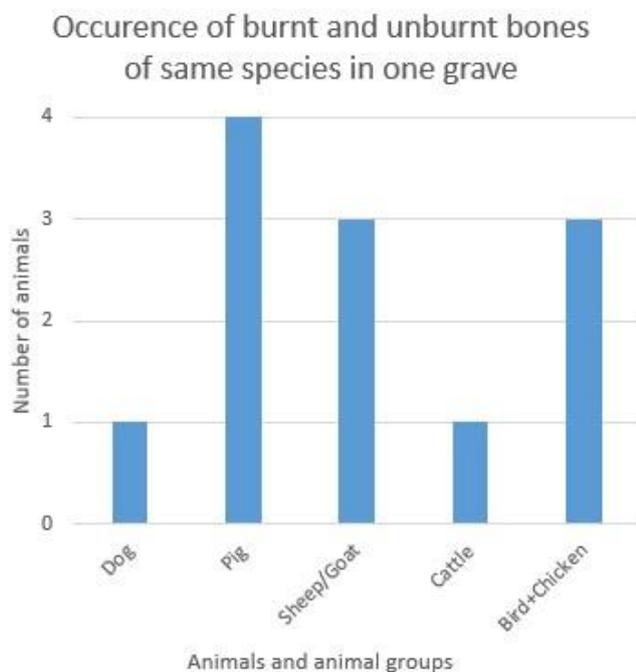


Figure 18 Correlation of burnt and unburnt bones of the same species in the same grave.

²¹ No disturbance of bone containing layers, cf. Chapter 3.2.4.



Figure 19 Body part frequency among incompletely deposited animals in cremation graves according to different bone conditions.

Incomplete Burnt Dogs

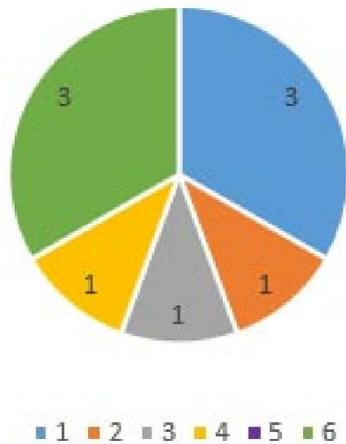


Figure 20 Body part frequency of incomplete burnt dogs in cremation graves.

depositions. In comparison to that, pigs (4) are the species that occur most often both as burnt and unburnt depositions in the same grave, followed by sheep or goat (3) as well as birds or chicken (3), and finally cattle (1) and dogs (1) (Fig. 18). Even though, the material of evidence is not significant, there is a tendency that mainly pigs, sheep or goats and birds or chickens occur most often together in both different conditions. Whether there is a deeper meaning behind this incident, could be answered by the subsequent investigation.

An intentional selection of body parts can most clearly be observed among the incomplete depositions of burnt and unburnt cattle which are only represented by cranial parts and the hand/feet/tail-region (Fig. 19). The only difference between the burnt and unburnt material is a slightly higher number of the latter region among the burnt depositions, whereas the unburnt bones of cattle almost completely consist of cranial parts. Thereby, depositions of incomplete cattle are entirely lacking fleshy parts and can therefore most probably not be considered as remains from ritual feasting or food-gifts.

In comparison to that, pigs show a similar ratio regarding burnt and unburnt incomplete depositions (Fig. 19). Here again, the cranial parts make up the largest share, especially among unburnt depositions. Apart from the hand/feet/tail-region and the lower hind legs which are present both among the burnt and the unburnt material, the only difference is the occurrence of the front legs among burnt pig remains. Sheep or goat on the other hand, show a broader spectrum of body regions, present in both bone conditions. Moreover, there is a striking difference between the share of cranial parts among

parts of dogs and horses as unburnt bones, can be excluded because there is only one unburnt phalanx of a dog occurring in the cremation layer of a grave. The other species are not suitable for an investigation inside the group of complete animals, because they are not occurring frequently enough.

In contrast to that, the analysis of incomplete depositions gives more insight. To begin with, it is striking that among this material, there are more depositions of incomplete and -burnt (13) than unburnt pigs (6), while the opposite is the case for sheep or goat which are represented seven times as burnt and 13 times as unburnt and incomplete depositions. Moreover, also cattle occur slightly more often as unburnt and incomplete depositions (9) compared to the incident of six burnt and incomplete

Incomplete Burnt Horses

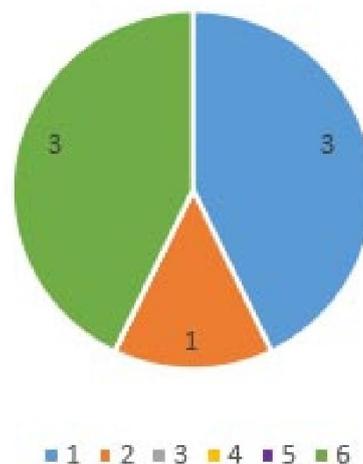
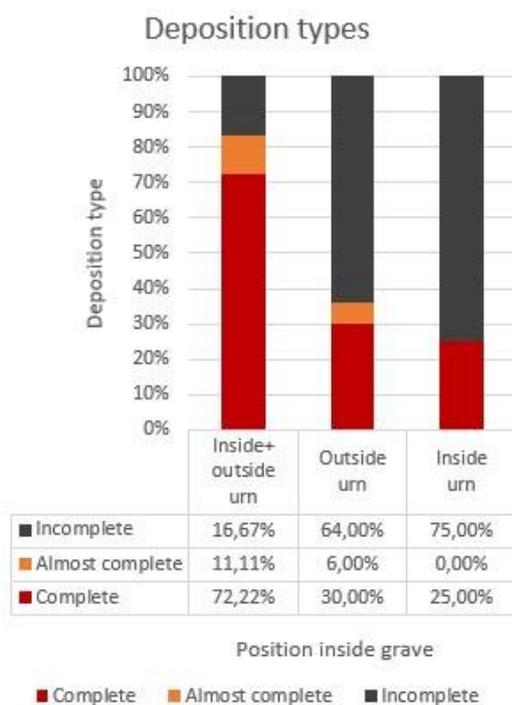


Figure 18 Correlation of burnt and unburnt bones of the same species species in one grave.

the burnt material which is only 1/6, whereas it makes more than half among the unburnt remains. Opposed to that, half of the share of burnt bones are represented by all the fleshy parts, with an emphasis on the lower hind legs. The unburnt depositions of sheep or goat, however, only contain less than a quarter of fleshy parts, which would be the front legs and the upper hind legs (Fig. 19).

Even though dogs and horses are most frequently deposited as complete animals, the previous analysis has demonstrated that around 20 % of the depositions are incomplete skeletal remains (Fig. 13). Since only one phalanx of a dog is among the unburnt material of dogs and horses, only the burnt remains can be discussed here. Comparable to most of the other domestic species, the



depositions of incomplete burnt dogs and horses mainly consist of depositions of cranial parts as well as fragments of the hands/feet/tail-region. In only one case, there are fragments of the horse's trunk region, which makes it the only fleshy part among this species (Fig. 21). The depositions of incomplete dogs on the other hand, contain apart from the trunk region also parts of the upper hindleg- and the frontleg- region in one case (Fig. 20). Even though the sample size is too little to come to broader conclusions, the fact that incomplete dog remains consist to 1/3 of fleshy parts raises the questions whether dogs could in very few cases have served as food as well.

However, traces of bone manipulation, that would be cut marks and marrow splits, indicating the consumption of meat and bone marrow, can solely be found on the remains of pigs, cattle, sheep or goat (3x each) and in one case on fish bones (cf. Database). Here again, these incidents are not very common but show a tendency that probably mainly these animals have been consumed – at least in combination with funerals. Rodents and wild

Figure 22 Spatial distribution of different deposition types inside urn graves.

mammals do not appear frequently enough to undertake a thorough examination of body part frequencies. Moreover, it has been mentioned before, that these animal groups only appear as incomplete depositions. However, bears as well as the single lynx are only represented by phalanx 3 respectively the claws in the grave assemblages. This is an important detail which will be picked up in later in this study.

4.2. Spatial analysis

4.2.1. The distribution of bones in- and outside the urn in cremation burials

The way of depositing and the context of a deposition, change its meaning, respectively the meaning of a certain animal, in the burial ritual. Therefore, this subchapter focuses on cremations graves, containing urns, in order to shed light on the relationship between the human dead and the animals, respectively the symbolic animal depositions, that accompanied them in the grave.

This analysis is based on the assumption, that faunal remains found inside urns were deposited intentionally. But was there even an intentional selection of the human and certain animal species? And is it possible to recognize and distinguish special depositions inside or

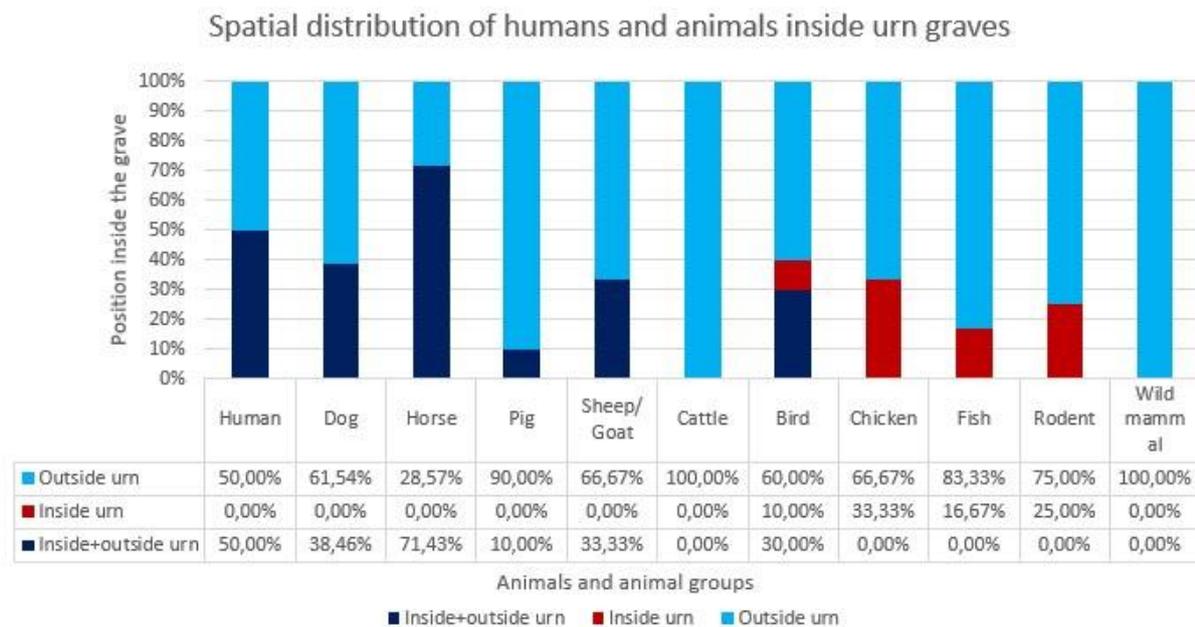


Figure 23 Frequent occurrence of species and animal groups in different spatial positions inside urn graves.

around the urn? This analysis calculates with depositions, respectively animals, instead of graves, because the questions concern the depositions and not the number of graves where a certain incident appears. Therefore, the animal MNI is respected here, in contrast to previous analyses.

The cremation graves which contain ceramic vessels, interpreted as urns, all have in common that burnt bones always occur both inside and outside the urn, never isolated inside the urn (Fig. 24). This indicates, that the place of the funeral pyre and the urn grave could have been identical, and that some remains have been scraped together after the burning and were subsequently deposited inside the urn. This would also explain, why cremation layers with an urn are often rather thin.

A striking fact to begin with, is that remains of the cremated human dead occur to only 50 % both inside and outside the urn, whereas horses do to 71 %. Dogs, sheep or goat and birds reach almost the same percentages in this case, which lie between 30 % and 40 % (Fig. 23). Were horses favoured to follow the deceased into the urn? Or did the selection happen unintentionally and it was just more likely to collect the species of which the biggest amount of burnt remains was left?

Following the latter suggestion, additional evidence would be given by the fact that incomplete depositions only appear to 16 % both inside and outside the urn, whereas complete- and almost complete depositions are selected to 72 % and to 11 % (Fig. 22). Consequently, a higher share (62 %) of incomplete depositions is left entirely outside of the urn. The share of 75 % of incomplete depositions inside the urn, solely derives from the remains of an unburnt fish and an unburnt rodent²². Whereas the remaining 25 % represent a complete and unburnt chicken from Valsgårde, grave 94.

On the other hand, the fact that 30 % of completely deposited animals remain outside of the urn, might once again be an indication for specific species to be chosen to follow into the urn, regardless their way of deposition (Fig. 22). However, there is a higher chance for completely deposited animals to follow into the urn, just by the fact that there is more left of a burnt complete carcass compared to incomplete ones. Thereby, as considered earlier, it is naturally more likely to pick the remains of a complete animal and likewise to pick the remains of an animal which is

²² Of course, it is still possible that the incomplete rodent does not represent an intentional deposition even though it was found inside the urn.

bigger than others, respectively which shows a larger amount of burnt remains than others. Moreover, the question is whether the burnt remains of humans and animals even carry a symbolic meaning after the ritual cremation.

With regard of the supposed course of the burial ritual, it seems only logical that the majority of unburnt animals (78 %) is deposited outside the urn. The share of 17 % of unburnt bones inside the urn is created by the already mentioned fish, rodent and chicken from Valsgårde, and an additional incomplete bird from grave 4206 from Ultuna. However, the percentage of 4 % of unburnt bones that occur both inside and outside the urn raises some questions (Fig. 24).

But when taking a closer look at the species and the kind of depositions, it becomes clear that this share only consists of another unburnt and complete bird (grave 4425 from Ultuna). In comparison to the complete and unburnt chicken from Valsgårde, grave 94, and the unburnt bird remains from Ultuna, grave 4206, which were placed on top of the urn²³, it seems most likely

that this bird was deposited in the same way and that parts of it slipped inside the urn, whereas others fell aside after the natural decomposition of the body. A more precise analysis of where exactly the bird bones have been found, could help to support this idea.

Furthermore, one of these graves are classified as female (Ultuna 4425), whereas the other one is undetermined. Since Valsgårde grave 94 is also (archaeologically) determined as a female burial, it would be promising to examine further, whether it was mainly women who received this ritual custom of an unburnt bird or chicken on top of the urn (cf. Chapter 5.2.2.1). In addition, this case shows once more that a number of unidentified birds might actually be chickens.

As a conclusion, it can be stated, that it is not an easy task to estimate whether specific species were deposited intentionally inside the urn. Based on the results of this analysis, it must be assumed that there was a higher chance for species (including the human dead), which were represented by a bigger amount of remains, to be selected. Those are complete depositions and naturally bigger animals, recognizable by the highest share of horse remains appearing both inside and outside of the urn.

A striking special deposition in this analysis, are the unburnt birds that are placed on top of urns. In combination with the deposition of the unburnt fish remains (and possibly the unburnt rodent alike), it seems that a symbolical relevance for the burial is more likely to be carried by unburnt remains. In contrast to that, burnt remains seem unlikely to bear a symbolic meaning after the cremation, which is not least expressed by the fact that human remains are in half the cases not deposited inside the urn.

What remains is the insight, that only more thorough analyses can give a more secure answer to this issue. Those could contain the comparison of the number of fragments (NISP²⁴) and the

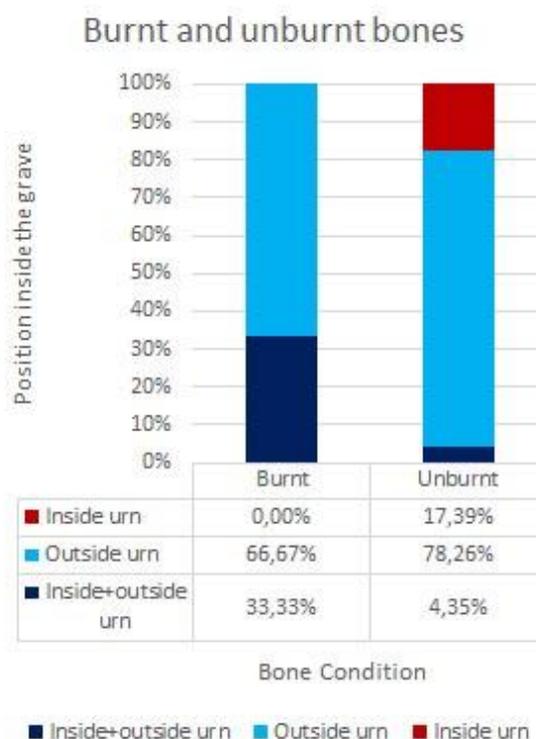


Figure 24 Spatial distribution of burnt and unburnt bones inside urn graves.

²³ The description “on top of the urn” is, after a comparison to similar incidents (cf. Bratt 2008: 244; Hulth 2014: 71), regarded as a deposition on top of the burnt remains, inside the urn.

²⁴ Number of Identified Specimens or Number of Individual Specimens, which regards each bone and fragment as

total weight of the remains of one species. Furthermore, analyses of cremations on-site, or archaeological experiments of cremation burials, could show whether it was possible to distinguish the remains that were left on the burnt down funeral pyre.

4.2.2. The spatial positions of bridles, halters and dog's collars and -leashes inside inhumation graves – an indication for special perceptions of certain animals?

This chapter focuses on the spatial distribution of bridles and halters inside inhumation graves and their spatial relation to the horse and the human dead. This analysis aims to test whether horses might have had an outstanding position among the sacrificed animals and a special relationship to the human. In this sense, a bridle which was on the horse's head or deposited close to it, could indicate that it belonged to the horse. But a bridle that is deposited close to the human seems more like a separate grave-good for the deceased. As a comparison, similar situations are presented concerning dogs and their equipment.

In general, there are four different positions in which bridles and halters can be found:

1. They were either left on the horse's head,
2. placed somewhere close to it,
3. placed in the front part of the boat,
4. or placed close to the human and their personal possessions.

Bridles that were left on the horses' heads, occur both during the Vendel Period and Viking Age, but more often during the latter. This difference increases significantly in category 2, "placed somewhere close to it" (Fig. 25). This group contains two graves, Prästgården 1 and Valsgårde 14, where the bridles are placed on top of the horses' backs (Nordahl 2001: 24, *in press*). In other circumstances, counted to the same category, there might be a possibility that they originally had been placed on top of the horses as well, but were no longer in situ, probably due to grave reopening or natural decomposition. This might be the case for Valsgårde grave 8 and the graves 3, 4 and 8 from Tuna in Alsike where the bridles were found close to horse skeletons.

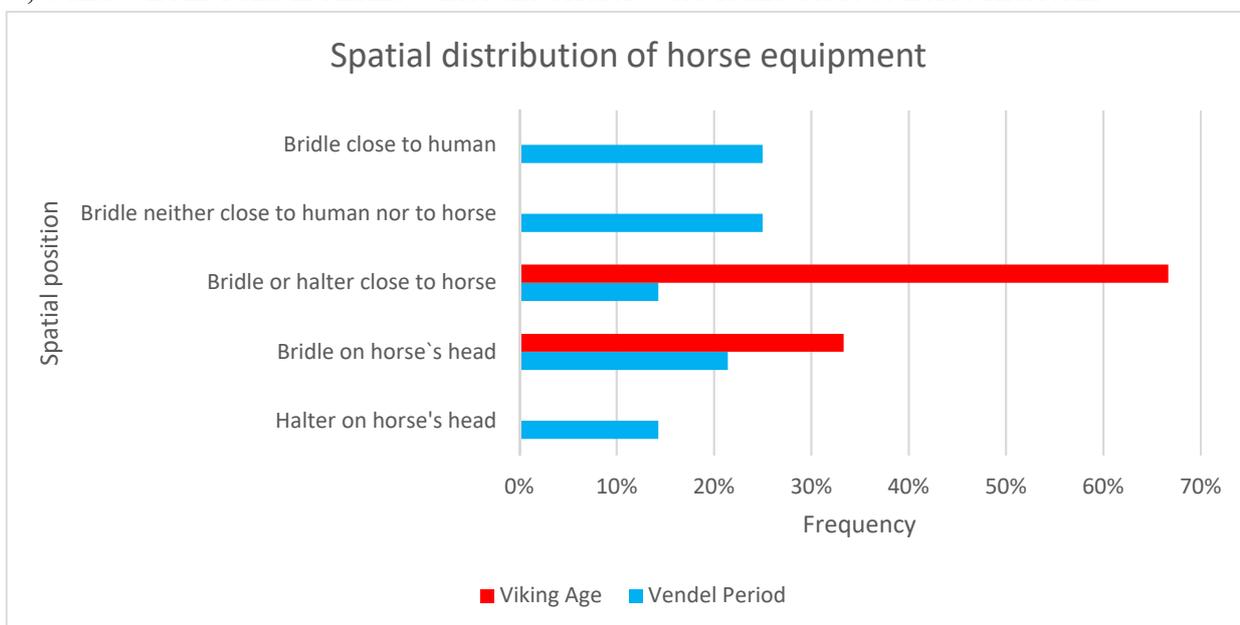


Figure 25 Spatial distribution of horses-halters and -bridles in different positions inside inhumation graves.

Bridles that are deposited close to the deceased, occur inside the graves 5 and 6 from Valsgårde

and inside the graves 3 and 12 from Vendel. These graves all date to the Vendel Period whereas bridles from the Viking Age are solely either left on the horse's head (33 %) or somewhere in the surrounding of the horse respectively on top of it (66 %) (Fig. 25).

In some boat-graves, bridles are neither placed close to the human nor directly to horses. They can seem to lay close to a horse, but are still deposited inside the boat, namely in the front part which is comparably far away from the common placement of the human dead. This applies to Valsgärde grave 5 and 13 and the graves 1, 3, 7, 10 and 11 from Vendel.

Apart from bridles, halters appear in the Vendel Period graves 6, 8 and 13 from Valsgärde and in the Viking Age boat-grave from Årby. The difference to the latter, however, is the fact that the Vendel Period graves from Valsgärde contain additional bridles for the horses with halters. In addition, the halters are placed either on the horse's head or right beside the horse, whereas the bridles are deposited close to the human (Valsgärde 6), inside a possible wooden box in the front of the boat (Valsgärde 13) and in one case close to the horse (Valsgärde 8). Another indication for the recognition of the horse could be the occurrence of a special appliance built of wooden sticks and planks for the horse in the Tibble grave (Arbman *et al.* 1993: 69f., fig. 50). Inasmuch as, the deceased in the Årby-grave was bedded on a special bed (of grass) as well (*idem*: 19). The perception of the horse will be further discussed in the following interpretation- and discussion chapters.

The occurrence of halters in a grave, could indicate that the horse was brought inside the grave alive and killed at the same place. This is supported by the fact that one horse leg was found in a deeper clay layer in the Tibble-grave, showing that the leg got stuck in the clay when it was alive (Arbman *et al.* 1993: 70). Another indication might be the horse's posture (legs under belly) in i.a. grave 11 from Tuna in Alsike (Arne 1934: 39). Besides, it makes more sense to kill a big animal, such as a horse, right on-site, instead of killing it elsewhere and having to transport it to the actual burial place. Interestingly enough, there are also two incidents where cattle were provided with halters, namely Valsgärde grave 6 where the halter was left on an ox (cf. Chapter 5.2.2.2, Fig. 27), and Valsgärde 7 with a halter close to the cattle's head (Arwidsson 1977: 64). Here again, these halters are most likely indications for the process of the burial ritual.

Apart from horses and in the mentioned few cases also cattle, findings of dog's leashes and collars are quite common as well, at least among inhumation graves. In boat-graves, dogs are usually deposited on the portside, at the front of the boat. In a few cases, this pattern is ruptured as they were put either on the starboard side (Prästgården 1 and Årby) or at the stem of the boat (Valsgärde 5 and Vendel 14).

Striking, however, is the fact that there are three graves from the cemetery in Valsgärde (grave 7, 8 and 14) that contain dog's leashes and collars but either only a dog's jaw or only the teeth or no remains at all. Were the dogs even inside those graves in the first place? Or are the leashes and collars symbolic depositions as representations of the dogs? At least in grave 14 from Valsgärde, yellow powder marks the traces of bones close to two leashes and indicates, that no less than one dog was deposited here (Nordahl *in press*). In addition, a wooden plug and a leash inside the Årby boat-grave, are possibly connected to the purpose of the tethering of the dog outside the boat (Arbman *et al.* 1993: 27). This would mean that the dog was alive at some point of the procedure of the funerary ritual and the same purpose could be valid for the leashes of the dogs in the other graves. However, the dog from the Årby grave was demonstrably killed with a hit on the back (*idem*), which excludes the interpretation that it could have been buried alive. Regarding the graves from Tuna in Alsike, dogs are mainly deposited close to the horse(s) or between the horse and the deceased and often seem to lay inside of the boat respectively inside the chamber. However, there are no mentions at all about any objects belonging to dogs in those graves.

