

Ways of Viking warriorhood

Examining the definitions and evidence of Viking warriorhood in archaeology

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Abstract:

The Viking Age is the roughly 300-year period of European history marked by the martial activities of raiding and wars of conquest as well as trading and colony building of broadly Scandinavian peoples. These people who left their homelands as part of raiding bands and armies are left their marks on peoples, material cultures and languages of Europe that are visible to this day. The reach of viking warriors was felt from Western Europe to the banks of Volga and the courts of Byzantium. These people are known by their reputation, but how are they defined in archaeological research of the Viking Age and how do these definitions affect archaeological research?

This thesis examines the concepts of Viking warriorhood and warrior burials used in the previous research and identify problems these concepts contain. This is done by critical analysis of the definition of warriorhood, and the argumentation used to support it. This analysis is further complemented by examining the archaeological source value of the known burials of the Viking age through existing scholarship and presenting three Viking burial sites outside of Scandinavia as case studies.

Patterns of burial behaviour conventionally associated with warrior burials in the Viking context are also tested by employing multivariate analysis techniques. The results are interpreted and used to leverage fragmentary bioarchaeological data of the burials. The multivariate analysis is performed on a cohort formed by sampling the burial grounds of the Swedish Viking age town of Birka.

Based on the results reached by the combination of these methods, in this thesis it is argued that both the concept of warriorhood as well as the concept of warrior burials in their present usage contain several problems and no longer represent the current reach of archaeological methodology. As this has ramifications for further research on the subject matter, these concepts need to be refined and adjusted to keep their usefulness for the archaeological research of the Viking warriorhood.

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1 Introduction

The Viking age as an archaeological concept or a period of European history is largely defined by its martial activities. The raiding parties as well as armies of conquest comprised of the peoples of broadly Scandinavian origin with fierce reputations have left their mark and affected the formation of Europe as we now know it. These warriors, as well as traders and new colonies of the Vikings have left behind evidence in a vast area that spans from the shores of north-western Atlantic to the banks of Volga and the courts of Byzantium. While the Viking society cannot be reduced to only its martial aspects and activities, the study of these features is an important window into understanding the Vikings as an archaeological phenomenon and the changes their existence affected to the world we live in. As the warriorhood and the martiality of the Vikings is provides some of the foundational elements of the archaeological study of Vikings and their era, the definitions of these elements greatly affect our field of study and the insights that can be gained from the study.

The study of Vikings and the concept of Viking warriorhood has been the subject of intensified debate within the past 10 years. Among others, methodologies which use DNA and elemental isotopes have cemented themselves in archaeological research and have brought into question many of the notions that have been held as true within the field of archaeology; the subject of warriorhood within the Viking context has not escaped these calls for readjustments. While these readjustments are necessary and provide interesting new angles to the field of research, they do very little to address some of the underlying core issues related to the reliability and suitability of materials and definitions within the topic of Viking warriorhood.

The aim of this thesis is to examine the previous academic discourse on Viking warriorhood and identify the problems with the reliability of its results. While it is not within the intended germane of this thesis to directly discuss the gender-aspect of archaeological warriorhood within the Viking context, the uncertainties present in the archaeological study of Viking warriorhood are crystallized clearly within the following excerpt regarding the discourse on the identity of burial 581 of Birka:

Can we prove that the occupant of Bj.581 was a warrior? This depends on definitions. We can first consider the non-literal interpretations. Perhaps she was a farmer, a housewife, a fisherwoman, a merchant, a craftworker, a poet or a slave, buried with expensive and dangerous things that did not belong to her, and with none of her own possessions. Perhaps she was, for some reason, interred with objects that conferred a proxy identity that she never had when alive. Equally, she may have lived as a warrior, but in a symbolic sense. In this light, we should also consider other early medieval cemeteries, both in Scandinavia and beyond, where we find people buried with what were clearly non-functional weapons, either unfinished or in such poor repair as to be useless. Similarly, we find operational weapons interred with individuals such as young children, who could never have physically wielded them [...] What is important here, however, is that all these combinations of artefacts and individuals—whether preserved from life or bestowed after death—refer to the concept of bearing arms, the gendered notion of ‘warrior-ness’ [...] *To be a warrior was, at least in part, a social construct, and not necessarily directly connected to entering actual combat. If such a thing applied to the person in Bj.581, we do not know exactly how this operated, and it is possible that we are just seeing the high-end ‘straight-to-Valhöll’ option from the Birka funeral directors, but it would have made this individual a warrior nonetheless.* Despite these possibilities, however, we contend that there is far better contextual evidence for the more literal and traditional interpretation, as summarised above. The person in Bj.581 was buried in a grave full of functional weapons and war-gear (and little else), in close proximity to other burials with weapons, next to a building saturated with weapons, outside the gate of a fortress. Furthermore, the interment took place at a time when the hillfort and ‘garrison’ were at their zenith. Many other interpretations of both funerary treatment and gender are possible, but Occam’s razor would suggest that to reach for them as a first resort is to attempt to ‘explain away’ what seems to be the most obvious and logical conclusion. In our opinion, Bj.581 was the grave of a woman who lived as a professional warrior and was buried in a martial environment as an individual of rank. In our 2017 article—as its title indicates—we strongly followed the same military reading as has been proposed for Bj.581 by a long series of archaeological authorities, and for the same sensible reasons that are far from arbitrary. In doing so, we find no problem in adjusting for the new sex determination. *To those who do take issue, however, we suggest that it is not supportable to react only now, when the individual has been shown to be female, without explaining why neither the warrior interpretations nor any supposed source-critical factors were a problem when the person in Bj.581 was believed to be male.*

(Price et al. 2019, 12) Emphasis added.

As is clear in the argumentation of the previous excerpt, the concept of warrior identity—at least in the archaeological Viking context—has not been clearly defined in a way that is

commonly agreed upon. Presently the burden of proof accepted for the label of a warrior seems to be tied to the presence of grave goods that are in some way connected to martial activities. While it is reasonable to assume that for the people of these communities warriorhood was a more nuanced concept than just those who directly participate in combat and probably had aspects that we cannot reach from the modernity (at least with our current methods); being too wary in making definitions of our own—even if they differ from the ones of the Viking age—seems to hinder rather than aid the usefulness of our research. If we accept just a general label of warriorhood without any specifications, which can contain anything between a trained combatant and a child with weapons as grave goods, the label gets diluted and by extension, loses some of its usefulness for research (as will be discussed in the later sections of this thesis). It is then paramount to examine the label of warriorhood, the challenges in its usage and the information used to construct it. Consequently, the research questions of this thesis are as follow:

- What does the concept of warrior contain in the archaeological study of Viking Age?
- Why and how is the current definition of Viking Age warrior problematic?
- What is the source value of known Viking Age burials for the archaeological study of warriorhood?
- How should the concept of warrior burial be modified for the study of Viking Age warriorhood?

The primary methodologies for this thesis in examining the research questions are formed by critical analysis of previous research and its argumentation as well as the examination of presently available archaeological source material that has been used to study Viking warriorhood. This thesis also uses multivariate analysis techniques to examine the patterns in Birka's weapon burials against used argumentation on the attribution of warriorhood.

1.1 On terminology and perceived challenges

The use of the term “Viking” and its variations can rightfully be criticised for being anachronous constructions which do not correspond to the historical identities, terminologies, or the majority of Scandinavian identity. Additionally, the terms do very little to describe the “international” qualities of the people we identify as Vikings by reputation (Brink 2008). Further unclarity is introduced when the term is used without referencing whether it is used

culturally, racially or vocationally (Downham 2012) and without acknowledging its etymology and effects (Jesch 2015, 4–8). Due to these problems, the clarification on the use of the term in this thesis is needed. In this thesis, the term *viking* (in lowercase) will be used to discuss the people who are participating in the acts of raiding or warfare abroad. Or at least were prepared to do so. The capitalised version *Viking* will be used to refer to the broadly Scandinavian cultural features when needed. Viking and viking are also the commonly used nomenclature in archaeology, which is why after defining the terms, using them will not cause unsurmountable problems for the work in this thesis nor the reader.

As for other problems expected, this thesis is limited mostly by its nature as a referential piece. The work was done with no access to the original archaeological material and is consequently only as reliable as the literature, archaeological records, and databases it references. Some other limiting and error-inducing factors are general problems with access and the language barrier, as several articles that handle the subject matter of this piece are beyond my language skills. There is also the possibility of human error as the information was collected by hand, rather than by programmed scraping, from the databases.

1.2 On the omission of an extended gender discourse

As briefly mentioned earlier, the germane of this work is not to discuss the gender-identity related questions on warriorhood or the Viking society at large. The main reason for this decision is in the stance that discussing the gender of warriors within the Viking seems somewhat premature before there is an agreed-upon and justified definition and terminology on what warriors are considered to do and be, and how that is established in archaeological context. Furthermore, I agree to a certain extent with the critique shortly discussed in (Price et al. 2019, 11–12) where the dangers of equating sex with gender and the layered and nuanced possibilities of gender perception are highlighted. The aforementioned matters do, however, reflect to this work as well: the main effect is the choice to refer only to the binary biological sex in this work if it has been bioarchaeologically established in the source material and if it has not, no gender assumptions will be made based on artefacts alone—even if it has been common practice in the past. Similarly, gender identity will not be assumed based on the biological sex alone. On the other hand, as a matter of accuracy, terminology of the sources used will not be reworded.

2 Warriorhood, to be is to be perceived?

One of the original rough ideas for this thesis was to pin down a meaningful and generally accepted definition of a Viking warrior burial and then compare it to the available archaeological data and comment on how accurate the definition seems to be when compared to the available evidence. This attempt could quickly be deemed impossible, as the presence of such clear definition within the available research proved to be wishful thinking. Within the relevant archaeological literature, there was not a source that would give a clear and testable definition with clear requirements, but rather authors discussing weapon burials within the Viking contexts and then occasionally referring to same burials as warrior burials. Warrior burials as a concept within the field seem to be something that is generally acknowledged, but not defined, and closely tied together with presence of weaponry in the grave goods. As a workaround, the presence of (specific) weaponry was taken as the closest available definition for warrior burials and was used as a basic property for discussing warrior burials. While weapon burials are an intrinsic part of the discussion, as the later sections of this work will show, the presence of weapons alone does not seem to be as clear and unquestionable indicator of warriorhood as one might quickly assume.

This hesitation within the academia to define warrior burials and the resulting conclusions more clearly is understandable from a conjectural base assumption: academics prefer to publish results that are not easily proven wrong with the presentation of new evidence; the more precise their conclusion, the easier it is to poke holes to it with new material that is not completely in line with the previous conclusion.

From this viewpoint, the choice to leave the definition of warriorhood and warrior burials loosely defined is not only understandable, but in many ways sensible. While this “loose”—or lack of a restrictive one—definition of a warrior is easily argued to be academically meritorious as it gives the opportunity to challenge the previously tightly held notions that would, could and have led into conclusions or lines of reasoning that are easily demonstrated to be false with the current archaeological evidence. For instance: “Only biological males use weapons -> only biological males are buried with weapons -> the individual in a weapon burial is a biological male” without actually having the complementary archaeological evidence (in the case of this example, aDNA or osteological material) to support it. Of course, many of the methodologies required for extracting these supporting types of information were not available during the earlier phases of archaeology as especially mainstream application of

aDNA within archaeology is a relatively recent development. Seeing as these methodologies are available now, it does not seem defensible to omit the requirement for their results in developing new archaeological theories or re-examining old ones.

2.1 Critical examination of the arguments for Bj. 581's warriorhood

Circling back to the excerpt from (Price et al. 2019) presented within the preface regarding the warriorhood of Bj. 581, let us examine the argumentation and its implications to the concept of warriorhood within Viking archaeology. As a short note regarding the decision to include such a long direct quote in this work, which is admittedly at least somewhat unorthodox, main consideration on topic turned in favour of its inclusion in the present form due to several reasons. Firstly, presenting the argumentation of (Price et al. 2019) in that form lessens the chance of misrepresenting their argumentation by what could be called cherry-picking. Secondly, the inclusion of the direct quote in that form makes it considerably easier for the reader to check whether my argumentation is based on the elements present in the referenced text. Thirdly, as the argumentation in the quote is dissected in an extensive fashion, this decision allows for the discussion in this work to flow more naturally, which makes it easier to read. Thus, I feel that the inclusion is not frivolous, but justified and serves the work in its current form. Turning now back to the discussion itself, it seems that Price *et al.* (2019) give us, some more explicitly than others, the following ways of being a warrior within the Viking world:

- A. Participating in combat
- B. Being a warrior symbolically
- C. Referencing the concept of bearing arms via symbolism.
 - Warrior (partially) due to social constructs
 - The funerary party having the means to choose “Straight-to-Valhöll” package of the Birka funeral directors.

Other parts of argumentation by Price *et al.* relate to Bj. 581 more specifically and include the proximity to other weapon burials (which loses some of its strength as an argument due to other weapon burials suffering from similar problems in the ascertaining the quality of warriorhood as Bj. 581), garrison and buildings used to store weapons; and the, in my opinion, weak and needlessly snarky remark where the prospective critique is implied to be

just reactionary to the discovered biological sex of the individual within the grave Bj. 581. As if the discovery of the biological sex of Bj. 581 would establish some sort of *terminus post quem* or limit after which where it is no longer “supportable” to criticise their findings without criticising the work they base their findings on.

Late as this thesis might be by the given challenge to discuss this, there are several unclarities or severe lacks in reasoning within their presented argumentation as well as the loose definitions they partially base their conclusions on. Firstly, establishing the equivalency in symbolism between Bj. 581 and young children buried with functional weaponry does not support the case for the conclusion of Bj. 581 being a military leader as clearly as Price et al. seem to imply; the main difference being that functional—and from a child’s perspective useless—weapons can as well be seen as indicators of type of *what a warrior the child could have become* expressions of identity and warrior status, as Ben Raffield (Raffield 2019, 13) discusses in his article on childhood within the martial Viking society. If we are to accept the conclusion on Bj. 581 that the burial contained a professional warrior—even in a symbolical sense—surely the martial status is already achieved, rather than prospective or hypothetical as it might as well be in the case of warrior symbolism relating to children? Secondly, the problems in attributing warriorhood based on the funerary party’s access to the *Straight-to-Valhöll* -option of the Birka funeral directors runs very directly into the problems of differentiating between a constructed and an actual identity, as discussed by Parker Pearson, (Pearson 1999, 1). Without solving the problems with attributing the grave goods to the deceased with corroborating and bioarchaeological evidence, much of the other sources used by Price et al. (2019) become much less substantial in the discussion of the Bj. 581 warrior identity.

Thirdly, their conclusion of the individual of Bj. 581 having lived as a professional warrior is quite ambiguous for many reasons. Price et al. essentially completely leave out what it means in practice to live as a professional warrior. If one could within the Viking context live as a professional warrior without participating in combat directly. As there are no evidence of participation in combat or training for it within Bj. 581, it cannot be used as a factor here, what does the symbolic or socially constructed professional warriorhood entail? Furthermore, if we do not know what it entails, how does one prove—or disprove for that matter—the actions of living as a professional warrior archaeologically? Without answering those two rather fundamental questions concerning the concept of living as a professional warrior and defining it more stringently, the concept is open-endedly left to be defined by the reader,

making it remarkably less useful as a conclusion. Another problem in the argumentation relating to line professional warrior is what seems to be a presupposition that Bj. 581 was buried as an “individual of rank” due to being a professional warrior despite the inverse (burial exhibiting warrior symbolism due to being an individual of rank) seems equally possible based on the evidence presented. After all, the exhibition of wealth and high status in the burial can hardly be brought under question.

Perhaps the largest theme within the presented ways of warriorhood is the similarity to the philosopher George Berkeley’s doctrine of *esse est percipi* or *to be is to be perceived*, but in this particular framework “to be a warrior is to be perceived—or portrayed—as one”, which leans rather heavily for support on the subjective and relative nature of warriorhood when the more exact nature of warriorhood has not been agreed-upon or it has been left undefined. Price et al. give out the three ways (previous points A, B, and C) in which Bj. 581’s occupant could have been a warrior and treat all of these ways as equal claims to warriorhood due to each of them allowing one to be perceived as a warrior, despite the fact that ways B and C invite quite different research questions. Namely, while way A invites the relatively simple question “Who within the Viking society participated in combat and was thus a warrior?”, the ways B and C invite questions that have much broader scopes that involve societal structure and archaeologically more indirectly visible qualities such as “What kind of individuals could hold a high status in Viking society? Was status in the Viking society tied to the individual merits or could it be inherited? Who was permitted to exhibit which statuses and in which ways?”. As the research questions emergent from the ways B and C are more difficult to answer conclusively and thus, harder to prove or disprove, it is relevant to consider whether these ways should be equated to the more—archaeologically speaking—direct way to warriorhood that the way A provides. After all, in the case of Bj. 581 (and many other weapon burials), can it be said that symbols of warriorhood were intrinsic to the high status i.e., could only warriors achieve a high status, or could presence of weaponry be used to bolster an already high status by invoking imagery of imposing your will by force if need be?

Defining warriorhood via the implied maxim of “to be a warrior is to be perceived as one” and treating these ways of being perceived as a warrior as equal might very well provide the best coverage of the Viking society’s image of warriorhood, even if we might never be able ascertain it completely. Whether it is the best and most workable definition for solid archaeological research is another matter entirely. As is hopefully evident from preceding writing, this loose definition that treats “direct” (way A) and “indirect” (ways B&C) as equal

warriorhood, does not seem to provide us with much in the ways of answers, but does instead provide opportunities to make claims without providing thorough reasoning for them. The relation between the indirect and direct warriorhood cannot be equal from an ontological perspective either: as indirect warriorhood references the direct warriorhood with the items or symbols recognisably related to it, they are dependent on the existence of the direct warriorhood whereas direct warriorhood does not need reference indirect warriorhood for its existence.

