The Role and Status of the Smith in the Viking Age

By

Timothy Carlisle
B.A., MLitt

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1001623

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University of Glasgow

Department of Archaeology

Faculty of Arts

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Abstract

It is often assumed that blacksmiths and ironworkers in Viking Age occupied important roles in their communities. However, the nature and source of this social role and the significance attributed to it is seldom explored or questioned. These assumptions are questioned by examining the social role and status of smiths, the archaeological expressions of those social aspects, and the cultural pressures which influenced the position of ironworkers in the Viking Age.

This thesis begins by exploring the literary expressions of smiths in Viking Age myths, legends, and sagas. These sources provide information about the contemporary social perspectives connected to smiths and their role, and provide a basis for how best to examine smithing through theoretical perspectives such as status, material expressions of status, value and technology in value ascription. The use of such theoretical terminology provides a way to examine the material culture associated with ironworking, and means of explaining the social relationships which acted upon and reacted with Viking Age material culture. Applying the theories of value and value ascription through technological processes to the current archaeological understanding of Viking Age smelting and smithing technologies imparts a practical understanding of the processes and technological actors which produced iron and iron objects as socially valuable objects. The interaction between symbolically charged iron objects and the social interactions in which they played a role suggests that examining the consumption patterns associated with iron objects is a route to examine those social meanings and test the research questions.

This work contains a comparison between two case studies, the Viking Age cemetery in Luistari, Finland and the Viking Age urban centre at Kaupang, Norway. The comparison between evidence of these sites provides complementary information for examining the general trends surrounding iron object use in differing regional contexts. Discussing these trends with supplementary examples of smithing material culture from the wider Viking world extends the ideas of smiths being valuable, venerated members of Early Medieval Scandinavian societies to the wider Viking Age sphere.

Examining the evidence from the case studies and supplementary information with respect to the theoretical applications of the terminology suggests that the smiths of the Viking Age were valued as the producers of valuable, symbolically charged objects. This appears to have been true for the producers of simple farm-tools as well as the producers of highly prized weapons. This important social role, and the role of the smith within the technological processes which were responsible for value and symbolic ascription, would have enhanced the prestige of the smith as a member of Viking Age societies in which they lived.

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"...Iron, a metal which is once the best and worst servant of humanity, for to bring death more speedily to our fellow man, we have given wings to iron, and taught it to fly"

-Pliny, Natural History XXXIX: 138

Part I: Defining the Issues

Chapter 1: Introduction

The archaeological study of historical smithing and, by extension, the smith in Viking Age Scandinavia, is a field of study which bears a noticeable slant in terms of academic understanding. When evidence of smithing and iron products are found there is an automatic conclusion that the objects are valuable, without considering why they are valuable or what implications can be made for the social value and status of iron workers. Furthermore, smiths and iron workers are often considered to be some of the earliest scientific chemists, developing smithing techniques for the sake of technological progress, although this perspective has been criticised as far back at the 1980's (Alexander 1982).

Generally speaking the current understanding of iron and ironworking is split in terms of methodology, interpretation, and goals. One side of study represents the study of the sciences of historical iron production and scientific methods of analysing iron and ironworking by-products (Abrahamsen *et al* 2003, Bartolla *et al* 1988, Buchwald 2003, Buchwald and Wivel 1998, Eriksson 1960, Espelund 1991/1991a, Godfrey *et al* 2003, Grandin and Hjärthner-Holdar 2003, Light 1987). Such studies have difficulty connecting the science and technology of iron working to the social aspects which would have surrounded the activities (Photos-Jones *et al* 1998: 31). This is partially due to inconsistent study and evidence of iron ore and furnaces of the Viking Age, leaving slag and finished objects as the only sources of evidence (Bartolla *et al* 2004:). Furthermore, there are difficulties related to artefact sampling and archaeometallurgical techniques, which limit the connection between science based analyses and finished artefacts. This being said, current studies into scientific analysis of Viking Age iron works are relatively nascent in their development, focusing on developing invariably valuable methodologies and establishing comparative samples to use in future studies. However, this does leave a gap when considering the socialised nature of the technical processes in relation to the technical actors.