The entire lack of dog's leashes and collars in the Viking Age graves from Tuna in Alsike are striking. Provided that the collars and leashes in the Årby boat-grave and the Vendel Period boat-graves had the purpose to tie up the dog until it was killed, a lack of those items among the graves

in Tuna in Alsike could indicate different ritual actions and proceedings in the ritual as the dogs might have been deposited as already dead creatures. This could be supported by the dog in the female Viking Age boat-grave 36 in Gamla Uppsala, whose posture indicates that it might have been lowered down into the grave on its tail, when already dead (Nordahl 2001: 57). On the other hand, leashes and collars made of organic material would not leave any traces in the mentioned graves or alternatively, they could equally have been taken off the dogs before closing the grave. But then again, the graves from Tuna in Alsike are almost exclusively regarded as high-status burials, which means that iron leashes and collars cannot be excluded for economic reasons.

If bridles deposited close to or on the horses' heads, are considered as an indication for the recognition of these and the ascription of the equipment as their possessions, the same should apply for dogs buried with collars and leashes. However, it has been explained earlier that the dog equipment could be of a more practical nature and thereby might not necessarily be connected to a deeper relationship between the human and the animal. Nevertheless, both dog and horse equipment is ornamented with fittings showing elaborate decorations.

Moreover, dogs could even have collars with iron spikes, that had the purpose to provide them from getting hurt in a fight (Gräslund 2004: 168). This could either be an expression of a special care for the dog, but likewise, a utilitarian explanation, in the sense of securing one's economic capital, is possible. This would apply to all kinds of dogs, that had a function beyond a pure emotional bond, namely, guarding-, hunting- and herding dogs.

In summary, there are in fact different ways of depositing bridles inside the grave. Especially the Viking Age burials show a tendency to leave the equipment close or even on the horse, instead of depositing it separately or close to the deceased, as it happens during the Vendel Period. If the horse as a social actor inside the burial can be regarded as an individual personality and/or whether it served to display the identity and social position of the human dead, will be further discussed in the following chapters.

4.3. Summary

The here presented analyses served to find general patterns among the custom of depositing animals in graves, and to identify shifts in this pattern regarding the burial type, the time- period and the social factors of the human age, gender and social status. The frequent occurrence of domestic animals can be regarded as a general pattern, with dogs occurring in almost every single grave during the Vendel Period. Dogs are followed in representation by horses and sheep or goats, pigs and cattle in descending percentages and in the same distribution in more than half of the graves. Subsequently, birds and/or chickens and fish occur and with a higher share than chickens. However, this result has been discussed as not representative, since a number of chickens seems to be classified among the category of undetermined birds. Wild birds and hunting birds occur to a higher percentage in the Vendel Period graves, respectively do hunting birds not appear in Viking Age graves at all.

The distribution of animals is widely the same during the Viking Age, but with a general decline of animal remains which is most significant among pigs, sheep or goats, cattle, fish, wild birds and hunting birds. Opposed to that, the representation of chickens and wild mammals does not show any changes in the Viking Age period.

Furthermore, a part of finding a pattern and to reach a broader comprehension of the functions and meanings of certain animals in the burial ritual, was to distinguish different types of depositions. These are expressed by complete-, almost complete- and incomplete depositions, as well as burnt and unburnt bones in cremation graves. The analysis shows, that dogs and horses are most commonly deposited as complete animals, whereas this happens only exceptionally for pigs, sheep or goats and cattle. Chickens, on the other hand, are represented by a high share of

almost complete depositions, which could suggest that the animal was originally deposited as complete, but ended up in a highly fragmented condition, owing to poor preservation-preconditions of the delicate skeleton. Thereby, chickens demonstrate a different deposition pattern than pigs, sheep or goat and cattle, but do still not reach the high percentage of completely deposited dogs and horses.

The ensuing more detailed analysis of body part frequencies, gave further insight of deposition patterns. The investigation of complete dogs and horses showed, repeatedly that parts of the hind legs are missing, which suggests an intentional act. Incomplete depositions, on the other hand, demonstrated a general majority of cranial parts, together with a frequent occurrence of parts of the hand/feet/tail-region. Pigs and sheep or goat show more fleshy parts among the burnt material, whereas cattle are solely represented by the cranial parts and the hand/feet/tail-region, both among burnt and unburnt bones. As exceptions, even dogs and horses occur as incomplete depositions, with a striking occurrence of fleshy-parts among the first mentioned.

In contrast to these general patterns, some animals expressed curious shifts in the pattern regarding both deposition type and social restrictions. Significantly gender-related incidents are depositions of wild mammals, wild birds, hunting birds and complete cattle which all solely occur in male graves. The latter appear in general more frequently in male burials, whereas chickens express an emphasis on female graves with a dominance of complete depositions. That completely deposited horses are more common in male inhumations, has been source critically mentioned, since a relatively high number of inhumations is represented by the non-osteologically-determined boat-graves of Vendel and Valsgärde.

In comparison to that, depositions that are most clearly connected to a social status, are again hunting birds which only occur in high-status burials. Furthermore, wild birds and completely deposited cattle almost exclusively belong to this category. Complete horses, on the other side, occur in almost all high-status graves but appear in more than half of the as lower social status-declared graves as well. Therefore, complete horses per se cannot be regarded as an indication for a high-status burial.

The spatial analysis of bridles inside inhumation graves has shown, that horses might have earned a special perception, indicated by the position of bridles close to or on the horses' heads instead of a deposition close to the human. However, this is only the case for graves that date to the Viking Age. The provision of dogs and cattle with leashes, collars and halters, has, in contrast, preliminary been interpreted as indications for the process of the burial ritual and not as evidence for special perceptions of dogs.

Opposed to that, the spatial analysis of bone distributions inside urn graves, gave a partially negative result. It cannot be said with certainty, that an intentional selection of burnt bones happened and if cremated remains even had distinct or different meanings at all. Unburnt bones, on the other side, showed an interesting tendency for the deposition of birds or chickens on top of the urn.

Additionally, two distinct groups have emerged in the study. One group contains burials of males of high status, present among both cremations and inhumations, however with a dominance in the latter. These graves contain wild birds and hunting birds and a comparably high number of complete animals which, however, is also common among graves with lower social status. The animal MNI in those burials are generally the highest of all graves in this study and so is the diversity of species.

The other group contains juveniles or young adults with a relatively high but also comparably often occurring animal MNI of 8 and 9 individuals. These graves belong to males and females of both social statuses, containing almost all kinds of species respectively animal groups, except for wild mammals and hunting birds. In addition, they all contain almost completely-deposited chickens and depositions of sheep or goats.

Based on these results, the most striking outcomes will be highlighted in the following chapters. That would be, first of all, the different types of depositions, complete-, almost complete- and incomplete, as well as burnt and unburnt bones. Ensuing, significant animals and deposition types will be interpreted. This shall contribute to the general understanding of different depositions and of the symbolical functions of these animals.

5. Interpretation

5.1. Interpretation of different kinds of depositions

5.1.1. How to recognize an intentional deposition?

During the work with furnished burials, it is important to be aware of pre- and post-depositional mixing of animal bones. Faunal remains could equally derive from bone debris of younger occupation phases or from rodents that dug into the context. Depending on the soil and the position inside the grave, it is often difficult to recognize and to assess whether animal bones were part of an intentional deposition or came into the grave at a later date.

Concerning inhumation graves, which only contain unburnt bones, there is a risk that faunal remains might derive from bone debris of younger occupation phases, respectively that they were non-intentionally deposited with the filling when the grave was closed. This applies especially to simple inhumation- and coffin graves from the late Viking Age which either contain only single teeth of cattle or sheep. The graves 4 and 44 from the cemetery Lilla Ullevi only contain a tooth of a cattle, respectively one of a sheep (cf. *App.* 2). Since the latter derives from the filling, it is possible that these animal remains do not represent an intentional deposition. The same situation could be valid also for the tooth in grave 44, even though it is described as originating from the find layer. But still, the deposition of single teeth is repeated as a significant pattern and can therefore not be regarded as a random incident.

A similar difficulty concerns unburnt bones from cremation graves which generally can emanate from later occupation phases. However, this study regards unburnt bones from cremation layers as belonging to actions of the burial ritual, since patterns in the selection of species and body parts have in fact been discerned (cf. Chapter 4.1.5; Chapter 4.2.6.1).

Furthermore, as in every archaeological context, it is always possible that more or less recent rodents passed a context and ended up dying just there. In light soils, such as European loess soils, such secondary mixing in of animal remains can be indicated by narrow tunnels, visible by a different colour and structure of the soil. In darker soils, these tunnels are more difficult or impossible to detect, resulting in a complication of the interpretation of the remains of rodents in a context. Nevertheless, rodents have been included in this study, because they can still have been deposited intentionally against all probabilities. As a matter of fact, rodents occur exclusively in female graves, to a significantly higher extent in cremation burials, and twice as often during the Vendel Period. However, the small sample size does not allow to draw secure conclusions on intentional deposition and possible links, why rodents are therefore not discussed any further.

The following chapters first try to distinguish and interpret different kinds of depositions, on basis of the earlier presented results of the analysis. Since pigs and sheep or goat do not show particularly patterns, they will only be mentioned in Chapter 5.1.2 on incomplete depositions²⁵. Only significant outcomes of the study are discussed more thoroughly in the ensuing separate chapters.

²⁵ Mythological connections to these species have been assembled by e.g. DuBois 2012, but cannot be discussed further in the frame of this thesis.

5.1.2. Incomplete depositions

The majority of faunal remains in the graves of this study consists of incomplete depositions. These are commonly interpreted as food-gifts for the deceased or feasting remains from the mourners (e.g. Kaliff 2004: 28; Mansrud 2004: 94f.). Due to the already mentioned conceptual problem with the latter interpretation, as well as the absence of a clear archaeological signature for identifying feasting (Russell 2012: 383), such an interpretation will not be presumed.

The analysis of body part frequencies has demonstrated, that the incomplete depositions of various body regions in cremation graves consist primarily of cranial parts (no. 1) and fragments of the hands/feet/tail-region (no. 6). The remaining body regions (no. 2, 3, 4, 5), the fleshy parts, were only encountered from certain animals and in a lower frequency.

The presence of fleshy parts is generally interpreted as food remains and can either be seen as food-gifts or the remains of a funeral party (cf. Russell 2012: 64–66). Those body regions are in this study represented among sheep or goats (all fleshy parts), pigs (body parts 3 and 5) and to a small extent among dogs (all fleshy parts) and horses (body part 2) (cf. Chapter 4.1.5). This corresponds in large with Iregren's (1972: 95–100) study, whereas Sigvallius (1994: 112, fig. 48, 114) notices a significantly higher occurrence of non-fleshy parts among sheep, compared to fleshy parts²⁶.

In addition, food-gifts should not show any signs of body manipulation that would indicate defleshing, and thus consumption of the meat, before the deposition (Russell 2012: 64f.) Nevertheless, even non-fleshy parts could be considered as possible consumable body parts, at least among specific animal species. As a matter of fact, eating the heads of sheep is still a traditional dish in western Norway as well as on Iceland, the Faroe Islands and on the Swedish island Gotland. Since the Scandinavian population emigrated to Iceland and the Faroe Islands during the Viking Age, it is a possible assumption that this dish existed during that time and might have been common in Swedish Uppland as well. But on the other hand, it is just sheep or goats which show a strikingly low share of cranial parts, at least among the burnt material. In addition, the consumption of pig cheeks and -feet could have been possible because these are rather meaty compared to other animal's cheeks and feet. Further, it is even possible that brains were eaten, which would also make skulls possible food-gifts.

Same as grave-goods and complete animal depositions, food-gifts were supposed to follow the deceased to the afterlife and went through a simultaneous burning (cf. Gräslund 1983). Thus, food-gifts for the deceased should be discernible as burnt bones in cremation graves. In contrast to that, it can be assumed that the funeral feast happened after the actual burial, i.e. after the burning among cremations. The bones from cremation graves interpreted as feasting remains would thus be unburnt (cf. Lichter 2001: 203)²⁷ and should ideally be fleshy parts, but with traces indicating the consumption of the meat before the act of deposition (Russell 2012: 66).

However, this study reveals, that there are generally less fleshy parts among the unburnt bones, in comparison with the ratio of fleshy parts among burnt bones. Especially cranial parts, but also remains from the hand/feet/tail-region, are significantly higher among the unburnt bones. Consequently, if only unburnt bones were possible remains of a funeral meal, they would mainly consist of cranial parts and to a lesser amount of feet among cattle. Among pig bones, there are additional lower hind legs and additional front legs and upper hind legs among the remains of sheep or goats.

Did these depositions have a different symbolical meaning compared to unburnt fleshy parts,

²⁶ It is not possible to make a detailed comparison to Sigvallius' (1994: 109–117) results, since she only displays whether fleshy- and non-fleshy parts are present or not, but does not mention which ones they are in detail.

²⁷ It is of course possible as well, that the feasting happened before the cremation, which would mean that remains of ritual feasting could likewise have been thrown on the pyre and thereby ended up as burnt bones as well (cf. e.g. Vretemark 2013 a: 381).

which are here interpreted as left-overs of a funerary meal? If considering the burnt material as grave-goods for the human dead, were the unburnt remains not intended to follow the deceased to the afterlife, but instead used as a sacrifice to the gods? This question is impossible to answer on the basis of archaeological material. But it seems clear that the depositions of burnt and unburnt bones demonstrate two different actions in the burial ritual, distinguished both temporally and symbolically.

At this point, it should be considered that feasting remains might not only be the actual left-overs of a meal, but could likewise consist of the parts of a slaughtered animal that were not intended to be eaten at the funeral party, which are hooves, the head or the tail (cf. Russell 2012: 66f.). Sigvallius (1994: 114) calls these remains “slaughter-waste” and does not provide them with a symbolical meaning. This is perhaps technically true but excludes the ideas and purposes behind the deposition, as a grave can hardly be regarded as a waste dump.

At the Viking Age settlement-site Hofstaðir on Iceland, the display of cattle skulls is interpreted as the presentation of trophies in remembrance of a periodical feasting ritual (Lucas & McGovern 2007). Although this example is not from a burial context, the selective choice of mainly cranial parts of cattle among the material of this study, could possibly indicate similar customs for feasting at different occasions.

Another indication for a specific symbolical function of animal crania, is the encounter of the Arabic traveller Ibn Fadlan with the *Rūsiyyah*²⁸ during the 10th century AD in today’s Russia. He describes a sacrifice to the gods in which parts of the animal are given away as alms, another part is sacrificed in front of wooden images and most importantly here, that the heads of the sacrificed cattle and sheep are put on erected poles (Frye 2005: 66). The display of heads on erected poles is hereby regarded as a special treatment, because it, firstly, shows a clear selection of the heads, and secondly exposes them in an unusual position, maybe with the intention to make them easier visible on the erected poles.

Besides, since a remarkable number of animal sacrifices, also outside burial contexts, consists of only cranial parts and long bones or feet, interpretations arose that these could be the remains of deposited hides of the animals (Piggott 1962). This shows that depositions of only cranial parts and/or remains of the hand/feet/tail-region, which are regarded as non- fleshy parts, could in fact rather be symbolical depositions than feasting remains or food-gifts.

An uncertainty remains for these body parts in a burnt condition. It can only be assumed that these represent symbolic depositions as well, or when it comes to pigs and sheep or goat, possibly also, but more unlikely, food-gifts.

Furthermore, the deposition of single bones, has been interpreted as symbolic depositions (Russell 2012: 67f.). But this time, feasting remains in a symbolical sense, can be excluded. Instead, it is suggested that it might rather be amulets, parts of costumes or ritual paraphernalia, respectively regarding single phalanx and the rather frequently occurring unburnt single teeth (cf. App. 2), symbolism of hunting have been considered (Russell 2012: 67f.). But the latter cannot apply to the material of this study, since the striking majority of faunal remains derives from domestic animals.

There are in general four different possible interpretations of incomplete depositions:

- Food-gifts,
- feasting remains, in the sense of left-overs of the funeral meal
- feasting remains, in the sense of symbolical depositions in remembrance of the feasting,

²⁸ These people have often referred to as “Viking Rus” (e.g. Duczko 2004; Hraundal 2014) and are continuously discussed as expressing an expansion of Scandinavian culture (Price *in press*). Nevertheless, this source needs to be used carefully, since the accounts of someone of another religion generally runs the risk to be biased and might be written with the intention to let the own culture look better compared to the described one.

- symbolical depositions in the sense of single bones.

Since the analysis of body part frequencies only contained material from cremation graves, the material from inhumation graves has been neglected here, and is, besides, more difficult to interpret because they only contain unburnt bones.

5.1.3. Complete and almost complete depositions

Complete animal bodies occur to a lesser extent in the graves of this study but are common for dogs and horses. The Rickeby grave in Vallentuna shows that also wild birds and hunting birds have been deposited as complete animals which could be possible for other graves as well²⁹. Even pigs, cattle, sheep or goat, chicken, birds and cats can appear as wholes in graves, but to a lesser extent or rather as exceptions.

The most common explanation for the custom of burying complete animals in the same grave as the human dead, is that the animal bodies constituted sacrifices. Depending on the species, different reasons for the sacrifices have then been formulated, such as companions of the human dead (Jennbert 2002: 124; 2011: 69), status symbols (*idem*; Steuer 2003: 52f.), or simply sacrifices without any further explanations (Vretemark 2013 a: 381). Thereby, it is implied that different animals had different meanings to humans and thus fulfilled different functions in the burial. However, an extensive discussion about this is usually missing and will therefore follow here in Chapter 6.

This study is also dealing with the occurrence of almost complete depositions, meaning skeletal remains that can neither be regarded as complete nor as incomplete (cf. Chapter 4.1.4). This phenomenon has up to now only rarely been mentioned or discussed. Sigvallius (1994: 162) for instance, uses the term "probably complete", which implies, that she assumes, that these carcasses were complete at some time. By contrast, there are incidents in the material presented here which indicate that these animals could have been deposited intentionally in this condition. This can be observed in grave 4206 from Ultuna, a cremation burial with an unusually high number of complete- and almost complete depositions of pigs, cattle and sheep or goats (cf. App. 2). The fact that a number of those were put as unburnt depositions in the grave, weakens the theory that parts of the skeleton could have been gone missing during the assumed moving of burnt remains of the cremation from the pyre to the actual burial place. In addition, the analysis on the spatial distribution of faunal remains in urn graves gave reason to suppose that the place of the pyre and the place for the secondary deposition could in fact have been the same (at least regarding urn graves).

In conclusion, as opposed to Sigvallius' (1994: 162) interpretation, that the animal was "probably complete" when it was put on the pyre, there seems to be room for other interpretations as well. For example, the animal was slaughtered and only few parts of it were eaten during a funeral party, whereas the rest, even though it was almost the whole body, was put on the pyre or as an unburnt deposition on top of the remains of the cremation. This corresponds to the earlier mentioned possible definition of feasting remains, saying that these do not necessarily have to be the bones of fleshy body parts but could likewise be the leftovers that have not been eaten. In this case, feasting remains could both consist of fleshy and non-fleshy body parts and could even be an almost complete deposition of an animal.

Other reasons for almost complete animal bodies can be taphonomical causes, or the possibility that the grave was open for a while and exposed to scavengers. This has also been considered for the absence of one body part among the complete depositions of dogs and horses (cf. Chapter 4.1.4.). But the fact that it is repeatedly parts of the hind legs that are missing, rather

²⁹ The presence of extremities, trunk and cranium among the hunting birds and wild birds in the Rickeby-grave, shows that they were all deposited as whole animals (Vretemark 2013 a).

point towards an intentional action than a random incident. Thus, it is possible that specific parts of a sacrificed animal might have been removed for consumption or for other ritual acts. Distinctive parallels to the discovery of a repeated loss of certain body parts among complete animal depositions have not been found in previous studies. A repetitive pattern of missing body parts could likewise exist among almost complete depositions, but the sample size in this study is too small to allow further investigations.

5.2. Interpretation of significant animal depositions

5.2.1. Depositions with exclusive social restrictions

5.2.1.1. *Dogs and horses*

Dogs and horses are the animals that occur most often in general and most often as complete depositions in the graves of this study. This agrees widely with Sigvallius' (1994) study, except that she observed only complete depositions, whereas the material of this study shows a few outliers of incomplete depositions as well.

Dogs are the oldest domesticated animals and have thereby a continuous long-term relationship to humans. Bronze Age rock carvings from Valla in Bohuslän for instance, show depictions of humans and dogs, interpreted as hunting scenes (Fredsjö *et al.* 1969, 115; Schmölcke 2013: 178). But evidence for a human-dog relationship already exists from the Stone Age. The Mesolithic (10 000–4000 BC) site Skateholm in southern Scania, Sweden, contains seven dogs that were deposited in human graves and additionally 11 dogs that were buried separately (Larsson 1988: 148f.).

Interestingly enough, the treatment of the dogs differed in the two burial contexts. At least two of the seven dogs in human graves were demonstrably killed on purpose, whereas this evidence is missing in the single dog burials, which were, moreover, accompanied by grave-goods (*idem*; Jennbert 2003: 140). Thereby, the treatment of the dogs in separate graves, resembles the burial practice and treatment of the human dead³⁰.

By contrast, horses are documented from the older Bronze Age (1700–500 BC) onwards, but it is not until the late Roman Iron Age (0–375 AD) that complete horses were deposited in graves (Jennbert 2002: 109). Separate horse burials date to the Early- and the Late Iron Age in central and northern Europe (Müller-Wille 1972), but are by far less common in Scandinavia (Jennbert 2003: 141). Instead, it becomes more common during the Late Iron Age, to lay the deceased and one or several horses together in one grave, or on the funeral pyre, as is also shown by this study (cf. Sigvallius 1994).

Nevertheless, the horse-burials from German „Reihengräberfelder“ cemeteries in Franconian and Alemannic areas, which appear spatially separated from the human's grave, can still reveal parallels to the Scandinavian deposition-type. An increased occurrence of horse-burials can be observed from the second half of the 6th century and during the 7th century (Müller-Wille 1972). The well-known “chieftain-grave” from Beckum in Northrhine-Westphalia in western Germany for example, is surrounded by six horse-burials, one of them containing a dog as well (Oexle 1992: 233f.). On basis of the grave-goods and due to the proximity to the human grave and similar

³⁰ Moreover, this shows that the term “animal grave” should be restricted to animals that were buried separately from the human and ideally do not show indications for ritual killing (cf. Jennbert 2003: 140). This entails, that the verb “buried” should merely be used for humans or animals in their own graves, but not for the animals that were ritually killed and deposited inside a human's grave.

orientations, these burials have been interpreted as belonging to the human dead (Winkelmann 1962: 9f.; Müller-Wille 1972: 142f.). Moreover, an important distinction is made in the Beckum burial, between riding horses and sacrificed horses that had different roles. Winkelmann (1962: 10) suggest that the sacrificed horses were deposited at the same time as the deceased, whereas the riding horses would have been deposited at intervals (Winkelmann 1962: 10). This distinction is made by means of riding equipment (*idem*; see also Capelle 1998: 88). The same categorisation, was also applied by Werner (1992: 156) when interpreting the 21 male horses that were deposited in a separate pit without harnesses outside the famous Merovingian grave of king Childerich I in Tournai, Belgium. Horses with equipment, are thus regarded as transportation for the dead to Valhalla (*idem*) which has also been discussed by Peter Shenk (2002: 78f.) on basis of mythological sources, in a more recent master's thesis on Scandinavian material.

Both the deposition of complete dogs and horses inside human graves and their burial in separate graves, have been explained by a special emotional bond between animals and its owner, associated with them being companion species be it on hunts, or the importance of the dog in herding and guarding, or as an emotional bond between horse and rider (Jennbert 2002: 124; 2003: 148). Likewise, Steuer (2003: 51) mentions that special treatments of animals have always been recognized when the functions of the animal were beyond food production. Gräslund (2004: 172f.) considers a specific symbolic meaning of dogs, owed to observations in literature, where dogs show a clear connection to sacrificial acts as well as sacrificial acts related to death. Therefore, Gräslund suggests to not merely regard dogs as companions or status symbols, but also to acknowledge their inevitable role in the transformation from life to death (*idem*).