While not as clearly implicit, this definition seems to also invite the idea of if one exhibits warrior identity in one way, one is bound to be warrior in other ways as well; but as the dependence between these concepts only flows in one direction, multiple simultaneous ways of warriorhood can only expand or emerge from the direct warriorhood, but not the other way around. Yet another issue that emerges from the loose definition is in its allowance of subjective back-and-forth that it is ripe for polemic outside the field of archaeology. The great amount of public discussion regarding the biological sex and the warriorhood of Bj. 581 is referenced in Price et al.(2019) as it was caused by the team's previous article "A female Viking warrior confirmed by genomics" (Hedenstierna-Jonson et al. 2017). From my point of view, the public reaction does not seem all that surprising as the title alone of the 2017 article is quite strong and definite—and as such probable to cause a strong reaction, especially if it is the only part read—while the article does again rather little to argue what being a warrior would contain. Due to these features, it is quite easy to imagine why it would capture the interest of the public within our global and internet-based conversational culture, which seems to be more interested in talking about gender than ever and consequently feels very strongly about it (one way or the other).

Still on the subject of the work presented in Hedenstierna-Jonson et al. (2017) and Price et al. (2019), there is one further point in the argumentation that seems especially poignant. That is the repeated use of argumentation along the lines of warrior interpretation based on this type of evidence has never been a problem, why should it be a problem now? In that regard, the aforementioned research teams are correct; if the previous interpretations are indeed sound, they can be used as a base to build the interpretations the research teams present. But what happens to their argument—and argumentation on Viking warriorhood on a larger scale—if the base they build their argumentation on suffers from problems as well? These interpretations should indeed have been brought to question more readily earlier. Despite the rather grand detail I have discussed the specific argumentation of Bj. 581, the larger and more

important topic of this thesis is the problems surrounding “archaeological warriorhood” within the Viking Age context at large; discussing Bj. 581 served more as an introductory and markedly famous example in which problems related to the warriorhood are readily observable.

2.2 Defining warriorhood

The definition of warriorhood in the case of Bj. 581 is loose, as has been discussed, but within the research history of Birka, there is another definition that has been used. Namely, in the doctoral dissertation on Birka’s martial material culture, Charlotte Hedenstierna-Jonson (2006, 11) chooses to reference a warrior definition given by Andrew Sanders (2008)¹ as a basis for the definition of warriorhood in the dissertation. Sanders’ (2008) definition is very strict in its terms in the sense that warriors are distinctly individuals who participate in the physical combat and makes no allowance for being a warrior in any other sense. Furthermore, Sanders (2008) notes that the warriors fight, mostly out of vocation, personal honour and as a way of life, with the weapons they themselves provide; whereas soldiers fight as a profession with weapons supplied by another party. Sanders (2008) does concede that making the complete distinction between the two terms is rather difficult. While Hedenstierna-Jonson (2006, 11) notes the blurring of lines between a soldier and a warrior within the Birka context, the strict definition of warriorhood which ties warriorhood to the participation is not challenged, but readily accepted and subsequently tied into Hedenstierna-Jonson’s definition of a professional warrior. While it is understandable that academic opinions change based on new evidence, it still seems curious that the presentation of new evidence has led to the abandonment of Sanders’ strictly combat-related definition in favour of the looser one, despite the previous definition’s use in earlier work in the same context by partially the same people. The term, professional warrior, changes from requiring participation to combat to not needing evidence of participation in combat for its usage despite the same context.

In Sanders’ (2008) work, the concept of warrior society is also discussed in some length. According to Sanders, the description of warrior society necessitates the integration of warfare into religious beliefs and ritual practices (which are strongly present in the Viking society) and socialisation of males into warriorhood and martial activities at a young age,

¹ Hedenstierna-Jonson references the first edition published in 1999, but the characteristics of the definition that Hedenstierna-Jonson references remain the same in the second edition accessed for this work.

which is also a recognized feature of the Viking society, as will be later discussed based on Raffield (2019). Sanders (2008) also discusses the relation in the mode of warfare, hand-to-hand and defensive structures vs projectile-based, where the former is thought to be linked to centralized political systems and the latter to uncentralized political systems; chiefdoms seem to also propagate ideas of honour or chivalry in personal combat but use ambush tactics to their advantage. Sanders (2008) also writes on the ideas that within chiefdoms warrior status was to some degree hereditary.

Sanders (2008) does not directly reference the Viking society in the text and rather bases the discussion on other cultures around the world, but the observable similarities to the known attributes of Viking society seem striking enough that referring to the Viking society as a warrior society per the Sanders' given definition seems warranted. That is not to say that Sanders' definitions do not need some adjustments to accommodate for the Viking use of battle formations, which is described as an advanced and soldier-like form of warfare in Hedenstierna-Jonson (2006, 11) and on the other hand something that can be picked up by modern children watching re-enactors (Raffield 2019, 12; citing Williams, forthcoming). In Gareth Williams' (2019, 36–58) book, the Viking battle formation knowledge is described to be quite intricate and is discussed in sufficient detail. All in all, there seems to be little reason to dismiss the Sanders' definition on warriorhood and warrior society as it seems to fit into the Viking context quite well. Seeing as the discussed combat-related definition of a warrior functioning within a warrior society fits the Viking context so well, it does raise a question on whether using the broader terminology is useful or should the possible indirect ways of warriorhood be discussed in different terminology. Differentiating warrior burials to concern only those with a provable (or at least more likely) combat role and other weapon burials along the lines of expressions of martiality could form to be a workable definition when fleshed out to a suitable degree.

3 Pinning the sword on a warrior

While relatively new research into several Viking Age Northern European cemeteries and other burials have shed considerable light on the origins of the interred and their sex thanks to the study of elemental isotopes and aDNA (e.g., (Melchior et al. 2008; Krzewińska et al. 2015; Buś et al. 2019), this information is perhaps surprisingly mute when it comes to actually tying the contents of warrior burials to the occupants of the graves or the occupants of the graves to the martial activity one might expect warrior burials to signify as per

definitions like the one of Sanders (2008). As Parker Pearson (1999) has previously argued, graves do not represent their occupants as definitely as they represent the communities responsible for carrying them out. Essentially, we can draw conclusions from what kind of representations constructed with grave goods were important to the community but making the distinction between the grave goods being an “honest telling” of the interred individual’s life as a collection of their belongings, and grave goods forming a constructed narrative as a curated assemblage used to bolster a chosen image is difficult to say the least. Of course, the existence of simple truths without some levels of uncertainty and interpretation is quite rare in archaeology, but it does not free us from obligation to either try to use the incomplete evidence as holistically as we can; or to openly admit the limits of our proposed conclusions. What this in essence means is that we need to reach our conclusions by using the available archaeological material as holistically as possible. Failing to do so, we need to include the reasons for the failure and the subsequently lessened strength of our evidence as caveats within our conclusions.

In the case of arguing for the warriorhood of the interred within an archaeological context, it is one thing to say that the interred partook in warfare using only weapon grave goods as a basis for this claim and another to argue the same point by using the presence of weapons, the weapons’ biographical information (e.g., use-wear analysis, construction of the weapons, evidence of repairs etc. see (Moilanen and Moilanen, 2020) on analysis of a medieval sword) and the biographical information of the deceased, such as build, evidence of (violence-related) trauma or activity-related morphology within the osteological material. To clarify at the risk of repetition: our findings are much more reliable if we require their basis to be a consistent whole, rather than a relatively singular attribute with multiple possible interpretations.

Following this line of reasoning, the presence of weapons in a grave alone is quite open-ended archaeologically speaking, but if the weapons show signs of being functional and signs of being used (indications of repairs and of damage), the case for weapons representing participation in warfare becomes stronger. Furthermore, if there are functional and used weapons in a grave where the interred individual shows signs of participating in combat (trauma) and/or training for it (morphological changes in bones), the case is significantly harder to refute, even if we keep in mind the previously mentioned problems with attribution in funerary archaeology. The requirement for this level of complete evidence of course raises the bar for establishing a warrior interpretation considerably as the evidence, for many reasons, might just not be there. To name two, taphonomical challenges and issues with

whether buried population represent the whole and other challenges pertaining to the interpretation of osteological material (per osteological paradox, see (Wood et al. 1992; Cohen et al. 1994; DeWitte et al. 2015) will surely provide challenges to archaeology in the future just like they have before. Despite the possibility of raising the bar on establishing archaeological warriorhood might inhibit us from making as far-reaching interpretations (at least temporarily) as freely, is it not better to prioritise ascertaining the validity of one's premise rather than the possible conclusions that might stem from it? As the conclusion can only stand if the premise holds, it seems justified to say so.

While osteological material could be used to strengthen the case for weapon burials being indicative of warrior by combat identity, the results might also indicate the opposite. A study conducted by Valerio Gentile et al. (2018) on the Samnite burial population is an example of this. Despite the very different context (Central Italy of c.800-500 BCE vs. the late northern European Late Iron Age), the results are interesting and answer similar questions in Samnite context that plague the research in the Viking context. The examined Samnite population shows similar funerary behaviour as the Viking context in the sense that graves can be categorized by status and weapons, and that these types of burials are prevalent (Gentile et al., 2018). Gentile's team then examined whether the presence of weaponry correlates with the presence humeral biomechanical asymmetry, which has been used to determine whether individuals have had martial training, practiced archery etc. While the research was able to identify individuals which had signs of martial training—and thus reinforce the presence of martial training within the population—the results indicate that there was no statistically significant correlation between evidence of martial training and presence of weaponry as grave goods (Gentile et al., 2018).

These results very clearly highlight the problems with equating presence of weapons as grave goods with at least direct warriorhood. While the results are not contextually related to Vikings, they raise questions on what similar methods of analysis would tell of the correlation between Viking Age weapon burials and the evidence of martial training within the Viking Age cemeteries in Scandinavia, considering the prevalence of martiality within the Viking society. The application of the methodology of Gentile et al. would seem promising for Viking society considering the evidence for the presence of martial training and inclusion in martial activities even in adolescents within the Viking society (Raffield, 2019). While some similar observations on bone morphology relating to martial training have been made within the Vikings buried at the English site of Ridgeway Hill (Raffield 2019, 13; citing Niwayama

1998; Waldron 2009; and Loe et al. 2014), as far as could be gathered, no similarly systematic studies on bone morphology as Gentile et al. (2018) have been published on Scandinavian Viking Age cemeteries. Thus, from this aspect of biographical information, the correlation between weapons in burials and participation in martial activities is strictly speaking still left unproven in the Scandinavian Viking populations.

4 State of archaeological evidence on the warring vikings

If we do not have the information on the prevalence of martial training in the Viking Age osteological material, the other natural way of looking for direct evidence of warfare comes from the prevalence of trauma—more specifically weapon-related trauma—in the Viking Age Scandinavian context. Despite the generally held Viking reputation for violent martial activity, within the currently available research, the presence of trauma seems to be surprisingly rare within the Viking Age Scandinavian cemeteries. In a general view, the lack of expected trauma is discussed in the chapter 4 of the book “The Viking Age: a time of many faces” by Caroline Ahlström Arcini (2018, 4), where she has compiled data from eight Viking Age burial grounds in south-eastern Sweden (Trinitatis, Vannhög, Fjälkinge, Kopparsvik, Slite Square, Fröjel, Birka and Skämsta). The previously mentioned present that trauma, especially ones caused by bladed weapons, is absent with very few exceptions; even the seven weapon burials from the cemetery of Kopparsvik show no signs of fractures or weapon injuries (Arcini 2018, 4). It is worth mentioning that Arcini also notes that as the osteological material at Birka is either burnt or poorly preserved, it does not lend itself well to this kind of inquiry, but one individual from Birka was found to have sharp weapon trauma in the skull and left arm; this individual, “the man in grave 138” (Arcini 2018, 61), does not fit into the previously established mould of weapon or warrior burials, as the grave did not contain weapons.

Arcini, (2018, 63) does recognise the disparity between the violent reputation of Vikings and lack of violence associated trauma visible in the osteological material of Sweden and ponders on what could be the reason for this phenomenon; Arcini brings up the possibility of opportunistic battle tactics being so successful that no injuries were sustained, possibility of weapons causing injuries that are not osteologically visible or thirdly injuries sustained in battle being so dire that the injured would not make it back to their homelands and were thus buried abroad. The success of opportunistic viking raiding tactics to such an absolute level that there would be no injuries whatsoever does seem unlikely considering the phenomenon’s

prevalence, but presently unfalsifiable. Whatever the reason may be for the lack of signs of violence within Swedish osteological material of the Viking Age, it leaves us in something of an awkward position regarding warriorhood in the Viking Age Sweden. Similar material could be searched from Norway as well, especially from the site of Kaupang, which is in many ways comparable to Birka due to large cohort in burials, presence of weapons in burials and similar qualities in habitation, but the published material seems to be devoid of studies on osteological trauma (Skre 2007; Skre 2011).

Overall, the question of why there is so little evidence of the viking individuals in Scandinavia in the Viking Age raises other explanations that bear mentioning. As well as the possibilities mentioned by Arcini, there are also possibilities that relate to viking warrior identity itself. Maybe the actively viking individuals would have formed a group which demanded a separate (archaeologically invisible or just yet unfound) burial rite and location from the early urban centres where most of these excavations have taken place. This behaviour could be explained by societal liminality of vikings, where the warriors are both part and not-part of the society by existing on the borders of society rather than strictly in it. This possibility has been examined in the context of *berserker* and more specifically their subtype of *vikingr berserker* (Dale 2022, 18–19, 116). This could explain the present lack of burials with combat injured and weapon burials in the Scandinavian context. *Berserker* are also a relevant factor in hinting at that the Viking society ostensibly could have had liminal social classes that relate to violence and warfare. Other factor that might complicate the identification of vikings in Scandinavia is the possibility of viking activity being a phase which would not carry into the burials in terms of grave goods if the buried no longer was an active participant in it. I.e., if a viking managed to “age out” of the viking activity and not die abroad, it is possible that their burial would depict their identity at the time of burial, be it a tradesman, trader or a farmer etc., rather than what the individual was earlier in their lives. This would not explain the lack of weapon-related trauma in the present material, but could contribute to the lack of clear warriorhood in urban contexts of the Viking Age.

Establishing warriorhood from a bioarchaeological perspective is not without its challenges: the available Scandinavian material makes it exceedingly difficult. Neither the environment nor the Viking funerary material itself seem all that considerate towards archaeological interests. The Viking burial rituals are quite diverse as variety between the exact characteristics of burials depend on locales. Furthermore, cremation seems to have been the most common practice (Brink 2008). Cremation as funerary trait is, from the

bioarchaeological perspective, frustrating, as the bones left from cremations are generally quite fragmented and leave little to analyse in the ways of osteology or genetic material, even if the cremains are suitable for carbon dating. Even if relevant inhumations are found, the soil can prove to be challenging to the preservation of the material. For instance, the soil in Southern Sweden has been found to be inopportune for the preservation of archaeological bones (Nielsen-Marsh et al. 2007).

Despite literal material on warriorhood and its ideals within the Viking society (see Jesch 2009) and the martiality present in the material remains of Birka e.g., in the form of the garrison and abundance of weaponry etc. (Hedenstierna-Jonson 2006, 46–65), we are still lacking in establishing who actually directly participated in warfare (and as such, fulfils the condition of direct warriorhood set out in the chapter 2) within the Viking Age society, at least when we are looking at strictly Scandinavian material. Without the information on who was a warrior directly, it seems hard and somewhat premature to try and establish who would be a warrior in the indirect i.e., symbolic, or socially constructed ways, as how can one argue for these immaterial links without knowing whose actions they actually try to reference?

When the “local” material seems presently unsuitable for constructing the picture of “who in the Viking society participated directly in warfare?” due to the reasons previously discussed, the relevant direction of inquiry becomes to look for answers from the outside of Scandinavia proper. What this means is that rather than trying to solve the question at hand only by



Figure 1 Map showing the locations of Salme, Birka and Gotland.

extrapolating from the local material of the Viking homeland, we need to look at the Viking Age material in foreign contexts that are associated with violence and warfare. Rather than searching for people with martiality, the more prudent action seems to be the search for martiality with people instead. While the context alone does not necessarily seamlessly answer whether the Viking Age individuals of Scandinavian origin that met their violent end abroad were directly warriors, it does provide a stronger line of reasoning for it by answering the question “what kind of individuals from Viking society were sent to situations that carried the risks of violence or warfare?” and thus associated with them archaeologically. A reasonable assumption to make would be that one of the best available strategies for increased success in these situations that require taking the risk, would have the individuals be as well trained and equipped for those situations as possible, making trained warriors a great choice for the crew. Can we then identify qualities in the foreign contextually martial cohorts—or vikings—that could be transferred or compared to the Scandinavian counterparts? Opportunities to gain these kinds of insights arise in sites like the Salme ship burials of Estonia and the English sites of Ridgeway hill and Repton that will be discussed in the next chapter of this thesis.

4.1 Salme



Figure 2 Anterior view of Salme II and some of the buried individuals. Photo by Jüri Peets and Reet Maldre. Adopted from Peets *et al.* 2013

The Salme ship burials are a pair of boat burials dating to the end of the Vendel period (650-750 CE), which were found in the years 2008 (Salme I) and 2010 (Salme II) with fieldwork carried out in the years 2008 and 2010-2012 (Peets *et al.* 2013). The excavations of these two ship burials unearthed total of 34 individuals, seven from Salme I and 27 from Salme II (Price *et al.* 2020), buried within the ships, great array of different artefacts including broken swords, seaxes, deliberately damaged shield bosses, 91 arrowheads (some as grave goods, some apparently stuck to ships after being fired at them), gaming pieces, and material fragments associated with different artefacts (textiles and timbers) (Peets *et al.* 2013).

The people buried in the Salme ships were proved to be of non-local origin with archaeological material resembling Swedish contemporary tradition (Price *et al.* 2016) and a later study on isotopic ratios of the buried seems to point quite strongly to the East-Central Sweden and Gotland (Price *et al.* 2020). The dating of around 750 CE given by Peets *et al.* (2013) does miss the conventionally given start of the Viking Age, marked by the raid of Lindisfarne in 793 CE. The margin is archaeologically speaking however quite narrow and there are reasons to challenge it.