On the other side of the spectrum many archaeological works focus on analyses of artefact and artefact hoards, with reference to their local and historical context (Bradley 1988, Brewster 1980, Callmer 1977, Dinnetz 2003, Gorman 1999, Jones 1997, Leahy 2003, Pierce 2002). The approaches to artefact analysis have changed with the development of theoretical perspectives within material culture studies, especially in reference to an object's social context. However, these studies tend to lack engagement with evidence of object creation, and social aspects connected to object creation. This is often due to a lack of sampling and evidence, with exception of objects which display obvious evidence of technical processes, such as pattern-welded weapons. An observation made by Buchwald and Wivel is that analysis of objects raise questions about the artefact's origin as well as questions concerning the object's quality (1988). Although valid questions, this perspective focuses on the objects themselves and omits questions of social relationships related to the artefact's creation and their creator.

Relatively recent studies have been undertaken from ethno-archaeological perspectives to bridge the gap between artefacts, the technology of their creation, and the social contexts of that creation (Chirikure 2006, Englund 1999, Gansum 2004, Håland 2004, Håland *et al* 2002). Studying existing cultures which practice traditional methods of iron production, these studies explore the socialisation of technical processes involved in ironworking, especially related to the rituals associated with iron production. Furthermore, studies which have been focused on applying socio-centric perspectives of ironworking have been focused on Middle-Iron Age Celtic societies in Northern England (Giles 2004, McDonnell 1989). Although steeped in socio-cultural contexts, the lack of study related to socialised production methods of the Viking Age make the conclusions difficult to connect to that time period. This being said, ethno-archaeological approaches and historical studies do provide valuable perspectives in evaluating the link to the object producers and reconcile the difference between the smith's role as a progressive chemist and mystic craftsman.

The goal of this thesis is to explore and understand the reciprocal role of the smith in the thriving societies of the Viking Age, both as valued craftsmen and agents of social power. Understanding the social status of smiths and ironworkers is possible through examination of the socialised iron production technologies and finished iron artefacts in their archaeological context. Analysis of archaeological materials utilising recent academic theories and understandings allows for evaluation of social aspects associated with artefacts and accurate conclusions concerning the artefact producer to be drawn.

At this point it is necessary to make a clarification of terms, establishing a difference between two different iron production methods. The first process of producing refined iron or mild steel from iron ore will be identified as smelting or blooming, as the resulting metallic iron formation is known as a bloom. The process of forming iron objects (eg. tools, weapons, armour, locks, etc) from iron blooms and ingots will be identified as smithing or forging. They have different archaeological contexts, technological processes, and ultimately have differing social implications attached to them. However, they are interconnected, vital steps in the creation of iron objects both in the physical act of fabricating iron objects, as well as the creation of iron objects as socially important items. In order to more fully appreciate the object group and social implications, iron smelting and smithing will be discussed separately, with respect to how the processes interact and produce social status for the people involved.

Separate discussion of iron smelting and smithing also allows exploration of the interplay between Viking Age societies, the iron workers, and the artefacts being both produced and consumed in each stage of their production. Understanding the nature of iron as a material will allow for an examination of social aspects connected to the process, where the change from an iron bloom into an iron object occurred, and what processes influenced the value of resulting objects. The socialisation of the smelting and smithing processes form the basis for examining the reciprocal relationship between the smith and his wares in forming and expressing status.

Hypothesis and Research Questions:

As the producers of valuable goods, smiths were obviously esteemed, important members of Scandinavian society. It follows to suggest that smithing, or other forms of iron working were high status activities, and the services of a talented smith were much sought after. As mentioned above, the question becomes focused on the social reasoning behind this value and status, as well as assessing this through the use of archaeological materials. Early readings into the subject-matter and information from contemporary literature allows for the formulation of a hypothesis and set of research questions aimed at giving focus to the study.

The research questions for this thesis are as follows:
-What is the apparent social role of smiths and other ironworkers in the Viking Age?
-How did the social role of the smith manifest in contemporary material culture?
-What factors appear to have influenced the smith's role within society?