Horses specifically, are also regarded as status symbols (c.f. Jennbert 2002: 124; Steuer 2003: 52f.), although in this study, half of the total number of horses occur in graves with lower social status as well. In this study, it can only be stated that riding horses, recognizable by special equipment, such as saddle and/or bridle, usually occur in graves of high status. Likewise, Ljungkvist (2006: 43–46) has mentioned riding equipment as one marker of elite burials. Therefore, those artefacts do not occur in graves of lower social status in this study. Besides, it demonstrates that the horse cannot be regarded as a status symbol per se but is only tied to high status when having the specific purpose as a mount. If the horse even had a significance for social status beyond this use, as draught animal for instance, cannot be answered in this study and would require the creation of additional social strata among the group of lower social status.

The interpretation of the 'riding horse' as provision for the journey to the afterlife in Valhalla is creative and plausible, in any case being accompanied by a horse certainly had the plain advantage of displaying power and a certain social status among the living. But, the occurrence of complete horses in graves with lower status, in female burials and without riding equipment, is left without equally inspiring interpretations. Instead, general explanations for the need of sacrifices have been discussed mainly in the fields of religious history and literature. These studies were already reviewed in the beginning of this work (Chapter 1.1) and explained sacrifices as a necessity of expressing the cosmological origin (e.g. Jennbert 2002: 116; cf. Kaliff 2007; Lincoln 1986; Näsström 2002). Due to the occurrence of dogs and horses in burials regardless the human gender, the age and the social status, this explanation might be suitable for these animals.

Although rare, both dogs and horses occur as incomplete depositions in this study. But while horses are only represented by cranial parts, the hand/feet/tail-region and in one case fragments of the trunk, incomplete dogs are represented also by fleshy parts, just as pigs and sheep or goat. This raises the question if this means that dogs and horses have been eaten? The consumption of dog meat was in fact a common practice in Celtic and Germanic areas during the Pre-Roman Iron Age, but has not been attested during the Roman Iron Age (Peters 1998).

Moreover, evidence of consumption of dogs has been found in the Viking Age settlement Hedeby in northern Germany (Wendt 1978: 21). But butchering- and cutting traces were not only

found on the skeletal remains of dogs but also on those of cats and horses (Teegen 2009; Zachrisson 2017), thus cut-marks could also be indications for the use of the fur or hides instead of meat consumption. In addition, the repeating appearance of cranial parts, extremities and vertebrae of horses (and cattle) in Danish and southern Swedish wetland-sites, led to interpretations of the deposition or display of the hides of those animals (Hagberg 1967: 59f.; Russell 2012: 109). The same body parts are present among the material of this study, which is why this interpretation could be applied here as well. Possibly, the remaining parts of the body were eaten. This might also be reflected among the exemptions of the new Christian law, introduced to Iceland in the year 1000 AD, which says that it was still allowed to eat horsemeat, demonstrating that it did in fact happen in pre-Christian times. But the extent is hard to estimate so far (Jennbert 2003: 148).

5.2.1.2. *Symbolic depositions of cattle*

A remarkable fact in the material of this study, is that cattle are exclusively represented by cranial parts and/or remains of the hand/feet/tail region in cremation graves, with an emphasis on the first-mentioned, especially among unburnt remains (cf. Chapter 4.1.5). Among cattle, these body regions are regarded as non-fleshy parts. Therefore, such depositions cannot be interpreted as food-gifts for the deceased, but rather as symbolical actions.

Cattle belong together with dogs, pigs and sheep or goats, to the Neolithic group of domesticated animals (Jennbert 2002: 109). From this point, cattle-remains are also found in Central European burials (Jennbert 2003). Moreover, a special symbolic importance of cattle skulls during the Neolithic Period (4000–1700 BC) has been suggested (*idem*).

An example is a burial from the Beaker Period (2900–1800 BC) in England, discussed by Simon Davis and Sebastian Payne (1993). The burial can be compared to the already in chapter 5.1.2 mentioned case-study from Iceland (cf. Lucas & McGovern 2007), even though the latter is not a burial context. Nevertheless, in both studies the depositions are interpreted as representations of feasting, in the sense of depositing trophies in remembrance of the event (*idem*; Russell 2012: 60; cf. Chapter 5.1.2). This correlates with the argument by Davide Zori *et al.* (2013), that cattle were the most valued animals for feasting in the Old Norse society. Zori *et al.* (*idem*) support this claim by ethnographical comparisons which show that in different societies, it is often the largest available domesticate which is slaughtered, in order to display a certain culinary wealth during the feasting (*idem*).

However, it is questionable if something like a display of specific bones is applicable to burial contexts, since graves are usually closed, at least after a certain amount of time, and thus would not allow the deposited remains to be visible. Therefore, an intention to connect the funeral meal to the deceased could rather be considered, in the sense that the funeral party happened in honour of the dead. A sacrifice to the gods or a food-gift for the deceased, is excluded for the Beaker Period burial in England, because of cut-marks that indicate the defleshing of the bones before the deposition (Davis & Payne 1993). The same applies to the boat-graves 6 and 7 from Valsgårde, where cut marks and marrow-splits have been found on the skeletal remains of cattle, however, not only cranial parts and bones from the hand/feet/tail region are deposited here but other parts as well (Arwidsson 1942: 110, 1977: 105).

Although the connection of cattle to animal wealth seems plausible, this does not become apparent by the distribution of incomplete depositions of this species among the material of this study (*Fig. 15*). The reason for that is most probably that there are only 4 of 46 cremation graves with high status which appear in the study of Body Part Frequencies (Chapter 4.1.5), and that the simple division in only two different social groups cannot describe further social strata among the category of lower status. It is possible that animal wealth does not correlate with the material distinction of social inequality (in terms of grave-goods), which the division of social statuses is

based on in this study. However, this issue cannot be investigated further here. In contrast to incomplete depositions, almost complete and complete depositions of cattle, on the other side, do show both gender- and status restrictions and are therefore discussed in the following subchapter.

5.2.2. Depositions with possible social restriction

5.2.2.1. Chickens in special placements – a symbolic action with a restriction to female burials?

The material of this study reveals that there are different ways of depositing chickens in graves, tied to different ritual actions. The practice of depositing an unburnt bird on top of the urn for instance, (probably) occurs three times among the investigated burials. Grave 94 from Valsgärde contains an unburnt chicken which is said to have been placed inside the urn, on top of the cremated remains. In addition to that, there are two urn graves, grave 4206 and 4425 from Ultuna, which contain one unburnt bird each that occur both inside and outside of the urn. The occurrence of burnt bones both inside and outside the urn has been explained previously by the practice of collecting parts of the burnt carcasses from the burnt down funeral pyre, with subsequent deposition inside an urn which stands inside the cremation layer (cf. Chapter 4.6.1). Therefore, the incident of one and the same unburnt bird, found both inside and outside the urn, is here considered as the possibly same custom as in Valsgärde grave 94 – the deposition of an unburnt chicken or bird on top of the urn.

Except for the bird from Ultuna grave 4206, all birds are deposited completely. The incomplete bird is represented by probably three different body parts, which can be considered as almost complete as a specific meaning for birds, since the delicate skeletons of birds are easier exposed to natural decomposition (Prata & Sjöling 2017: 207). Two of these three graves are categorized as female, whereas grave 4206 from Ultuna remains undetermined. Therefore, it has been considered earlier in this work, that this custom might be in favour of female burials.

However, there is a counter-example from the site Gullhögen in Husby-Långhundra Parish where two unburnt roosters have been deposited as a lock to the urn on top of the burnt bones (Bratt 2008: 244). The burnt remains of the deceased in the urn came from a young man, but another urn in the same grave contained the remains of a young woman (*idem*). Still, this incident weakens the assumption that the practice of depositing chickens or birds as unburnt carcasses on top of urns is limited to female burials.

Another find comes from grave 1148 from Birka, Sweden's oldest trading town, situated in the Mälaren archipelago in Stockholm. The description in Holger Arbman's (1943: 473) publication says, that an unburnt skeleton of a hen had been deposited on top of the urn which was placed inside a cremation layer. The burial cannot be gender determined but the find of an arrowhead in combination with a whetstone could indicate that a man was buried here. On the other hand, a whetstone was also deposited inside the second urn in grave C from Gullhögen, which contained the cremated remains of a young woman (Bratt 2008: 244).

Considering, that even grave 94 from Valsgärde is osteologically determined as a male (Bäckström 2001), but archaeologically as female (Ljungkvist 2008), and thus utterly contradictory in its gender classification, leads to the conclusion that a restriction of this practice to a specific gender cannot be confirmed. Striking, however, is the fact that all of those here named graves date to the Viking Age. Additionally, I find it probable that the two unburnt birds from the graves 4206 and 4425 from Ultuna, were most probably chickens as well, since this is the case for the other three mentioned graves. This agrees with the earlier suggested idea that a number of chickens remained unidentified among the determined birds.

Even though, there are probably three contexts in this study which demonstrate the here

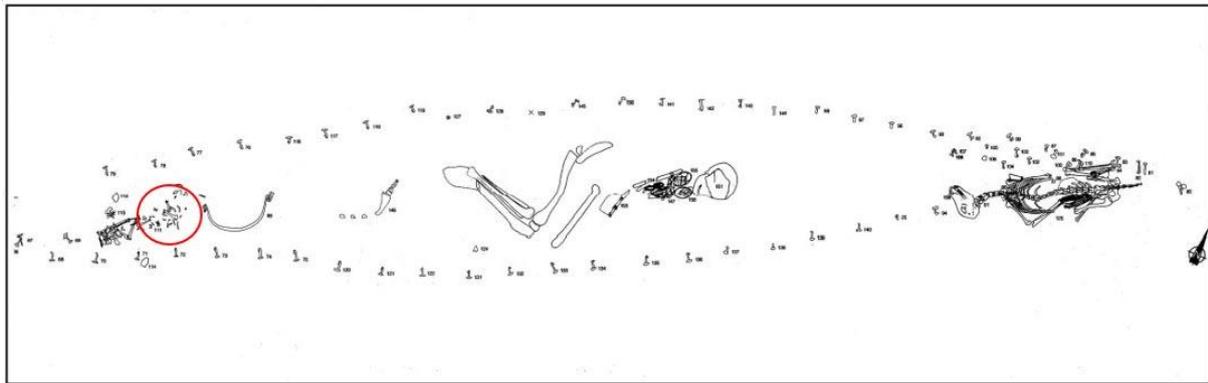


Figure 26 The female boat-grave 36 from Prästgården in Gamla Uppsala, with the special placement of a complete chicken (red circle) inside the front part of the boat and a complete dog outside the stern (modified after Nordahl 2001, table 4).

discussed custom, it seems to be a relatively rare occurring phenomenon. However, the previous analysis has shown that chickens and birds are quite common in general, but occur more often in cremation graves (Fig. 9). Nevertheless, there at least three inhumation graves in this study, which can serve as additional evidence for special treatments of chickens in the burial ritual. The female boat-grave 36 from Prästgården in Gamla Uppsala, contains the deposition of a complete chicken inside the bow of the boat (Fig. 26), which is the only completely deposited animal in this grave, apart from a dog which lays outside at the other end of the boat. The same position of a chicken has been found in the boat-grave from Årby in Rasbokil Parish (Arbman *et al.* 1993: 23f.). In comparison, boat-grave 11 from Tuna in Alsike, contained the remains of a chicken which were placed on top of a horse (Arne 1934: 39). The intention behind this unusual position remains speculative. But when acknowledging a special perception or reputation of horses, that were buried with bridles on their heads or close to them, it is a reasonable assumption to expect that a chicken placed on top of a horse (cf. Chapter 4.2.2), might have been deposited for the sake of the horse and not for the human dead.

Another boat-grave from Tuna, number 6b, contained an undetermined bird, deposited in the front part of the bow (*idem*: 34), just as boat-grave 36 from Gamla Uppsala and the boat-grave in Årby. Interestingly enough, three of these graves are determined as female burials, and grave 11 from Tuna has an unconfirmed archaeological gender determination as male. Here again, all burials date to the Viking Age. Incomplete remains of chickens and undetermined birds also occur in male boat-graves (i.a. Valsgårde 7, Valsgårde 13, Vendel 3) but together with remains of other domestic animals that can be interpreted as food-gifts or feasting remains. Moreover, a connection between women and chickens might also exist in the description of Ibn Fadlan, who describes that a female slave, who will be killed later-on in order to join a dead man in the grave, is cutting off a hen's head in a ritual proceeding (Frye 2005: 68–69). After that, the dead hen is laid inside the boat (*idem*). This, narrative however, does not explain why exactly the chicken is sacrificed in this situation, or respectively the symbolic function of this animal.

Due to the special treatments and extraordinary positions of the chickens, both inside cremation- and inhumation graves, the meaning behind these depositions needs to be discussed. Since the skeletal remains are unburnt, (probably) complete and since no bone manipulations, that would indicate the defleshing of the animal, are mentioned in the publications, interpretations as feasting remains or food offers might be excluded. Anne-Sofie Gräslund (1980: 54), however, regards chickens, as well as findings of eggs, bread, nuts, pips, and wheat grain, as food, but admits at the same time, that “*from the point of view of magic, [...] they all signify rebirth, fertility and life force*”. Moreover, she places the depositions of unburnt chickens on top of urns, together with occurrences of eggshells and bread, in the same category as “objects with cult or religious significance” (*idem*). Objects with cult or religious significance would be for instance rings with

Thor's hammer pendants which can be found in or on the urns in cremation graves from Birka, Adelsö Parish (*idem*).

As it has been considered earlier in this study, different intentions might underlie the occurrences of burnt and unburnt bones in cremation graves (cf. Chapter 5.1.2). Assuming, that everything which was burnt on the pyre, was intended to serve the deceased in or on their way to the afterlife (cf. Gräslund 1983), unburnt chicken in cremation graves would represent something else than food-gifts or an animal companion. Moreover, no remains of other unburnt species are found deposited in this way. However, the fact that the animals, also in the examples from the female inhumations, are deposited completely and do not show any signs of defleshing before they were deposited, distinguishes them also from feasting remains, in the sense of leftovers of a funeral meal (cf. Chapter 5.2.3). In contrast to the incomplete depositions of cattle, however, chickens are still deposited completely and in very curious placements.

Therefore, the here discussed chickens in special placements are considered neither food-gifts for the deceased, nor as feasting remains in any kind of way. They are rather sacrifices with a specific symbolic meaning. In general, they are more common among female burials, but it needs more comparative material to analyse whether this tendency remains.

5.2.2.2. Completely deposited cattle in male graves of high status

The results of the analyses have shown that, complete depositions of cattle only occur in male inhumations of high social status from the Vendel Period. Those are the boat-graves 5, 6, 7 and 8 from Valsgärde and the boat-graves 1 and 3 from Vendel. In addition, there are also complete- and unburnt remains of a cattle in grave 4206 from Ultuna which seems to be a rather exceptional urn grave regarding animal depositions as already mentioned in previous chapters. Apart from incomplete depositions, it contains two complete and unburnt pigs and two almost complete and unburnt sheep or goats, creating a MNI of 16 animals in total. But despite its abundance of animals, it does not reveal any signs of a connection to a higher social class in the society and due to only few and insignificant artefacts, it cannot be gender-determined either.

From a source critical point of view, it has to be mentioned that there are only three female inhumations of high status in the study and they all date to the Viking Age. The gender determinations of the boat-graves from Vendel and Valsgärde only rely on archaeological material, due to fragmentary remains of the bodies and a lack of detailed analyses of the preserved remains. This means that, even though the grave-goods are traditionally interpreted as objects indicating a male burial, the osteological determinations may be the opposite. Since complete depositions are most common among dogs and horses, which is often explained by a special emotional bond to those animals (Jennbert 2002: 124, 2011: 69), the question arises, why cattle

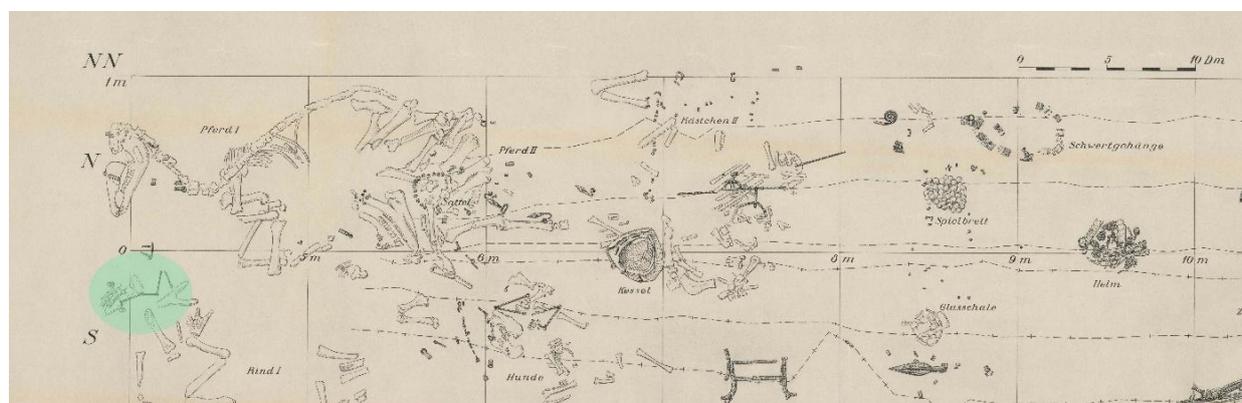


Figure 27 Front part of boat-grave 6 from Valsgärde. The green section marks the cattle's cranium with the remains of a halter (modified after Arwidsson 1942, table 44). Reproduced with permission by the *Viking Phenomenon Project*.

received this treatment in some cases as well. From an economical point of view, the deposition of a whole cattle in a burial demonstrates, that, whatever family owned it, could afford to sacrifice it in preference for needing it as productive livestock or working animal. Due to the fact, that complete cattle only occur in high-status burials in this study and the only exception is an urn grave with an apparent prosperity of animal sacrifices, this deposition type is clearly tied to specific social strata.

Furthermore, complete pigs and sheep or goat occur in this material with a similar frequency in graves with lower social status, respectively goat even appear more often in this category than in burials with high status (*Fig. 15*). These depositions derive from contexts that show a comparably high number of animal depositions³¹, which suggests that they are tied to a certain economic status or animal wealth. But since cattle almost exclusively occur in high-status burials in this study, it makes sense to consider a special symbolic function of those animals.

That cattle remains in human burials appear in Central Europe from the Neolithic Period onwards, has already been mentioned in chapter 5.2.1.3. But apart from selected body parts that were deposited, even depositions of complete cattle already occur during the Neolithic Period and Bronze Age. Especially complete cattle, buried in pairs beside each other, as they can be found in close proximity to so called stone-heap burials in Jutland, Denmark, have been connected to the ideological significance of wagons and draught animals (Johannsen & Laursen 2018). Moreover, they were interpreted as having a sacred status (Behrens 1964: 66) and have been connected to sun symbolism (Pollex 1999).

A connection to the use of the animal during lifetime, might also be reflected in the graves 6 and 7 from Valsgårde, where the completely deposited cattle were provided with halters on or close to their heads (*Fig. 27*) (Arwidsson 1942: 111, 1977: 64). Likewise, these halters could reflect the procedure of the funerary ritual. A speculation would be, that the cattle was used as draught animal to pull a cart or wagon during a funeral procession. The transportation of the deceased to the burial place in a wagon has also been suggested by archaeologist Jan Bill (2016), in the case of the well-known Oseberg ship-burial in Norway. In addition, a [religious] procession might also be observed on the embroidered tapestry deriving from this grave (cf. Ingstad 1995: 141). However, both the tapestry and the grave itself do not contain depositions of complete cattle and a wagon, cart or sleigh, as present in the Oseberg burial, has neither been found in Valsgårde 6 nor 7. Therefore, a simpler explanation, such as the leading of the cattle at the halter to the grave, could be thinkable.

That the above-mentioned cattle were fitted with halters indicates that they could have been used as draught animals. Completely deposited pigs and sheep or goat could possibly be interpreted as food-gifts, since they did not have a specific agricultural purpose apart from meat- and milk production. Meanwhile, complete cattle should rather be considered as sacrifices with a symbolic function as argued here. It actually makes these animals comparable with the horses in these burials that were fitted with horse gear. If there was a similar symbolic meaning of cattle during the Late Iron Age in Scandinavia, as suggested for cattle during the Neolithic Period and Bronze Age, remains unclear.

5.2.2.3. *Indications for hunting only in male graves of high status?*

Since a significant majority of depositions in this study consists of domestic animals, signs for hunting are not only rare but also difficult to identify. Gräslund (2014: 37) regards the combination of horse, large dogs (grey hounds) and hunting birds as an indication for falconry. In this study, the category of hunting birds consists of different kinds of falcons, hawks and owls. The latter were not trained as actual hunting birds, but used as decoy during the hunt (Sjösvärd *et*

³¹ Those are grave 65 and 70 from Valsgårde, grave 4060, 4206, 4350 and 4425 from Ultuna.

al. 1983: 142). Owls have still been included to this group, not least because they are the only birds of prey (and thereby the only possible evidence for falconry) in grave 7 from Valsgärde and in grave 3 from Vendel.

Hunting birds are here restricted to a social group of males from high-status burials dating to the Vendel Period. If a determination is possible, those males have been identified as being in a mature age (cf. App. 2). This agrees widely with a study by Vretemark (2013 a: 383, table 1), with a few exceptions of three graves dating to the Viking Age and three graves containing the remains of women, yet always in company of one or several men. The Rickeby grave in Vallentuna, Vretemark (*idem*: 382) regards wild chicken, wild geese and crane as the raptor's prey, which means that their presence in other graves could be an indirect sign of falconry as well. Especially the crane is regarded as the most reputed prey of goshawks, known from a passage in *Fagrskinna*, describing the Swedish King Olof's hunt of crane with hawk and dog (Carstens 2013: 397ff.).

Falconry was introduced to Sweden in the second half of the 6th century, as the earliest finds of raptors in the western of the three big royal mounds from Gamla Uppsala show (Vretemark 2013 a: 384). So far, the evidence for this form of hunting is, with a few exceptions, limited to mid-eastern Sweden, namely the area around Lake Mälaren (*idem*: 384) and, as evident in this study, north of that in Vendel, Valsgärde, Gnista and Rickeby. Falconry could have been used in other regions as well, after the custom of furnished burials disappeared, but this imbalance can still be considered as an indication that this form of hunting came to Sweden from the East (*idem*). Since hunting with birds of prey has a long tradition among the steppe peoples of Central Asia (Kock 2007: 6), other material evidence for direct or indirect connections to the East has been discussed by different scholars (e.g. Hedeager 2007, 2011; Hedenstierna-Jonson 2012; Näsman 2008). Other wild birds, such as ducks, black grouse, hazel grouse and capercaillie occur both in the Rickeby grave and in other contexts as well and correlate widely with the presence of hunting birds (cf. Fig. 9–13). In combination with the presence of hunting birds, they can probably be regarded as the raptor's prey as well. But in a few exceptions, these birds, and especially geese, occur in graves despite the absence of raptors. These are the contexts Lilla Ullevi 5, Valsgärde 5 and 8, Vendel 1 and Alsike 4 and 12. Except for Lilla Ullevi 5, they are all high-status burials and both from the Vendel Period and Viking Age. The age determination is not possible for all these graves, but Lilla Ullevi 5 contains a young adult.

Apart from Alsike 12, which contains a capercaillie and a black grouse, the wild birds in these graves are represented by geese. It is, however, not sure whether those geese were in fact wild fowl or if they were domesticated. The majority of identified geese derives from the boat-graves from Vendel, Valsgärde and in one case from Tuna in Alsike (grave 4). The publications lack of latin terms for those birds, but are occasionally described as domestic geese (e.g. Valsgärde 6 and 7, Arwidsson 1942: 110, 1977: 106). Jennbert (2011: 67f.) mentions that domestic geese were kept in Scandinavia already in the Stone Age, whereas chickens joined the poultry only during the Early Roman Iron Age. But this does apparently not exclude hunting of wild geese and chickens. Geese without sociality of hunting birds and without detailed determination, could thus either be domestic geese as a part of livestock, or wild geese. The latter would open the possibilities for ritual hunting (cf. Russell 2012: 162–164), which was not necessarily done with falconry but also common hunting methods as well. But since a ritual hunt is rather impossible to prove in these contexts, it seems more likely that geese, be that wild or domestic, were food supplies just as chickens as well. A single occurrence of geese (or other wild birds) is therefore not regarded here as evidence for falconry, but rather of different forms of hunting or possibly interpreted as a domestic animal. However, the presence of a crane and an eagle-owl (Vendel 3), or an eagle-owl and another wild bird (Valsgärde 7), is here regarded as a possible indirect indication for falconry.