The conventional starting point of the Viking age has also been questioned, Judith Jesch (2015, 8–12) argues in her book that as the raiding behaviour that is the reason for the conventional date cannot have started from nothing, but would have required preparation, scouting etc.; the start of the Viking age could be

around 750 CE. This is also the definition Jesch decides to use in the book. The Salme ship burials would fit this adjusted chronology very well. Furthermore, it is hard to argue against the burials fitting into the continuum of The Viking Age activity as an early example. As the Salme event is interpreted as a diplomatic envoy accompanied by elite warriors (whatever elite in this context means) travelling and aiming to establish trade or alliances abroad and meeting their end in an intense battle (Price et al. 2020).

More importantly for the themes of this thesis, we have a well-studied group of individuals originating from Sweden roughly within our time period, buried with weapons (probably hastily, using whatever they already had with them) and with extensive evidence of combat both in the ships themselves and in the skeletal material. In the terms of whole warrior contexts, this is pretty much as complete as one can archaeologically hope for. What traits did these individuals then have? Salme I contained the remains of seven biological males: four young adults, young to middle aged adult and two middle aged adults with the average height of 172.5 cm and bodyweight of 78.2 kg and some cranial injuries (Price et al. 2020). The bodies were placed inside the ship quite loosely, but with some indications of intentionality in relating bodies to positions on the ship (Allmäe et al. 2011). Salme II contained remains of 34 individuals, out of whom 27's sex could be established reliably osteologically to be biologically male and five indeterminately (Price et al. 2020). Ages varied from adolescence to old adult (one adolescent/young adult, 12 young adults, six young/middle-aged adults, six middle-aged adults, two middle-aged/old adults and two old adults), average height was 173.3 cm and average bodyweight was 74.4 kg; 13 individuals showed evidence of sharp force trauma with nine suffering from multiple injuries and "three certain cases of decapitation" (Price et al. 2020). It also seems likely that five individuals had been struck in the soft tissue by arrows (Peets et al. 2013).

While at the time of publication of Price et al. (2016) the analysis of the human remains was still ongoing, some of the grave good contexts and details are written out; which I will summarise here:

Sall/1, male, aged 30-40, 176.9-179.9 cm and 79 kg, injuries (probably) caused by a single slash of a bladed weapon on the right forearm (ulna) and left upper arm (distal end of the humerus). "Single-edged sword" placed between body and left arm.

Sall/2, male, aged 25-35, 169.1-173.2 cm and 73 kg, suffered from Atlanto-occipital fusion, blade wounds to the upper left forearm (ulna) and "medial lower edge of the femoral head", gaming piece and an iron tack found near the mouth.

Sall/3, male, aged 25-35, 170.4-174.6 cm, sword hilt of gilded bronze and pommel inlaid with precious stones found under right arm with a head of a sacrificed dog.

Sall/4, male, aged 40-60, 170.6-174.6 cm and 82 kg, broken sword placed on top of the right forearm topped with a shield boss, extensive perimortem injuries including stab wounds to the back, three slashing cuts to the right humerus and a “heavy slash” that caused a “penetrating injury” to the left side of the skull.

Sall/5, male, aged 25-30, 179.7-182.2 cm and 87 kg, whalebone, and walrus ivory game pieces and three dice placed on lap, damaged sword placed above left hip.

Some further summarisation is provided by Price et al. (2016) concerning the Salme burials: individuals buried in the Salme II were “young, tall males, with substantial evidence for trauma and violent death”. Presently, no studies on musculoskeletal stress markers or diet have been published, but the information could potentially be very enlightening. Even so, the Salme burials provide several valuable pieces of information that shows potential for identifying direct warriorhood in the Viking Age Scandinavian context. Based on the Salme burials, the attributes that tie together this early viking retinue of warriors or seafarers prepared for violent encounters are: height of around 170 cm or above, biological male sex, relative youth, presence of swords and shields, and game pieces.



Figure 3 Map showing the positions of Repton and Ridgeway Hill in the United Kingdom.

4.2 Ridgeway Hill

Ridgeway Hill was discovered in 2009 during roadworks in Southern England. The site contained the skeletons of 51 adult biological males, all of whom had been decapitated and subsequently buried in the pit with heads separated at the southern edge of the pit and bodies strewn across the rest of the pit with no little to no regard for the bodies. In terms of age, most of the individuals seem to have been young adults (sub-25) with some older adults present. 34 of the skulls have evidence of at least singular sharp force injuries with many showing signs of multiple instances of trauma. (Chenery et al. 2014) citing (Loe et al. 2014).

At the offset, the human remains were thought to correspond to the multiperiodic nature of the site which was described as “late Iron/early Roman Age with reuse in the 10th century” but the eventual radiocarbon dating that sampled 10 of the excavated skulls gave a date range 970-1025 CE with 93% probability (Chenery et al. 2014). The isotopic analyses conducted (oxygen, strontium, carbon, and nitrogen) establish the buried individuals as “non-local” i.e., not from the UK, with indications of broadly and diversely Scandinavian and Russian origins (Chenery et al. 2014). The proposed conclusion that the team reaches is that the buried individuals were “Viking raiding/pirating men who originated from a variety of places within Scandinavia” (per Chenery et al. 2014) that were executed by the locals, offering historical sources in addition to the isotopic results as further proof of this conclusion (Chenery et al. 2014).

Unlike the burials of Salme, the Ridgeway Hill individuals were not buried with any grave goods, much less weaponry. The relevance of Ridgeway Hill comes from the osteological examination of described by Loe et al. (2014) that gives extensive evidence of how going viking was not just based on opportunism or a whim, but a culmination of a lifestyle that was preparing for it. The individuals buried in Ridgeway Hill show the signs of living active, physically demanding lives with indications of repetitive movements. This is made plain by the prevalence of indicative morphological changes present in the skeletal material of Ridgeway Hill in the form of changes to the muscle, tendon, and ligament attachment sites as well as bone growth abnormalities that are linked to adolescent contact sports in modern populations (Loe et al. 2014, 86, 97, 132). The lifestyle evident in these changes is also further corroborated by the individuals’ body physique indicators, which were examined by measuring the claviculo-humeral index and femoral robusticity (Loe et al. 2014, 85).

These features are a nuanced type of evidence, but when combined with the isotopic values originating from the Viking sphere of influence, the picture of these individuals being particularly robust and suitable for martial activities is hard to rebuke. Furthermore, the mean stature of 172 cm and age demographic of mainly young adults and adolescents (Loe et al. 2014, 211) compares well to the individuals of Salme. The repetitive movements of the upper body correspond to many activities that could be explained by less martial activities, but the indications of contact sports point in a different direction. Considering the depictions of viking battle tactics (Williams 2019) that include the use of shield-walls as well as the often archaeologically overlooked need for training in using weapons effectively, the assumption of martial training seems like a good option. Some weapons are easier than others to use at least

semi-effectively and by extension, do not necessarily require the same amount of training. For instance, a spear is relatively easy to use effectively enough that getting past the defence with a shorter weapon (spears, axes etc.) requires a disproportionate amount of skill from the attacker². This is, however, further complicated by shields, which are also tools that require skill to use effectively. While the mode of use varies between shield types, the typical Viking round shield shows characteristics of being best used in an active, rather than a passive manner (Warming 2016), meaning that rather than just requiring strength and consistency in upholding it, there is technique to be trained for in its use. This could play a part in the osteological features visible in the Ridgeway Hill individuals.

Loe et al. make a further pertinent observation regarding the potential warriorhood of their individuals by noticing the similarity between them and the people buried at the battlefield cemetery of Towton. The battle of Towton and its battlefield cemetery are not a Viking age site, but a battle in the War of the Roses in 1461 CE and in this regard are dissimilar, but for the topics of this thesis, Towton holds significance as a battlefield cemetery which contains osteologically studied individuals who are deemed to have been professional soldiers (Fiorato et al. 2007, 9). Thus, the notable similarities between the individuals of Ridgeway Hill and Towton despite the chronological and contextual separation offers further reason to interpret the individuals of Ridgeway Hill as at least people prepared for war despite the lack of weaponry in the grave goods.

There still remains doubt on the individuals of Ridgeway Hill and their warriorhood due to the lack of presence of healed previous battle injuries (Loe et al. 2014, 211), but as the group demography skews young and adolescent, there might have not been opportunities for past battles. I am inclined to follow Raffield's (2019) line of thinking in the sense that while participation in raiding and martial activities even in late adolescence might have been common and a way for the young of the Viking Age Scandinavian societies to start accumulating social status, it was not without its risks. The concrete realisation of those risks is quite evident in the case of Ridgeway Hill. The group of prospective professionals of violence were by some way or another subjugated, taken captive and executed with a sword (Loe et al. 2014). Following that, the Ridgeway Hill population should probably be viewed as individuals mostly on their way to warriorhood as the evidence for training for it seems quite

² Observation stems from my own experience in HEMA and other martial arts, as well as discussions with the more experienced in the community.

strong. The journey towards seasoned warriorhood was however cut short with the failure of their early—if not first—attempt at functioning in that capacity.

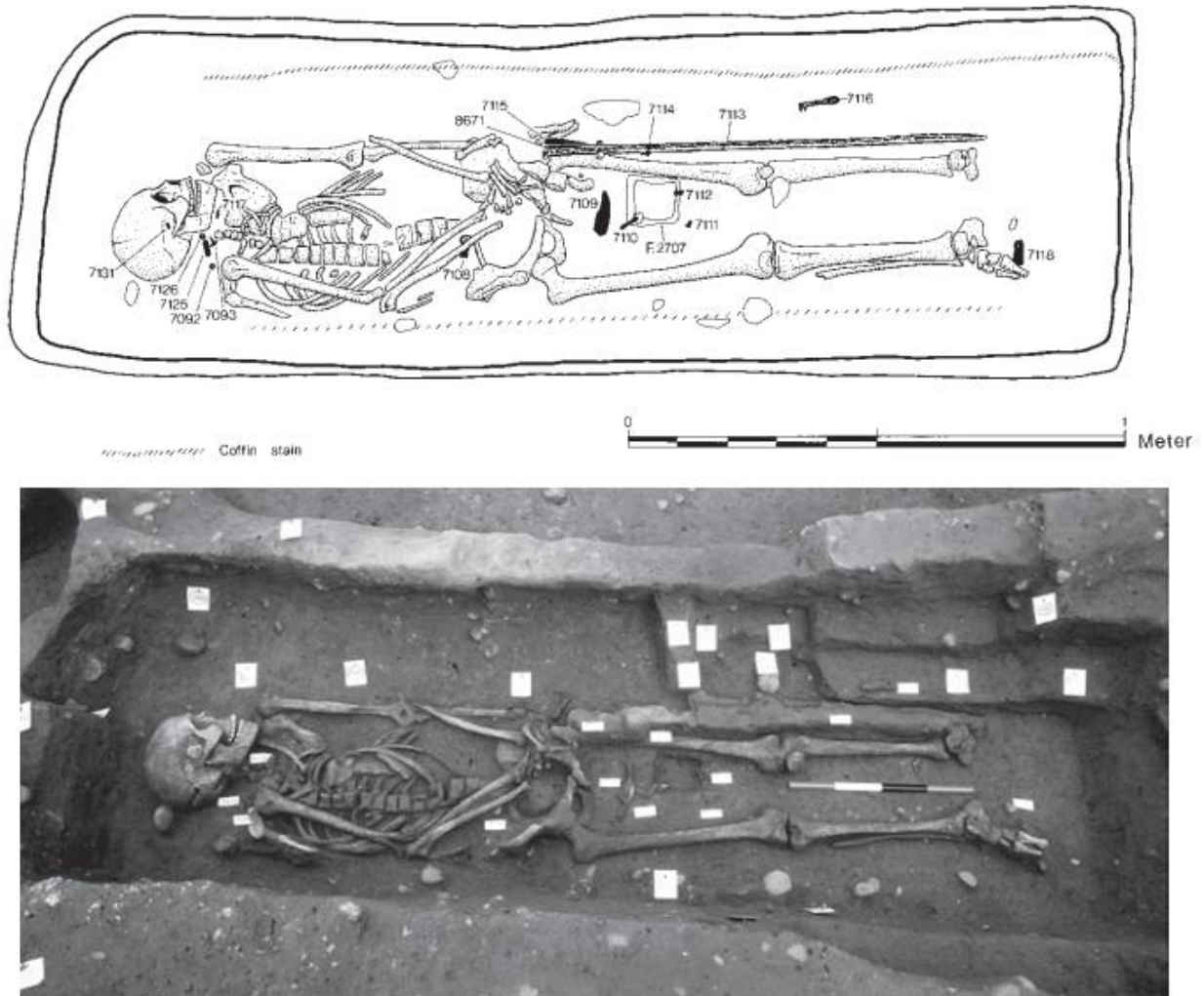
4.3 Repton

Last and arguably the least cohesive—as well as the most ambivalent—resource on Viking martial activity outside the broadly Scandinavian homeland that will be discussed within the parameters of this work is Repton. The site of Repton is challenged by several factors that complicate the quality of archaeological contexts and the subsequently proposed results in addition to the fact that the primary source used was published around 30 years ago (fieldwork took place between the years 1974-1993 (Biddle et al. 1997)). Repton's significance to this thesis comes from the site being an established martial context of people with Scandinavian origins.

In the related research, Repton has been interpreted as the winter camp site of the Great Viking army and was occupied between the years 873-874 CE. The site contained an existing Anglo-Saxon church which was repurposed to be a part of the camp's defences and burials made by the Viking army as well as some previous burials on the site. In addition to the individual burials during the site's Viking occupation, the site also contained a burial mound placed on top of a mass-grave that contained the bones of at least 264 individuals with varied dating. After the Viking army left the site, the use by local population continued and several subsequent cemeteries were formed on the site. (Biddle et al. 1997).

The particularly relevant aspects of Repton for this work are the demographical descriptions and the burial 511 discussed in Biddle et al. (1997). The burial 511 is described to have contained an adult male killed with a cut to the head of the left femur (the implied cause of death here is assumed to be the severing of a femoral artery) after a hit to the head fell him to the ground. The individual was buried with a sword laid next to left leg and other apparently personal effects. The grave 511 was associated with the grave 295, which contained a young male with the cause of death proposed to have been a cut to the right side of the skull. The individual in grave 295 was not buried with a sword, but with a knife. The interpretation proposed is that of a warrior and weapon-bearer. (Biddle et al. 1997, 16-20). Another interpretation is mentioned by Raffield (2019,7; citing Hadley 2008) where the disparity in grave goods is more directly related to the possibly yet-to-be-achieved quality of the younger individual's warriorhood.

Nonetheless, both individuals are clearly in a martial context with violence-related injuries. Biddle et al. (1997) describe the individual in grave 511 to have been “1.81 m tall and similar in physical type to the male population of the mass burial” and the individual in grave 295 to have been 1.79 m tall and with signs of great physical strain evident in the legs. The demography of the previously mentioned mound can be summarised to be 82% male, male ages between 17 and 35 form 68% of the population and the mean stature sitting at 176.1 cm (Biddle et al. 1997, 29-31). The population of the mound is of further importance and has



4 Photograph and plan of the Repton grave 511. Photograph by Martin Biddle, plan by Judith Dobie. Adopted from Biddle et al. 1997.

been studied and described. Biddle and Kjølbye-Biddle deem the population of the mass burial to contain bones of Scandinavian males, who are markedly tall and robust when compared to the “ordinary Scandinavian Viking Age cemeteries” as well as women who seem English and not Scandinavian; finally drawing to the conclusion that the present cohort gives off the impression of a cemetery of a Guards regiment (Biddle et al. 1997). The authors support their findings by mentioning the prevalence of some non-metric traits that point to

Scandinavia, but their methodology otherwise is left to some degree vague. The paper does not mention any other methodologies employed to support the claims of provenance or bone robusticity.

While there is room for due criticism on the relative vagueness of the methodology for the claims presented and possibly the method of osteological stature estimation used by Biddle et al. (1997), the profile of the participant in Viking martial activity seems remarkably similar as the other sites (tall and robust biological males mainly between the ages of 17 and 35 with Scandinavian origins), that were found and excavated later with non-related teams and more modern methods.

5 Return to Birka

The information on warriorhood that can be gained from the field burials that were previously discussed is valuable for few key reasons. The field burials and the artefacts they might contain (like in the case of Salme and Repton) are convincing due to the very clear martial context and the artefacts as grave goods seem more honestly attributable to the interred as by their nature, field burials have to be conducted with the items that the funerary party must have brought with them not for the specific purpose of a burial. As such, the assemblages found in field burials seem more likely to contain the personal items of the deceased, rather than an assemblage of offerings that can be gathered from the materials present at the permanent dwellings. While the possibility of carrying superfluous “in case of a burial” - packages cannot be completely dismissed as a possibility even in the case of field burials, the assumption is that it would be a less likely explanation. On the other side of this assumption is Birka, the Viking Age garrison and a trade hub of the Mälaren region on the island of Björkö, around 30 km westward from the modern-day Stockholm city centre.

The richness of material for the archaeological research of the Viking Age present in Birka is hard to describe succinctly, as Birka’s research history spans over a hundred years, covers over a thousand excavated burials of different types with different items, and the excavations during the 21st century have uncovered several destroyed buildings with good indications of their Viking Age use. The site functioned from around the year 700 until around the year 1050 and was among the first series of early urban centres in Scandinavia (Hillerdal 2010). The burials of Birka have been studied with methodologies ranging from stable isotope analyses to the osteological as well as statistical methodologies, e.g., Ringstedt 1997; Linderholm et al.

2008; Price et al. 2018. The findings related to Birka also include a significant amount of material that indicates the far-reaching connections of Birka, as the finds include Arabic and Anglo-Saxon coins as well as artefacts typologically linked to the Rus. Due to this well-researched status and the richness of source material, Birka offers in many ways a rather unique cross-section of a Viking Age dwelling site with its own characteristics. Birka's people and the interpretations made from them also hold arguably much greater influence in our perception of Viking society and warriorhood due to the unprecedented level of public interest shown in the case of BJ581 by a large margin.