In Scandinavian folklore, when a smith character appears it is often to forge a singularly special metal object for the protagonists to use. This suggests that the nature of a smith's status and position in society, as reflected by contemporary story-tellers, is integrally engaged in producing valuable goods, as mentioned earlier. It also suggests that a smith's status is evident through the value and consumption patterns associated with iron objects made at the forge. The majority of available evidence of such patterns come in the form of grave furnishings. In this respect the Viking Age is especially rich in information.

For most of the Viking Age, furnishing graves with the personal belongings of the recently deceased, was a common pagan burial tradition. In some places of early Christian conversion this tradition endured in a reduced capacity. Although by definition Scandinavian burials were atypical, existing in different forms depending on the region and associated culture, furnishing the grave was a common element. Furthermore, burials are thought to be innately socialised rituals (Symonds 2009: 49). Some suggest that burial practices were as much for the family and neighbours as they were for the individual being buried. The grave goods are thought to represent the status and personal belongings through the perceptions of the people participating in the event. In this way graves archaeologically represent the final stage of artefact consumption and, when considered in conjunction with archaeological context, information concerning the prestige of the individual and social meaning of the object can be elucidated (Symonds 2009: 62).

In order to more fully understand the socialisation of the production processes and social aspects that will be accessed, the over-arching archaeological and anthropological theories should be defined and examined. These theories correspond to several of the terms already been used above, including but not limited to value, function, and status. Defining these terms and formulating a comprehensive theoretical framework will allow for a clearer appreciation of what is being examined, and how to best measure and interpret the archaeological data.

This information must therefore be examined through the scope of the production methods and social function of the objects in order to extend discussions of status *via* artefactual data to the smith. Most of the information for iron production processes come in the form of slag deposits, and the remains of furnaces and forges. There is also artefact evidence in the form of smithing tools, however they often occur in funerary contexts and only by extension constitute production evidence. Much of the archaeological data concerning iron smelting comes from central and southern Norway (Martens 1987, Espelund 1991, and Stenvik 2003), southern Denmark/Northern Germany (Lyngstrøm 2003, Nørbach 2003), and Iceland (Smith 2005) as this is where most of the excavation of iron extraction sites have been carried out. It is only recently that investigations into methods of sourcing iron through chemical analyses have made it possible to link finished goods to slag deposits (Abrahamsen *et al* 2003, Buckwald and Wivel 1998). This allows for the technical processes to be fully understood, creating a situation where strong conclusions of the social aspects and status connected to ironworking can be made with support from empirical, archaeological data.

Chapter 2:
Smiths and Objects in Myth, Legend, and Saga

Contemporary Scandinavian and Northern European myth and legends are a strong source for beginning the assessment of the role and status of smiths in Viking Age society. Although the usability of the individual events and people in an academic setting is questionable and problematic, the terms used as they were committed to text, and the context of those terms can inform upon the truth-values carried within the stories and the cultural perspectives of the subject matter. Furthermore, mythology and legends are likely to be far older than the verses which recorded them, which suggests that verses formally recorded in the twelfth century are representative of earlier ages (Christie 1969: 228). Through examining the content of these poems and stories, the contemporary social views of the smith can be used to inform upon the apparent literary role of smiths, from where the position of Viking Age smiths has derived, and how these socially held attitudes were connected to contemporary material culture (Hall 1995).

Within Scandinavian myth and legends, the smith has a variety of literary uses. The majority of these roles centre around the smith's mastery of metal and, in many cases, mystical productive capabilities. This connection to smithing activities implies that the role of a smith in society is consequent on producing high value objects. This is expressed in Snorri Sturluson's <u>Prose Edda,</u> also known as <u>The Younger Edda,</u> and other Scandinavian legends (Sturluson trans. Brodeur 1916). In <u>The Prose Edda,</u> Sturluson retells the Scandinavian creation and destruction myths, and stories about the Norse Gods from a twelfth century perspective. He is credited with committing those myths to text in twelfth century Iceland in what is commonly taken as an attempt to preserve the skaldic poetic tradition in which he was trained. These stories are thought to have a relative degree of authenticity because the skaldic tradition depends heavily upon kennings, an extended metaphor which utilised allusions to mythological figures and only can be understood with a prior knowledge of a commonly held mythological system. Assuming that if skaldic poetry and kennings were traditions which date back to the Viking Age, the myths which the major devices which concurrent poetic traditions were dependent upon must have been contemporary.