Other forms of hunting might be visible in the presence of other wild species. The occurrence of

fish for instance, is in this study neither tied to gender- nor to social status restrictions, but is more common during the Vendel Period. This leads to the assumption that fish, in contrast to falconry, cannot be regarded as a direct sign for fishing, in the sense that the deceased is connected to the practice of fishing. A confirmation for this could be the detection of cut-marks on the bones of a pike from Valsgårde 6, indicating that the fish was eaten before the deposition. Therefore, this fish should be regarded as feasting remains and cannot directly connect the human dead to fishing. This might apply for the other occurrences of fish remains as well. However, the fins of an unburnt fish were deposited inside the urn of grave 42 from Gnista, which could either be food remains or a symbolic deposition. Nevertheless, due to the relatively few incidences of fish in this study, and the limited scholarly debate about the practical and possible symbolic use of fish (cf. DuBois 2012: 82– 86), it inevitably leads to an interpretation as food and cannot be compared to the symbolic value of falconry.

By contrast, the distribution of wild mammals resembles the one of hunting birds and wild birds by the restriction to male graves. However, they are not restricted to a specific age group or social status. The presence of only one body region from a single wild pig from grave 7a from Odenslunda and grave 729 from Inhåleskullen, are mysterious. In this case, a symbolic or even magical function in the sense of paraphernalia might be thinkable here, but remain speculative without reference material. A connection to hunting is possible but dubious, since the example of the Rickeby grave shows that hunting trophies were apparently deposited as complete animals (cf. Vretemark 2013 a: 381). Näsström (2002: 255) mentions, that old hunting rituals can be recognized in the custom of laying the head of the slaughtered or sacrificed animal together with big bones back on the ground, which is here not the case.

Bear and lynx, on the other side, show a pattern in the restriction to the deposition of *phalanx* 3, respectively the claws. They both belong to the category of wild mammals and are thereby restricted to male burials as well. The archaeologist Oliver Grimm (2013: 292), however, mentions that, bear-claws are equally distributed on male and female graves during the later Roman Iron Age and Migration Period. Moreover, findings of bear-claws are not limited to high-status burials in this study, on the contrary, they even occur in graves that do not contain any further animal depositions (Valsgårde 85).

Bear-claws has, so far, been commonly interpreted as evidence for fur that the deceased was covered in or used as a mattress (e.g. Sigvallius 1994: 76). More visionary ideas led to discussions of bear-warriors, called berserk in Old Norse literature (e.g. Hedeager 2011, 91–98; Wamers 2009). But the apparent heterogeneity of these graves, exemplified for instance by the fact that not all of these graves contained weapons (Grimm 2013: 292), speaks against a general interpretation as bear-warriors. Moreover, we cannot be sure that possible bear-skins belonged to the deceased or even that it was themselves who had killed the animal. It can likewise be a grave-good that belonged to the buried before (cf. *idem*) or a result of trade (cf. Iregren 1988). But, not all findings of bear-claws necessarily need to derive from skins. Depositions of single bear-claws can occur as well (*idem*), yet they are always plural in this study. It is suggested here, that other fur-bearing animals, such as lynx, (possible) squirrels and cat, that are occurring among this material³², need to be considered as remains of skins as well. This applies especially to the lynx claws, found in grave 110 from Odenslunda. Apart from one complete cat in grave 8 from Lilla Ullevi, the possible squirrels and other two cats are, however, only represented by single body regions. Nevertheless, cut- marks on cat bones have been found in contexts from the medieval town Sigtuna in Uppland, which indicate that trade with cat-skin happened, at least during this time-period (Zachrisson 2017: 4). In contrast to the group of wild mammals, wild birds and hunting birds, squirrels and cats occur in female burials as well. As with the bear-skins, remains

³² Lynx-claws occur in grave 110 from Odenslunda, a squirrel each might be present in the graves 4060 and 4425 from Ultuna and cats occur in grave 700 from Inhåleskullen, as well as in the graves 5 and 8 from Lilla Ullevi.

of lynx and squirrel do not necessarily directly connect the deceased to hunting, but that it is more likely grave-goods or belonged to clothing.

In conclusion, only graves connected to falconry probably show a direct link between the human dead and hunting, since the indicating animals were deposited completely. In contrast to that, fish are here regarded most likely as food remains and fur-bearing animals as indications for the possible use of their skin, respectively representing grave-goods without secure direct connections to hunting. In a few cases, the presence of single body parts of cats, red deer and wild boar remains unclear and speculative. Moreover, only grave contexts connected to falconry show a clear restriction on male burials of high status (and determined as mature if possible), which has also been compared to another study (cf. Vretemark 2013 a).

5.3. Conclusion

The interpretation of the results from the database analysis has shown, that the claims which were set up at the beginning of this study (cf. Chapter 1.2), can be confirmed in most cases. The first claim, that the way of depositing changes the meaning of the animal, is reflected in the division of different types of depositions. Those are namely incomplete, almost complete and complete, as well as burnt and unburnt bones in cremation graves.

When it comes to the meaning of the animal, the different types of depositions were interpreted first. It has been demonstrated, that even inside the categories of incomplete-, almost complete- and complete depositions, these can be linked to different practices. Incomplete depositions were connected to the motivations of offering food-gifts, depositing feasting remains in the sense of left-overs from the funeral meal, and feasting remains in the sense of symbolic depositions to commemorate the feasting and to connect it to the deceased (cf. Chapter 5.1.2). The latter also applies to almost complete depositions which is probably tied to the expression of wealth (cf. 5.1.3). That other faunal remains could represent paraphernalia, amulets or other sorts of symbolic depositions has been mentioned, but could not be supported on the basis of the analysis presented here. The most significant incomplete depositions in this study were the occurrences of burnt and unburnt cranial parts and fragments from the hand/feet/tail-region of cattle, interpreted as symbolic depositions connected to feasting. Incomplete depositions, thereby, do not only represent beneficial gifts for the deceased but also symbolic depositions that might either represent an animal or the funeral as a whole.

Complete depositions, on the other hand, are commonly interpreted as sacrifices and thereby suggest a deeper symbolical meaning (cf. Chapter 5.1.3). Different intentions or motivations that lay behind the practice of depositing or sacrificing a whole animal, were in this study described as the display of power and status or economic wealth (especially hunting birds, complete cattle and horses in some cases) and a probable expression of gender (cattle, hunting birds, chickens in some cases). As have been discussed here, chickens could have had a symbolical or magical function, representing rebirth and fertility (Gräslund 1980: 54; cf. Chapter 5.2.2.1). Meanwhile, dogs, which seem not to have any social restrictions, might have been necessary mediums for the transportation to the afterlife (cf. Gräslund 2004: 172f.; cf. Chapter 5.2.1.1).

The second claim in this study, that the context of the deposition changes the meaning of the animal, was only partially confirmed. This thesis was applied in the spatial analysis of urn graves. An intentional selection of burnt material inside the urn was not possible to confirm. However, it is confirmed for unburnt material, which is represented by the deposition of chickens in curious placements (cf. Chapter 4.6.1; Chapter 5.2.2.1). Moreover, the spatial analysis of horse bridles inside inhumation graves has shown, that not only the context of animal depositions, but also the context of artefacts is important. In this case, a special perception of some of the deposited horses, which enjoy a higher reputation with their owner or in society, compared to other animals, has

been suggested. Decisive was here the placement of the bridle in relation to the human dead and the horse itself (cf. Chapter 4.2.2; Chapter 5.2.1.1).

That animals connected to falconry only occur in male graves of high status, was already stated by Sten and Vretemark (1988; cf. Vretemark 2013 a) and is confirmed here. The restriction of complete cattle to graves of males, was, however, not mentioned in former studies (cf. Iregren 1972; Sigvallius 1994). At least in this study, those complete cattle derive almost exclusively from Vendel Period boat-graves. The occurrence of unburnt chickens, placed on top of urns, has been discussed in previous studies (e.g. Bratt 2008: 244; Gräslund 1980: 54). However, the fact that complete chickens received special placements in inhumation graves, and moreover, that the latter show a tendency to a restriction on female graves has not been reported before. Likewise, the spatial position of horse bridles and the deduction of possible special perceptions of horses has not been discussed before. Furthermore, the commonly claimed connection of horses to high status could only partially be confirmed in this study, since half of the percentage of horses occur in graves with lower status as well (cf. Chapter 4.3).

As a conclusion, it can be said that these results both confirm patterns realized in previous studies (cf. Iregren 1972; Sigvallius 1994), and add new patterns and interpretations of different types of depositions, creating more detail and understanding to the burial practice in Uppland. What remains, is a discussion about the perception of the different depositions and animals, meaning human-animal relationships, as means of understanding the burial ritual itself.

6. Final Discussion

“Humans use animals in order to draw elaborate pictures of themselves.”

(Tilley 1999: 49)

Animals in graves, and especially complete depositions, are commonly interpreted as sacrifices. This seems to be a self-evident interpretation when comparing graves to other ritual contexts in which animals are deposited and interpreted as sacrifices as well. Such contexts can be bogs, post-holes or wells for example. However, graves differ considerably from those contexts, because they are carried out for the human dead.

The common definition of a sacrifice is to offer something to a deity in order to receive something from them, which thus expresses a reciprocity (Näsström 2002: 254f.; cf. Chapter 1.3). When trying to apply this concept to a burial, different questions arise: who was making the sacrifice and to whom was it addressed? Did members of the mourning society make the sacrifice, in order to honour the deceased and/or assure them a good afterlife, or was it a single person, in charge of the whole funerary ceremony? Were the sacrifices made for a deity or for the deceased? Such questions do not arise when sacrifices are made in other contexts which demonstrates the complexities in applying the concept of sacrifice to burial contexts.

Debating the possible interpretations, it becomes clear that there could be two totally different associations of burials in general. In one scenario, the animals and grave-goods are deposited or sacrificed to the human and not a deity. Then again, this could either mean that we are not dealing with sacrifices but with grave-goods, in the sense of gifts for the dead, or that humans got a divine status in death (Kaliff 2005: 137).

The other scenario would describe a situation in which the sacrifices are made for one or several deities. Apart from the question, what request the sacrifice was made for, it could be asked whether it is possible that the burial as a whole was a sacrifice to the gods (cf. Kaliff & Østigård 2013: 88). The plea in this sacrificial act could be to ask for a good afterlife for the deceased which, of course, can also be the case if only single animals are regarded as sacrifices.

Accepting the general interpretation of sacrifices, another question is, why it should only apply to complete animal depositions. After all, the incomplete skeletal remains from other ritual contexts mentioned above, are described as sacrifices as well (e.g. Fredengren & Löfqvist 2015; Lucas & Lucas 2013; 103–107). This study has demonstrated, that incomplete animals in the burial context, can be connected to different actions. A food-gift refers rather clearly to the human dead, in the sense of an object or a grave- good. Feasting remains, on the other side, to wit both those that were deposited as left-overs of consumed meat and those that probably represented the feasting as a kind of trophy in remembrance of the feasting (cf. Chapter 5.1.2; 5.2.3), cannot be regarded as gifts or grave-goods. How do we categorize those depositions? Are they sacrifices as well? And if we call them sacrifices, who was the receiver? Assuming, that these depositions have the purpose to represent trophies in remembrance of the feasting, respectively serve to connect the feasting to the deceased, in a sense of honouring the dead. Animal body parts from feasting, could also be considered as sacrifices but directed to the deceased and not a deity. In this context, food-gifts could be sacrifices as well, when comparing them to libation offers.

This ambiguity of the term sacrifice and diversity of practices that could possibly be included,

describe both a terminological and a conceptual problem. It shows either that the definitive limitations of a sacrifice, or the classification, respectively the perception, of animal depositions in graves are unclear. However, the ritual acts that archaeologists call sacrifices, might have been flexible actions without strict rules during the times they were carried out. Assuming, that such actions were not restricted to an official person but that everyone could create their own sacral environment, there would have been no control of these activities. Moreover, the term sacrifice defines an action which archaeologists nowadays do not know if it actually happened as they describe it. Thereby, they are trying to make a term fit to an action that they have not even entirely recognized in the archaeological record. For this reason, the different actions that led to the deposition of animals in graves, rather need to be regarded individually.

The previous chapters have already pointed out that the animals in this study have been deposited with various motivations. It becomes clear, that the common division of sacrifices as complete animals and food-gifts as incomplete depositions (e.g. Vretemark 2013 a: 381) cannot be applied as easy as suggested. Therefore, this thesis seeks for an alternative description of complete animals as *individual agents*, as opposed to incomplete- and almost complete depositions which cannot be perceived as such after the physical manipulation to represent food-gifts, feasting remains, symbolical depositions or just sacrifices as it has been discussed before. It is worth considering, why certain animals were chosen to be deposited completely, respectively how these *individual agents* were given meaning.

The alternative description of complete animals as *individual agents*, derives from the idea, that animals might receive their meaning in the burial ritual, as a consequence of their own actions, appearance and character – their agency. Certainly, it is humans who carry out the burial, who ascribe different meanings to animals and who give them different purposes, both in life and in ritual practice. But on the other side, certain characteristic aspects of an animal could be the reason for making humans ascribe a specific meaning to it and thereby its personality has an influence on our actions and the construction of a symbolic environment.

In *Ynglingatal* chapter 6 for example, there is a description of *berserks* (bear-warriors) who were “[...] mad as dogs or wolves [...] and [...] strong as bears or wild bulls [...]”. Apparently, the appearance and behaviour of those animals led humans to associate them with a certain character and meaning. Of course, wolves or dogs are not only aggressive and strong but have a lot of other characteristics as well. However, the most distinct features are chosen to construct the character and thereby create the symbolical meaning of that animal.

Furthermore, it seems that the perception of an animal and ensuing treatment in the burial ritual was the consequence of their use during lifetime (cf. Steuer 2003: 51). This is reflected by the fact that dogs and horses occur the most often as complete depositions in graves, whereas food producing animals (pigs, sheep, goats, cattle) are mainly deposited as incomplete bodies (cf. Iregren 1972; Sigvallius 1994). The presence of dogs and horses in graves with both higher and lower social status, could either mean that they had a certain symbolical meaning for the ritual, as mentioned at the beginning of the discussion, or that there were different kinds of dogs and horses which had different purposes during their lifetime and were thereby perceived differently.

Dogs for example could have had various purposes during lifetime, such as guarding, herding and hunting. The identification of sighthounds in burials, has therefore led to an association with hunting and high status (Gräslund 2004). But at the same time dogs appear in “common” graves as well and as known from the grave in Rickeby, Vallentuna Parish, several different types of dogs can occur in the same grave as well (Vretemark 2013 a: 381).

When it comes to horses, this distinction of the purpose during lifetime should even be reflected in the material record, since different kinds of horse equipment indicate different uses of those animals. Bridles, stirrups and saddle for example, are riding gear and regarded as an indication for high status (cf. Ljungkvist 2006: 43, fig. 14; 46, fig 16). Horse-bow mounts, which led the reins to the bridle, were used for draught horses, and are found in boat-grave contexts

interpreted as being used to pull the boat to the burial site (Sjøvold & Sandelin Löfgren 2013: 180). While these items are richly decorated in high-status graves, the lower classes used horse-bow mounts made of wood, bone or horn (*idem*: 181f.). Obviously, the latter cannot be traced in cremation graves, since the fire has destroyed them.

A special perception of horses has already been discussed in chapter 4.6.1 and 5.2.1.1. Since this concerns riding horses, it is likely that there were stronger emotional bonds between a horse and its rider than a draught-horse and its owner. Moreover, riding horses probably had a higher reputation among the society, not only concerning social strata but maybe even a symbolical reputation. This is where the term individual agent is reflected once again. The individuality of an animal is not only bound to the species, but even to different individuals among one species. Dogs, horses and cattle had different purposes during lifetime and apparently special bonds existed between humans and animals according to their use. But even chickens have proved to receive different functions in the burial ritual (cf. Chapter 4.2.1; 5.2.2.1), some have been burnt on the pyre, while others were placed on top of an urn after the interment of the cremated remains. Whether those animals already received a different purpose during lifetime is impossible to retrace.

Furthermore, that the horse which pulled the boat to the actual site of the burial, is a notion which could apply to the two cattle with halters, in the boat-graves 6 and 7 from Valsgårde, as well. This would mean, that not only the purpose of the animal during lifetime but during the burial ritual itself was important. Inasmuch as the cattle were deposited in the grave, because they have had a special task during the ritual and could not return to their daily routine or regain their pragmatic meaning. Raptors, on the other side, probably did not have a specific meaning during the burial ritual, but were solely transformed to status-symbols, as a consequence of their use for falconry, which was restricted to specific social strata.

In addition, it is important to keep in mind that it is not the deceased, but the bereaved who are carrying out the funeral. On the one side, this means that the character of the burial, meaning the construction, the grave-goods and the animal depositions, are not only reflecting the human dead, but rather their family, respectively the reputation the dead had in their family or in society. And on the other side, this means that the funeral made the biggest impression on the mourners and not on the deceased.

Therefore, the idea of animals as agents works here again, in the sense that the animals gave a sensory experience to the mourners. This impression is created by the appearance, behaviour and reputation of the animal in society. While it was common to slaughter animals that served as food in everyday-life, the ritual killing of dogs, horses, cats and maybe also cattle must have made a huge impression on the mourners, because it was something special. Moreover, it is possible, that the colour of fur and the sex of the animals played a role here (cf. Svensson *et al.* 2012). Certainly, the colour of the animal was more important when it comes to the sensory engagement of the mourning society, because it was more visible than the sex of the animal. However, there could be a completely different theory about the meaning of animals in burial contexts. Historical sources such as the account of Ibn Fadlan or the notations of the German Christian cleric Adam von Bremen in his chronic *Gesta Hammaburgensis ecclesiae pontificum*, mention the practice of sacrificing humans during the Viking Age. Those reports need to be considered very carefully because they were created in different geographical areas, in different time periods, were religiously biased, and in the case of Adam von Bremen created on basis of accounts of others, meaning that he had never been in Scandinavia himself (Hultgård 1997: 9). Nevertheless, archaeologists may have found evidence of human sacrifices in the material record as well (cf. e.g. Gotfredsen *et al.* 2014; Jankuhn 1967; Jesch 1991: 25). Even cremation graves, containing more than one individual, have been considered as evidence for human sacrifices, but could not be confirmed (Sigvallius 1994: 124f.).

The archaeologist Neil Price (*in press*) argues, that (some) double interments of a man and

woman might reflect sort of a marriage in death. Price (*idem*) bases this thought on a ritual that is described in Ibn Fadlan's account of a burial among people he called the Rūsiyyah, who lived during the 10th century AD in today's Russia. He compares this funeral to a wedding ritual called the *drunnur* on the Faroe Islands, known since the 19th century and continuing until today, and to *Völsa þáttur* ("Tale of Völsi"), an Old Norse *prosimetrum* (*idem*).

The idea of a wedding in death is an interesting theory, since it expresses a shift in perception, implying that it might have been regarded as an honour to be buried together with someone and to follow them to the afterlife. This notion can also be sensed when taking a thorough look at Ibn Fadlan's description:

"When the above-mentioned man had died, his relatives said to his slave girls: 'Who will die with him?' Thereupon one of them answered 'I'. Then the relations of the deceased charged two girls to watch her and go with her wherever she went" (Frye 2005: 66f.).

Even though we cannot be sure to what degree it really was the free will of these slave girls to be buried with the dead (and if indeed it ever happened), it seems that it was at least illustrated as an honourable task to follow the master to death³³. Is it possible that it was a similar honour for the animals that were buried together with the human dead? Or in reverse, were human sacrifices no longer considered human beings but rather received the same status as the sacrificed animals?

There is a chance that it is not possible for us nowadays to understand the way of thinking and the moral standards of this past society. If the whole concept of death for example was perceived differently, if dying was just a transition to another life, then it could be regarded as an honour for such animals to be chosen to follow the deceased to this other life.

As a conclusion it can be stated, that the term sacrifice, when applied to animals in human burials, is commonly used without a specific definition that would be suitable in this context. This leads not least to a problem of the burial as a concept itself. The use of the term individual agents was suggested as an alternative for the interpretation as sacrifices. This term is, however, limited in the sense that it is an animal's character and appearance that leads us to the creation of a symbolic meaning of that animal, but on the other side, it is humans who selectively pick specific characteristics in the large spectrum of the animal's behaviour, and build symbolisms and representations around them. Therefore, this thesis argues, that as long as animals are not buried on their own, for their own sake in their own graves, but inside the grave of a human, they served a specific purpose, in a utilitarian sense. For even though completely deposited animals were not physically manipulated as in the transformation of an animal into food, underlying the deposition is still a symbolic manipulation and -meaning (cf. DeFrance 2009). Be that to accompany the deceased on their way to the afterlife, to make a sacrifice to the gods or to the human dead, or to create a huge spectacle for the mourning society.

³³ Women could likewise have been accompanied by a human sacrifice, which was e.g. suggested by Pearson (1999: 99) for the presence of a younger and an elderly woman in the well-known boat-grave of Oseberg in Norway.

7. Future Prospects

After a long way of hard work, it still feels like having only scratched the surface of the custom of depositing animals in graves. There is still so much that couldn't be dealt with in the limited scope of this thesis, and, moreover, the outcome of the study and ensuing interpretation and discussion, have created even more questions than answers.

A few issues were already excluded from the start, but could contribute to further studies. The weight of bone material per species, would indicate the loss of bones and would allow ideas of ritual activity that are intangible in the archaeological record. Moreover, there are different degrees of combustion visible on faunal remains. It expresses the influence of the fire on the bones, which could indicate where on the pyre an animal was deposited, if the flesh had already been removed, or, regarding unburnt respectively sooty bones, how quickly after the cremation the unburnt material was put on the pyre. Sooty and singed but originally unburnt bones probably indicate that they had been put on the pyre at a time when the ashes were still hot enough to influence the condition of the bones. Besides, it has not been talked thoroughly about the spatial positions of animal depositions inside inhumation graves in this thesis. A detailed analysis about that, could show patterns and relations between different elements in the grave towards each other. Likewise, the sex, age and health condition of the animals was excluded from the start, which contributes to the nature of the ritual, but also to the relation of humans to these rituals. In some cases, only animals of a specific sex and age might have been chosen, that might have been important for the meaning of the ritual. But on the other side, it is worth considering that people thought economically in ritual practice, and chose animals that were old and sick and thereby not any longer useful for their economic needs. In addition, the condition and growth of bones, especially regarding cattle, horses and dogs, could even tell about the use of this animal. A horse used for riding uses other muscles than draught horses for example, which leads to a different growth of the skeleton. Furthermore, left and right symbolism, meaning attention to side choices among selected body parts, has in Scandinavian Archaeology widely been neglected. Osteological reports on cremation graves do not give information about the body side of which a bone or fragment originated, most probably because it is difficult or rather impossible to determine the side of the body on fragmented, cremated material. But likewise, investigations on side choices are also missing from inhumations.

In addition, the outcome of this project led to even more questions and recommends further examinations. Is it possible to regard the combination and number of animals in a grave as a sign for economic wealth, does it reflect the reputation of the human dead in the society, or does it reflect a certain identity of the human dead or their relatives? And if it is a reflection of economic wealth, can we use animal depositions for further classifications of social strata, beyond the two social groups that were used in this study? In this context, further investigations on horses that occur as complete depositions in graves with lower social status are necessary. The occurrence of complete horses in graves with lower social status could be a parameter for economic wealth and further social strata.

Moreover, the fact that dogs and horses repeatedly lack parts of the hind legs among complete depositions looks like a pattern and needs further investigation. The here called "almost complete depositions" have not been analysed thoroughly yet and have the potential to give further insights

to ritual practice.

The custom of placing unburnt chickens on top of urns seemed to be in favour of female burials among the material of this thesis. The comparative material, however, weakened this tendency, which is why more comparative material is needed to find a secure pattern. As a similar problem, other analyses contained small sample-sizes from the beginning. Those were especially the age groups of juveniles/young adults and seniles. The former seemed to develop an own pattern with a high number of animals in this study, but without a larger sample-size of juvenile burials, this remains an insecure result. Likewise, the numbers of infant- and senile burials were extremely low. Further investigations of such graves could show more secure patterns and might reveal different treatments of different age groups in the burial ritual.