5.1 Materials of martiality in Birka

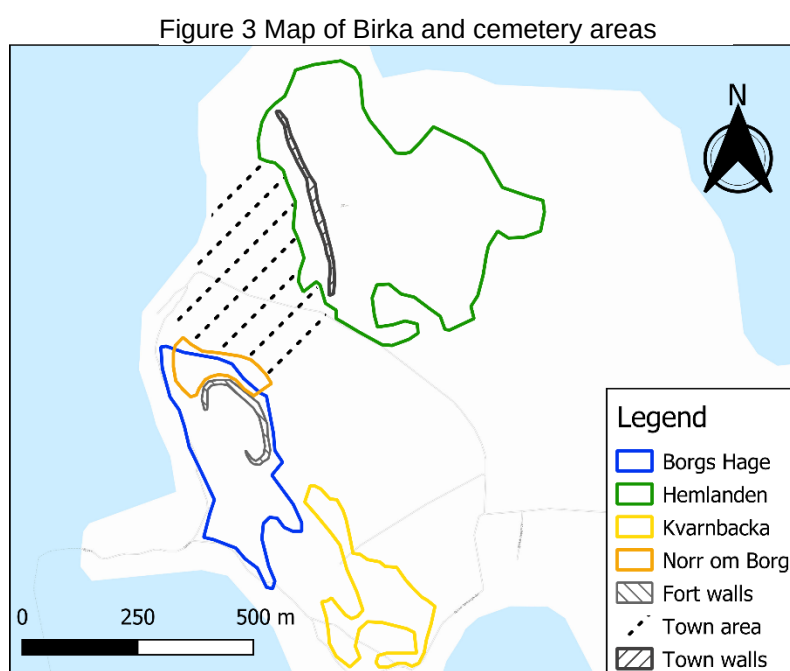
Birka was an early urban centre in Scandinavia and emerged to fill the need for sites for manufacturing and trading among sites in the “same series” of early urban settlements like Kaupang, Ribe, Hedeby and Staraya Ladoga (Hillerdal 2010). While Birka's main function may have had more to do with economy rather than martiality, Birka does contain elements of martiality which have been studied at length in its research history. Among the most extensive publications on these features of Birka are Hedenstierna-Jonson's doctoral thesis (2006) as well as several articles from the themed publication of Stockholm university on martial society in Scandinavia (Holmquist Olausson et al. 2009), which provide the majority of the argumentation regarding the martiality and its qualities present in Birka.

Based on the rich material culture present, Birka has been described as containing warriors who identified as “culturally Rus” (Hedenstierna-Jonson 2006, 79), warriors who were trained in the use the composite bows of the steppe nomad horseback archers (Lundström et al. 2009), stylistic expressions of warriorhood adopted from the eastern Magyaar culture in the form of dress, belts and pouches (Hedenstierna-Jonson et al. 2006) as well as possible indications of service in the royal guard of Byzantine emperor (Hägg 1983; Hägg 2006). However, what is not present in the archaeological source material of Birka—at least at the time of writing—is the bioarchaeological evidence of participation in warfare in the form of prevalence of trauma in the skeletal material (as discussed earlier, only one skeleton has been observed to have sharp force injuries) or the “warrior lifestyle” (evident in the Ridgeway Hill individuals) that would cause morphological changes to the skeletal material.

The case far from conclusive, as there is a distinct possibility that the individuals of Birka could have had them, but the taphonomical issues as well as the prevalence of cremation as a burial ritual within the Birka cohort have made observing them with the present methods

exceedingly difficult. The direct evidence of individuals of Birka being engaged in combat is not present in the similarly direct way as the contexts of Salme, Ridgeway Hill and Repton. Consequently, the martiality of Birka and its possibilities of transferring warriorhood in itself to the individuals buried on the site is not without its challenges. As the site functioned as a town with evidence of social stratification, demonstrated in the burial habits (Ringstedt, 1997), as well as a garrison, one has to take to the account the possibility of exhibiting material signs of warfare not only for practical, but for societal reasons as well.

When it comes to the burial material itself, Birka's character as a garrisoned wealthy town with trading activity raises the possibility of including weapons as grave goods in more sacrificial or image-building sense for a few reasons. Firstly, as the material is more readily available at the site, it allows for access to it by the funerary party even if was not a personal possession of the deceased, as is discussed in (Price et al., 2019, 12) the weapons of Bj. 581 being possibly a part of the "straight-to-Valhöll funerary package" that would lend a martial image to the deceased via the addition of warrior's tools. Secondly, as the population present on site is more diverse and includes more complicated power structures and social stratification than a raiding party or a warband might, the possibilities for expression of status also become more complicated and opaquer; the possibilities of heritable status groups and the related expressions of said status open many unknowns in interpreting the meaning behind the grave goods.



Drawn based on the information of the historiska.se web-GIS portal.

5.2 Angling for openings

Problems of attribution in grave goods as well as the many unknowns of the Viking Age status expression cannot be completely sidestepped, but the material of Birka offers several angles of approach for at least testing some of the assumptions on the presence of weapons in Viking Age burials. While, as previously discussed, weaponry cannot straightforwardly be linked to warriorhood as the correlations between weapons and warrior lifestyle has not been established in habitation contexts and weaponry is present in burials that contain deceased that could not have used them (e.g., children) nor is it possible to prove that the weapons belonged to the buried individuals themselves, the inclusion of weaponry or other martial material still presents a quantifiable opportunity. As the dead do not bury themselves, neither do the weapons; as such the presence of weapons—and in larger scale the burial method—demonstrate choices that we can assume to have a motivation behind them, and we can prove not to be random. This allows for examination of trends or correlations between different assemblages which could, in turn, indicate qualities that inspire the act of offering of an item or sets of items as grave goods. In so many words, examining whether certain items occur only separately or in addition to other specific items and in which burial types give us possibilities to observe whether exclusive categories of burials strongly linked with specific item sets emerge, which can then be subjected to interpretation.

5.2.1 The eastern connections

Birka has been connected to the Varangians, who according to the historical sources were essentially mercenaries drawn from the Rus and broad area of Viking influence and hired to serve in the Byzantine royal guard as well as a unit on the battlefield. The position was quite prestigious, and Harald Hadrada is written to have served as a Varangian in the earlier stage of his life. The presence of Vikings in the Byzantine world is evidenced in historical sources, graffiti and artefacts both in Northern Europe and near the borders of Byzantium. The Mälaren region at large is also noted as a centre for multiple runestones that reference locals going to “Greece” to offer their services in war. The interpretation given by Inga Hägg (2003), that some of the Birka burials contain individuals that have served in the royal guard, offers a valuable group to examine for patterns in the weapons they are buried with as well as their possible interpretations. The specific connection between Birka burials and Byzantine connections has been examined at the largest length by Hägg in the papers on clothing in the Birka burials (Hägg 1983; Hägg 2006).

5.2.2 Equestrianism and its relation to warriorhood

In previous research by Hedenstierna-Jonson (2006, 68), the possibility of martial identity or status being expressed by the inclusion of horse equipment—or indeed horses themselves—in the grave goods of the burials. Horse equipment is present in a number of weapon burials in the form of leads, stirrups etc. in Birka. Overall, whether horsemanship is particularly “Vikinglike” or “vikinglike” expression of warriorhood is somewhat debatable; the battle tactics and strategies associated with Viking warfare in the current scholarship bear barely any mentions of using cavalry (Hubbard 2015; Williams 2019) and considering the etymology of viking being a *sea warrior* (Jesch 2015) horses at the offset do pose difficulties in arguing for their connection to viking warriorhood at large. On the other hand, horses do appear in connection to berserkers in sagas and were an important part of domestic Viking workforce. In Icelandic burial contexts, horses are found in both female and male graves and do not seem to be interpretable as particularly warriorlike features, but rather just as aids to passing to the otherworld (Loumand 2006).

The relevance of equestrianism in Birka is further complicated in terms of its “Vikingness” due to the prevalence of archery equipment that typologically draws towards the steppe nomads. Per Lundström et al. (2009), several eastern type archery equipment, like finger rings, arrows and quiver loops have been found in the garrison as well as in the burial BJ1125B. While one could argue that the island of Björkö does technically have the space for mounted warriors to operate, being in the present day around three kilometres long at its longest and a little less than two kilometres wide at its widest, the question still remains; what practical point or purpose would mounted warriors serve for Birka? Lundström et al. (2009) also note that Björkö was probably too small to operate on horseback but argue that the style of steppe horseback archery with its composite bow was learned in the east and brought over to Birka as a skill, which would then tie equestrianism as a staple of warriorhood. Regardless of whether equestrianism is viewed as particularly Viking or viking in its nature, the fact remains that the presence of horse equipment is a staple in the Birka burials which deserves further examination.

5.2.3 Trading equipment and gaming pieces

There are a number of burials in Birka that contain items that relate to trading, like weights, scales and purses. While weights and scales do have their uses outside of trading in more local

activities, they still provide an interesting marker for investigating the signs of activity abroad. Especially since the scholarship in its description of Viking activities abroad has swung between violent raiding and peaceful trading to a possibility of something of a mixture opportunistic model, trading equipment does provide opportunities for earmarking individuals with more abroad activities than others. In similar fashion, but perhaps more precarious, possibilities arise from coinage. While coins by their nature are not very strongly personal—rather being transactional—as grave goods, they offer opportunities. The coins present in Birka burials are mainly Arabic, as is to expected for the time (Hillerdal 2010, 17), but there are also several Frankish and English coins, as well as a Denar present in the grave goods. The coins are mostly present as single instances in burials, largest number being four in one burial and as such they do not seem to present wealth, but rather something else. The placement of coins can be scrutinised in the same way as all the other grave goods in the terms of whether they are biographical or not, but the placement does represent an act of trying to depict something, even if it cannot presently be proved what that something is. The coins could be related to the other trading equipment or something else entirely, but the possibility of coins relating to biographical history offers a potential feature worth investigating.

Gaming pieces have been found in the Viking burials abroad, as was presented in the earlier case studies and thus do provide a grave custom of interest in the warrior context. In the scholarship, some are placing more heavy meaning to gaming equipment, especially to gaming boards. Gaming boards have been thought to indicate training in tactics which would then translate into a commanding role in the warband (Hedenstierna-Jonson et al. 2017; Price et al. 2019), but I fail to see why the addition of a board with the pieces specifically should be seen as an elevation of the assumed tactical ability rather than elevation of material available. Furthermore, the reading of heavy assumption does raise the impulse to dismiss it offhand by noting that history is rife with great chess players who are barely capable of commanding their own lives as well as great commanders who were at best middling at chess³. Despite the fact that the correlation between board games and excellence in tactics might not be fully substantiated, it does not refute the possibility of Vikings believing in this correlation. There

³ Overall, this assumed correlation between viking gaming and tactical prowess seems very reminiscent of the modern misconception, prevalent in non-chess-players, of seeing ability at chess as an overall indication of intelligence or intellectual abilities. This needlessly mystifies chess to represent something other than what chess players would describe the game to be: a trainable and fun skill but with very few practical applications.

are also differing academic opinions on gaming pieces in the Viking context. Paper by Helène Whittaker (2006), raises the possibility of gaming equipment being primarily a much-needed way to pass time on campaigns as well as a sign of elite status by indicating ability to spend time in a “non-productive way”. This is at least as equally reasonable of an assumption. How gaming equipment is spread out in the Birka burials needs to be examined before making any further judgements.

6 Birka and the multivariate approach

The archaeological material of Birka offers plentiful amounts of data for analysing despite the fact that not all of the Birka burials have been excavated at the time of writing. At a point where more of the graves of Birka are excavated, the ratios and significance of the analysis conducted in this work are subject to change, but presently the over 1000 excavated burials, even if they represent only about a third of the total that includes unexcavated graves, still provide a meaningful sample for this type of research. While the sample is meaningful, the results might not directly translate to other Viking Age burial sites, as the Viking sites seem to differ greatly in relation to each other (Brink et al. 2008; Arcini 2018) despite sharing features of the burial narrative between each other (Price 2010). Nonetheless, as the Birka site is extensive, and the records of its burials are easily accessible via the Swedish historical museum’s *Björkögravar*⁴ database, Birka offers a good opportunity to examine the martiality of Birka burials with the means of data exploration methods.

6.1 Methodology and forming the data

Under the assumption that the choice to include weapons and other items in the grave goods are not random but rather dictated by some reasoning (biographical or other), it should be possible to identify patterns in the burials based on their grave goods. The method chosen for this task in this thesis is MCA (Multiple Correspondence Analysis). To describe it briefly, MCA is a variation of CA (Correspondence Analysis), which is a data exploration method that aims to identify and summarise relationships between given set of variables that are present in a set of individuals. An example and good description of its usefulness in archaeology specifically is provided by Kris Lockyear in the context of using the method to analyse Roman coin hoards in the UK (2000).

⁴ <https://mis.historiska.se/mis/sok/start.asp>

CA is broadly conceptually similar to PCA (Principal Component Analysis), but instead of continuous numerical variables that are examined in PCA, CA analyses nominal variable pairs with counts, for example how many coins of this type are present in the group if at all (then value would be zero) or binary categorisations (0 for no, 1 for yes). Some of the variables in this thesis could be analysed with this binary methodology of CA, like just the presence of any set of grave good in binary terms (yes or no), but in the more complex questions with multiple options, like burial type (“Is the burial a chamber, boat, cremation, coffin or a skeletal burial?”), that cannot conveniently be coaxed into a yes/no questions an adjustment is needed. MCA allows to analyse variables that have more than two possible categories, which makes it better suited for the complex burial data from Birka. As MCA, like CA or PCA, also places individuals into a point cloud with coordinates, MCA also allows to perform clustering on the examined individuals. This clustering will be used in analysing the groups that emerge from the analysis. MCA has been used in studying Viking burial behaviour previously in research by (2019), in which the identities in burials with arrowheads were examined in a broader Viking context. More in-depth descriptions and explanations of these methodologies are not within the remit of this thesis, but can be found in other works (e.g., (Husson et al. 2011; Pagès 2015; Kassambara 2017).

The data for the analysis was formed by collecting the information of Birka burials from the Björkögravar database. The database was queried for weapon burials within Birka and the burials with at least one weapon type were chosen for the dataset. In the interest of limiting the study to the burials with the strongest depicted martial identity, the burials with only arrows or knives were omitted from the dataset as the interpretation of arrows is muddled by the possibility of hunting identity rather than a strictly martial one (as discussed in (Lund et al. 2019). Similarly, while a knife can be a weapon, its utility as a general tool is at least as strong of an interpretation. Especially when “weapon knives” (per the Björkögravar database’s definition) or saxes are present in the Birka burial material and denote a violent use more clearly.

As the interest was also not in comparing the typological differences between the weapons, the presence of any weapon in a burial was recorded only in binary terms (yes or no). The interest was also not at this point to zero in on the complications provided by graves with multiple instances of the same weapon (although I suspect that this particular behaviour would limit mostly to the wealthiest burials). These limits to the cohort produce a set of burials in the Birka material that are conventionally argued to have been warrior burials in

the research history and introduce the least unknowns as well as being harder to argue against on more subjective definitions. That is not to say that a more total approach should not be valuable in the future; similar methodology with a more allowing approach in terms of cohort selection could give interesting results, but for the aims of examining the foundations of the conventionally argued warrior burials in Birka, it is necessary to try to simplify the data to some degree. In the interest of considering also local practices that differentiate burials, the areas of burials were also included as a supplementary variable by simplifying the areas into the five main categories present. In the end, the 107 burials were examined, the weapon burial of Skopintull had to be dropped as a subject due to it creating a variable category of one due to it being the only burial in the cohort from that area.

The variables that could not be expressed as binary values, like burial area, burial type and the byzantine influenced clothing were broken down to their respective categories. Burial area into the categories of BH (Borgs Hage), HEM (Hemlanden), KVB (Kvarnbacka) and NOB (Norr om Borg) and was treated as a supplementary variable. Similarly, the byzantine influenced clothing was broken into the ranking presented by Hägg (2006) which goes A1-A3, B, C and D in descending order of perceived rank. Category of N was added to represent having no influenced clothing. This variable was also treated as supplementary. Burial type was divided into categories of Boat, Chamber, Cremation, Coffin and Skeletal.

Grave good variables were recorded as binary categories in simple Y or N form. This applied to arrows, axes, saxes, shields, spears, swords, weights, purses, coins, gaming pieces and horse equipment.

In addition to variables that relate to the presence of weaponry, several other variables were taken into the analysis in the interest of seeing how trading equipment (weights and purses), horse equipment (horse bits, stirrups, ice-spikes etc.) or gaming equipment relate to the weapons and burial styles in the dataset. Scales and gaming boards were also considered as variables, but in the earlier instances of running the analysis, due to their rarity, they formed outliers that needed to be suppressed on the variable or the individual level. This meant that the variable largely lost its usefulness. These variables were thus not included. Furthermore, as both of the aforementioned variables occur in mainly in connection to another variable (scales with weights and gaming boards with gaming pieces), the variables are thematically represented by the more common variable. Similarly, as indicators of activity abroad, which seems to have been a cornerstone of becoming a warrior as discussed earlier in this work,

presence of coins was also taken as a variable. The coins present at these burials in Birka are mainly Arabic, but there were also singular Frankish, Roman, and Anglo-Saxon coins (in addition to one from Hedeby) present. As the coins by and large originate from areas with known Viking raids or mercenary activity (service under the Byzantines), the coins seemed to offer an interesting possibility of acting as indicators of something akin to a service record. The possibility of the coins ending up in the burials via more peaceful mercantile activity or long trade networks cannot be overlooked but as the coins were mostly single instances and at the greatest quantity of four in a single grave, their use as a strict indicator of only wealth seems unlikely.