[redacted]

Fig. 2.1 Wood carving from Hylestad Stave church, Norway of Sigurd and Regin forging or repairing a sword (after Willemsen 2004: 122)

One passage from the Prose Edda includes a competition and wager, engineered by Loki the god of mischief, between two dwarf smiths known as the sons of Ivaldi. Attempting to outdo each other, they produce priceless treasures endowed with magical properties and present them to the gods for judgement. These treasures include, Sif's golden hair (made to replace her natural hair which was cut off by Loki), a sword called *Skidbladnir*, a spear called *Gugnir*, a golden boar, *Daupnir* the magic arm ring which reproduces eight rings, and a short-handled hammer "which would not fail" (Sturluson trans. Brodeur 1916: 145-147). The sword *Skidbladnir* and golden boar are presented to the fertility deity Frey. *Draupnir* and the spear *Gugnir* are presented to Odin, chief deity of the Scandinavian mythological system. The hammer, a primary symbol of a smith, is judged to be the best item created by the smiths and is given to Thor, in recognition of his superior fighting prowess (Motz 1977: 47). This indicates that smiths held a role as recognised producers of fine objects.

In another passage, dwarf smiths are commissioned to forge chains, known as *Gleipnir,* which are capable of holding *Fenrir*, the giant wolf which was predicted to kill Odin and bring about the end of the world. The fetters that they make are said to have been made with things which would be seemingly impossible to gather, such as; "the noise a cat makes in foot-fall, the beard of a woman, the roots of a rock, the sinews of a bear, the breath of a fish, and the spittle of a bird." (Sturluson trans. Brodeur 1916: 43). This suggests a special magic ability held by the dwarf, also identified as black elf, smiths. The smiths which are asked to perform this task are, in essence, charged with preserving existence through their craft and are duly recognised for their skills.

These few examples suggest that the smiths are "the willing or unwilling donors of gifts which are vital" to the protagonist and his, or her, quest (Motz 1977: 48). This places smiths within a literary role which is peripheral, yet important to the story. The section of The Saga of the Volsungs which is known as the *Reginsmal*, has Regin, the dwarf-smith and foster-father of the hero Sigurd, forging a sword capable of slaying *Fafnir* the dragon, depicted in Fig. 2.1 (Finch trans. 1965: 26). Sigurd fighting the dragon is an important and climactic chapter in this saga. The smith may not be the central figure to the adventure, but the story is contingent upon the inclusion of the smith and the application of his considerable skills.

Stories of smiths and their powerful wares come from other ancient mythological systems as well. The lightning bolts wielded by Zeus originate in the workshops of the Cyclops and later are made at Hephaestus' forge. In Egyptian mythology, the weapon which defeats Seth, the killer of Osiris, is made by Ptah, the god of craftsmanship (Motz 1977: 50). These examples suggest further that the role of the smith was as the producer of mystic objects for gods and heroes. It appears that the effectiveness and status of the smiths involved is contingent upon their crafting skills, and shown through the qualities of the produced objects. In turn, this suggests that in historical contexts the role of the smith in society was to make high value objects, many of which "came to constitute trappings of power" valued by the social elite (Wright 2010: 131).

Furthermore, a literary theme which is connected to the production skills of a smith, and smithing activities is the role of the smith in binding, or crime and punishment stories. In many cases, the Fenris wolf and binding of Loki stories included, the smiths are central to producing the chains used for binding criminals or, in some cases punishing crimes themselves (Sturluson trans. Brodeur 1916: 77). In the Finnish epic poem *Kalevipoeg*, a part of The Kalevala, the hero, who lends his name with the story, kills the son of a Finnish blacksmith while travelling (Lönnrot 1963). The blacksmith retaliates by summoning and cursing Kalevipoeg's sword, an act which implies that the smith was the master of the weapon. Many years later when Kalevipoeg has retired to the forest from his royal duties he steps into a river and his sword, which was lying on the bottom, cuts off his legs "in fulfilment of the curse of the Finnish Blacksmith". (Oinas 1976: 8).