Moreover, the study of objects that are affiliated to an animal (e.g. riding equipment), were only used in order to find out special perceptions of certain animals in this study. A more intensive analysis of such artefacts could lead to an advanced understanding of the use of that animal during lifetime. In some cases, it is mentioned in the osteological reports or publications how an animal was killed³⁴. Admittedly, the cause of death is impossible to detect osteologically, in cases where the skeleton did not get damaged. But still, extensive studies on this issue are apparently missing and would contribute to the understanding of the overall ritual practice in the burial context.

³⁴ E.g. in the boat-grave from Arby where the horse was evidently decapitated (Arbman *et al.* 1993: 27) and the dog was cleft in halves.

Summary

The presented work served to find out the functions and meanings of different animals that were deposited in human graves. The material consists of both cremation and inhumation graves from 15 different sites in the Swedish historical province Uppland. The contexts date to the Vendel Period and the Viking Age and had to undergo further preconditions to be suitable for this study.

The project is based on a database that had been compiled first, forming the basis for the ensuing statistical analysis. In order to find about the meanings of different animals, the analysis had to follow certain questions that were used as tools to approach the overall aim of this work. That would be to find patterns in the custom of animal depositions in human graves, and how these patterns shift, measured at the burial type, the time period and at the social factors of the human age, gender and social status. Furthermore, it was a concern to distinguish different types of depositions.

The most significant results of the analysis were then further interpreted. That was, at first, the attempt to explain the various practices that culminated as different types of depositions in the grave. Subsequently, specific animal species, were discussed further, in order to reach an understanding of their functions and symbolical meanings in the burial ritual. Those were dogs and horses, that occur most frequently as complete depositions in the material of this study, incomplete depositions of cattle, that are regarded as symbolic depositions to commemorate the feasting that happened in honour of the human dead, chickens in special placements, that were placed with a symbolical or magical intention as unburnt depositions on top of urn or in curious placements in female inhumation graves, completely deposited cattle that appeared in male graves of high status as a sign of power and wealth, and the depositions of raptors and wild birds in graves of men that indicated that falconry was confined to the male aristocracy.

In a following concluding chapter, it was discussed whether the term “sacrifices”, which is commonly used for complete animals, is even suitable for the depositions of animals in human burials. It is argued that the definition of this term does is not easily applicable in a burial context. As an alternative, it has been suggested to apply a shift in perception of animals in graves and to call complete depositions individual agents instead. This was based on the idea, that animals might receive their meaning in the burial ritual, as a consequence of their own actions, appearance and character – their agency. This includes the the sensory engagement of the mourning society, who is influenced by the appearance of different animals that take part in the funeral. But on the other side, the symbolic meaning and reputation of an animal could likewise be a consequence of their use during lifetime (cf. Steuer 2003: 51).

As a last attempt to approach the human-animal relationships at that time, it has been considered if it could have been regarded as an honour for such animals to follow the human dead in the grave. This notion derived from a comparison to the descriptions of the Arabic traveller Ibn Fadlan, who portrays a funeral among the Rus in today’s Russia. In this account it seems to be regarded as an honour for a slave to accompany a human dead in the grave, which is why the same could be valid for the selected animals.

However, the conclusion of this thesis is that even though animals have an influence on the human, it is still them who selectively pick specific attitudes in the large spectrum of the animal’s behaviour, in order to construct the symbolism of an animal. Furthermore, animals in burial contexts always serve a specific purpose, be that to accompany the deceased on their way to the

afterlife, to make a sacrifice to the gods or to the human dead, or to create a huge spectacle for the mourning society. Thereby, they always underlie a symbolical manipulation (cf. DeFrance 2009) in this context and are to be regarded in a utilitarian sense.

List of Abbreviations

Abbreviations in the text and bibliography

AMASRUU	Acta Musei Antiquitatum Septentrionalium Regiæ Universitatis Upsaliensis
app.	Appendix in cited work
App.	Appendix in own work
ASVRUU	Acta Sepulcreti Valsgardiae Regia Universitatis Upsaliensis
cf.	Latin confer/conferatur, short for „compare”, points out comparative sources for the reader
chapter	Chapter in cited work
Chapter	Chapter in own work
e.g.	Example given
facsim.	Facsimile
fig.	figure/figures in a cited work
Fig.	Figure/figures in own work
fn.	Footnote in a cited work
i.a.	Latin inter alia, short for ”among others”
i.e.	Latin id est, short for “that is/means”
idem/eadem lat.	“the same” replaces the short reference (author’s name and year) when it stays the same
KVHAA	Kungliga Vitterhets Historie och Antikvitets Akademien
MNI	Minimum number individuals (excluding humans in the entire thesis)
NISP	Number of identified specimens
no.	Number
RGA	Reallexikon Germanischer Altertumskunde
RGZM	Römisch Germanisches Zentralmuseum
SAU	Societas archaeologica upsaliensis
table	Table in a cited work
Table	Table in own work
WBG	Wissenschaftliche Buchgesellschaft
ZBSA	Zentrum für Baltische und Skandinavische Archäologie

Abbreviations in the database

Age	Age of the human dead, osteological determination
Als	Tuna in Alsike Parish
Brista 601a	Called "centralgraven" (central grave) in publication
Brista 601b	Called "sekundärgraven" (secondary grave) in publication
CoS	Cremated on-site
DoD	Degree of disturbance
Gender	Social gender of the human dead, archaeological determination GU Gamla Uppsala
HS	Higher status
IHK	Inhåleskullen
Ind.	Number of human individuals
LillaU	Lilla Ullevi
Nr.	Context number, given by the excavators
Odslu	Odenslunda
Odslu_7a	Called "F161" respectively "brandlager 1" (cremation layer 1) in publication
Odslu_7b	Called "F162" respectively "brandlager 2" (cremation layer 2) in publication
RAÄ	Riksantikvarieämbetet/National Heritage Board (within the database this abbreviation shows the number that an archaeological site is registered in)
Ult	Ultuna
Unsp.	Unspecified remains
VA	Viking Age
Vgde	Valsgårde
VP	Vendel Period
Sex	Biological sex of the human dead, osteological determination

Tables and Figures

- Figure 1: Example for ritual animal depositions in a posthole of the large Vendel Period hall on the southern plateau in Gamla Uppsala (Foto: Hannah Strehlau, taken in connection with the *Viking Dynasties*-excavations in Gamla Uppsala).
- Figure 2: Map over the investigation area. The upper part shows the location of Uppland in Scandinavia, marked as red square (modified after Klevnäs 2015, fig. 1). The lower part shows the selected sites marked by red dots (created with ArcGis).
- Figure 26: The female boat-grave 36 from Prästgården in Gamla Uppsala, with the special placement of a complete chicken (red circle) inside the front part of the boat and a complete dog outside the stern (modified after Nordahl 2001, table 4).
- Figure 27: Front part of boat-grave 6 from Valsgårde. The green section marks the cattle's cranium with the remains of a halter (modified after Arwidsson 1942, table 44). Reproduced with permission by the Viking Phenomenon Project.
- Table 1: Classification of age groups (Modified after Ohlsson 2012: 113; cf. Sigvallius 1994: 155, app. 4).
- Table 3: Example for a table showing information on the determined animals in a grave context. The numbers 1–6 in the upper line represent the body parts 1–6 according to the same classification as applied in this thesis (modified after Ohlsson 2012: 119, own translation).

All figures and tables not specifically mentioned here are from the author.

Material footage and imagery was kindly provided by the *Viking Phenomenon Project*.

Sources

Publications used for the database

Inhaleskullen:

Ohlsson, A. (2012) Bilaga 5. Osteologisk Analys. In : Seiler, A. & Appelgren, K. *Inhaleskullen – ett mångtydigt gravfält från yngre bronsålder – äldre vikingatid: Uppland; Vaksala socken; Fyrislund 6:1, Vaksala-Norrby 1:2 och 1:3, Vaksala 155:1*. Riksantikvarieämbetet, Stockholm, pp. 112–125.

Prästgården:

Nordahl, E. (2001) *Båtgravar i Gamla Uppsala: Spår av en vikingatida högreståndsmiljö*. Departement of Archaeology and Ancient History, Uppsala.

Gnista:

Gustavsson, R. (2016) Bilaga 3: Osteologisk analys: Bränt benmaterial från undersökningen av Gnistahögen och dess tillhörande gravfält år 2013. RAÄ 62:1, Danmarks socken, Uppland. SAU rapport 2014:17 O. In: Hennius, A., Sjöling, E. & Prata, S. *Människor kring Gnistahögen och tidig medeltid: Begravningar från vendeltid, vikingatid och tidig medeltid*. SAU RAPPORT 2016:10. Upplandsmuseet & Societas Archaeologica Upsaliensis, Uppsala, pp. 1–26.

Ultuna:

Sjöling, E. & Bäckström, Y. (2014) Osteologisk analys. In: Hulth, H. *Den skyddande logen: Brandgravar från yngre järnålder samt en och annan medeltida och efterreformatorisk grop på Ultuna*. Arkeologisk för- och slutundersökning. Societas Archaeologica Upsaliensis, Uppsala, pp. 48–57.

Grimsta:

Jonsson, L. (2010) Bilaga 1: Osteologisk rapport. In: Jakobsson, A. H. *Gravar från Vendel- och Vikingatid i Grimsta: RAÄ 30, Fresta socken, Uppland*. Särskild arkeologisk undersökning. Arkeologikonsult, Upplands Väsby, pp. 67–80.

Odenslunda:

Sigvallius, B. (2005) Bilaga 5: Osteologisk analys. In: Olausson, M. (2005) *Bytomten vid Odenslunda: Bebyggelselämningar från folkvandringstid – nyare tid samt delar av ett gårdsgravfält från vendeltid – vikingatid*. Riksantikvarieämbetet, Hägersten, pp. 55–74.

Brista:

Jonsson, L. (2009) Bilaga 4: Osteologisk Analys. In: Renck, A. M. *Gravar och Gårdslämningar vid Brista: Den arkeologiska undersökningen 2006*. In: Renck, A. M. *Gården som upphörde: Om en uppländks järnåldersbygds förändring i mellersta järnålder*. Särskilda arkeologiska undersökningar. Arkeologikonsult, Upplands Väsby, pp. IV:53-IV:65.

Lilla Ullevi:

Jonsson, L. (2011) Bilaga 3: Osteologisk Rapport: Ben från gravfältet Lilla Ullevi, RAÄ 40 i Bro socken i Uppland. In: Jakobsson, A. H. & Lindblom, C. *Gård och gravfält vid Lilla Ullevi: Arkeologisk undersökning*. Arkeologikonsult, Upplands Väsby, pp. 277–317.

Enbacken:

Sjöling, E. (2006) *Enbacken: Ett gravfält från yngre järnåldern i Uppland*. Arkeologisk slutundersökning för E4, RAÄ 89 Uppsala sn, Uppland. SAU Rapport 2006:3. SAU Skrifter 19. Societas Archaeologica Upsaliensis, Uppsala.

Rickeby:

Sjösvärd, L. (1989) *Haukr – en ringer från Vallentuna : arkeologisk undersökning av fornlämning 27, Rickeby, Vallentuna socken, Uppland*. Stockholm, Riksantikvarieämbetet.

Sjösvärd, L., Vretemark, M. & Gustavsson, H. (1983) A Vendel warrior from Vallentuna. In: Lamm, J. P. & Nordström, H.-Å. (eds.) *Vendel Period Studies: Transactions of the Boat-grave symposium in Stockholm, February 2–3, 1981*. Statens Historiska Museum, Stockholm, pp. 133–150.

Vretemark, M. (2013 a) The Vendel Period royal follower's grave at Swedish Rickeby as starting point for reflections about falconry in Northern Europe. In: Grimm, O. & Schmölcke, U. (eds.) *Hunting in northern Europe until 1500 AD: Old traditions and regional developments, continental sources and continental influences*. Papers presented at a workshop organized by the Centre for Baltic and Scandinavian Archaeology (ZBSA). Wachholtz, Neumünster, pp. 379–386.

Valsgärde cremations:

Bäckström, Y. (2001) *Osteologisk analys: Brandgravar*. SAU Rapport 2001:8. Uppsala.

Valsgärde inhumations:

G. Arwidsson (1942), *Valsgärde 6*. AMASRUU 1 = Gräberfunde Valsgärde 1. Uppsala, Stockholm: Almqvist & Wiksell.

G. Arwidsson (1954), *Valsgärde 8*. AMASRUU 4 = Gräberfunde Valsgärde 2. Uppsala, Stockholm: Almqvist & Wiksell.

G. Arwidsson (1977), *Valsgärde 7*. AMASRUU 5 = Gräberfunde Valsgärde 3. Uppsala, Stockholm: Almqvist & Wiksell.

Nordahl, E. (*in press*). *Valsgärde 14*. ASVRUU 1. Uppsala University, Uppsala.

Arwidsson, G. (1980) Båtgravarna i Valsgärde. In: Sandwall, A. (ed.) *Vendeltid*. Statens Historiska Museum, Borås, pp. 45–79.

Nichols, C. (*unpublished*) *Hounds of Hel: Dog remains in Vendel – Viking inhumations at Valsgärde, Sweden* (Dissertation). Uppsala University.

Tuna i Alsike:

Arne, T. J. (1934) *Das Bootsgräberfeld von Tuna in Alsike, Uppland*. Archäologische Monographien 20. KVHAA, Stockholm.

Arby + Tibble:

Arbman, H. (*facsim.*), Greenhill, B., Roberts, O. T. P. (1993) *The Årby boat*. Statens historiska museum; Båtdokumentationsgruppen, Stockholm.

Vendel:

Stolpe, H. & Arne T. J. (1912) *Gravfältet vid Vendel*. Monografier 3. KVHAA, Stockholm.

Lundström, A. (1980 b) Gravgåvorna Vendel. In: Sandwall, A. (ed.) *Vendeltid*. Statens Historiska Museum, Borås, pp. 31–44.

Primary sources

- Grimnismál (Poetic Edda)* Hansen, W. (1981) *Die Edda: Germanische Göttersagen aus erster Hand*. Nach der Übersetzung von Karl Simrock neu herausgegeben, bearbeitet und kommentiert von Walter Hansen. Ueberreuter, Wien/ Heidelberg.
- Ynglingatal* Noreen, A. (1925) *Ynglingatal*. Text översättning och kommentar av Adolf Noreen. KVHAAH 28:2 = N. F. 8:2. Akademiens förlag, Stockholm.
- Ibn Fadlan* Frye, R. (2005) *Ibn Fadlan's journey to Russia: A tenth-century traveller from the Baghdad to the Volga river*. Markus Wiener Publishers, Princeton.
- Gesta Hammaburgensis ecclesiae pontificum*
Adam av Bremen (facsim.) (1846) *Adami Gesta Hammaburgensis ecclesiae pontificum*. Ex recensione Lappenbergii in usum scholarum ex Monumentis Germaniae historicis recudi fecit G. H. Pertz. Hannover.

Internet sources

- Shenk, P. (2002) *To Valhalla by Horseback? Horse Burial in Scandinavia during the Viking Age*. A Master's Thesis in Nordic Viking and Medieval Culture. University of Oslo, Oslo. <https://www.duo.uio.no/bitstream/handle/10852/26678/7064.pdf?sequence=1> (Unpublished)
- Vatomsky, S. (2017) *The Movement to Bury Pets Alongside People: "Whole-family cemeteries" make the case that you should be allowed to rest with your dog or cat*. <https://www.theatlantic.com/family/archive/2017/10/whole-family-cemeteries/542493/> (Published 2017-10-10)

Literature

- Andersson Cederholm, E., Björck, A., Jennbert, K., Lönngrén, A.-S. (eds.) (2014). *Exploring the animal turn: Human-animal relations in science, society and culture*. Pufendorf Institute for Advanced Scholars; Lund University, Lund.
- Arbman, H. (1943) *Birka I: Die Gräber*. Text. Almqvist & Wiksells, Stockholm.
- Arbman, H. (facsim.), Greenhill, B., Roberts, O. T. P. (1993) *The Årby boat*. Statens historiska museum; Båtdokumentationsgruppen, Stockholm.
- Arne, T. J. (1879) *Das Bootsgräberfeld von Tuna in Alsike, Uppland*. Archäologische Monographien 20. KVHAA, Stockholm.
- Arnold, B. (1991) The Deposed Princess of Vix: The Need for an Engendered European Prehistory. In: Walde, D. & Willows, N. D. (eds.) *The archaeology of gender: Proceedings of the 22nd annual conference of the Archaeological Association of the University of Calgary*. University of Calgary, Calgary/Alta, pp. 366–374.
- Arrhenius, B. (1983) The chronology of the Vendel graves. In: Lamm, J. P. & Nordström, H.-Å. (eds.) *Vendel Period Studies: Transactions of the Boat-grave symposium in Stockholm, February 2–3, 1981*. Statens Historiska Museum, Stockholm, pp. 39–70.
- Arwidsson, G. (1980) Båtgravarna i Valsgärde. In: Sandwall, A. (ed.) *Vendeltid*. Statens Historiska Museum, Borås, pp. 45–79.
- Back-Danielsson, I.-M. (2010) Sense and Sensibility: Masking Practices in Late Iron Age Boat-Graves. In: Fahlander, F. & Kjellström, A. (eds.) *Making Sense of Things: Archaeologies of Sensory Perception*. Postdoctoral Archaeological Group, Stockholm, pp. 121–140.
- Bäckström, Y. (2001) *Osteologisk analys: Brandgravar*. SAU Rapport 2001: 8. SAU, Uppsala.
- Behres, H. (1964) *Die neolithisch-frühmetallzeitlichen Tierskelettfunde der Alten Welt: Studien zu ihrer Wesensdeutung und historischen Problematik*. Veröffentlichungen des Landesmuseums für Vorgeschichte in Halle 19. Deutscher Verlag der Wissenschaften, Berlin.
- Bell, C. (1992) *Ritual Theory, Ritual Practice*. Oxford University Press, Oxford/New York.
- Bill, J. (2016) Protecting against the dead? On the possible use of apotropaic magic in the Oseberg burial. *Cambridge Archaeological Journal* 26 (1), 141–155.
- Bourdieu, P. (1977) *Outline of a Theory of Practice*. Cambridge University Press, Cambridge.
- Bratt, P. (2008) *Makt uttryckt i jord och sten: Stora högar och maktstrukturer i Mälardalen under järnåldern*. Stockholm Studies in Archaeology 46. Institutionen för arkeologi och antikens kultur, Stockholms universitet, Stockholm.
- Capelle, T. (1998) *Die Sachsen des frühen Mittelalters*. WBG, Stuttgart.
- Carstens, L. (2013) On the hunt in Old Norse sources. In: Grimm, O. & Schmölcke, U. (eds.) *Hunting in northern Europe until 1500 AD: Old traditions and regional developments, continental sources and continental influences*. Papers presented at a workshop organized by the Centre for Baltic and Scandinavian Archaeology (ZBSA). Wachholtz, Neumünster, pp. 397–418.
- Davis, S. & Payne, S. (1993) A barrow full of cattle skulls. *Antiquity* 67 (254), 12–22.
- DeFrance, S. D. (2009) Zooarchaeology in Complex Societies: Political Economy, Status, and Ideology. *Journal of Archaeological Research* 17 (2), 105–168.
- Descola, P. (1996) *In the society of nature: Native ecology in Amazonia*. Cambridge Studies in Social Anthropology 93. Cambridge University Press, Cambridge.
- DuBois, T. A. (2012) Diet and Deities: Contrastive Livelihoods and Animal Symbolism in Nordic Pre

Christian Religions. In: Raudvere, C. & Schjødt, J. P. (eds.) *More than Mythology: Narratives, Ritual Practices and Regional Distribution in Pre-Christian Scandinavian Religions*. Nordic Academic Press, Lund, pp. 65–96.

Duczko, W. (2004) *Viking Rus: Studies on the presence of Scandinavians in Eastern Europe*. Brill, Leiden.

During, E. (1998) *Kremerat skelettmateriel: Kompendium i arkeosteologi*. Undervisningskompendium. Arkeosteologiska forskningslaboratoriet, Stockholms universitet. Stockholm.

Ferenius, J. (1971) *Vårby och Vårberg I. En studie i järnålders bebyggelsehistoria*. Thesis and Papers in North-European Archaeology 1. Institutionen för arkeologi och antikens kultur, Stockholms Universitet, Stockholm.

Fredengren, C. (2015) Water politics: Wet deposition of human and animal remains in Uppland, Sweden. *Fornvännen* **110**, 161–183.

Fredengren, C. & Löfqvist, C. (2015) Food for Thor: The Deposition of Human and Animal Remains in a Swedish Wetland. *Journal of wetland archaeology* **15** (1), 122–148.

Fredsjö, Å., Janson, S. & Moberg, C.-A. (1969) *Hällristningar i Sverige, 2nd. edn*. Forum, Stockholm.

Frye, R. (2005) *Ibn Fadlan's journey to Russia: A tenth-century traveller from the Baghdad to the Volga river*. Markus Wiener Publishers, Princeton.

Gardela, L. (2013) 'Warrior-women' in Viking Age Scandinavia? A preliminary archaeological study. *Analecta Archaeologica Ressoiviensia* **8**, 273–340.

Gejvall, N.-G. & Persson, O. (1970) Osteological analysis of the human and animal cremated bones. *Excavations at Helgö III. Report for 1960–1964*. KVHAA, Uppsala.

Giddens, A. (1984) *The Constitution of Society*. Polity Press, Cambridge.

Gonçalves, D., Cunha, E., Thompson, T.J.U. (2013) Weight References for Burned Human Skeletal Remains from Portuguese Samples. *Journal of Forensic Sciences* **58** (5), 1134–1140.

Gotfredsen, A. B., Primeau, C., Frei, K. M., Jørgensen, L. (2014) A ritual site with sacrificial wells from the Viking Age at Trelleborg, Denmark. *Danish Journal of Archaeology* **3** (2), 145–163.

Gräslund, A.-S. (1980) *Birka IV: The Burial Customs. A study of the graves on Björkö*. Almqvist & Wiksell International, Stockholm.

Gräslund, A.-S. (2004) Dogs in graves – a question of symbolism? In: Santillo Frizell, B. (ed.) *Pecus: Man and Animal in Antiquity*. Proceedings of the Conference at the Swedish Institute in Rome, September 9–12, 2002. Swedish Institute, Rome, pp. 171–180.

Gräslund, A.-S. (2006) Wolves, serpents and birds: Their symbolic meaning in Old Norse belief. In: André, A., Jennbert, K., Raudvere, C. (eds.) *Old Norse religion in long-term perspectives: Origins, Changes and Interactions*. An international conference in Lund, Sweden, June 3–7, 2004. Nordic Academic Press, Lund, pp. 124–129.

Gräslund, A.-S. (2014) En hund begravet: Hunden från stenålder till medeltid. In: Gräslund, A.-S. & Svanberg, I. (eds.) *Från renhållningshjon till modeaccessoar: 10 000 år av relationer människa – hund i Sverige*. Författarna och Kungl. Gustav Adolfs Akademien för svensk folkkultur, Uppsala, pp. 31–48.

Gräslund, B. (1983) Jordfästning och likbränning: Vägen till livet efter detta speglad i bronsålderns och stenålderns gravskick. Foredrag ved det 1. Nordiske Bronsealder-symposium på Isegran 3.–6. Oktober 1977. *Varia* **9**, 48–56.

Grimm, O. (2013) Bear-skins in northern European burials and some remarks on other bear-related furnishings in the north and middle of Europe in the 1st millennium AD. In: Grimm, O. & Schmölcke, U. (eds.) *Hunting in northern Europe until 1500 AD: Old traditions and regional developments, continental sources and continental influences*. Papers presented at a workshop organized by the Centre for Baltic and Scandinavian Archaeology (ZBSA). Wachholtz, Neumünster, pp. 277–296.

Hagberg, U. E. (1967), *The Archaeology of Skedemosse II: The Votive Deposits in the Skedemosse Fen and their Relation to the Iron-Age Settlement on Öland, Sweden*. Almqvist & Wiksell, Stockholm.

Hansen, W. (1981) *Die Edda: Germanische Göttersagen aus erster Hand*. Nach der Übersetzung von Karl Simrock neu herausgegeben, bearbeitet und kommentiert von Walter Hansen. Ueberreuter, Wien/Heidelberg.