Due to Birka's and the Mälaren region's established connection in the Viking age to the Byzantines as also evidenced by runestones (Blöndal et al. 1978, 223–233), the burials of Birka also offer the possibility of examining the individuals whose grave good assemblages are in the research history said to contain indications of serving in the byzantine royal guard. The connection to the Byzantine royal guard or mercenary work could present an interesting opportunity to identify individuals that can be assumed to have been proficient in fighting as the idea of serving in the royal guard without being an adept soldier seems unlikely if the group can be noticed to be cohesive in the analysis. In the monograph on Birka textiles by Geijer (1938), it is discussed that working with silver or gold thread was markedly a byzantine technique, the possibility for local production cannot be ruled out. The variable of Byzantine for the analysis was formed based on the list presented by Inga Hägg (2006), where Hägg listed and ranked the individuals in Birka with clothing that expressed Byzantine influences. Her ranking is in a descending alphabetical order of elite status from A1-A3 to D; value of N was added to present the non-presence.

The decision to use burial area and Byzantine clothing as supplementary variable categories stemmed was based on the aim of getting the clearest picture of the relationships between weaponry and the other proposed indicators of warriorhood present in Birka weapon burials. As supplementary variables, the variables do not contribute to the dimensions that are constructed in the MCA and thus do not influence the distribution of active variables or the individuals.

Biological characteristics would have been ideal to include in this study but there are several problems with their inclusion. Famously, the previously held notions of the sexes of the Birka buried that were based on assumptions rather than modern methods have been rightfully

questioned and proven false (e.g., BJ581 discussed earlier). While some work has been done with a broader analysis of the dead with laboratory methods, the studies by (Linderholm et al. 2008) and (Price et al. 2018), both of which offer osteological sex determinations in their results, do not offer a significant enough overlap to the cohort used in this thesis.

Implementing the sex of a fraction of the cohort and leaving the rest unknown would introduce outliers that would make the interpretation of the results harder as well as skewing the results to an unsuitable degree. Similarly, the stable isotopes of some of the Birka buried have been previously studied in the aforementioned Linderholm et al. and Price et al. but the overlap between the previous cohorts and the cohort of this thesis is not significant enough to include in the MCA as variable. The results of these papers will be used in reviewing the results of the MCA. Additionally, as the osteological data in Birka is generally quite fragmentary due to either burial styles or taphonomical reasons, and comprehensive osteological reports could not be accessed, no variables based on osteological data could be used.

6.2 The analysis

The MCA was run in Rstudio⁵, with R version 4.2.2 (R Core Team 2022), using FactomineR (Lê et al. 2008) and Factoextra (Kassambara et al. 2020) packages. The preliminary checking of the results was done by analysing the data with FactoInvestigate (Thureau et al. 2022). The FactoMineR and Factoextra packages use ggplot2 (Wickham 2016) package for visualisations.

The collected data was fed into Rstudio and formatted into a contingency table, which then was fed into the MCA function. The MCA results were then examined with the FactoInvestigate package's Investigate function. The report created by the Investigate function confirmed that the dataset was not random, and the variability explained by the dimensions is statistically significant. Based on the 4183 simulated data tables of same size and their 0.95-quantile of the inertia percentages distribution when compared to the data presented, the Investigate function posits that only the first two dimensions are relevant, which is why only the first two dimensions are used in the visualisations.

⁵ RStudio 2023.03.0+386 "Cherry Blossom" Release (3c53477afb13ab959aeb5b34df1f10c237b256c3, 2023-03-09) for Windows

With the given 29 active variables and two supplementary variables across the 107 individuals in the weapon burial cohort, the MCA is able to depict 31.28% of the total variance in the first two dimensions. The amount of variance retained by the two dimensions is not ideal, but this result in itself also seems to indicate that burials in display a respectable amount of individuality instead of conforming to very strict and formulaic rules across the variables given. Furthermore, the fact that the weapon burial behaviour of Birka cannot be completely simplified with even the relatively broad selection of variables used in this analysis is a result in itself; Birka weapon burials are not completely formulaic based on these variables but are either more individualistic or the variable that would explain the formula is not present within these variables that were picked out based on the previous research as well as available data. Nonetheless, the results of the analysis still contained variables that are well represented within the dimensions are germane to analysing the weapon burials of Birka. All the variables present in the analysis also cleared the ± 1.96 v.test value in at least one of the two dimensions, which makes their examination statistically relevant.

6.2.1 Variables and dimensions

Examining the variables without the individuals (figure 4, plot 1a) yields some observations that are worth pointing out. Observing the dimensions 1:2 shows that the basic trend can be summarised to essentially having any of the examined grave goods is makes it more likely to have other kind of grave goods and that generally having grave goods in cohort is most related to the burial style of chamber burials. This is in line with the general consensus that the chamber burials mostly contain the richest—or the most elite—individuals in Birka (discussed in Ringstedt 1997). The quality of representation (indicated by the cos2 value) does vary considerably between the variables, which does affect the certainty of some of the more detailed observations, but some can still be made. In simple terms for reading the graph: the warmer the colour of a variable, the more certain is its placement in the graph. In the terms of highest contributions to the dimensions by variables, the variables in the 3rd quartile include all the burial types except for boat burials and in terms of grave goods, shields, coins, purses, gaming pieces, horse equipment, swords, arrows and axes.

Chamber burials are especially strongly related to having swords but are also related to having all the other weapon types. Having coins seems to be related to purses, but the stronger connection seems to be with purses and gaming pieces. Unexpectedly, while in the same direction on the axis, weights are not as closely connected with purses or coins as with

weights as administrative implements in addition to the trading use. The coins do form an interesting detail in its position in the biplot as well as when the dataset is observed. While coins are in the same direction as weights, they are not tied to the weights absolutely. As such, coins might offer a base for other connections than to just trade or commerce. The coin variable group is also diametrically opposed to burial type of cremation, but the negative correlation might very well be explained by the taphonomical reasons i.e., these items not surviving a funerary fire, rather than a strictly social one relating to reasoning for choosing a burial method. Cremations and boat burials do not seem to be particularly linked to having any variable at all. Interesting to note is also that horse equipment is more related to arrows than any other weaponry. The positive horse equipment variable is relatively well represented in these dimensions and more differentiating, indicated by its position further away from the origin than any of the positive weapon variables. This seems to hint at an interpretation that archery in Birka is, as previously discussed, tied quite strongly to equestrianism and that arrows, by extension, might be an indicator of the steppe nomad culture to some extent.

6.2.2 The individuals

When the individuals are coloured based on their burial area (plots 1b and 2a), we can note that individuals from KVB (Kvarnbacka) and BH (Borgs hage) seem to be relatively similar as their individuals are mainly in the same quadrant of the grid. This is also indicated by centre spots of their groups being close to each other (plot 2a). The individuals of Hemlanden (HEM) and Norr om borg (NOB) on the other hand are spread out throughout the grid, mostly overlapping each other. Hemlanden individuals are also in the midst of KVB and BH individuals.

From this emerges some key points: Firstly, the area of burial does seem to hold some significance in the burial behaviour of Birka, as the areas of KVB and BH do seem to separate themselves from the other weapon burials of Birka, even if they are the more marginal groups of the cohort (around 19% of all the burials observed). Secondly, the individuals of NOB at large do not form a separate group when compared against the individuals of Hemlanden based on the variables present in this analysis. This considerably undermines the assumption that the weapon burials of NOB should be viewed as more warriorlike burials than others present in Birka. Taken further, as what might be called the rule of inclusion within the NOB does not seem visible in the variables, the rule must stem from some other individual

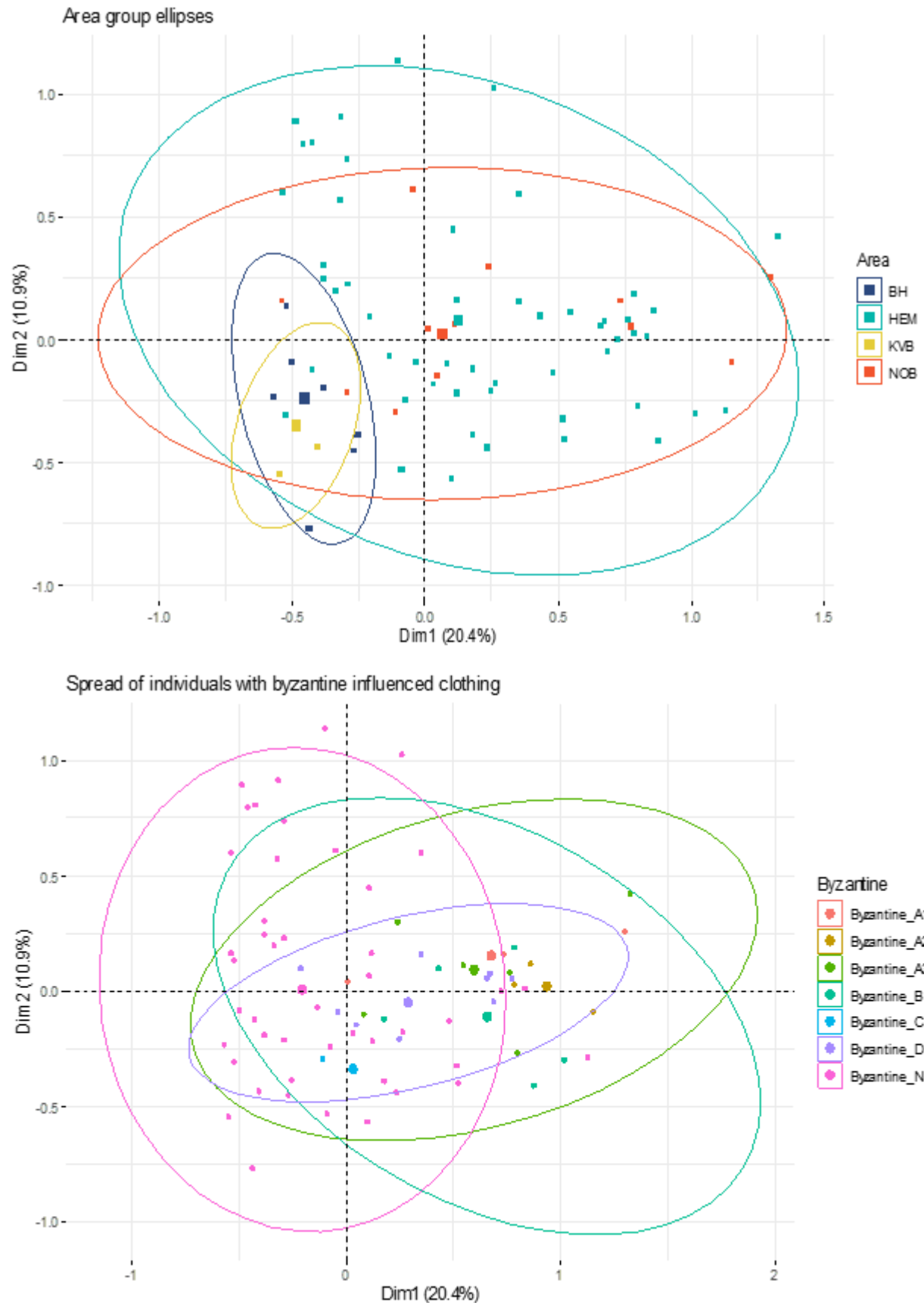


Figure 5 Plot 2a (Above) individuals coloured and ellipsed based on burial area. Ellipses represent standard deviation.
 Plot 2b (Below) Individuals coloured and standard deviation ellipsed based on the ranking by Hägg (2006). Some ranking groups contained too few individuals for ellipses.

would emerge in considering other item variables or examining, for example, the familial relations between the individuals of NOB, cannot be determined in this analysis, but would provide opportunities for further research.

Similarly, the individuals identified by Hägg's definition of Byzantine influenced clothing are spread out across the plot and the subgroups mostly overlap each other and burial areas (plot 2b). Even though one can observe.

that mainly the byzantine influenced individuals tend to be closer to the rightmost edge of the plots, where variables the variables for having coins, purses, gaming pieces and horse equipment are positioned, the subgroups still cover a wide enough range of individuals with different grave goods. This seems to indicate that Hägg's given ranking does not in absolute terms translate to formulaic patterns that would separate the ranking subgroups with the variables given. This means that arguably, the ranking proposed by Hägg is not internally meaningful in the examined cohort and within the active variables present. On the other hand, the individuals with byzantine influenced clothing do form an interesting group as a whole. When examined, the group contains only chamber burials (31 chamber burials out of the 58 present in the whole cohort) and has a higher occurrence of every single variable present than the whole dataset.

Table 1 Table depicting occurrence in the whole dataset vs. occurrence in the individuals with Byzantine influenced clothing.

	Arrow	Axe	Sax	Shield	Spear	Sword	Weights	Purse	Coins	Gaming	HE
Whole	24,30 %	13,08 %	12,15 %	70,09 %	51,40 %	34,58 %	28,97 %	14,02 %	23,36 %	9,35 %	23,36 %
Byzantine	41,94 %	25,81 %	16,13 %	96,77 %	64,52 %	67,74 %	48,39 %	35,48 %	48,39 %	22,58 %	38,71 %

6.3 Clustering

In order to examine the features emergent from the MCA as well in order to combine the results to other studies, the individuals were separated into clusters. Due to the MCA producing coordinates for every individual in the cohort based on their combined variables, clustering the individuals that are the near each other is a relatively simple task. Coordinates of the individuals in the first three dimensions were analysed for the optimal number of k-means clusters with the gap statistic method (Tibshirani et al. 2001) as well as silhouette and wss methods. These methods are essentially ways of examining whether the clusters improve (by labelling individuals more accurately) or deteriorate (introduce more errors) by increasing

(like Sax_N) are less meaningful and thus the clusters are more likely to contain variation within in that variable. There is also a degree of error that comes with striking a balance with a manageable number of clusters and their accuracy, even though the balance was considered by applying the optimisation methods. Furthermore, the method used in later examination depends on the summarised characteristics of the whole cluster rather than singular individuals, which does allow for some throw in accuracy on the bordering individual level. Thus, the clusters are not perfect, but provide a workable tool for extrapolating results based on the few individuals that are present in the cohorts of other studies.

Table 2 Table depicting the cluster placement of the individuals.

Cluster 1	Cluster 2			Cluster 3		Cluster 4			Cluster 5
BJ524	BJ467B	BJ605B	BJ985	BJ495	BJ956	BJ19	BJ366	BJ504	BJ116
BJ581	BJ510	BJ628	BJ1053B	BJ496	BJ957	BJ30	BJ369	BJ722	BJ477
BJ644	BJ514	BJ703	BJ1098	BJ624	BJ1074	BJ62	BJ370	BJ764	BJ592
BJ735	BJ520	BJ713	BJ1125B	BJ643	BJ1151	BJ104	BJ372	BJ914	BJ725
BJ736	BJ532	BJ798	BJ VI	BJ708		BJ193	BJ376A	BJ1035	BJ737B
BJ750	BJ536	BJ801		BJ710		BJ205	BJ377	BJ1076	BJ765
BJ832	BJ542	BJ823		BJ727		BJ320	BJ386	BJ1153	BJ865
BJ834	BJ544	BJ850		BJ731		BJ326	BJ391	BJ IV	BJ904
BJ842	BJ547	BJ872		BJ752B		BJ334	BJ394	BJ A2000	BJ909
BJ944	BJ558	BJ894B		BJ830		BJ335	BJ421		BJ986
BJ III	BJ560A	BJ955		BJ855		BJ336	BJ426		BJ991A
	BJ561	BJ958		BJ886		BJ352	BJ438		BJ1069
	BJ573	BJ977		BJ942		BJ361	BJ452		BJ1077

6.3.1 Cluster 1

The cluster is comprised of 11 individuals, all of one whom are chamber burials. There are eight individuals buried in Hemlanden and three in Norr om Borg. All but one have byzantine influenced clothing and horse equipment. Seven of them have coins (one nondescript coin, one coin from Hedeby and the rest of them are Arabic coins), three have purses, six have weights and four have gaming pieces. The individuals are heavily armed, all of them have swords and shields, all but one have a spear, eight have arrows, seven have axes and six have saxes. The cluster is thus comprised mainly of those with clear indications connections to the south-eastern parts of the Viking world as well as generally being the most affluent per the amount of grave goods present and the burial method of chamber burials.

6.3.2 Cluster 2

A much larger cluster than the previous and is formed by 31 individuals. 29 of the burials are chamber burials with one skeletal and one cremation. The individuals are spread fairly evenly between Hemlanden and Norr Om Borg with 16 and 15 individuals respectively. In terms of weaponry, there are no individuals with axes, only one with a sax and eight with arrows. Only eight have swords. Most of the individuals have shields (26), over half of the individuals have spears (18). The non-weapon variables are not very strongly present, as the individuals that have weights, purses or coins number at two, gaming pieces are not present at all and there are only five individuals which have horse equipment. Most of the individuals have no Byzantine influenced clothing (21), and the ones that do range from rank A1 to D in Hägg's ranking system. The general description of this cluster is then that it contains individuals that are mostly buried in chambers with generally the most common weapons present, but mostly without reasons to infer abroad connections or activity.

6.3.3 Cluster 3

The cluster is mostly quite similar to the cluster 1 and is its neighbouring cluster. Cluster consists of 17 chamber burials, 13 of which are in Hemlanden and four on Norr om Borg. The individuals are still quite heavily armed, but generally lack the two more rare weapons; there are no individuals with saxes and only one with an axe. There are seven with swords, 16 with shields, 14 with spears and seven with arrows. The other variables are quite well present as more than half have coins (13) weights (11) and purses (9). Only three have gaming pieces and less than half (7) have horse equipment. The cluster contains six individuals that have Byzantine influenced clothing, ranging between A2 and D in Hägg's ranking. The cluster is essentially a somewhat diluted version of the cluster 1 in terms of weaponry but is marked by the heavy presence of coins.