In another popular legend which features Kalevipoeg, he is sent to hell by the gods and is bound there in order to guard over the devil. In alternative versions of the story he is taken to hell and bound there by the devil (Oinas 1976: 10). The story goes that lesser devils burn the bindings so that they will break. By Christmas time every year Kalevipoeg's fetters are thin and ready to break. However, when bells ring on Christmas day the chains grow thick again (Oinas 1976: 10). The role of the smith in this passage comes in the reported tradition of smiths striking a bare anvil several times, an act symbolic of strengthening chains, suggesting that there was still a perception that smiths, through their skills and tools, had special command of metals and were vital to social traditions. This implication is supported by ethnographic examples of blacksmiths in "Alpine villages" striking their anvils in time with one another, supposedly to strengthen the bindings which "enchain the devil" (Motz 1977: 49-50).

As mentioned above, the qualities, value, and mystic properties of weapons and objects made at the smith's forge are contingent upon the smith's personal qualities and smithing abilities. Examining the qualities and characteristics associated with smiths in literature can inform upon potential avenues for status in historical contexts. In a great deal of Scandinavian mythology, smiths are exclusively identified as either dwarves or black elves, the terms used interchangeably. This is an interesting association between an altered state of being and smithing activities.

Furthermore, within Scandinavian literature the terms used to identify smiths as dwarves and elves is problematic because it implies that humans were not the smithing masters of the stories and the deeds of master smiths are not necessarily equivalent to social perceptions of smiths in historical settings. However, upon closer examination there are passages that imply that the difference between dwarf-smiths and normal men was based on crafting expertise more than appearance or heritage, and was difficult to discern.

Stanza fourteen of Snorri's Prose Edda mentions the original mythical creation of dwarves and elves. It indicates that dwarves were originally given shape and life by the first frost giant Ymir and "by decree of the gods" were given consciousness, the intelligence of men, and "human shape" (Sturluson trans. Brodeur 1916: 26). This passage suggests, within the mythology and social consciousness, that dwarves were thought to be physically identical to humans, and maintained their powers derived from their mystical creation.

The section of The Poetic Edda, entitled the *Havamal* or "Sayings of the High-one", gives a similar indication concerning the appearance and identification of dwarves (Bellows trans. 2012: 28-67). This particular poem is taken to represent "a compendium of social and ethical maxims upon which society based its rules of conduct" (Sturtevant 1911: 50). The social advice is addressed to the character *Loddfafnir* who, within the context of the poem, is a pupil of the "high-one", commonly accepted to be an alias of Odin (Bellows trans. 2012: 28-67). A section of Odin's lesson is known as the *Runatal*, which concerns the magic of the runes, also known as "magic songs" (Sturtevant 1911: 51). In this section, Odin recounts the magical runes that he has mastered and their effects. Stanza 160 is the fourteenth of these songs and reads as follows;

"A fourteenth I know, If fain I would name
To men the mighty gods
All know I well of the gods and elves,
Few be the fools know this"
(Bellows trans. 2012: 66)

This indicates that Odin was thought to have held special knowledge of distinguishing between gods, men, and elves. Dwarves, which have already been identified as "Black Elves" in The Prose Edda fall into this category, suggesting that dwarves were considered to have been identical to humans and gods in terms of their appearance (Sturluson trans. Brodeur 1916: 145). Consideration of earlier passages suggests that the primary difference is related to crafting skills. This is important for the current discussion of smiths in Norse myth and legend because it suggests that the characteristics of dwarves can potentially be applied to smiths in general. This allows for a exploration of the “nature of the craftsman's talents”, and informs upon the Scandinavian perspectives of smiths (Motz 1977: 47).

As mentioned above, within Scandinavian myth and legend, dwarves and smiths are either the willing or unwilling donors of powerful objects and weapons, and held a special power to command fire and metal. This parallels an anthropological theory which suggests that for a great deal of human history artisans have been thought to hold “magical or mysterious powers” (Motz 1977: 49). In many modern African cultures, generally located in Eastern Africa, the village smith “holds a role of high and often religious importance” derived from their apparent command of talents beyond those of other members of society and the ritual surrounding the iron working process (Motz 1977: 49).