- Harvig, L., Lynnerup, N., Amsgaard Ebsen, J. (2012) Computed Tomography and Computed Radiography of Late Bronze Age Cremation Urn from Denmark: An Interdisciplinary Attempt to Develop Methods Applied in Bioarchaeological Cremation Research. *Archaeometry* **54** (2), 369–387.
- Hedeager, L. (2007) Scandinavia and the Huns: An Interdisciplinary Approach to the Migration Era. *Norwegian Archaeological Review* **40** (1), 42–58.
- Hedeager, L. (2011) *Iron Age Myth and Materiality: An Archaeology of Scandinavia AD 400–1000*. Routledge, New York.
- Hedenstierna-Jonson, C. (2012) Traces of Contacts: Magyar Material Culture in the Swedish Viking Age Context of Birka. In: Bendeguz, T. (ed.) *Die Archäologie der frühen Ungarn: Chronologie, Technologie und Methodik*. Internationaler Workshop des Archäologischen Instituts der Ungarischen Akademie der Wissenschaften und des Römisch-Germanischen Zentralmuseums Mainz in Budapest am 4. und 5. Dezember 2009. Verl. des Römisch-Germanischen Zentralmuseums, Mainz, pp. 29–46.
- Hedenstierna-Jonson, C., Kjellström, A. & Zachrisson, T. *et al.* (2017) A female Viking warrior confirmed by genomics. *American Journal of Physical Anthropology* **164** (4), 853–860.
- Helms, M. W. (1998) *Access to origins: Affines, ancestors, and aristocrats*. University of Texas Press, Austin.
- Hennius, A., Sjöling, E., Prata, S. (2016) *Människor kring Gnistahögen och tidig medeltid: Begravningar från vendeltid, vikingatid och tidig medeltid*. Upplandsmuseet & SAU, Uppsala.
- Hill, E. (2011) Animals as Agents: Hunting Ritual and Relational Ontologies in Prehistoric Alaska and Chukotka. *Cambridge Archaeological Journal* **21** (3), 407–426.
- Hill, E. (2013) Archaeology and Animal Persons: Toward a Prehistory of Human-Animal Relations. *Environment and Society: Advances in Research* **4**, 117–136.
- Hines, J. (2003) Myth and Reality: The Contribution of Archaeology. In: Clunies Ross, M. (ed.) *Old Norse Myths, Literature and Society*. University Press of Southern Denmark, Viborg, pp. 19–39.
- Hodder, I. (2012) *Entangled: An Archaeology of Relationships between Humans and Things*. Wiley-Blackwell, Chichester.
- Høilund-Nielsen, K. (1999) Female grave goods of southern and eastern Scandinavia from the late Germanic Iron Age or Vendel Period. In: Hines, J., Høilund-Nielsen, K., Siegmund, F. (eds.) *The Pace of Change: Studies in Early-Medieval Chronology*. Oxbow Books, Oxford, pp. 160–194.
- Hraundal, T. J. (2014), ‘New perspectives on eastern Vikings / Rus in Arabic sources’, *Viking and Medieval Scandinavia* **10**, 65–98.
- Hultgård, A. (1993) Altskandinavische Opferrituale und das Problem der Quellen. In: Ahlbäck, T. (ed.) *The Problem of Ritual*. Based on papers read at the symposium on religious rites held at Åbo, Finland on the 13th–16th of August 1991. Almqvist & Wiksell, Stockholm, pp. 221–259.
- Hultgård, A. (1997) Från ögonvittnesskildring till retorik: Adam av Bremens notiser om Uppsalakulten i religionshistorisk belysning. In: Hultgård, A. (ed.) *Uppsala och Adam av Bremen*. Nya Doxa, Nora.
- Hulth, H. (2014) *Den skyddande logen: Brandgravar från yngre järnålder samt en och annan medeltida och efterreformatorisk grop på Ultuna*. Arkeologisk för- och slutundersökning. SAU, Uppsala.
- Ingstad, A. S. (1995) The Interpretation of the Oseberg-Find. In: Crumlin-Pedersen, O. & Thye, B. M. (eds.) *The Ship as Symbol in Prehistoric and Medieval Scandinavia*. Papers from an International Research Seminar at the Danish National Museum, Copenhagen, 5–7 May 1994. Nationalmuseet, Copenhagen, pp. 139–148.
- Iregren, E. (1972) *Vårby och Vårberg II: Studie av kremerat människo- och djurbensmaterial från järnåldern*. Theses and Papers in North-European Archaeology 1. Institutionen för arkeologi och antikens kultur, Stockholms Universitet, Stockholm.
- Iregren, E. (1988) Finds of Brown Bear (*Ursos arctos*) in Southern Scandinavia – Indications of Local Hunting or Trade? In: Hardh, B., Larsson, L., Olausson, D. & Petré, R. (eds.), *Trade and exchange in prehistory*. Studies in honour of Berta Stjernquist. Acta Arch. Lundensia. Ser. in 8o. Lunds Universitets Historiska Museum, Lund, pp. 295–308.
- Jakobsson, A. H. (2010) *Gravar från Vendel- och Vikingatid i Grimsta: RAÄ 30, Fresta socken, Uppland*.

- Uppland Särskild arkeologisk undersökning. Arkeologikonsult, Upplands Väsby.
- Jakobsson, A. H. & Lindblom, C. (2011) *Gård och gravfält vid Lilla Ullevi: Arkeologisk undersökning*. Arkeologikonsult, Upplands Väsby.
- Jankuhn, H. (1967) *Archäologische Beobachtungen zu Tier- und Menschenopfern bei den Germanen in der Römischen Kaiserzeit*. Nachrichten der Akademie der Wissenschaften in Göttingen, Philologisch-historische Klasse. Vandenhoeck & Ruprecht, Göttingen, pp. 115–147.
- Jennbert, K. (2002) Djuren i nordisk förkristen ritual och myt. In: Jennbert, K. (ed.) *Plats och Praxis: Studier av nordisk förkristen ritual*. Nordic Academic Press, Lund, pp. 105–133.
- Jennbert, K. (2003) Animal Graves: Dog, Horse and Bear. *Current Swedish Archaeology* **11**, 139–152.
- Jennbert, K. (2006) The heroized dead: People, animals, and materiality in Scandinavian death rituals, AD 200–1000. In: Andrén, A., Jennbert, K., Raudvere, C. (eds.) *Old Norse religion in long-term perspectives: Origins, Changes and Interactions. An international conference in Lund, Sweden, June 3–7, 2004*. Nordic Academic Press, Lund, pp. 135–140.
- Jennbert, K. (2011) *Animals and humans: Recurrent symbiosis in archaeology and Old Norse religion*. Nordic Academic Press, Lund.
- Jesch, J. (1991) *Women in the Viking Age*. Boydell, Woodbridge.
- Johannsen, N. & Laursen, S. (2010) Routes and Wheeled Transport in Late 4th–Early 3rd Millennium Funerary Customs of the Jutland Peninsula: Regional Evidence and European Context 85. *Prähistorische Zeitschrift* **85**, 15–58.
- Kaliff, A. (2004) Offerritual och gravplatser: Några kommentarer kring sambandet mellan arkeologisk terminologi och tolkning. In: Melheim, L. Hedeager, L., Oma, K. (eds.) *Mellom himmel og jord: Foredrag fra et seminar om religionsarkeologi, Isegran 31. Januar – 2. Februar 2002*, Oslo Archaeological Series 2. Institutt for arkeologi, kunsthistorie og konservering, Oslo, pp. 18–31.
- Kaliff, A. (2005) The Grave as Concept and Phenomenon: Reflections on the relation between archaeological terminology and interpretation. In: Artelius, T. & Svanberg, F. (eds.) *Dealing with the Dead: Archaeological Perspectives on Prehistoric Scandinavian Burial Ritual*. The Swedish National Heritage Board; The Museum of National Antiquities in Sweden, Stockholm, pp. 125–142.
- Kaliff, A. (2007) *Fire, Water, Heaven and Earth: Ritual Practice and Cosmology in Ancient Scandinavia – An Indo-European Perspective*. Riksantikvarieämbetet, Stockholm.
- Kaliff, A. & Østigård, T. (2013) *Kremation och Kosmologi: En komparativ arkeologisk introduktion*. Institutionen för arkeologi och antik historia, Uppsala Universitet, Uppsala.
- Kivikero, H. (2015) Interpretations of animal bones found in Finnish inhumation graves. *META Historiskarkeologisk Tidskrift* **2015**, 95–106.
- Klevnäs, A. (2015) Abandon Ship! Digging out the Dead from the Vendel Boat-Graves. *Norwegian Archaeological Review* **48** (1), 1–20.
- Koch, A. & Historisches Museum der Pfalz Speyer (2007) *Attila und die Hunnen*. Konrad Theiss Verlag, Stuttgart.
- Kreinath, J., Snoek, J., Strausberg, M. (2006) *Theorizing Rituals: Issues, Topics, Approaches, Concepts*. Numen Book Series. Studies in the History of Religions 114:1. Brill, Leiden/Boston.
- Larsson, L. (1988) *The Skateholm project I. Man and environment: interdisciplinary studies*. ARSHLL 79. Almqvist & Wiksell International, Stockholm.
- Larsson, L. (2005) Hills of the Ancestors: Death, forging and sacrifice on two Swedish burial sites. In: Artelius, T. & Svanberg, F. (eds.) *Dealing with the Dead: Archaeological Perspectives on Prehistoric Scandinavian Burial Ritual*. The Swedish National Heritage Board; The Museum of National Antiquities in Sweden, Stockholm, pp. 99–124.
- Latour, B. 1993 [1991]. *We have never been modern*. Harvard University Press, Cambridge.
- Lichter, C. (2001) *Untersuchungen zu den Bestattungssitten des Südosteuropäischen Neolithikums und Chalkolithikums*. Monographien (Internationale Interakademische Kommission für die Erforschung der Vorgeschichte des Balkans) 5. Verlag Philipp von Zabern, Mainz.
- Lincoln, B. (1986) *Myth, Cosmos, and Society: Indo-European Themes of Creation and Destruction*.

Harvard University Press, Cambridge/Mass.

Lindström, T. C. (2015) Agency 'in itself'. A discussion of inanimate, animal and human agency. *Archaeological Dialogues* **22** (2), 207–238.

Ljungkvist, J. (ed.) (2000) *I maktens närhet: Två boplatsundersökningar i Gamla Uppsala. Raä 285, Norra Gärdet. Raä 547 Matsgården. Gamla Uppsala socken, Uppland*. SAU skrifter 1. SAU, Uppsala.

Ljungkvist, J. (2006) *En hiar atti rikR: Om elit, struktur och ekonomi kring Uppsala och Mälaren under yngre järnålder*. Uppsala University, Departement of Archaeology and Ancient History, Uppsala.

Ljungkvist, J. (2008) Valsgårde: Development and change of a burial ground over 1300 years. In: Norr, S. (ed.) *Valsgårde Studies: The place and its people, past and present*. Uppsala University, Departement of Archaeology and Ancient History, Uppsala, pp. 13–56.

Ljungkvist, J. (2015) Gravar i en övergångsperiod: De yngsta kammargravarna och brandgravarna i Uppland under 1000- och 1100-talet. *META Historisk arkeologisk Tidskrift* **2014–2015**, 21–45.

Lucas, M. & Lucas, R. (2013) *Gårdar och hästoffer: Järnålder och tidig medeltid i Fyrislund*. Upplandsmuseets Rapporter 2013: 02. Upplandsmuseet, Uppsala.

Lucas, G. & McGovern, T. (2007) Bloody slaughter: Ritual decapitation and display at the Viking settlement of Hofstaðir, Iceland. *European Journal of Archaeology* **10** (1), 7–30.

Lundström, A. (1980 a) Vendel och Vendeltid. In: Sandwall, A. (ed.) *Vendeltid*. Statens Historiska Museum, Borås, pp. 10–18.

Lundström, A. (1980 b) Gravgåvorna Vendel. In: Sandwall, A. (ed.) *Vendeltid*. Statens Historiska Museum, Borås, pp. 31–44.

Mansrud, A. (2004) Dyrebein I graver: En kilde til jernalderens kult og forestillingsverden. In: Melheim, L., Hedeager, L., Oma, K. (eds.) *Mellom himmel, og jord: Foredrag fra et seminar om religionsarkeologi, Isegran 31. Januar – 2. Februar 2002*, Oslo Archaeological Series 2. Instituttet for arkeologi, kunsthistorie og konservering, Oslo, pp. 82–112.

Morris, J. (2011) *Investigating Animal Burials: Ritual, mundane and beyond*. Archaeopress, Oxford.

Müller-Wille, M. (1972). Pferdegrab und Pferdeopfer im frühen Mittelalter; mit einem Beitr. Von H. Vierck. *Berichten van de Rijksdienst voor het Oudheidkundig Bodemonderzoek* **20–21** (1971), 119–248.

Müller-Wille, M. (1978) Bootsgrab. In: *Reallexikon der Germanischen Altertumskunde*, 2nd edn. Walter de Gruyter, Berlin/New York, pp. 249–269.

Näsman, U. (2008) Scandinavia and the hunns: a source-critical approach to an old question. *Fornvännen* **103**, 111–118.

Näsström, B.-M. (1997) Stucken, hängd och dränkt: Rituelle mönster i norrön litteratur och i Adam av Bremens notiser om Uppsalakulten. In: Hultgård, A. (ed.) *Uppsala och Adam av Bremen*. Nya Doxa, Nora, pp. 75–99.

Näsström, B.-M. (2002) *Blot: Tro och offer i det förkristna Norden*. Pax Forlag, Oslo.

Nerman, B. (1969–1975). *Die Vendelzeit Gotlands*. KVHAA, Stockholm.

Nordahl, E. (2001) *Båtgravar i Gamla Uppsala: Spår av en vikingatida högreståndsmiljö*. Departement of Archaeology and Ancient History, Uppsala.

Nordberg, A. (2008) Döden är ett kosmiskt drama: Religiös arkitektur på gravfältet i Sylta. In: Olausson, M. (ed.), *Hem till Jarlabanke. Jord, makt och evigt liv i östra Mälardalen under järnålder och medeltid*. Historiska Medier, Lund, pp. 250–274.

Nordin, P. (2005) Wealthy women and absent men: Gender in Early Iron Age burial-grounds. In: Artelius, T. & Svanberg, F. (eds.) *Dealing with the Dead: Archaeological Perspectives on Prehistoric Scandinavian Burial Ritual*. The Swedish National Heritage Board; The Museum of National Antiquities in Sweden, Stockholm, pp. 221–235.

Nørgård Jørgensen, A. (1999) *Waffen und Gräber: Typologische und chronologische Studien zu skandinavischen Waffengräbern 520/30 bis 900 n. Chr.* Det Kongelige Nordiske Oldskriftselskab, København.

Olausson, M. (2005) *Bytomten vid Odenslunda: Bebyggelselämningar från folkvandringstid – nyare tid*

- samt delar av ett gårdsgravfält från vendeltid – vikingatid. Riksantikvarieämbetet, Hägersten.
- Öhman, I. (1983) The Merovingian dogs from the boat-graves at Vendel. In: Lamm, J. P. & Nordström, H.-Å. (eds.) *Vendel Period Studies: Transactions of the Boat-grave symposium in Stockholm, February 2–3, 1981*. Statens Historiska Museum, Stockholm, pp. 167–182.
- Overton, N. J. & Hamilakis, Y. (2013) A manifesto for a social zooarchaeology: Swans and other beings in the mesolithic. *Archaeological Dialogues* **20** (2), 111–136.
- Pearson, M. P. (1999) *The archaeology of death and burial*. Sutton, Stroud.
- Peters, J. (1998) *Römische Tierhaltung und Tierzucht: Eine Synthese aus archäozoologischer Untersuchung und schriftlich-bildlicher Überlieferung*. Passauer Universitätschriften zur Archäologie 5. Verlag Marie Leidorf, Rahden.
- Petré, B. (1984) *Arkeologiska undersökningar på Lovö: Bebyggelsearkeologisk analys. D. 4. Studies in North-European archaeology 10*. Almqvist & Wiksell International, Stockholm.
- Piggott, S. (1962) Heads and hoofs, *Antiquity* **36**, 110–118.
- Pollex, A. (1999) Comments on the interpretation of the so-called cattle burials of Neolithic Central Europe. *Antiquity* **73**, 542–550.
- Prata, S. & Sjöling, E. (2017) Bränt var det här! – en osteoarkeologisk studie av begravningar med bålplatser. In: Beronius Jörpeland, L., Göthberg, H., Seiler, A., Wikborg, J. (ed.). *At Upsalum – människor och landskapande. Utbyggnad av Ostkustbanan genom Gamla Uppsala*. Rapport 2017:1/1. Arkeologerna; Statens historiska museer, Stockholm.
- Price, N. (in press) Vikings on the Volga? Ibn Fadlan and the rituals of the Rūsiyah. In: Shepard, J. & Treadwell, L. (eds.) *Muslims on the Volga in the Viking Age: diplomacy and Islam in the world of Ibn Fadlan*. IB Tauris, London.
- Renck, A. M. (2009) *Gården som upphörde: Om en uppländks järnåldersbygds förändring i mellersta järnålder*. Särskilda arkeologiska undersökningar. Arkeologikonsult, Upplands Väsby.
- Rundkvist, M. (2003) *Barshalder I: A cemetery in Grötlingbo and Fide parishes, Gotland, Sweden, c. AD 1–1100. Excavations and finds 1826–1971 (PhD dissertation)*. Institutionen för arkeologi och antikens kultur Stockholm, Stockholm.
- Russell, N. (2012) *Social Zooarchaeology: Humans and animals in prehistory*. Cambridge University Press, New York.
- Salmi, A.-K., Äikäs, T., Fjellström, M., Spangen, M. (2015) Animal offerings at the Sámi offering site of Unna Saiva: Changing religious practices and human-animal relationships. *Journal of Anthropological Archaeology* **40**, 10–22.
- Schjødt, J. P. (2003) Myths as Sources for Rituals – Theoretical and Practical Implications. In: Clunies Ross, M. (ed.) *Old Norse Myths, Literature and Society*. University Press of Southern Denmark, Viborg, pp. 261–278.
- Schmölcke, U. (2013) The evidence for hunting dogs from Mesolithic times up to the Viking Age from a zoological point of view – A survey. In: Grimm, O. & Schmölcke, U. (eds.) *Hunting in northern Europe until 1500 AD: Old traditions and regional developments, continental sources and continental influences*. Papers presented at a workshop organized by the Centre for Baltic and Scandinavian Archaeology (ZBSA). Wachholtz, Neumünster, pp. 175–183.
- Schönbäck, B. (1980) Båtgravskicket. In: Sandwall, A. (ed.) *Vendeltid*. Statens Historiska Museum, Borås, pp. 108–122.
- Scudder, B. (1997) Egil's Saga. In: Thorsson, Ö. (ed.) *The Sagas of Icelanders: A Selection*. Penguin, New York, pp. 3–184.
- Seiler, A. & Appelgren, K. (2012) *Inhåleskullen – ett mångtydigt gravfält från yngre bronsålder – äldre vikingatid: Uppland; Vaksala socken; Fyrislund 6:1, Vaksala-Norrby 1:2 och 1:3, Vaksala 155:1*. Riksantikvarieämbetet, Stockholm.
- Sigvallius, B. (1994) *Funeral Pyres: Iron Age Cremations in North Spånga*. Theses and Papers in Osteology. Osteological Research Laboratory, Stockholm.
- Sjöling, E. (2006) *Enbacken: Ett gravfält från yngre järnåldern i Uppland*. Arkeologisk slutundersökning

- för E4, RAÄ 89 Uppsala socken, Uppland. SAU Rapport 2006:3. SAU Skrifter 19. SAU, Uppsala.
- Sjösvärd, L. (1989) *HaukR – en rinker från Vallentuna : arkeologisk undersökning av fornlämning 27, Rickeby, Vallentuna socken, Uppland*. Riksantikvarieämbetet, Stockholm.
- Sjösvärd, L., Vretemark, M., Gustavsson, H. (1983) A Vendel warrior from Vallentuna. In: Lamm, J. P. & Nordström, H.-Å. (eds.) *Vendel Period Studies: Transactions of the Boat-grave symposium in Stockholm, February 2–3, 1981*. Statens Historiska Museum, Stockholm, pp. 133–150.
- Sjøvold, T. & Sandelin Löfgren, S. (2013) Valsgårde 1, 2 & 4: The Horses. In: *Valsgårde 1, 2 & 4. English version*. Valsgårde Studies. MGAF, Uppsala University, Västerås, pp. 169–190.
- Steele, T. E. (2015) The contributions of animal bones from archaeological sites: The past and future of zooarchaeology. *Journal of Archaeological Science* **56**, 168–176.
- Sten, S. & Vretemark, M. (1988), Storgravsprojektet – osteologiska analyser av yngre järnålderns benrika brandgravar. *Fornvännen* **83**, 145–156.
- Steuer, H. (2003) Pferdegräber. In: *Reallexikon der Germanischen Altertumskunde*, 2nd edn. Walter de Gruyter, Berlin/New York, pp. 50–96.
- Stolpe, H. (1876) Grafundersökningar på Björkö. *Tidskrift för antropologi och kulturhistoria* **1** (10), 1–21.
- Thomas, K. D. (1996) Zooarchaeology: Past, Present and Future. *World Archaeology* **28** (1), 1–4.
- Svensson, E. M., Telldahl, Y., Sjöling, E., Sundkvist, A., Hulth, H., Sjøvold, T. et al. (2012) Coat colour and sex identification in horses from Iron Age Sweden. *Annals of Anatomy – Anatomischer Anzeiger* **194** (1), 82–87.
- Teegen, W.-R. (2009) Book review: Dirk Heinrich; Heidemarie Hüster Plogmann; Ulrich Schmölcke; Kirsten Johanna Hüser with a foreword by Kurt Schietzel: Untersuchungen an Skelettresten von Tieren aus dem Hafen von Haithabu. Berichte über die Ausgrabungen in Haithabu 35, Neumünster, Wachholtz (2006). *Mammalian Biology* **74**, pp. 81f.
- Tilley, C. (1999) *Metaphor and Material Culture*. Blackwell Publishers, Oxford.
- Vretemark, M. (2013 a) The Vendel Period royal follower's grave at Swedish Rickeby as starting point for reflections about falconry in Northern Europe. In: Grimm, O. & Schmölcke, U. (eds.) *Hunting in northern Europe until 1500 AD: Old traditions and regional developments, continental sources and continental influences*. Papers presented at a workshop organized by the Centre for Baltic and Scandinavian Archaeology (ZBSA). Wachholtz, Neumünster, pp. 379–386.
- Vretemark, M. (2013 b) Evidence of animal offerings in Iron Age Scandinavia. In: Ekroth, Gunnel & Wallensten, J. (eds.), *Bones, behaviour and belief: The zooarchaeological evidence as a source for ritual practice in ancient Greece and beyond*. *ActaAth-4°*, 55. Svenska Institutet i Athen, Stockholm, pp. 51–59.
- Wamers, E. (2009) Von Bären und Männern. Berserker, Bärenkämpfer und Bärenführer im frühen Mittelalter. *Zeitschrift für Archäologie des Mittelalters* **37**, 1–46.
- Weil, K. (2010) A report on the Animal Turn. *Differences* **21** (2), 1–23.
- Wendt, W. (1978) *Untersuchungen an Skelettresten von Hunden*. Berichte über die Ausgrabungen in Haithabu 13. Wachholtz, Neumünster.
- Werner, J. (1992) Childerichs Pferde. In: Beck, H., Jankuhn, H., Wenskus, R. (eds.) *Germanische Religionsgeschichte*. RGA Ergänzungsband 5. Walter de Gruyter, Berlin/New York, pp. 145–161.
- Zachrisson, I. (2009) Antlers on graves and sacrificial sites in South Saami Society A.D. 1–1850: How to look upon South Saami culture and identity. In: Äikäs, T. (ed.) *Máttut – Máddagat: The Roots of Saami Ethnicities, Societies and Spaces / Places*. Publications of the Giellagas Institute 12. University of Oulu, Oulu, pp. 134–49.
- Zachrisson, T. (2017) Tamkatten – en nykomling under tidig järnålder. *Fauna och Flora* **112** (2), 2–4.
- Zori, D., Byock, J., Erlendsson, E., Martin, S., Wake, T. & Edwards, K. J. (2013) Feasting in Viking Age Iceland: Sustaining a chiefly political economy in a marginal environment. *Antiquity* **87**, 150–165.

Appendix I Tables

Table 4 Detailed illustration of the animal MNI in cremation graves. Dark blue marks Vendel Period- and light blue Viking Age graves.