6.3.4 Cluster 4

The cluster is the largest of the five clusters and it is comprised of 35 individuals. The individuals are spread out over Borgs Hage (14), Hemlanden (13), Kvarnbacka (6) and Norr om Borg (2). The strongest shared element between the individuals is the burial type of cremation (30). The cluster also contains three boat burials, one chamber burial and one skeletal burial. In the terms of weaponry, the cluster is quite varied; it has individuals with the rarer weapons (two axes and six saxes) and does more or less conform to the expected number

of shields (21). On the other hand, the cluster has far fewer spears (4) and arrows (1) than expected. The number of swords is also a little less than expected occurrence at eight. Out of the other variables, most present are weights with six individuals. There is only one individual with gaming pieces. Purses and coins are not present at all in these individuals. Horse equipment is present in three individuals. There is one individual (BJ1076) with Byzantine influenced clothing, ranking at D in Hägg's ranking. The cluster is quite eclectic and hard to summarise but seems to mainly contain individuals that do not give off the air of abundance in the terms of their grave goods and thus seem unlikely to represent the most elite individuals in the cohort in the terms of their grave goods even though the prestige of boat burials should not be completely dismissed either.

6.3.5 Cluster 5

The cluster contains 13 individuals buried mostly in Hemlanden (11) and two in Norr om Borg. The burial type is split rather evenly between coffin and skeletal burials, both types having six individuals each, but the cluster also contains one chamber burial. Weaponry is rather sparse in the cluster as many of the individuals only have one weapon present in their burials. The cluster stands out quite clearly in the terms of weaponry by containing only one shield—which was the most common armament in the cohort—while having around the expected number of spears with nine individuals. The cluster is scant for swords and saxes as none are present but an interesting feature worth noting in this cluster is the heavy presence of axes. Axes were the second most rare piece of weaponry in the cohort and seemed to have been present only in addition to other weaponry in the previous clusters, whereas in cluster 5 they are present as the only weapon in the burial. In the terms of other grave goods, they are few but present. Weights in five burials, purse in one, coins in three, gaming pieces in two. Horse equipment is not present. Byzantine influenced clothing is not present in the cohort. The cluster seems to contain the individuals of least affluence in the cohort per the number of grave goods, but not completely lacking in variables that were chosen to represent abroad activities.

6.3.6 On the features of the clusters

The groups depicted by the clusters lend themselves to some observations and interpretations. In terms of status, it seems clear that the most affluent individuals are captured by the first three clusters, but especially the clusters 1 and 3. From this it can be inferred that examined

grave goods in some ways tend to centre around the most affluent. I.e., by having something, you are more likely to have something else as well. This affluence also seems to be related to the presence of horse equipment as well the byzantine influenced clothing but whether the presence of byzantine influenced clothing and horse equipment in the burials is the cause or the effect of affluence cannot be said based on this material alone, but there are some reasons for doubting the side of causality. As the horse equipment—and to some degree the clothing—can also be found in the less affluent cluster 4 marked by cremation burials, their presence does not seem to translate to high status treatment completely formulaically in terms of grave goods or burial method. There is also the implication that if the byzantine clothing and equestrianism are imported cultural features, then much of the weapon-bearing elite burials of Birka consists of burials which depict a meaningfully foreign identity. If this is the case, it has ramifications for the interpretation of Birka at large, but there is also the possibility that these are at least in part manufactured locally for other reasons.

Comparing cluster 3 to the cluster 1 raises to likelihood of roughly capturing the high-status individuals with indications of trading; much of the cluster 3 individuals have the combination of coins and weights, whereas in cluster 1 individuals tend to have one or the other.

7 Refining and problematising the results

It would be enticing to conclude that the individuals with the byzantine influenced clothing would then be the most evidently Viking warriors in the cohort. After all, based on the items they were interred with, the group has an over-abundance of weaponry and items like coins or weights that have been used to indicate connections to foreign lands. Furthermore, the individuals did almost totally form the cluster 1 as well as parts of the more affluent clusters (2-3). The problem with that conclusion is in its neglect of examining several questions that can still cast this result into doubt. Firstly, as these individuals were grouped by their clothing influenced by other culture; whether the signs of activity abroad stem from spending time abroad and returning or from being a foreigner in the land they were buried in. In other words: whether we are observing more the burial behaviour and expressed identities of Norse Vikings, the steppe culture of Magyaars (who have been connected with Birka (Lundström et al. 2009) or the culturally hybridized Rus. Secondly, the conclusion is drawn on the assumption that all the weapons are placed for similar—ostensibly practical and ownership

related—reasons. These doubts cannot be answered with just the data that was used in the MCA but rather require incorporating information from several other studies.

7.1 Stable isotopes

The stable isotopes of the burials of Birka have been studied previously, in this thesis two in particular are of interest. First of them, study by Linderholm et al. (2008), examined the relationship between grave goods and diet-indicating stable isotopes of carbon and nitrogen as well as sulphur, which in turn was used to examine whether the nutrition came from different areas. The study contained four shared individuals between their cohort and the cohort of this thesis, as well as the female individual buried in the double burial of BJ644. The study concluded all the weapon burials contained individuals with higher indications of marine diet. One individual (BJ496, in the cluster 3 of this thesis) was found to also have a marine diet but based on the comparison between the carbon value and the nitrogen value, it seems likely that the individual's marine diet came mostly from freshwater or brackish fish. BJ496 was also found to have likely originated from elsewhere, as the individual's sulphur values were very different when compared to the local values. Linderholm et al. also included in their study classifications for individuals involved in trading, having high social status or royalty.

The other study, by Price et al. (2018), used stable strontium isotopes to study the region of birth of individuals among other stable isotopes. Overlap between their cohort and the cohort of this study was eight individuals. Price et al. conclude that there are several non-locals present in the Birka burials based on their strontium values. Price et al. argue that the lower strontium values than present in Birka indicated origin somewhere in northern Europe whereas higher strontium values indicate origin somewhere further away. The study also contained osteological sex and age determinations, as well as other notions on the examined individuals that will be carried over for comparisons. In total, the combination of Linderholm et al. and Price et al. give additional information on 11 individuals of this thesis, even if no individuals from cluster 4 were in the shared individuals. While admittedly fragmentary, the combined information from the aforementioned studies does provide some opportunities for crossing out some claims in the absolute sense and justifications for some levels of extrapolation. First is the indication of marine diet with weapon burial individuals. This would match the assumption of warriorhood being expressed and developed by going abroad and with the Viking mode of transport of choice (or even necessity) being ships, depending more greatly on marine sources of sustenance seems like a reasonable explanation for this

phenomenon. At the same time, we can observe that this feature is not limited to only more heavily outfitted weapon burials in the cohort, as indication of a marine diet is also present in the cluster 5 individual BJ116, who was buried with a spear as their only weapon. This again undermines the sensibility of assuming the increase of warriorhood along number of weapons increasing in the weapon burials present in Birka.

Table 3 Table with combined information from the isotopic studies.

	Linderholm et al. (2008)	Price et al. (2018)
Cluster 1		
BJ644	Royal?, marine diet, trading	Non-local Male, low-range strontium
(BJ644:2)	Female	Local female, connection to east in grave goods, royalty?
BJ834		Local, Female 20-39, Witchcraft?
Cluster 2		
BJ605B		*Non-local, low-range strontium
BJ823	Marine diet, high social status	
BJ1053B		Local, Male 20-39
Cluster 3		
BJ496	Marine diet (brackish/freshwater), non-local, trading	Non-local male, high-range strontium
BJ624	Marine diet	
BJ643		Local
BJ855		Non-local, high-range strontium
Cluster 5		
BJ116	Marine diet	
BJ865		*Local, Male

Asterisk denotes match between individual and obtained results is not reliable due to archival errors per Price et al (2018). High strontium ranges imply origin further away from Birka, lower strontium ranges imply roughly northern European origin.

The non-local origins and the peculiarity in diet of BJ496 published by Linderholm et al. and the concurring results of Price et al. add nuances to the possibilities of interpretation of the individual. As BJ496 is a multiple weapon burial (buried with a shield, a spear and a sword), one of Hägg's individuals (rank A2), was buried weights and coins (Arabic), and had horse equipment; the abroad activities seem likely to be at least partially explained by the individual's origin. Further note is we have something out of the established pattern in the terms of diet occurring in a non-local individual. Why this distinction occurs is of course very hard to prove with the present material, but one interesting hypothetical stems from the act of imitating the diet of the seafaring individuals with the local freshwater fish.

Based on the results of the individuals of BJ644, it is possible to infer some things further. Firstly, while Price et al. only discuss the burial in the terms of being a connection between

Birka and the east, the possibility of BJ644 being an exogamic burial seems quite likely. What is remarkable in this is also the eastern cultural aspects being adopted in the local woman's grave goods, which does highlight the lack of squeamishness in mixing influences and items. Price et al. make similar comments in their article, but connected to the presence of some typologically Finnish items in the graves of the locals. In BJ644 we can also see the presence of horse equipment in a richly furnished grave of a non-local whereas horse equipment is not present in the local high-status individual of BJ823.

Finally, the individual BJ834 serves to challenge some absolute assumptions once again. At the least, the individual being a biological female and being buried with an almost full set of weapons (only missing an axe) does again stand against the assumption of weapons being only in the realm of male burials. Female weapon burials have also been encountered elsewhere in Viking contexts and have been to some degree studied with warnings against a straightforward warrior interpretation (Gardela 2021) with the exception of Price et al. 2019. In Price et al. 2018 (citing Gustin 2010) the interpretation given for BJ834 is of witchcraft, allowing for the interpretation of the presence of weaponry be in the implied and archaeologically very familiar bracket of other or ritualistic reasons. As a sidenote, it seems somewhat curious that this interpretation was not adjusted or even mentioned in Price et al. 2019, despite BJ834 containing mostly the same weapons, same burial type, horse equipment and the two located within about 400 metres from each other. Digression now out of the way, the poignant feature of BJ834 in the larger scheme of things is that there is a precedent of weaponry, even a good number of them, being used to present an identity other than a warrior identity. This again opens the possibility for doubting the assumption of number of weapons indicating an honest biographical warrior identity.

An interesting feature is also found in the examination on the isotopic information gained on the cluster 3, which was noted to possibly contain traders. Considering that the cluster both contains locals as well as individuals with high strontium values from further away, it does seem to highlight the nature of Birka as a meeting place of people sharing similar goals but different origins.

7.2 Weapons, the king and the *hird*

It has been argued that swords in graves signify buried's belonging to the local royal retinue, or the *hird* (Stjerna 2009). Generally, the previous research seems to imply heavily, if not outright say it, that the ones who belong in a *hird* would be the elite warriors of the society.

Thus, identifying the members of the *hird* has been a subject of debate in research and the concept is relevant to this thesis. In a book section regarding the Viking age weaponry in Eastern Middle Sweden, Niklas Stjerna (2009) argues that some weapons hold meaning as symbols of power-relationships and raises a possibility of swords being included in burials as votive offerings and subsidised by the king as indicators of belonging in a *hird*. The reasoning behind this argument is that as swords are prestigious items, placing them into the grave without some manner of compensation the material loss would be too great for the family of the buried individuals. This view, along with indications of communal, rather than individual, nature of possession of spears and shields in Birka is used to argue for the likelihood of local production of swords and other prestige weapons only meant for burials.

This is in direct opposition to the position of Hedenstierna-Jonson (2009), who argues that as some of the swords present in Birka have the sword chape motif of the Birka falcon, the swords represent deeply personal possessions which follow the owner to the grave.

Hedenstierna-Jonson goes further in her doctoral thesis (2006) by giving a total statement that weapon burials in Birka do not contain votive offerings, but professional warriors and their tools. Hedenstierna-Jonson's position in its absoluteness runs directly afoul of the previously discussed Viking penchant for depositing swords in the graves of individuals that could have not used them, as well as the interpretation of BJ834, in which weapons are present with a non-warrior identity. Both positions have their merits and weaknesses. Stjerna's base argument of swords being essentially too prestigious to waste rings true in the sense that swords are commonly accepted as prestige weaponry, and local production for funerary practice would sidestep this problem. This is however presently unproven, as metallurgical studies on Birka weapons do not seem to be available. Another issue is that Vikings seem to have been demonstrably quite comfortable with "wasting" swords in field burials like Repton or arguably Salme, in which it would be considerably harder to argue for the presence of swords manufactured for votive reasons.

In Hedenstierna-Jonson's position, there is again the support of the swords' nature as personal possessions in the foreign context as well as the distinctive sword chapes that hint at bespoke production (even if sword chape and sheath do not necessarily need to be made in the same place and by the same people as the sword). Explanations that would reach the synthesis between the two positions stem from either A) the sword for some reason not being a loss for the family or B) sword not being a loss at all. In the case a, swords being lost to the burial would not matter if the family is not present or the sword would be considered forfeit in any

case, which could be explained by being buried far away from family and home. This could be the case in the field burials as well as in non-locals being buried in Birka. Seeing as there are also locals buried in Birka with swords, case A does not adequately explain the behaviour and necessitates the case B, where the sword is not considered a loss, or the value (symbolic or practical) gained from forfeiting the sword is somehow greater than the forfeit itself.

Another stance is introduced by Fedir Androshchuk (2009), who argues that based on the examination of sword burials in eastern Sweden and Birka, there is no reason to assume that swords indicate status as a member of the military elite, especially in Birka, which Androshchuk states should not be viewed as a “Viking town” but a “town of merchants and craftsmen”. Androshchuk also hypothesizes that based on the distribution of Viking Age weaponry, the individuals for Viking raids were largely pulled from more rural areas, rather than early urban centres like Birka. Androshchuk finishes his analysis by suggesting that swords were likely the remit of all socially active males originating from the countryside. Androshchuk’s stance solves many of the issues relating to the current evidence for Viking warriorhood. If vikings for raiding were indeed drawn mainly from the countryside, it does partially explain the lack of the battle wounded in the archaeological source material based on the early urban centres (discussed in chapter 4). This stance would also be roughly in accordance with the some of the stances set out in the oldest recorded laws of Norway, which stem from the 11th century (Simensen et al. 2021, 25). The older *Gulathing* law states that all free men of major age should be able to present sword or a broad-axe, a spear, and a shield (Simensen et al. 2021, 206). This set of weaponry is said to be mandated by King Håkon the Good in *Fagrskinna* chapter 12 (ibid.). In this sense, if swords are at least every free man’s right if not an outright duty in the Viking society, how could swords be used to indicate belonging to a warrior elite? The law seems to allow the substitution of a sword for a more economical axe. This still gives reason to believe swords despite their almost mandatory nature have been more prestigious and socially discriminating weaponry but equating them to an indication of class might not be supportable.

Similarly to swords, axes have also been suggested as indicative weapons of royal connection in Birka by Hägg (2006), where it is argued that the individuals with byzantine influenced clothing who had axes might have served in the Byzantine royal guard as the guard has been symbolically linked to axes. Hägg goes further and posits that these kinds of connections, along that of Harald Hadrada, would then influence the adoption of axes in the medieval royal coat of arms of Norway. This is a compelling argument but does little to explain the axes

present in the more ascetically fitted graves that have axes as their only weapon in the cluster 5. If axes are used to signify the high status connected with serving in a prestigious position, why does it not always translate to higher status burials? The relative rarity of axes in the burials in and of itself is something of an oddity. Despite axes being considered easier to make and accrue (Williams 2019, 11) as well as part of the weaponry of every free man mentioned in the Gula ting law (Hjardar et al. 2016, 146; Simensen et al. 2021, 205) as well as the first weapon for the free man to get and a particularly Viking weapon (Hjardar et al. 2016, 156); the axes only appear in the richest and the poorest of weapon burials in Birka. Again, the proposed role of a weapon as an indicator of rank alone does not satisfactorily explain the conditions that can be observed in the Birka burials.

7.3 Gaming and trading

Returning back to inspect the relevance of gaming pieces as well as trading equipment, we can notice some aspects that aid in their interpretation. Leaning back on the results of isotopic studies to close out some absolute statements, the individuals with marine diet indications do not in absolute terms have gaming pieces as their grave goods. Gaming pieces are present with BJ644 of cluster 1 and BJ624 of cluster 3, but otherwise absent in the other individuals that we know to have marine diet indications. In more general terms, gaming pieces are present in 10 individuals of the whole cohort, most of whom have clothing identified by Hägg (7), but not absolutely so. Similarly, all but two are chamber burials. Shields are found on nine of the individuals, which does link gaming to shield-bearing in the cohort. Other weapons do not quite reach similar levels of presence. Least armed individual with gaming pieces is BJ710 of cluster 3, only weapon being a shield. Thus, it can be concluded that gaming pieces are mostly present in chamber burials and are mostly linked to the Hägg's individuals, but not absolutely so. As they are rare in terms of grave goods, but not limited to only the most prestigious graves, gaming pieces seem to be more of a personal item than an indicating and formulaic one limited to only e.g., sword-carrying individuals. Further note is that despite the heavy slant on the Byzantine-influenced individuals, gaming pieces are also present in BJ477 of cluster 5, which is a coffin burial without any particularly abroad connections in clothing, coins, or weights.

Trading equipment, formed by weights and purses in this work show some features worth mentioning. As was demonstrated by the MCA variable relationships, weights are not strictly defined by the presence of coins or purses. This is noticeable from the data itself: there are 31

burials present in the cohort with weights, but in this group purses are present only in seven and coins in 13 burials. Similarly, Hägg's individuals form about half of the burials (15) which have weights. From this emerges some notions. Firstly, purses do not behave similarly to weights, but might be related to something else. Secondly, weights likely have other functions than strictly abroad activity related ones. The most natural split in the functionality of weights seems to come from coins, as coins are present in a little less than half of the burials which have weights. This could form a distinction between trading individuals and individuals with more administrative functions. Examining the individuals with weights without foreign coins reveals that the list includes amongst others BJ581, BJ644 and BJ736, all of whom are heavily armed, buried in chamber graves and belong to the cluster 1.