Another interesting characteristic of dwarves in Norse myths is that they live and practice their crafts on the periphery of society. Many dwarves live in mounds or stones, as indicated by the earlier passage from The Prose Edda. Regin, from The Volsunga Saga, similarly lives alone in a cave. The Westphalian-Nordic Thidricks Saga, recounts the training of Wieland, thought to be an equivalent to Wayland the smith, a cultural smithing icon considered to span the Indo-European mythic traditions (Christie 1969: 290). Wieland serves his apprenticeship in a cave with a dwarven master, apparently away from local villages, where he learns secrets of creating steel. This spatial relationship, when considered with earlier examples of the literary uses of smiths, suggests that in some historical contexts, smiths were both highly valued, and marginalised members of society (Wright 2010: 131).

Archaeological excavations of elite centres and palatial complexes seem to support this assertion. The excavations at the Lake Tisso manor complex in West Zealand, Denmark reveal that forges and other metal working activities were in areas peripheral to the main settlement (Jørgensen 2003: 197-204). A similar pattern is seen at Yeavering in Northern England, where direct evidence of smithing activities were positioned at the edge of the palatial complex (Wright 2010: 133). The association between the status of the sites and apparent spatial position of smiths within the sites suggests that there was an expressed elite authority over metal working activities. However, it appears that, although they were valuable members, smiths were seen to be separate from the rest of the community. Furthermore, similar trends of segregation have been found at sites such as L'anse aux Meadows, Newfoundland where the smithy appears to have been located far from the other buildings (Eldjárn 1977: 87). It is likely that the noise, smell, and apparent danger associated with operating a forge would have been a factor in segregating smiths from the community, and that the segregation was a practical solution for coping with the fire-hazards and other dangers associated with smithing.

It is important to mention that many examples of stories and legends that include elusive smiths come from areas which currently do not have mining or strong metal industries (Motz 1977: 50-52). This suggests that familiarity with smithing activities and perceptions of a smith's apparently supernatural abilities were major factors in the status of smithing. It is possible that a smith's work habits as well as the apparent impacts of smithing activities on the environment were also a contributing factor in this marginalization. Forge operation in the dark or at night is a behaviour theorised to be common to early smithing. These behaviours would have had a practical application in the technical process, the low level of ambient light would have made it easier for the smith to judge the temperature from the colour of heated metal. However, it would have seemed irregular to the community and added to the perception of the smith's supernatural abilities.

Fig. 2.2 The Franks Casket contains a relief of the most common depiction of Wayland on the far left. (after http://ealdrice.org/gods/ last accessed 31-10-2012)

A similar example of strange smithing practice comes from Thidricks Saga. One of the practices performed by Weiland used to make steel is by feeding iron filings to geese, and smelting the droppings. This is depicted on the right-most panel of Fig. 2.2. At first glance this would appear to be an odd behaviour, with an unclear connection to the quality of the resulting metal. With the benefit of modern chemical science we can theorise that this represents the introduction of nitrogen into the iron via the goose's digestive system (Christie 1969: 290). However, contemporary people would have seen the quality of the resulting objects even if they did not understand the connection between that quality and the smith's behaviour. The unusual behaviour, rituals, and seemingly supernatural abilities of smiths must have been tolerated by society in order to have continued access to the materials which the smith provided (Wright 2010: 134). The wealth of iron objects that are commonly recovered from Scandinavian sites and graves provide strong evidence for wide spread consumption and use of iron objects, as well as the personal association held objects (Leahy 2003: 124-125).

Despite this however, it appears this spatial and social marginalization did not remain constant throughout history. In later periods, as smiths began moving into urban areas, metalworking assumed a more "everyday position" in social perceptions, potentially increasing the level of familiarity held between the community and smithing practices (Leahy 2003: 116). One potential cause for this normalisation was the changing character of kingship and kingly duties during the seventh and eighth centuries (Wright 2010: 134). Clause 7 of the Laws of Æthelberht states that in the event of a smith's death at the hands of another man, the weregild, or blood price, would be paid to the king instead of the smith's kin, suggesting that the smith was expressly the "king's man" (Wright 2010: 131). This suggests that the role and status of a smith was closely tied to the local lord or king. The aforementioned change potentially was paired with a change in perceptions of smiths and the characterisation of smiths in stories, however the pseudo-magical command of metals appears to have endured to be preserved in later literature.