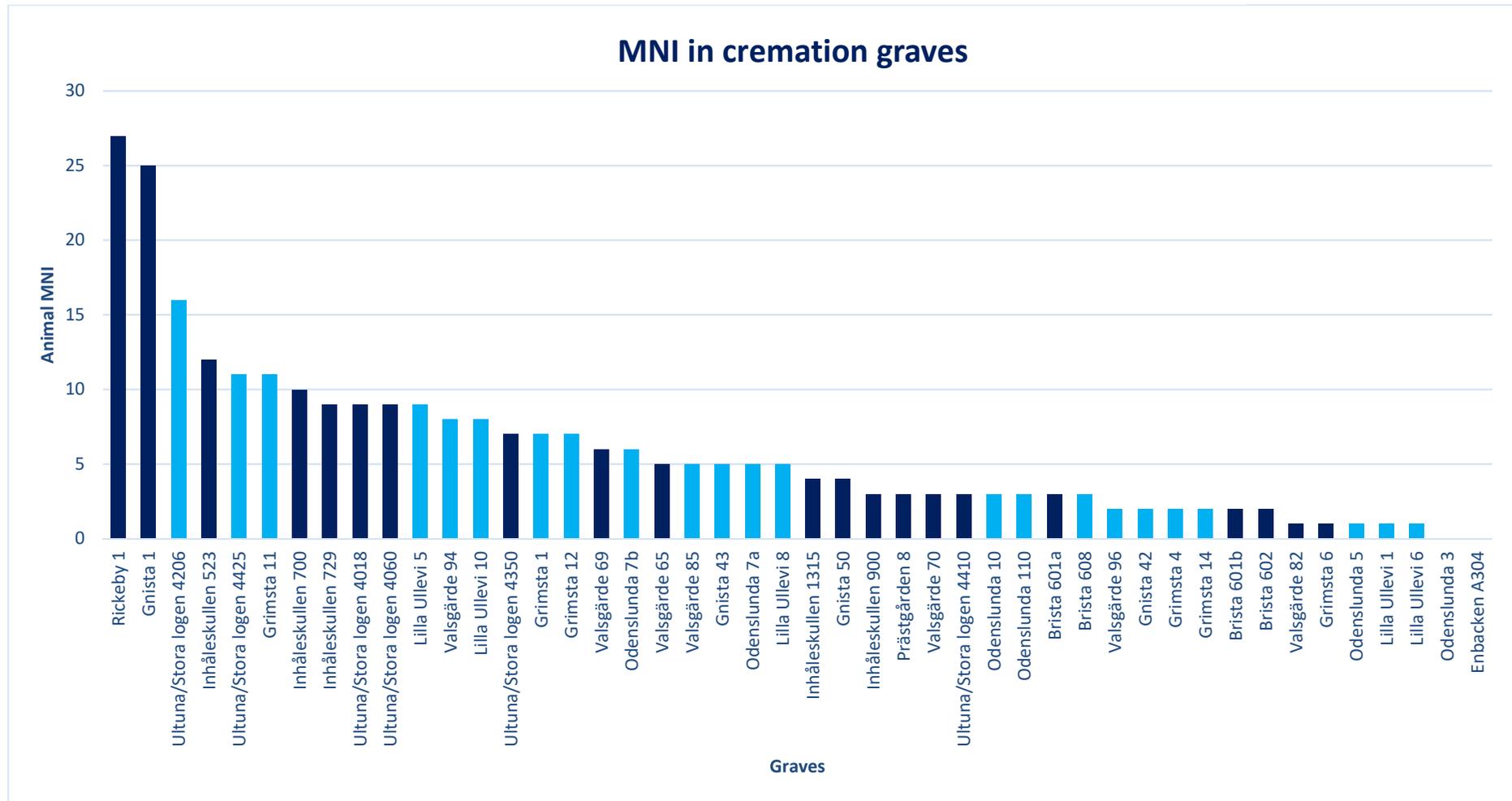
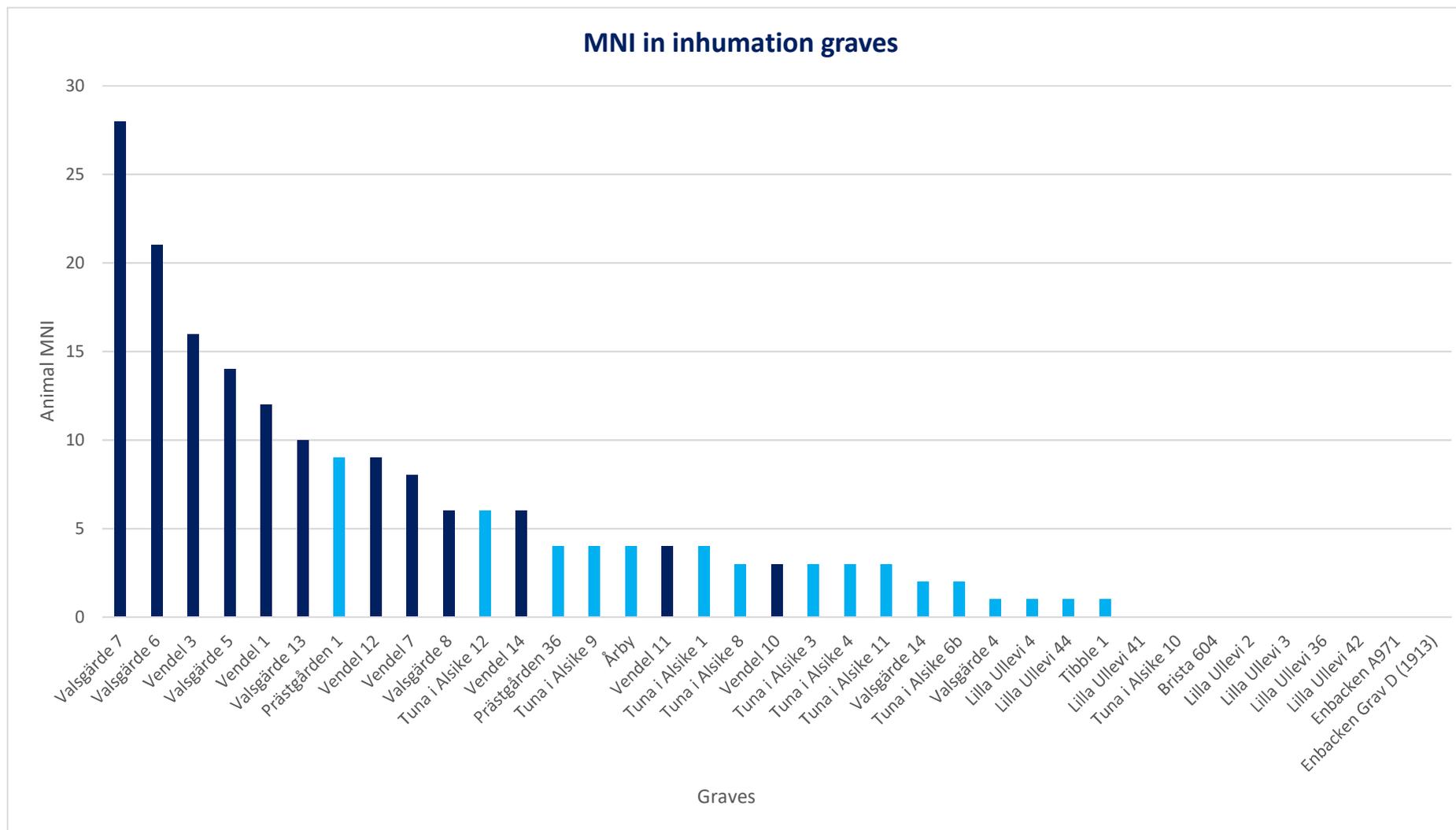


Table 5 Detailed illustration of the animal MNI in inhumation graves. Dark blue marks Vendel Period- and light blue Viking Age graves.



Appendix 2 The Database

General information on cremation graves

Site Name	Parish	RAÄ	Nr.	Burial Type	Dating	DoD	HS	Ind.	Layer/Position	CoS	Gender	Sex	Age	MNI	Unsp.
Inhåleskullen	Vaksala	155:1	523	cremation	VP	0	no	1	cremation layer; clay layer	no	-	female	18-44	12	yes
Inhåleskullen	Vaksala	155:1	700	cremation	VP	0	yes	1	cremation layer	no	male	female	20-30	10	yes
Inhåleskullen	Vaksala	155:1	729	cremation + urn	VP	0	no	1	cremation layers (+ urn?)	no	female	male?	18-64	9	yes
Inhåleskullen	Vaksala	155:1	900	cremation	VP	0	no	1	clay layer; cremation layer	no	-	-	10-44	3	yes
Inhåleskullen	Vaksala	155:1	1315	cremation	VP	2	no	1	cremation layer	no	-	male?	18-89	4	yes
Prästgården	Gamla Uppsala	74:3?	8	cremation	VP	?	no	1	bone layer	no	-	-	18-44	3	yes
Valsgårde	Gamla Uppsala	209:1	65	cremation + urn	VP	2	no	2	urn; cremation layer	yes	male	male + ?	18-44; 5-14/10-24	5	yes
Valsgårde	Gamla Uppsala	209:1	69	cremation + urn	VP	0	no	1	urn; cremation layer	no	-	male?	35-64	6	yes
Valsgårde	Gamla Uppsala	209:1	70	cremation + urn?	VP	0	no	1	cremation layer	no	-	male	35-64	3	yes
Valsgårde	Gamla Uppsala	209:1	82	cremation	VP	0	no	1	cremation layer	no	male	-	18-44	1	yes

Valsgärde	Gamla Uppsala	209:1	85	cremation	VA	0	yes	1	cremation layer	yes	female	female ?	35-64	5	yes
Valsgärde	Gamla Uppsala	209:1	94	cremation + urn	VA	0	yes	1	inside urn; cremation layer	no	FEMALE	male	18-44	8	yes
Valsgärde	Gamla Uppsala	209:1	96	cremation	VA	0	no	1	cremation layer	no	female	female	18-44	2	yes
Gnista	Danmark	62:1	42	cremation + urn	VA	2	no	1	urn; cremation layer	no	-	-	20-39/40-59	2	yes
Gnista	Danmark	62:1	43	cremation	VA	0?	no	1	cremation layer	yes	-	male?	60+	5	yes
Gnista	Danmark	62:1	50	cremation + urn	VP	3	no	1	inside urn; outside urn	no	-	-	20+	4	yes
Gnista	Danmark	62:1	1	cremation + urn?	VP	2	yes	1	cremation layer	yes	male	male	40-59	25	yes
Ultuna/Stora logen	Bondkyrko	401/653	4018	cremation + urn(s)	VP	0	no	2	cremation layer; inside urns	yes	female + ?	-	mature/senile; juvenile/adult	9	yes
Ultuna/Stora logen	Bondkyrko	401/653	4060	cremation	VP	0	no	1	cremation layer; filling between stone setting	no	female	-	younger adult	9	yes
Ultuna/Stora logen	Bondkyrko	401/653	4206	cremation + urn	VA	0	no	1	cremation layer; urn	yes	-	-	adult	16	yes
Ultuna/Stora logen	Bondkyrko	401/653	4350	cremation	VP	1	no	1	cremation layer; trample layer; post-hole	no	female	-	mature	7	yes
Ultuna/Stora logen	Bondkyrko	401/653	4410	cremation	VP	0	no	1	cremation layer	no	female	-	child (1-14 years/Infans I-II)	3	yes

Ultuna/Stora logen	Bondkyrko	401/653	4425	cremation + urn	VA	1	no	1	urn; cremation layer	yes	female	-	adult/mature	11	yes
Grimsta	Fresta	30	1	cremation + urn	VA	0	no	1	cremation layer; urn?	yes	female	-	30-50	7	yes
Grimsta	Fresta	30	4	cremation	VA	0	no	1	cremation layer	no	female	-	adult	2	yes
Grimsta	Fresta	30	6	cremation	VP	0	no	1	cremation layer	no	female?	-	50-70+	1	yes
Grimsta	Fresta	30	11	cremation+urn	VA	0	no	1	cremation layer	no	-	female?	juvenile	1	yes
Grimsta	Fresta	30	12	cremation+urn	VA	0	no	1	cremation layer	no	male?	male	40-60	1	yes
Grimsta	Fresta	30	14	cremation+urn	VA	0	no	1	cremation layer	no	-	-	40-60	2	yes
Odenslunda	Fresta	263	3	cremation+urn?	VA	0	no	1	cremation layer	no	-	-	18-89	0	yes
Odenslunda	Fresta	263	5	cremation+urn	VA	0	no	1	cremation layer	no	-	male	18-64	1	yes
Odenslunda	Fresta	263	7a	cremation+urn	VA	0	no	1	urn; cremation layer	no	female?	male	18-44	5	yes
Odenslunda	Fresta	263	7b	cremation + 2 urns	VA	0	no	1	urn; cremation layer	no	female?	-	35-64	6	yes
Odenslunda	Fresta	263	10	cremation+urn?	VA	0	no	1	cremation layer	no	female?	male	18-44	3	yes
Odenslunda	Fresta	263	110	cremation	VA	0	no	1	cremation layer	no	-	-	18-44	3	yes
Brista	Norrsunda	7	601a	cremation+urn	VP	0	no	1	urn; cremation layer	no	-	male	35-50	3	yes
Brista	Norrsunda	7	601b	cremation	VP	1	no	1	cremation layer	no	female	female	20-35	2	yes
Brista	Norrsunda	7	602	cremation	VP	1	no	1	cremation layer	yes	-	female?	20-35	2	yes
Brista	Norrsunda	7	608	cremation	VA	1	no	1	cremation layer	yes	-	male?	adult	3	yes
Lilla Ullevi	Bro	40	1	cremation+urn	VA	0	no	1	cremation layer	no	-	-	adult	1	yes

Lilla Ullevi	Bro	40	5	cremation+urn	VA	0	no	1	creamtion layer	no	male	-	young adult	9	yes
Lilla Ullevi	Bro	40	6	cremation+urn	VA	0	no	1	creamtion layer	no	female	-	adult	1	yes
Lilla Ullevi	Bro	40	8	cremation+urn	VA	0	no	1	creamtion layer	no	female	female ?	30-50	5	yes
Lilla Ullevi	Bro	40	10	cremation+urn	VA	0	no	1	creamtion layer	no	male?	-	18-20	8	yes
Rickeby	Vallentuna	27	1	cremation	VP	0	yes	1	creamtion layer	yes	male	male	40-50	27?	yes
Enbacken	Uppsala	89	A304	cremation pit	VA	1	no	1	cremation layer	no	-	-	infans 0-14	0	yes

General information on inhumation graves

Site Name	Parish	RAÄ	Nr.	Burial Type	Dating	DoD	HS	Ind.	Layer/Position	Gender	Sex	Age	MNI	Unsp.
Prästgården	Gamla Uppsala	74:3	1	boat-grave	VA	3	yes	1	towards starbord side	-	male	35-45	9	yes
Prästgården	Gamla Uppsala	74:3	36	boat-grave	VA	3	yes	1	amidships	female	female	45+	4	yes
Valsgårde	Gamla Uppsala	209:1	6	boat-grave	VP	0	yes	1	quarterdeck	male	-	adult	21	no
Valsgårde	Gamla Uppsala	209:1	7	boat-grave	VP	0	yes	1	amidships	male	-	probably adult	28	no
Valsgårde	Gamla Uppsala	209:1	8	boat-grave	VP	0	yes	1	amidships	male	-	adult?	6	no
Valsgårde	Gamla Uppsala	209:1	4	boat-grave	VA	0	yes	1	quarterdeck	male	-	adult?	1	no
Tuna i Alsike	Alsike	40:2	8	boat-grave	VA	0	yes	2	between amidships and quarterdeck	-	male?	infant	3	no
Tuna i Alsike	Alsike	40:2	9	chamber	VA	0	no	1	east	-	female?	adult	4	yes
Tuna i Alsike	Alsike	40:2	10	boat-grave	VA	0	no	1	amidships	female	female?	adult	0	no
Tuna i Alsike	Alsike	40:2	12	boat-grave	VA	0	yes	2	amidships	male?	-	adult	6	yes
Brista	Norrunda	7	604	inhumation	VA	3	no	1	-	female?	-	-	0	no
Lilla Ullevi	Bro	40	2	inhumation	VA	0	no	1	-	-	-	-	0	no
Lilla Ullevi	Bro	40	3	wood coffin	VA	0	no	1	-	-	-	-	0	yes
Lilla Ullevi	Bro	40	4	wood coffin	VA	0	no	1	-	-	-	-	1	no
Lilla Ullevi	Bro	40	36	inhumation	VA	0	no	1	-	-	-	4-5 years	0	no
Lilla Ullevi	Bro	40	41	inhumation	VA	0	no	1	-	-	-	-	0	yes
Årby	Rasbokil	14	-	boat-grave	VA	3	no	1	quarterdeck	-	female?	-	4	no
Lilla Ullevi	Bro	40	42	wood coffin	VA	0	no	1	-	male?	-	-	0	no
Lilla Ullevi	Bro	40	44	inhumation	VA	0	no	1	-	-	-	<3 years	1	yes

Vendel	Vendel	9	1	boat-grave	VP	2	yes	1	-	male	-	-	12?	no
Vendel	Vendel	9	3	boat-grave	VP	3	yes	1	-	male	-	-	16	no
Enbacken	Uppsala	89	A971	wood coffin	VA	0	no	1	head WNW; back position	-	male	45+ (maturus)	0	no
Enbacken	Uppsala	89	Grav D (1913)	wood coffin	VA	0	no	1	head NWback position	-	female	29-60+ (adult/mature)	0	no
Vendel	Vendel	9	7	boat-grave	VP	3	yes	1	-	male	-	-	8	no
Vendel	Vendel	9	10	boat-grave	VP	3	yes	1	-	male	-	-	3	no
Vendel	Vendel	9	11	boat-grave	VP	2	yes	1	quarterdeck?	male	-	-	4	no
Vendel	Vendel	9	12	boat-grave	VP	3	yes	1	amidships?	male	-	-	9	no
Vendel	Vendel	9	14	boat-grave	VP	0	yes	1	quarterdeck/amidships?	male	-	-	6	no
Valsgårde	Gamla Uppsala	209:1	5	boat-grave	VP	0	yes	1	amidships towards quarterdeck	male	-	-	14	no
Valsgårde	Gamla Uppsala	209:1	14	boat-grave	VA	0	yes	1	-	male	-	-	2	yes
Valsgårde	Gamla Uppsala	209:1	13	boat-grave	VP	0	yes	1	quarterdeck/amidships	male	-	-	10	no
Tuna i Alsike	Alsike	40:2	1	boat-grave	VA	3	yes	1	in eastern part with head east	male	male	adult?	4	no
Tuna i Alsike	Alsike	40:2	3	boat-grave	VA	3	yes	1	amidships (1,50 m east of dog)	male	male	adult?	3	no
Tuna i Alsike	Alsike	40:2	4	boat-grave	VA	3	yes	1	eastern part which was destroyed	male	male	adult?	3	no
Tuna i Alsike	Alsike	40:2	6b	boat-grave	VA	0	yes	1	amidships	female	female	adult?	2	no
Tuna i Alsike	Alsike	40:2	11	boat-grave	VA	1	yes	1	quarterdeck	male?	-	adult?	3	no
Tibble	Rasbokil	39:1	1	chamber	VA	0	yes	1	head in SW, sitting position?	female	female?	adult?	1	no

Specific information on animals in cremation graves

IHK_523						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes	1; 2; 3; 5; 6	burnt		cremation layer
Dog (<i>Canis familiaris</i>)	2	yes	1; 2; 3; 4; 6	burnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	no	6 (phalanx)	unburnt		cremation layer
Bird (<i>Aves</i>)	1	no	3; 6	burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	almost	1; 2; 3; 6	burnt		cremation layer
Chicken (<i>Gallus gallus</i>)	1	almost	2; 3; 4; 6	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	almost	2; 3; 4; 6	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)	unburnt		outer clay layer
Herring (<i>Clupea harengus</i>)	1	no	2	burnt		outer clay layer
Pig (<i>Sus domesticus</i>)	2	no	1; 3; 6	burnt		outer clay layer
IHK_700						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Bird (<i>Aves</i>)	1	no	2; 4; 6	burnt		cremation layer
Bird (<i>Aves</i>)	1	no	?	burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	1; 2; 6	burnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	yes	1; 2; 3; 4; 6	burnt		cremation layer
Horse (<i>Equus caballus</i>)	1	almost	1; 2; 4; 6	burnt		cremation layer
Chicken (<i>Gallus gallus</i>)	1	no	4; 6	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	almost	1; 2; 3; 6	burnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1; 6	unburnt		outer layer
Pig (<i>Sus domesticus</i>)	1	no	6	burnt		cremation layer
Cat (<i>Felis catus</i>)	1	no	6	burnt		cremation layer
IHK_729						

Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Bird (Aves)	1	no	2	unburnt		outer cremation layer
Sheep/Goat (Ovis/Capra)	1	no	1; 6	burnt		outer and inner cremation layer
Dog (Canis familiaris)	1	yes	1; 2; 3; 5; 6	burnt		outer and inner cremation layer
Horse (Equus caballus)	1	yes	1; 2; 3; 5; 6	burnt		outer and inner cremation layer
Red deer (Cervus elaphus)	1	no	6	burnt		inner cremation layer
Cattle (Bos taurus)	1	no	1; 6	burnt		outer and inner cremation layer
Rat/Mouse (Murinae)	1	no	3	burnt		outer cremation layer
Pig (Sus domesticus)	1	no	1; 6	burnt		outer and inner cremation layer
IHK_900						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (Canis familiaris)	1	no	1; 3	burnt		cremation layer
Cattle (Bos taurus)	1	no	1; 6	unburnt		outer clay layer; burnt layer
Pig (Sus domesticus)	1	no	1; 6	burnt		cremation layer
IHK_1315						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (Canis familiaris)	1	yes	1; 2; 3; 4; 5; 6	burnt		cremation layer
Horse (Equus caballus)	1	almost	1; 2; 5; 6	burnt		cremation layer
Cattle (Bos taurus)	1	no	1; 6	burnt		cremation layer
Pig (Sus domesticus)	1	no	1; 6	burnt		cremation layer
GU_8						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog? (Canis familiaris)	1	no	2	burnt		bone layer
Pig? (Sus scrofa domesticus)	1	no	2	burnt		bone layer
Cod (Gadus morhua)	1	no	1	burnt		bone layer

Vgde_65						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Sheep/Goat (<i>Ovis/Capra</i>)	1	yes		burnt		urn; cremation layer
Chicken (<i>Gallus gallus</i>)	1	yes		burnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	yes		burnt		cremation layer
Bear (<i>Ursus arctos</i>)	1	no	6 (claws)	burnt		cremation layer
Pike (<i>Esox lucius</i>)	1	no	-	burnt		cremation layer
Vgde_69						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes		burnt		
Bird (<i>Aves</i>)	1	yes		burnt		
Dog (<i>Canis familiaris</i>)	1	yes		burnt		
Pig (<i>Sus domesticus</i>)	1	no	4	unburnt		
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	6	unburnt		
Cattle? (<i>Bos taurus</i>)	-	no	1	unburnt		
Cattle (<i>Bos taurus</i>)	1	no	1; 6	burnt		
Vgde_70						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes		burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	yes		burnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1 (all parts)	burnt		cremation layer
Vgde_82						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Bear (<i>Ursus arctos</i>)	1	no	6 (claws)	burnt		cremation layer

Vgde_85						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes		burnt		cremation layer
Dog (<i>Canis familiaris</i>)	2	yes		burnt		cremation layer
Chicken (<i>Gallus gallus</i>)	1	yes		burnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1 (jawbone)	burnt		cremation layer
Vgde_94						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Chicken (<i>Gallus domesticus</i>)	1	yes		unburnt		over urn
Dog (<i>Canis familiaris</i>)	1	yes		burnt		inside urn; cremation layer
Horse (<i>Equus caballus</i>)	1	yes		burnt		inside urn; cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1	burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	2	burnt		cremation layer
Bird (<i>Aves</i>)	1	no	-	burnt		cremation layer
Rodent (<i>Rodentia</i>)	1	no	1 (jawbone)	unburnt		cremation layer
Vgde_96						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes		burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)	burnt		cremation layer
Gnista_42						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes	1; 2; 3; 4; 5; 6	burnt		urn; cremation layer
Fish (<i>Pisces</i>)	1	no	fins	unburnt		urn
Gnista_43						

Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes	1; 2; 4; 5; 6	burnt		cremation layer
Bird (<i>Aves</i>)	1	no	long bones	burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	6	unburnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	yes	1; 2; 3; 4; 5; 6	burnt		cremation layer
Gnista_50						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes	1; 2; 3; 5; 6	burnt		inside urn; outside urn
Bird (<i>Aves</i>)	1	no	6	burnt		outside urn
Chicken (<i>Gallus gallus</i>)	1	no	5; 6 (feet and wingbone)	burnt		outside urn
Rodent (<i>Rodentia</i>)	1	no	6	burnt		outside urn
		no				
Gnista_1						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	2	yes	1; 2; 3; 5; 6	burnt	inflammation on teeth	cremation layer; urn pit; looting pit
Goshawk (<i>Accipiter gentilis</i>)	1	no	6	burnt		cremation layer; looting pit
Sheep/Goat (<i>Ovis/Capra</i>)	2	almost	1; 3; 5; 6	burnt	cut marks?	cremation layer; urn pit; looting pit
Dog (<i>Canis familiaris</i>)	5	yes	1; 2; 3; 4; 5; 6	burnt		cremation layer; urn pit; looting pit
fish (<i>Pisces</i>)	1	no	6	burnt		cremation layer; looting pit
Pig (<i>Sus domesticus</i>)	4	yes	1; 2; 3; 4; 5; 6	burnt	cut marks on pelvic bone	cremation layer; urn pit; looting pit
Pig (<i>Sus domesticus</i>)	1	no	?	unburnt		cremation layer
Eagle-Owl (<i>Bubo</i>)	1	no	wingbone; 6	burnt		cremation layer; urn pit; looting pit
Bird (<i>Aves</i>)	1	no	long bones; 6	burnt		cremation layer; urn pit; looting pit

Cattle (<i>Bos taurus</i>)	1	no	6	burnt		urn pit
Peregrine falcon (<i>Falco peregrinus</i>)	1	no	3; 6	burnt		looting pit
Sheep/goat (<i>Ovis/Capra</i>)	(1)	no	1 (teeth)	unburnt		?
Rodent (Rodentia)	1	no	1 (tooth)	unburnt		looting pit
Pike (<i>Esox lucius</i>)	1	no	1 (tooth)	burnt		looting pit
Ult_4018						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes		burnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	yes		burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	6	burnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	yes		burnt		urn; cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	1; 3	unburnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1; 5	unburnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)	unburnt		cremation layer
Fish (Pisces)	1	no	2	unburnt		cremation layer
Rodent (Rodentia)	1	no	2	unburnt		urn
Ult_4060						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes		burnt		cremation layer; filling between stone setting
Pig (<i>Sus domesticus</i>)	1	yes		burnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1 (tooth); 6	unburnt		cremation layer; filling between stone setting
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	5	burnt		filling between stone setting
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	1 (tooth); 6	unburnt		cremation layer

Horse (<i>Equus caballus</i>)	1	no	1 (tooth)	burnt		cremation layer
Fish (<i>Pisces</i>)	1	no	1 (atlas)	unburnt		cremation layer; filling between stone setting
Rodent (<i>Rodentia</i>)	1	no	5	burnt		cremation layer
Bird (<i>Aves</i>)	1	no	3	burnt		cremation layer
Ult_4206						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes		burnt		urn; cremation layer; bone concentration A, B, C
Dog (<i>Canis familiaris</i>)	2	yes		burnt		cremation layer; bone concentration A, B, C
Cattle (<i>Bos taurus</i>)	1	yes	1; 2; 3; 5; 6	unburnt		cremation layer;
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	1; 5; 6	burnt		urn; cremation layer; bone concentration A, B, C
Sheep/Goat (<i>Ovis/Capra</i>)	2	almost	1; 3; 5; 6	unburnt		cremation layer; bone concentration B
Pig (<i>Sus domesticus</i>)	2	yes		burnt		cremation layer; bone concentration A, B, C
Pig (<i>Sus domesticus</i>)	2	yes	1; 3; 4; 5; 6	unburnt		cremation layer; bone concentration B, C
Fish (<i>Pisces</i>)	2	no	1 (atlas); 2	unburnt		cremation layer; bone concentration b
Bird (<i>Aves</i>)	1	no	6	burnt		cremation layer; bone concentration A
Bird (<i>Aves</i>)	2	no	1; 4?; 5	unburnt		urn; cremation layer
Ult_4350						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position

Dog (<i>Canis familiaris</i>)	2	yes		burnt		cremation layer; trample layer; post-hole
Horse (<i>Equus caballus</i>)	1	yes		burnt		cremation layer; post-hole
Sheep/Goat (<i>Ovis/Capra</i>)	1	yes		burnt		cremation layer; trample layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	1 (tooth)	unburnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1 (axis+tooth); 6	burnt		cremation layer
Bird (<i>Aves</i>)	1	no	-	burnt		cremation layer
Ult_4410						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	no	1 (tooth)	burnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1 (tooth)	burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	3; 4	burnt		cremation layer
Ult_4425						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes		burnt		urn; cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	2	yes		burnt		urn; cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	3; 4; 6	unburnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	yes		burnt		urn; cremation layer
Cattle (<i>Bos taurus</i>)	1	no	6 (sesambone)	unburnt		cremation layer
Bird (<i>Aves</i>)	1	no	-	burnt		cremation layer
Bird (<i>Aves</i>)	1	yes	-	unburnt		urn; cremation layer
Wood mouse? (<i>Apodemus sylvaticus</i>)	1	no	?	burnt		?
Squirrel? (<i>Sciurus vulgaris</i>)	1	no	6	burnt		cremation layer
Fish (<i>Pisces</i>)	1	no	-	burnt		cremation layer

Grimsta_1						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	no	1 (div); 2; 6	burnt		cremation layer
Dog (<i>Canis familiaris</i>)	2	yes		burnt		cremation layer
Sheep (<i>Ovis aries</i>)	1	no	1 (div); 5; 6	burnt		cremation layer
Chicken (<i>Gallus gallus</i>)	1	no	-	burnt		cremation layer
Bird (<i>Aves</i>)	1	no	-	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)	unburnt		cremation layer
Grimsta_4						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	no	6 (tail;foot)	burnt		cremation layer
Chicken (<i>Gallus gallus</i>)	1	no	6	burnt		cremation layer
Grimsta_6						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	1 (tooth)	unburnt		cremation layer
Grimsta_11						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Sheep (<i>Ovis aries</i>)	1	no	5; 6	burnt		cremation layer
Grimsta_12						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes		burnt		cremation layer
Grimsta_14						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position

Dog (<i>Canis familiaris</i>)	1	yes		burnt		cremation layer
Sheep (<i>Ovis aries</i>)	1	no	4; 5; 6	burnt		cremation layer
Odslu_5						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	no	2; 6	burnt		-
Odslu_7a						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes	1 (div); 2; 3; 4; 6	burnt		urn; cremation layer
Horse (<i>Equus caballus</i>)	1	almost	1 (div); 2; 4; 6	burnt		urn; cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)	unburnt		cremation layer
Wild pig (<i>Sus scrofa</i>)	1	no	6	burnt		cremation layer
Bird (<i>Aves</i>)	1	no	-	burnt		cremation layer
Odslu_7b						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes	1 (div); 2; 3; 4; 5; 6	burnt		cremation layer
Horse (<i>Equus caballus</i>)	1	almost	1 (div); 2; 3; 6	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	6	burnt		cremation layer
Sheep/Goat (<i>Ovis/Capra</i>)	1	no	1 (teeth)	unburnt		cremation layer
Pig (<i>Sus domesticus</i>)	1	no	1 (tooth)	unburnt		cremation layer
Bird (<i>Aves</i>)	1	no	-	burnt		cremation layer
Odslu_10						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes	1 (div); 2; 3; 4; 5; 6	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (teeth)	unburnt		cremation layer

Pig (<i>Sus domesticus</i>)	1	no	1 (tooth); 5	burnt		cremation layer
Odslu_110						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Pig (<i>Sus domesticus</i>)	1	no	3; 5; 6	burnt		cremation layer
Lynx (<i>Lynx lynx</i>)	1	no	6 (claws)	burnt		cremation layer
Brista_601a						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Cattle? (<i>Bos taurus</i>)	1?	no	1 (tooth)	burnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	no	1 (jaw); 4; 6 (tail)	burnt		cremation layer
Horse (<i>Equus caballus</i>)	1	no	1 (teeth); 6	burnt		urn; cremation layer
Chicken (<i>Gallus gallus</i>)	1	no	-	burnt		cremation layer
Brista_601b						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	no	1 (head); 2; 6	burnt		cremation layer
Horse (<i>Equus caballus</i>)	1	yes	1 (div); 2; 3; 4; 6	burnt		cremation layer
Bird? (<i>Aves</i>)	1	no	-	burnt		cremation layer
Brista_602						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	1	yes	1 (div); 2; 3; 4; 5; 6	burnt		cremation layer
Horse (<i>Equus caballus</i>)	1	no	1 (div); 3; 6	burnt		cremation layer
Brista_608						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	no	1 (div); 6	burnt		cremation layer

Horse (<i>Equus caballus</i>)	-	no	1 (tooth)	unburnt		filling/over cremation layer
Dog (<i>Canis familiaris</i>)	1	no	3; 4	burnt		cremation layer
Chicken (<i>Gallus gallus</i>)	1	no	-	burnt		cremation layer
LillaU_1						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Cattle (<i>Bos taurus</i>)	1	no	1 (teeth)	unburnt		cultural layer; cremation layer
LillaU_5						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	yes	1 (div); 2; 3; 4; 6	burnt		cremation layer
Dog (<i>Canis familiaris</i>)	2	almost	1 (div); 2; 3; 6	burnt		cremation layer
Cat (<i>Felis catus</i>)	1	no	6	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)	unburnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)	burnt		cremation layer
Sheep (<i>Ovis aries</i>)	1	no	1 (tooth)	unburnt		cremation layer
Goose (<i>Anserinae</i>)	1	no	-	burnt		cremation layer
Chicken (<i>Gallus gallus</i>)	1	no	-	burnt		cremation layer
LillaU_6						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Pig? (<i>Sus domesticus</i> ?)	1	no	6	burnt		cremation layer
Pig (<i>Sus domesticus</i> ?)	-	no	1 (tooth)	unburnt		cremation layer
LillaU_8						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	no	6 (feet+tail)	burnt		cremation layer
Dog (<i>Canis familiaris</i>)	1	yes	1 (div); 2; 3; 4; 5; 6	burnt		cremation layer

Pig (<i>Sus domesticus</i>)	1	no	1 (div)	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	almost	1 (jaw); 3; 5; 6	burnt		cremation layer
Cat (<i>Felis catus</i>)	1	yes	1 (div); 2; 3; 4; 5; 6	burnt		cremation layer
LillaU_10						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Horse (<i>Equus caballus</i>)	1	almost	1 (jaw, teeth); 2 (neck); 5; 6	burnt		urn; cremation layer
Bird? (<i>Aves</i>)	1	no	-	burnt		urn; cremation layer
Dog (<i>Canis familiaris</i>)	3	yes	1 (div); 2; 3; 4; 5; 6	burnt		cremation layer
Sheep (<i>Ovis aries</i>)	1	no	1 (tooth)	unburnt		cremation layer
Pig (<i>Sus domesticus</i>)	2	no	1 (teeth)	burnt		cremation layer
Rickeby						
Species	MNI	Complete	Body Parts	Condition	Bone Manipulation	Layer/Position
Dog (<i>Canis familiaris</i>)	4	yes	?	burnt		cremation layer
Horse (<i>Equus caballus</i>)	1	yes	1-6	burnt		cremation layer
Sheep (<i>Ovis aries</i>)	4	no	?	burnt		cremation layer
Cattle (<i>Bos taurus</i>)	1	no	?	burnt		cremation layer
Pig (<i>Sus domesticus</i>)	4	no	?	burnt		cremation layer
Wild chicken (<i>Galloanserae</i>)	1	yes	-	burnt		cremation layer
Black grouse (<i>Lyrurus tetrix</i>)	1	yes	-	burnt		cremation layer
Goose (<i>Anserinae</i>)	3	yes	-	burnt		cremation layer
Hazel grouse (<i>Tetrastes bonasia</i>)	1	yes	-	burnt		cremation layer
Crane (<i>Grus grus</i>)	1	yes	-	burnt		cremation layer
Eagle owl (<i>Bubo bubo</i>)	1	yes	-	burnt		cremation layer
Sparrow-hawk (<i>Accipiter nisus</i>)	1	yes	-	burnt		cremation layer

Goshawk (<i>Accipiter gentilis</i>)	1	yes	-	burnt		cremation layer
Peregrine falcon (<i>Falco peregrinus</i>)	2	yes	-	burnt		cremation layer

Specific information on animals in inhumation graves

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Dog (<i>Canis familiaris</i>)	2	yes			starbord side (close to human)	
Horse (<i>Equus caballus</i>)	1	yes			starbord side in front part of boat	spikes; bridle with ornamentation
Bear (<i>Ursus arctos</i>)	1	no	6 (claws)		-	
Sheep (<i>Ovis aries</i>)	1	no	?	marrowsplit	-	
Pig (<i>Sus domesticus</i>)	1	no	2; ?	marrowsplit	between dogskeletons	
Cattle (<i>Bos taurus</i>)	1	no	?	marrowsplit	-	
Bird (<i>Aves</i>)	1	no	?		-	
Fish (<i>Pisces</i>)	1	no	?		-	
GU_36						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Dog (<i>Canis familiaris</i>)	1	yes			outside the stern of the boat	
Chicken (<i>Gallus gallus</i>)	1	yes			inside boat	
Sheep (<i>Ovis aries</i>)	1	no	?			
Vole (<i>Muridae</i>)	1	no	1			
Vgde_6						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	2	yes	?		on right side of the stem	spikes; bridles and halters; maybe saddle
Cattle (<i>Bos taurus</i>)	1	yes	?		on left side of the stem	halter
Dog (<i>Canis familiaris</i>)	3	yes	?		on left side of the bow, behind the cattle; inside the boat?	2 collars

Sheep/Goat (<i>Ovis/Capra</i>)	6	no	1; 6 (goat); +"others" (sheep)	chopped up and scattered	-	
Pig (<i>Sus domesticus</i>)	4	no	1 (mainly teeth); + "half a pig without head"		-	
Black grouse (<i>Tetrao tetrix</i>)	1	no	2 (Coracoid + vertebrae cervicales)		-	
Greylag (<i>Anserinae</i>)	1	no	1; wings; 6		-	
Pike (<i>Esox lucius</i>)	1	no	fins; 4; 6 (tail)	cut marks	-	
Merlin (<i>Falco columbarius</i>)	1	no	6		-	
Cattle (<i>Bos taurus</i>)	1	no	1; 2; 3; 6	cut marks on jaw bone; marrowsplit on humerus	-	

Vgde_7

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	4	yes			around stem on both portside and starboardside	4 bridles; 1 saddle; spikes for 4 horses; neckrings
Cattle (<i>Bos taurus</i>)	1	yes			portside of bow	halter
Pig (<i>Sus domesticus</i>)	1	yes			portside of bow	
Snowy Owl (<i>Bubo scandiacus</i>)	1	yes			portside of bow	
Horse (<i>Equus caballus</i>)	1	no	2		(bow)	
Cattle (<i>Bos taurus</i>)	4	no	1 (teeth); 2; ?	cut-marks	(bow)	
Pig (<i>Sus domesticus</i>)	4	no	1; 1 (teeth); 2;	cut-marks	(bow)	
Sheep (<i>Ovis aries</i>)	3	no	1; 1 (teeth); 2; ?		(bow); head of a lamb alone in stern;	
Goat (<i>Capra hircus</i>)	1	no	1 (tooth); 6; 2; ?		(bow)	

Goose (Anserinae)	2	no	-		(bow)	
Black grouse (Lyrurus tetrix)	1	no	-		(bow)	
Duck? (Anatidae)	1	no	-		(bow)	
Chicken (Gallus gallus)	1	no	-		(bow)	
Bird? (Aves)	1	no	-		(bow)	
Pike (Esox lucius)	1	no	-		(bow)	
Dog (Canis familiaris)	1	no	1 (jaw)		portside	4-5 dog leashes with iron elements from 4 collars

Vgde_8

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (Equus caballus)	2	yes			starboard outside boat	2 bridles; 1 halter; spikes; saddle
Cattle (Bos taurus)	1	yes			stem (inside or on starboard side of boat?)	
Dog (Canis familiaris)	1	no	1 (teeth); ?		portside (inside boat?)	collar; leash
Sheep/Goat (Ovis/Capra)	1	no	1 (teeth)		amidships	
Goose (Anserinae)	1	no	-		bow	

Vgde_4

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (Equus caballus)	1	yes			in bow inside boat	bridle; stirrups; horse-bow-mount; saddle; spike

Als_8

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
---------	-----	----------	------------	-------------------	----------------	----------------

Horse (<i>Equus caballus</i>)	1	yes			towards bow	2 stirrups in different positions; bit of a bridle
Horse (<i>Equus caballus</i>)	1	no	-		towards bow	
Dog (<i>Canis familiaris</i>)	1	yes			towards amidships? (inside boat?)	
Als_9						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	yes			north-west inside chamber	spikes; bit of a bridle
Dog (<i>Canis familiaris</i>)	1	yes			south-west inside chamber	
Sheep (<i>Ovis aries</i>)	1	no	1 (diff. parts); 2; 4; 6 (toes)		toes under dog; north, eastern half/human side of chamber	
Pig (<i>Sus domesticus</i>)	1	no	1 (diff. parts); 2		north, eastern half/human side of chamber	
Als_12						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	2	yes			in front of stem; behind first horse	spikes; stirrups
Dog (<i>Canis familiaris</i>)	2	yes			behind horses in bow (inside boat?)	
Capercaillie (<i>Tetrao urogallus</i>)	1	no	-		one of the birds in bow	
Black grouse (<i>Lyrurus tetrix</i>)	1	no	-		one in the stern	
LillaU_4						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects

Sheep (<i>Ovis aries</i>)	1	no	1 (tooth)		filling	
Arby						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	yes	1-6		starboard outside boat	halter
Dog (<i>Canis familiaris</i>)	1	yes	1-6		starboard outside boat, behind horse	leash
Chicken (<i>Gallus domesticus</i>)	1	no	?		bow	
Cattle (<i>Bos taurus</i>)	1	no	2		outside ship around quarter deck	
LillaU_44						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Cattle (<i>Bos taurus</i>)	1	no	1 (tooth)		find layer	
Vendel_1						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	3	yes	?		outside starboard side from bow to middle of boat	3 bridles; 7 spikes; stirrups?; hook;
Dog (<i>Canis familiaris</i>)	3	yes	?		portside	iron leash
Cattle (<i>Bos taurus</i>)	1	yes	?		portside	
Sheep (<i>Ovis aries</i>)	2	yes	?		inside bow of boat in the very front; portside	
Pig (<i>Sus domesticus</i>)	2	no	?		portside; starboard side	
Goose (<i>Anserinae</i>)	1	no	?			
Vendel_3						

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	3	yes	?		starboard	
Cattle (<i>Bos taurus</i>)	1	yes	?		portside	
Dog (<i>Canis familiaris</i>)	4	yes	?		portside	
Sheep (<i>Ovis aries</i>)	2	yes	?		portside	
Pig (<i>Sus domesticus</i>)	1	no	?		portside	
Eagle-owl (<i>Bubo bubo</i>)	1	no	?			
Crane (<i>Grus grus</i>)	1	no	?			
Goose (<i>Anserinae</i>)	1	no	?			
Duck (<i>Anatidae</i>)	1	no	?			
Bird (<i>Aves</i>)	1	no	?			

Vendel_7

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	5	yes	?		outside starboard side	3 simple bridles and 1 luxury bridle inside boat
Dog (<i>Canis familiaris</i>)	2	yes	?			
Cattle (<i>Bos taurus</i>)	1	no	?		outside portside	

Vendel_10

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	yes	?		outside starboard side	bridle, spikes, towing hook
Dog (<i>Canis familiaris</i>)	1	no	?			
Cattle (<i>Bos taurus</i>)	1	no	?			

Vendel_11

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
---------	-----	----------	------------	-------------------	----------------	----------------

Horse (<i>Equus caballus</i>)	3	yes	?		outside starboard side	1 simple bridle; spikes; towing hook
Dog (<i>Canis familiaris</i>)	1	no	?			leash?

Vendel_12

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	2	yes			outside starboard side	1 luxury and 1 normal bridle, spikes, saddle, hoof picker, towing hook
Dog (<i>Canis familiaris</i>)	2	yes			portside	
Cattle (<i>Bos taurus</i>)	1	no	?		at stem on starboard side	
Pig (<i>Sus domesticus</i>)	1	yes			starboard side behind horses	
Pig (<i>Sus domesticus</i>)	2	no	?		inside middle of boat	
Bird (<i>Aves</i>)	1	no				

Vendel_14

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	yes			portside alongside quarterdeck (inside boat?)	1 bridle, saddle, spikes, stirrups
Dog (<i>Canis familiaris</i>)	2	yes			front of boat (one outside boat)	
Cattle (<i>Bos taurus</i>)	1	no	"steak"		inside boat towardsfront	
Pig (<i>Sus domesticus</i>)	1	no	"left side ham"		inside boat towardsfront	
Sheep (<i>Ovis aries</i>)	1	no	1 (cranium)		inside boat towardsfront	

Vgde_5

Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	2	yes	?		starboard side behind cattle	3 bridles, tow-hooks, spikes

Dog (<i>Canis familiaris</i>)	4	yes	?		at the stem	3 leashes
Cattle (<i>Bos taurus</i>)	2	yes	complete?		starboard side in front, behind dogs	
Pig (<i>Sus domesticus</i>)	2	no	?		inside bow	
Sheep (<i>Ovis aries</i>)	1	no	?		stern	
Greylag goose? (<i>Anserinae</i>)	1	no	?			
Vgde_14						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	yes	?			bridle, spikes, tow-hooks
Pig (<i>Sus domesticus</i>)	1	no	1 (teeth)		stem	
Dog (<i>Canis familiaris</i>)	(2)	no				2 dog 's leashes
Vgde_13						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Dog (<i>Canis familiaris</i>)	1	yes			?	
Dog (<i>Canis familiaris</i>)	2	no				
Cattle (<i>Bos taurus</i>)	1	no	?		inside bow	
Sheep (<i>Ovis aries</i>)	1	no	?		inside bow	
Bird (<i>Aves</i>)	1	no	?		inside bow	
Fish (<i>Pisces</i>)	1	no	?		inside bow	
Horse (<i>Equus caballus</i>)	3	yes			outside boat (probably starboardside)	1 bridle, 2 halters, spikes, tow-hooks
Als_1						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Dog (<i>Canis familiaris</i>)	1	yes			in western end with head west	

Horse (<i>Equus caballus</i>)	1 (2?)	no	back half			outside western part of grave	bridle; stirrups
Dog (<i>Canis familiaris</i>)	1	no	back half			outside western part of grave	
Bear (<i>Ursus arctos</i>)	1	no	6 (claws)			outside western part of grave	
Als_3							
Species	MNI	Complete	Body Parts	Bone Manipulation		Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	2	yes				front part of boat	horse-bow-mount; stirrups, spurs, bridle
Dog (<i>Canis familiaris</i>)	1	yes				1 m east of horse	
Als_4							
Species	MNI	Complete	Body Parts	Bone Manipulation		Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	yes				western part (inside bow of boat?)	towing hook; horse-bow-mount; bridle-bit
Dog (<i>Canis familiaris</i>)	1	yes	?				
Goose (<i>Anserinae</i>)	1	yes	?				
Als_6b							
Species	MNI	Complete	Body Parts	Bone Manipulation		Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	no	1 (jaw)			outside boat behind quarterdeck	horse-bow-mount; part of bridle-bit?
Bird (<i>Aves</i>)	1	no	? (parts)			close to items that belong to older grave in front part of boat	
Als_11							
Species	MNI	Complete	Body Parts	Bone Manipulation		Layer/Position	Animal Objects

Horse (<i>Equus caballus</i>)	1	yes			outside bow on starboard side	spikes
Dog (<i>Canis familiaris</i>)	1	yes			inside boat in bow	
Bird (<i>Aves</i>)	1	no	?		on top of horse	
Tibble						
Species	MNI	Complete	Body Parts	Bone Manipulation	Layer/Position	Animal Objects
Horse (<i>Equus caballus</i>)	1	yes	?		other end of chamber opposite to human	bridle with simple ornamentation