8 Reining in Birka

In a study on status and its visibility in Birka chamber burials, Nils Ringstedt (1997) approaches the quantification of Birka burials from with a methodology that contains a vast array of considerations ranging from the spatial (size of the chamber, volume of the mound, and burial area), thematic categories of items (weapons, household, tools, jewellery etc.), gendered items as well as the variety of grave goods in examining the expressions of status in the chamber burials. After the examination of the data, Ringstedt notes that the spatial metrics of burial chambers generally seem to correlate with the overall wealth presented in the grave goods of the burials (Ringstedt, 1997), i.e., the more you have, the bigger your grave or its mound is likely to be. After discussing some of the considerations on the interpretation of chamber burials, ranging from ethnic to religious, background of the burial habit in European archaeological records, and the differing interpretations, Ringstedt goes on to cautiously conclude that the chamber burials represent the wealthy elite present in Birka that “required the use of special burial customs” (Ringstedt 1997, 16–17) and could have included foreigners in the local service as well as local warriors, merchants, advisors and other high status individuals (*ibid.*).

Ringstedt's study is by and large part of the long-standing consensus of Birka chamber burial representing the elite of Birka and the meticulous study provides a number of important insights, but it is in the almost offhanded reference to K.R. Dark's writing on competitive destruction (Dark 1995, 105) where Ringstedt introduces an interpretation that seems to explain much of the incongruencies present in the Birka weapon burials. Per Dark (1995, 105) competitive destruction is a form of non-violent competition related to competitive

consumption, where status comparative to others is expressed by the ability to destroy or waste precious artefacts and other resources; making the stratification of status between one and the others clear. Viewing the Birka weapon burials through this theoretical viewpoint allows to harmonise many of the “odd” features present. In a society that highly values martiality in child-rearing (Raffield, 2019), has raiding seasons as a way of life, has martial violence as a staple in the cultural core narratives of the sagas and celebrates conquests, expressing status through referencing the tools of violence seems completely rational. Burial of a sword, be it an individual or a votive possession, is not a loss, but an act of jockeying for status. Axes being present as the only weapons or as a form of a complete set of weaponry is also sensible in this view; axe can be at the same time a cheaper alternative to a sword in poorer burials (Hjardar et al. 2016) as well as the proverbial cherry on top in richer burials.

Similarly, from the viewpoint of competitive destruction, despite horses not being all that essential for traversing an island as small as Björkö or particularly suited for viking seafaring raiding, offering horses as grave goods or referencing them through riding equipment again offers a possibility for elevating status by destruction rather than necessarily being all that linked to conducting warfare or practical matters. Whether the individuals that present this burial custom should be counted as representing Viking characteristics, adopted behaviour from abroad or just directly culturally foreign population is a matter of definition and debate. Birka grave goods show readiness for using typologically foreign items in the burials of locals, but on the other hand it is also clear that there is present a marked population of foreign individuals that have items that reference a whole different way of warfare and identity; as much is discussed at length by Lundström et al. (2009), where individuals are identified as having bow equipment that is tied to horse-archery of the steppe peoples rather than the more local variety. Whatever the case may be, these individuals do not escape the signs of competitive destruction, but rather seem to readily participate in it. A strong indication of weapons being used as more liberally than what would be convenient for warrior identification is the earlier discussed BJ834, where weapons are found in a high-status burial without necessarily evoking the identity of a warrior, in the view of competitive destruction weapons are there as a part of expression of elite status. Returning to the parlance of the chapter 2.1 of this thesis, weapon burials of Birka with their individuality and incongruencies are better explained at scale via the primary assumption of martial expression as a form of competitive destruction, rather than straightforward assumption of practical warriorhood.

A very different approach to examining Viking burials but with similar implications as the notion of competitive destruction can be gained from Neil Price's paper (2010) on the drama of mortuary behaviour in the wider Viking context. Price's proposed framework of understanding the Viking burial behaviour as a type of very deliberate "theatre" and narration is built by examining burials of different sites like Kaupang and Oseberg, the written report of Ibn Fadlan and other sources. The cautious and self-admittedly conjectural conclusion that Price eventually draws is that irrespective of the terminology what one calls the specific aspects of funerary process, there are shared *motifs* within and between burial sites which are created by the grave goods (which Price calls "materialised narrative") and burials themselves. Price proposes that while the narratives of burials likely have had references to the individuals themselves and perhaps biographical events, the burials were also used to participate in a narrative connected to the family or community, as well as deliberate references to mythological heroes.

This aforementioned framework could as well be employed to describe the Birka weapon burial behaviour as it presently appears. In this framework, the Birka weapon burials have the shared motif of using weaponry to tell the story of something. Despite the differences in the individual level that differ between the possibilities evoking meanings of witchcraft, galloping on the plains of the steppe nomads, and displaying the mundane tools of trading or administration, the fact remains that roughly 9-15% of the total in Birka⁶ participate in using this motif of weaponry.

In addition to the general framework, Price's paper (2010) also contains commentary on the effects of high status on the narrative construction could be extrapolated to explain burials of Birka. Firstly, in the context of discussing the funeral described by Ibn Fadlan, and the funeral taking place over at least ten days, Price highlights the making of "extremely rich" clothes for specifically the funeral as well the inordinate costs accrued by this process and the brewing of beer for the funeral ceremonies. This very directly ties the funerary process together with the concept of competitive destruction as well as opens possibilities for doubting that some of the clothing identified by Hägg (2006) might have been bespoke funerary pieces highlighted by thread made of precious metals as Price (2010) does mention similarities in between the description and some of the burials in Birka. Secondly, Price (2010) notes that the description

⁶ The cohort of this thesis is comprised of 107 burials of the total of 1255 burials excavated and catalogued in the björkögravar database at the time of writing. The weapon burial cohort offered by the database itself, "Vapen, rustningar och fångstredskap", is comprised of 182 individuals.

of the funeral bares barely any mention of the placed grave goods belonging to the buried, which ties into and strengthens the possibility of using a “straight-to-Valhöll funerary package” as expressed by Price et al. (2019) and discussed in chapters 1 and 2.1 of this thesis. Thirdly, while discussing the Ibn Fadlan’s description Price (2010) notes that as all the proceedings are observed by the “Angel of Death” acting as a funeral director, all the features that could less diligently be interpreted just as the Viking/Rus equivalent ceremonial partying are actually part of a very deliberate process that does not necessarily have anything to do with enjoyment. Focusing on the fact that raping a screaming female slave while sharing a bed with a corpse going through stages of decomposition can hardly be seen as pleasantly celebratory or an act of desire, Price deems this part of the ritual to be an expression of power. Assuming that Price’s reading is right, the implication is quite clearly that expressions of power play a key role in narrative language of high-status burials.

Regardless of whether Birka burials are examined through the framework of competitive destruction, the materialised narrative framework or the synthesis of the two, the primary assumption of martial expression cannot rule out the buried individual’s participation in direct warriorhood or viking activities. As much is indicated through the similar indirect signs of participation in raiding in high status burials as well as lower status burials through the stable isotopes depicting a marine diet. However, in the higher status individuals there are more elements to essentially doubt the veracity of the warriorhood presented in the grave goods.

Were the weapons deposited just personal possessions of a warrior, we should see the full set of spear, shield, sword, sax, axe and bow more readily spread out in the burials of Birka as we have the marine diet individuals in the lower end of the equipped burials, but that is not the case. Instead in Birka, the weaponry seems to be concentrated most to the graves that present the largest amounts of resources (in artefacts or in amount of work put into the construction of the graves themselves) “wasted” or destroyed by the funerary process. This is demonstrated in the results of Ringstedt as well. While Ringstedt’s results need to be updated in some details (e.g., BJ581 being a female grave rather than a male grave as marked), Ringstedt’s results on ranking chamber burials by area or cubic capacity as well as the wealth of grave goods still stand. Sadly, Ringstedt does not provide a full ranking list in his work but mentions some key individuals. According to Ringstedt, the highest-ranking individuals in the terms of wealth and likely to belong in rich households contain BJ750 (ranked highest) and BJ644 (Ringstedt 1997, 12) and goes on to mention that out of the 20 highest ranking chamber graves 11 contain weapons and eight equestrian equipment. In ranking burials by their area and cubic

capacity, Ringstedt notes that BJ750 is also the highest ranked in cubic capacity and third in the area of the burial; BJ581 is ranked ninth in value, seventh in cubic capacity and 13th in terms of area (Ringstedt 1997, 13). All of these individuals that Ringstedt mentions belong to the cluster 1.

Taking in again the features that have been discussed regarding the weapon burials of Birka, it evidently cannot be said that more weapons nigh automatically translate to a warrior identity (as we have weapons in graves that have been interpreted as non-warrior identity) nor can it be said that lesser number weapons translates to more dubious participation in warrior activities (per the marine diet present in the lower status burials). The higher status individuals also contain more that have some features that stand out from the expectation based on the evidence, be it BJ496's pseudo-marine diet, BJ581's sex or BJ834 being interpreted as connected to witchcraft in terms of what we can expect Viking warriors to be based on the evidence abroad or within Birka's context.

Similarly, being buried near the Borg does not seem to seem to mean being more conclusively linked to warrior identity based on the weaponry, as the same pattern of burials in terms of weaponry and the select items does not concentrate on the Borg but is spread to the Hemlanden area as well. This does not leave many other options than to deduce that the most heavily armed individuals in the burials belong to a social class that requires the display of weapons as a burial rite—as well as participation in the game of competitive destruction or narrative building—but which cannot be explained by warriorhood alone. From this follows that those who have been buried with the most, have been buried by the social circle to whom it was most important to bolster the status of the deceased and by extension, their own. The exact reason for this behaviour is not really in the remit of this work, but this could be explained by any number of familial, hereditary, or political reasons. As seen in the terms of trading equipment, there could also be possibilities in identifying administrative individuals, who could have expressed their stature in the hierarchy by wearing weaponry.

All of this leads to the somewhat counter-intuitive conclusion that in Birka, having more weapons present in the burial also gives more reason to doubt the “truthfulness” of the presented viking warrior identity. A counterpoint to this could be given in the sense, that obviously the lessened reason for doubt for poorer burials stems from the fact that there less material to work with. This is admittedly true but does not deter from the fact that we have reasons *presently* to doubt the richer burials more as there is more evidence and a clear motive

for embellishing the narrative of warriorhood by exorbitant acts of martial expression in burials. This forces to adopt a position where at the present coverage of evidence, whether it is osteological, stable isotopes or use-wear analysis, Birka does not offer much in terms of establishing a sound and cohesive argument on who was a warrior by participating directly in combat and by extension, what are the warriors marked by in terms of grave goods or burial styles.

9 Discussion

The subject matter of this thesis has required a broad scope of topics to be discussed as the whole concept of warriorhood demands examination from multiple angles. This has inevitably led to prioritising some aspects over others, but this is a never-ending concern. There are always more case studies that could be considered, there are always more variables that could affect the results and an endless number of theoretical perspectives which could provide new insights into the subject matter but considering the—in many ways incomplete—state of archaeological understanding and definition of Viking warriorhood, these concerns are somewhat premature. The work in this thesis is by no means the final word on archaeological view of Viking warriorhood nor was it ever intended to be one. The intent was to examine and test the basic assumptions, argumentation and suitability of the evidence used in the formation of archaeological view of warriorhood in the Viking context. In this regard the thesis has been largely successful.

The critical analysis of argumentation and source material in this thesis has been able to challenge the usefulness of some of the features and presuppositions that are present in the current archaeological Viking warriorhood discourse. For instance, based on the results of the critical analysis, the sensibility of aiming to adopt the most similar image of warriorhood in archaeology as the people of the past *might* have had in the past should be challenged. Adopting that particular research aim and base of argumentation does not seem useful in reaching more accurate and refinable information, but instead allows to conflate several research questions which have very different implications. Without an accepted and accurate definition of what the term warrior contains, it is at the same time premature and largely scientifically meaningless to ask questions like “Did the Vikings have warrior women?” as the inherent inaccuracy of the question allows for similarly inaccurate or subjective answers.

The MCA employed in this thesis can also be viewed as successful in many ways despite the complicated and fragmentary data provided by Birka burials. The results of the analysis provided new empirical ways of arguing for and against some of the assumed connections between several grave goods, but surprisingly the challenges faced in the accuracy of the MCA were also useful. The very fact that the MCA was able to depict only a limited number of variation present in the dataset simplified to the variables that were largely based on the conventional warrior indicators was a result in itself. Either the Birka burials largely defy the formulaic assumption of warriorhood contained by grave goods due to their individuality or the correlation is in lies in some other grave good or feature that was not considered. This hints at possibilities for future research, but even mostly similar analysis with some additions could yield stronger results. For instance, incorporating the size of the chamber burials or mounds as well as the instances of multiple weaponry directly into the multivariate analysis and changing the method into a multivariate analysis method that can process mixed data. Methods like MFA (Multiple Factor Analysis) or FAMD (Factor Analysis of Mixed Data) could potentially refine the understanding material distribution in the burials further. Similarly, the multivariate analysis methods could be used to examine burials with a broader scope for previously unknown patterns and relationships.

The work in this thesis does highlight the need for gaining new empirical information from the already existing archaeological source material as well as the need for new excavations. Leveraging the data by relatively advanced statistical methods does provide new insights, but the current ability is severely limited by lack of coverage in the more modern archaeological methods. In the case of Birka, much of the currently available source material concerning burials is based on over 100-year-old notes, standards and descriptions which have been further damaged by unfortunate archival mistakes. New excavations conducted with modern documentation methods, like photogrammetry and laser scanning, combined with artefact and bioarchaeological analyses would provide material for a completely different level of understanding the phenomena. With new source material, the correlation of some of the debated warrior indicators could be better examined against relevant bioarchaeological and artefact-oriented information. This could be very impactful for the field of research as the current coverage of items that can be tied to warriorhood with lesser amounts of attribution problems is very limited.

The results of the work done on this thesis are based on the many ways limited and fragmentary data that is currently available. This does make them in no uncertain terms fragile

to new evidence. The, in many ways, sceptical stance of this work could be proven to be needlessly so by providing corroborating evidence (that would not be as affected by problems of attribution) for some of the claims of concerning the conventional argumentation of warrior burials. Maybe, when examined at scale, the marine diet is more concentrated on the more heavily armed burials. Maybe all the swords of these prestigious burials show evidence of battle damage and repair. Perhaps there is unexamined osteological material in the Birka collections that gives more reasons for direct warrior interpretation or maybe new excavations uncover an elusive “viking warrior goldilocks” who has been preserved to sufficient degree with enough grave goods to offer a complete picture of viking warrior burial customs in the homeland. Even if the fate of this thesis’ sceptical stance to the correlation of weapon burials to direct warriorhood is to be proven wrong in the near future, the way it will be done will likely in more ways than not prove the importance and relevance of the problematisation of the practice provided in this thesis.

10 Conclusions

Warriorhood and by extension the term warrior in the study of the Viking Age from an archaeological perspective has been shown to have been mostly an implicitly rather than explicitly defined concept. This is evidenced by the tendency in archaeology to use terms *weapon burial* and *warrior burial* essentially interchangeably in the Viking Age archaeology. Warrior as a term in burials has thus been mostly formed by its relation to weaponry. One peculiarity of this practice of defining warriorhood archaeologically is that the problems of attribution—i.e., the difficulties in proving that the weaponry of the burial belonged to the buried has been and likely will be very challenging—have been widely acknowledged and discussed without the cautions actually following into practice in larger effect than mentions in the discussion sections of papers and theses.

The prevalence of implicit definition of warriorhood has arguably left space for using the relatively loose definition of warriorhood. The loose definition of warriorhood does not limit the definition of warrior to only those who are vocationally the professionals of warfare and exhibit this by preparing themselves for war or martial activities and participate in them. Instead, the loose definition essentially treats forms of more symbolic or societal warriorhood that can be found in e.g., burials of children with weaponry they would have lacked the physique to use, as equal warriorhood to the more direct and practical one. While this loose definition can justifiably be defended as being closer to the emic (intra-cultural) definition of

warriorhood in the Viking society, it is in many ways problematic for archaeological research. In a way, aiming for harmonisation of the archaeological view of warriorhood with the assumed loose emic view of Viking warriorhood does not advance the aims of understanding, but rather dulls the possibilities of inquiry and muddies the argumentation.

Archaeology is mostly limited to the etic (inter-cultural) type of inquiry, especially when the cultures studied have left little to no direct literary sources and have to be accessed and interpreted through the material culture that in a direct sense is mute on many aspects of ideas, thoughts, meanings, and beliefs. Thus, it seems inescapable that the aforementioned aspects of cultures are to some extent out of reach and this forces to accept certain degrees of uncertainty in the results of archaeological research. This acceptance in the form of the loose warrior definition has been taken to the point that the term *warrior* has been diluted to the point of near uselessness. If the application of the term to an individual does not need to be justified by evidence of combat nor can it be justified by giving the exact characteristics of the indirect and symbolic ways of warriorhood, there is no meaningful way to prove or disprove its relevance archaeologically. This makes the term consequentially largely pointless for further research.

The loose definition also implies that symbolical warriorhood and direct warriorhood are archaeologically the same, but the ways invite very different research questions. Direct requires the answer to the question “Who in Viking society participated in warfare?” whereas indirect requires “Who in Viking society was allowed to exhibit this type of symbolism?”. In terms of origins, the loose definition seems to largely stem from the earlier stages of archaeological methodology which had not developed methods for uncovering corroborating biographical evidence from the dead themselves or their grave goods but relied more heavily on mere presence of grave goods and their typologies. This older methodology created a very light burden of proof for establishing warriorhood on essentially weapons alone, which has also lead to the—now proven false—assumption of weapon burials only being in the realm of males of the Viking society. Despite the development of archaeological methodology, the loose definition, which still relies on conventional light burden of proof for warriorhood, has not matured with the methodology and available evidence, as there are presently ways of answering the research questions surrounding the ways of warriorhood.

The Scandinavian archaeological source material is in many ways very challenging for establishing a clear correlation between weapon burials and participation in warfare. This can

be partially explained by the challenging taphonomical conditions, which affect the availability of osteological source material as well as prevalence of cremations as a burial type. These are not, however, the only reasons. The majority of studies that concern themselves with Viking burials and have done osteological studies use source material from the Viking urban centres, which for many possible reasons do not seem to be the places where the fighting vikings are buried; hazards of the vocation include dying abroad, the viking bands might have been mustered from rural areas, and there is also the possibility of individuals actively in the vocation inhabiting societally liminal roles which would require different burial rites and sites that have not been yet found. Additionally, there does not seem to be systematic studies conducted on the histories of the weapons themselves which are buried in the weapon burials, which would clarify whether the once functional weapons had actually been used. Simply put, the Scandinavian source material is at the same time limited and possibly yet to be found, but at the same time the existing material has not been leveraged to the extent possible with current methods.