The widespread stories of Wayland the smith, depicted in Fig. 2.2, reflect this change, especially the connection between smiths and the social elite of their respective culture (Wright 2010: 131). As mentioned above, Wayland shares uncanny similarities with smiths from other European folklore traditions. As a result of these literary similarities some scholars suggest that the Mediterranean master craftsman Daedalus shares common roots with the Northern European Wayland (Christie 1969: 286). The old norse name *Völundr* is derived from the German name *Weland*. In Icelandic *Völundur* translates as 'master smith', showing the distance which the smith lore travelled in historical context (Christie 1969: 287). Sir Walter Scott even made reference to Wayland stories in Chapters X, XI, and XII of Kenilworth (Scott and Alexander (eds) 1993). The name Wayland is given to a blacksmith believed to have supernatural power, showing the propagation of this idea in more recent time periods, and a long standing perspective of smiths.

In contrast to earlier examples of smiths in literature, with few exceptions, Wayland is expressly a man although he is often associated with dwarves and elves. French versions often give Wayland a fairy mother (Christie 1969: 287). These associations are seen as potential literary sources of his considerable technical skills and the perception of supernatural powers shared by most versions of Wayland (Wright 2010: 126). The change of the master smith from being identified as a dwarf to being identified as a man suggests a change in familiarity with smithing. However, the maintenance of the smith's abilities in later versions suggest that it was still held in the cultural memory of the peoples developing and re-telling the folklore.

An aspect of Wayland which is widely shared, and particularly telling of the status of smiths in historical context is that although the master smith is always venerated for his service and skills, he is never ennobled (Davidson 1958: 159). This suggests that the status of smiths in this time period was highly dependent on the service which they provided to society, and the discretion of the social elites. For example, sharpening weapons appears to have been an important service provided by smiths and was an especially symbolic interaction between weapon owners and the smith. Yielding one's prized weapon for honing would have been an act of both submission and trust (Wright 2010: 132). This suggests that it would have been valuable to have a smith on hand, and provides one of many explanations for the veneration of smiths (Barndon 2006: 101). It could be argued that the prolific attitude of marginalising smiths within society, in reference to the character of leaders in Scandinavian society, provided a social mechanism for limiting the status of smiths. Although the objects made at a smith's forge became trappings of power for social elite and interaction with those artefacts became symbolic of social strata as a result of the smith's skills, the smith was not socially elevated beyond a certain point.

[redacted]

Fig 2.3 Woodcarving from the Hylestad Stave Church, Norway of Sigurd slaying Fafnir the dragon.
(after Willemsen 2004: 50)

Further evidence of a smith's skills is provided by the objects made at the smith's forge. In Anglo-Saxon poetry the phrase 'work of Weland' is used in reference to weapons and armour of exceptional quality (Davidson 1958: 157). This suggests that evaluating the characteristics of objects could provide a basis for evaluating the status of smiths, because this status is directly related to the quality of objects forged by literary smiths.

Most examples from Scandinavian literature of a weapon's or other forged object's quality comes in the form of descriptions and implications of what an object is capable of doing, usually in reference to a particularly exceptional quality expected from the object. For example, the sword made for Sigurd in <u>The Saga of the Volsungs</u>, re-forged by Regin, is tested by Sigurd against Regin's anvil and cleaves the anvil in half. The blades which were made by Regin before this were made from inferior materials, and broke when struck against the anvil. Upon discovering the cutting power of the reforged blade, Sigurd takes the sword and a piece of wool to a nearby stream. As another test Sigurd throws the wool into the stream and holds the blade in the water, allowing the wool to be drawn against the cutting edge by the stream's current alone. The sword effortlessly cuts the wool, showing its superior cutting edge (Finch trans. 1965: 27). It is only then, when presented with a sword of such quality, that Sigurd leaves for Fafnir's lair intent on slaying the dragon, seen in Fig. 2.3.