The strongest and most cohesive evidence of the martial vikings comes from the targets of viking activity rather than its origins. In the form of mass graves and battlefield cemeteries, the discussed sites of Salme, Ridgeway Hill and Repton can very directly be used to answer the question of who or what kind of people participated in warfare as well were trained for it. The profile drawn based on these sites is surprisingly specific: vikings seem to have been males from Scandinavia and Slavic areas with robust physiques and signs of combat trauma or skeletal distress, aged between 15-35 and an estimated stature of over 170 cm. This profile stays consistent between the independent sites. The strength of these sites as evidence comes from the use of more or less modern bioarchaeological methods as well as the benefit of combat being contextually evident rather than just implied by grave goods. The foreign source material also establishes archaeologically the presence of a portion of the Viking population being groomed for war. As it stands, in establishing the viking warriors, the strongest case for it can be formed by looking at the phenomenon from the outside inward and comparing this information to the Scandinavian material, rather than focusing on establishing it from the Scandinavian context alone.

Based on the examination of the Birka weapon burial cohort through the research history and the multivariate analysis performed, the current coverage of bioarchaeological information or artefact studies of the cohort is insufficient to conclusively identify patterns which would indicate individuals who participated in combat. Similarly, the pattern established by

examining the viking burials abroad cannot presently be effectively used to compare against the cohort of Birka at scale. The results of the multivariate analysis were used to leverage the fragmentary bioarchaeological information provided by the stable isotope analyses, which contain indications of a seafaring lifestyle that would match the viking activities during the Viking age. The analysis of this thesis showed that there was presently no reason to primarily assume that individuals buried with more weapons are more or less likely to have participated in this way of life. The relevant bioarchaeological indicators are also found in the burials of the less-equipped burials.

Conversely, the clusters of the affluent weapon burials contained more burials which gave reasons to doubt the veracity of the proposed warrior identity of the buried individual by either containing features that have been interpreted to relate to non-warrior identities, are in contradiction with the profile of vikings abroad or contained peculiarities in the marine diet that was used as an indication of viking lifestyle. The most armed burials tend to also be the most expensive in the terms of resources used for their construction and other grave goods. The examination of the MCA results and previous research showed that neither axes or swords seem to be useful as indications of belonging to a class of warrior elite. Neither weapon type is exclusive to the elite burials present in the cohort. The conclusion to be drawn from this is that elite funerary behaviour in Birka contains aspects of narrative identity and status construction that is partially expressed by destruction of weaponry in the burial process as a part of social behaviour of competitive destruction.

The interpretation of weapon burials of Birka is also further complicated by the site's multicultural nature as a centre of production and trade. This also factors into the weapon burials as the weapon burials contain non-local individuals with culturally distinct items as well as locals whose burials can be interpreted either as showing either the adoption of other cultural influences or the willingness to use cultural effects not particularly related to the origin of the buried.

The effect of all the factors considered in this thesis on the concept of warrior burials and the archaeological definition of warriorhood in the Viking context is profound. The loosely defined concept of warrior burials has not matured with the advance of archaeological methodology or evidence. In its present condition, the term invites the use of lower burden of proof which no longer represents the capabilities of archaeological inquiry nor is particularly useful to it. Based on the challenges of archaeological warriorhood, the term is at its most

useful when it is clearly defined and is limited to the characteristics that can be proven with archaeological methods. A clear opportunity for this approach comes from defining the term through its direct and practical connections to warfare which can be archaeologically observed. Warrior burials as a concept has similar properties. The current interchangeable nature of warrior burials and weapon burials as concepts no longer represent the reach of archaeological methods or the picture gained with them of Viking funerary behaviour. As a result, the term of warrior burial would similarly be more archaeologically useful when it is limited to the burials that can more cohesively be shown to contain warriors. The term of weapon burials is by its nature more neutral, and the adjustments are not as necessary.

Discussion concerning the presence of weapons, armour and other pieces of martial artefacts in Viking burials is likely to stay as a prominent feature of the field of research. In the light of the problems highlighted in this thesis, I suggest that the primary terminology for this topic should migrate more towards examining weapon burials primarily as a form of martial expression. Concept of martial expression (or something similar) allows to discuss this observable feature of Viking burials without assigning labels that prove problematic if they are not more cohesively supported.

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12 Appendices

1. Script for MCA

```
#Loading the required packages
Packs <- c("ggplot2", "FactoMineR", "factoextra", "FactoInvestigate", "cluster")
lapply(Packs, library, character.only=T)

#Loading the data for analysis from a .csv with individual names
data <- read.csv(file = "XXXXXXXXXX\birx.csv", sep = ";", row.names = 1)

#Coercing the columns of the data frame into factors
data[1:14] <- lapply(data[1:14], factor)

#Running the MCA with FactoMineR and treating the Area and Byzantine variables
# as supplementary
birmca <- MCA(data, quali.sup = c(1,2), ncp = 5)

#Checking the MCA with FactoInvestigate without HCPC clustering
# and generating an automated report as a word file
Investigate(birmca, display.HCPC = F, document = c("word_document"))

#extrating results for individuals and variables in the analysis
ind <- get_mca_ind(birmca)
var <- get_mca_var(birmca)

#Extracting the coordinates of individuals for clustering
indcoords <- ind$coord

#Removing the coordinates of other than the first three dimensions
indcoords <- indcoords[,-c(4,5)]

#Setting the seed
set.seed(1876)

#Clustering and visualising the results
kmeans(indcoords, centers = 5, nstart = 25)
```


2. Table of the Birka cohort

Ind.	Area	Byzantine	Type	Arrow	Axe	Sax	Shield	Spear	Sword	Weights	Purse	Coins	Gaming piece	Horse equipment	Cluster
BJ III	HEM1E	N	Cremation	Y	Y	Y	Y	Y	Y	N	N	N	N	Y	1
BJ524	NOB2A	A1	Chamber	Y	Y	N	Y	N	Y	N	N	Arabic	Y	N	1
BJ581	NOB2B	A2	Chamber	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	1
BJ644	NOB2A	A1	Chamber	Y	Y	N	Y	Y	Y	Y	Y	N	Y	Y	1
BJ735	HEM1C	A3	Chamber	N	N	Y	Y	Y	Y	Y	N	Hedeby	N	Y	1
BJ736	HEM1C	A2	Chamber	Y	Y	N	Y	Y	Y	Y	N	N	N	Y	1
BJ750	HEM1C	A3	Chamber	N	Y	N	Y	Y	Y	Y	Y	Arabic	Y	Y	1
BJ832	HEM1C	B	Chamber	Y	N	Y	Y	Y	Y	N	N	Arabic	N	Y	1
BJ834	HEM1C	N	Chamber	Y	N	Y	Y	Y	Y	N	Y	Arabic	N	Y	1
BJ842	HEM1C	D	Chamber	N	Y	N	Y	Y	Y	N	N	Y	N	Y	1
BJ944	HEM1A	B	Chamber	Y	N	Y	Y	Y	Y	Y	N	Arabic	N	Y	1
BJ VI	HEM	N	Cremation	Y	N	N	N	Y	Y	N	N	Frankish	N	N	2
BJ1053B	HEM1D	N	Chamber	Y	N	N	Y	N	N	N	N	N	N	N	2
BJ1098	HEM1A	N	Skeletal	N	N	N	Y	Y	N	N	N	N	N	N	2
BJ1125B	HEM1B	A3	Chamber	Y	N	N	Y	Y	N	N	N	N	N	N	2
BJ467B	NOB2A	N	Chamber	N	N	N	Y	N	N	N	N	N	N	N	2
BJ510	NOB2A	N	Chamber	N	N	N	Y	Y	N	N	N	Arabic	N	N	2

Ind.	Area	Byzantine	Type	Arrow	Axe	Sax	Shield	Spear	Sword	Weights	Purse	Coins	Gaming piece	Horse equipment	Cluster
BJ514	NOB2A	D	Chamber	N	N	N	Y	Y	Y	N	N	N	N	N	2
BJ520	NOB2A	D	Chamber	N	N	N	Y	N	Y	N	N	N	N	N	2
BJ532	NOB2A	N	Chamber	N	N	N	Y	N	N	N	N	N	N	N	2
BJ536	NOB2A	N	Chamber	N	N	N	N	Y	N	N	N	N	N	N	2
BJ542	NOB2A	A1	Chamber	N	N	N	Y	Y	N	Y	N	N	N	N	2
BJ544	NOB2B	N	Chamber	N	N	N	Y	N	Y	N	N	N	N	N	2
BJ547	NOB2A	N	Chamber	N	N	N	Y	Y	N	N	N	N	N	N	2
BJ558	NOB2A	N	Chamber	N	N	N	Y	Y	N	N	N	N	N	N	2
BJ560A	NOB2A	N	Chamber	N	N	N	N	Y	N	N	N	N	N	N	2
BJ561	NOB2A	C	Chamber	N	N	N	Y	N	Y	N	N	N	N	N	2
BJ573	NOB2A	N	Chamber	N	N	N	Y	N	N	N	N	N	N	N	2
BJ605B	NOB2A	N	Chamber	N	N	N	N	Y	N	N	N	N	N	N	2
BJ628	NOB2A	C	Chamber	Y	N	N	Y	N	N	N	N	N	N	Y	2
BJ703	HEM1C	D	Chamber	N	N	N	Y	Y	N	N	N	N	N	Y	2
BJ713	HEM1C	N	Chamber	N	N	N	Y	Y	N	N	N	N	N	Y	2
BJ798	HEM1C	B	Chamber	Y	N	N	Y	N	N	N	Y	N	N	N	2
BJ801	HEM1C	N	Chamber	N	N	N	N	Y	N	N	N	N	N	N	2
BJ823	HEM1C	N	Chamber	N	N	N	Y	N	Y	Y	N	N	N	N	2
BJ850	HEM1B	N	Chamber	Y	N	N	Y	Y	Y	N	N	N	N	N	2

Ind.	Area	Byzantine	Type	Arrow	Axe	Sax	Shield	Spear	Sword	Weights	Purse	Coins	Gaming piece	Horse equipment	Cluster
BJ872	HEM1C	N	Chamber	Y	N	N	Y	N	N	N	N	N	N	Y	2
BJ894B	HEM1B	N	Chamber	N	N	N	Y	Y	N	N	N	N	N	N	2
BJ955	HEM1A	N	Chamber	N	N	Y	Y	Y	N	N	N	N	N	Y	2
BJ958	HEM1A	D	Chamber	N	N	N	Y	N	N	N	Y	N	N	N	2
BJ977	HEM1A	D	Chamber	Y	N	N	Y	N	Y	Y	N	N	N	N	2
BJ985	HEM1A	N	Chamber	N	N	N	Y	Y	N	N	N	N	N	N	2
BJ1074	HEM1A	N	Chamber	N	N	N	N	Y	N	Y	Y	Arabic	N	N	3
BJ1151	HEM1B	A3	Chamber	N	N	N	Y	Y	Y	N	Y	Arabic	N	N	3
BJ495	NOB2B	A3	Chamber	N	Y	N	Y	Y	N	N	N	Arabic	N	N	3
BJ496	NOB2B	A2	Chamber	N	N	N	Y	Y	Y	Y	N	Arabic	N	Y	3
BJ624	NOB2A	D	Chamber	Y	N	N	Y	Y	Y	N	Y	N	Y	N	3
BJ643	NOB2A	A3	Chamber	N	N	N	Y	Y	Y	Y	N	Arabic	N	N	3
BJ708	HEM1C	N	Chamber	Y	N	N	Y	Y	N	Y	N	N	N	Y	3
BJ710	HEM1C	A2	Chamber	N	N	N	Y	N	N	Y	Y	Denar	Y	Y	3
BJ727	HEM1C	N	Chamber	Y	N	N	Y	Y	N	N	Y	Arabic	N	Y	3
BJ731	HEM1C	A3	Chamber	Y	N	N	Y	Y	Y	N	Y	Arabic and English	N	N	3
BJ752B	HEM1C	D	Chamber	N	N	N	Y	Y	Y	Y	N	Arabic	N	Y	3
BJ830	HEM1C	N	Chamber	Y	N	N	Y	Y	N	Y	N	Arabic	N	Y	3

Ind.	Area	Byzantine	Type	Arrow	Axe	Sax	Shield	Spear	Sword	Weights	Purse	Coins	Gaming piece	Horse equipment	Cluster
BJ855	HEM1B	D	Chamber	Y	N	N	Y	Y	Y	Y	Y	N	N	N	3
BJ886	HEM1B	B	Chamber	N	N	N	Y	N	Y	Y	Y	Arabic	Y	N	3
BJ942	HEM1B	N	Chamber	Y	N	N	Y	Y	Y	N	N	N	N	Y	3
BJ956	HEM1A	D	Chamber	N	N	N	Y	N	N	Y	Y	Arabic	N	N	3
BJ957	HEM1A	B	Chamber	N	N	N	Y	Y	Y	Y	N	Arabic	N	N	3
BJ A2000	HEM1E	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ IV	BH	N	Cremation	N	N	N	N	N	Y	N	N	N	N	N	4
BJ1035	HEM1B	N	Cremation	N	N	Y	Y	N	N	N	N	N	Y	Y	4
BJ104	HEM1B	N	Cremation	N	N	N	N	N	Y	N	N	N	N	N	4
BJ1076	HEM1B	D	Chamber	N	Y	Y	N	N	N	N	N	N	N	N	4
BJ1153	HEM1B	N	Cremation	N	N	Y	N	N	N	Y	N	N	N	N	4
BJ19	HEM1B	N	Cremation	N	N	N	N	Y	N	N	N	N	N	N	4
BJ193	HEM1F	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ205	HEM1F	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ30	HEM1E	N	Cremation	N	N	N	N	Y	N	Y	N	N	N	N	4
BJ320	KVB4C	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ326	KVB4C	N	Boat	N	N	N	Y	N	N	Y	N	N	N	N	4
BJ334	KVB4C	N	Boat	N	N	N	Y	N	N	N	N	N	N	N	4

Ind.	Area	Byzantine	Type	Arrow	Axe	Sax	Shield	Spear	Sword	Weights	Purse	Coins	Gaming piece	Horse equipment	Cluster
BJ335	KVB4C	N	Cremation	N	N	N	Y	N	N	Y	N	N	N	N	4
BJ336	KVB4C	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ352	KVB4B	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ361	BH4A	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ366	BH4A	N	Cremation	N	N	N	N	N	Y	N	N	N	N	N	4
BJ369	BH4A	N	Boat	N	N	Y	Y	N	N	N	N	N	N	N	4
BJ370	BH4A	N	Cremation	N	N	Y	N	N	N	N	N	N	N	N	4
BJ372	BH4A	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ376A	BH4A	N	Cremation	N	N	N	Y	N	N	Y	N	N	N	N	4
BJ377	BH4A	N	Cremation	N	N	N	N	N	Y	N	N	N	N	N	4
BJ386	BH4A	N	Cremation	N	N	N	N	Y	N	N	N	N	N	N	4
BJ391	BH4A	N	Cremation	N	N	Y	Y	Y	N	N	N	N	N	N	4
BJ394	BH4A	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ421	BH4A	N	Cremation	N	N	N	Y	N	N	N	N	N	N	Y	4
BJ426	BH4A	N	Cremation	N	N	N	N	N	Y	N	N	N	N	N	4
BJ438	BH4A	N	Cremation	N	N	N	Y	N	N	Y	N	N	N	N	4
BJ452	NOB2A	N	Cremation	N	N	N	N	N	Y	N	N	N	N	N	4
BJ504	NOB2A	N	Skeletal	N	N	N	Y	N	N	N	N	N	N	N	4
BJ62	HEM1B	N	Cremation	Y	Y	N	N	N	N	N	N	N	N	N	4

Ind.	Area	Byzantine	Type	Arrow	Axe	Sax	Shield	Spear	Sword	Weights	Purse	Coins	Gaming piece	Horse equipment	Cluster
BJ722	HEM1C	N	Cremation	N	N	N	N	N	Y	N	N	N	N	N	4
BJ764	HEM1C	N	Cremation	N	N	N	Y	N	N	N	N	N	N	N	4
BJ914	HEM1E	N	Cremation	N	N	N	Y	N	Y	N	N	N	N	Y	4
BJ1069	HEM1A	N	Skeletal	Y	N	N	N	Y	N	N	N	N	N	N	5
BJ1077	HEM1B	N	Skeletal	N	Y	N	N	N	N	Y	N	N	N	N	5
BJ116	HEM1E	N	Coffin	N	N	N	N	Y	N	N	N	N	N	N	5
BJ477	NOB2A	N	Coffin	N	N	N	Y	Y	N	N	N	N	Y	N	5
BJ592	NOB2A	N	Skeletal	N	N	N	N	Y	N	N	N	N	N	N	5
BJ725	HEM1C	N	Skeletal	N	N	N	N	Y	N	N	N	Arabic	N	N	5
BJ737B	HEM1C	N	Coffin	N	Y	N	N	N	N	Y	N	Arabic	N	N	5
BJ765	HEM1C	N	Skeletal	N	N	N	N	Y	N	N	N	N	N	N	5
BJ865	HEM1C	N	Skeletal	N	Y	N	N	N	N	Y	N	N	N	N	5
BJ904	HEM1B	N	Coffin	Y	N	N	N	Y	N	N	Y	Y	N	N	5
BJ909	HEM1E	N	Coffin	N	Y	N	N	N	N	N	N	N	N	N	5
BJ986	HEM1A	N	Chamber	N	N	N	N	Y	N	Y	N	N	Y	N	5
BJ991A	HEM1A	N	Coffin	N	N	N	N	Y	N	Y	N	N	N	N	5