The two tests performed by Sigurd are directly related to qualities expected from a sword. This suggests that Regin made a sword which is superior in the correct ways using his smithing skills, and high quality materials from pieces of an already famous sword. Re-forging two pieces of a sword blade in this manner would have involved more than just welding the halves together. Re-working a sword which was probably made out of steel, if it were to have a material counterpart, to a state of such high quality would have needed an especially high level of technical skill on the part of the smith because steel is a material notorious for strong material memory. This means that once a steel blade is bent in a certain place a weak point in the material is formed, and careful temperature control is necessary to reform the chemical integrity of the metal and effectively erase that material weakness (Davidson 1962: 17).

Other object names and descriptions imply that they were made with similarly superior skill. This trend is not limited to weapons, there are many stories which include high quality objects of a more domestic nature being made by talented smiths. The Finnish Kalevala includes a passage about a young smith named Ilmarinen who forges Sampo, a miraculous mill, for the maiden of *Pohjola* (Lönnrot 1963) The story maintains that the Sampo mill would incessantly produce flour, money, and salt, three domestically vital substances (Oinas 1976: 7).

The Grinkeswell or Grinkenschmied, depending on the translation, also includes a description of an artisan who is credited with the creation of implements with magical properties. These include scythes which never need to be sharpened and locks which never rust (Motz: 1977: 55). The supposedly magical properties of these objects appear to be exaggerations of characteristics expected of high quality objects. A well designed mill would have an exceptionally efficient rate of production. A scythe which needs infrequent sharpening would be an object one would hope to obtain from a talented smith, who had the skills necessary to make and forge steel. This same method of describing an object in terms of its qualities extends to weapons as well.

Examples from mythology include mention of a sword called *Dainsleif* which is said to have been forged by dwarves and will kill a man every time it is drawn. The sword given to Freyr, named *Skidbladnir,* was said to fight of its own accord independent of the wielder. Even the main characteristics of *Mjollnir,* Thor's prized hammer, are related to quality and reflect its status as a power symbol. Thor's hammer was used in mythology to hallow graves, sanctify rituals, and restore life, however one of the earliest characteristics of the hammer is how it can only be wielded by the best of fighters (Sturluson trans Brodeur 1916: 73, Motz 1977: 47). This suggests the connection between smiths and social elites through high quality objects as symbols of authority, as well as special reverence for the hammer as a source of power.

The quality of a weapon is often expressed through the weapon's name as well as description. The names of weapons in Icelandic saga are especially telling of a weapon's quality, as well as the weapon's position as a venerated object. Two examples are *brynbitr* and *fótbitr,* from <u>The Laxdæla Saga</u> (Kunz trans. 1997: 340). There are many named weapons from the sagas which include examples such as *Rimmugyr* from <u>The Brennu-Njals Saga,</u> which translates to Battle-Ogre, and many others. However, few speak to the quality of design and smithing abilities as *brynbitr* and *fótbitr.*

Brynbitr translates to 'mail biter', implying the weapon could penetrate Viking Age chain-link armour. *Bryn* derives from the term *brynja* which directly translates as mail shirt (Short 2009: 57). This term is seen in the names of many weapons in <u>Egil's Saga</u> and <u>The Laxdæla Saga</u> including: *Brynthvari* or 'mail scraper', *Bryntröll* or 'mail troll'*,* and *Brynklungr* or 'mail bramble' (Scudder trans. 1997: 85, Kunz trans. 1997: 340). The use of the term in weapon names implies that they had some special quality intended to pierce a *hringabrynja*, or ring mail shirt, which was designed and made to protect from tissue laceration resulting from a cut from a bladed weapon (Short 2009: 61). Armour shirts such as this would also have been a significant object made at a smith's forge. A waist length shirt with short sleeves would have been made with around thirty thousand individual links. A shirt of considerable quality would have had all of the links individually coiled, cut, inter-linked, and the terminals forged together into a solid ring.

Alternatively some of the links could be punched from a sheet of iron, which suggests the acquisition of many iron samples (Short 2009: 61). This suggests that even a small armour shirt would have represented a considerable investment of time, material, and skill to produce. Furthermore, it would have been valuable for the protection it provided. It follows to suggest that a weapon which could snag, damage, or even pierce a mail shirt would have needed a comparable level of specific design elements and skill to produce. This would suggest that the producer of these mighty weapons would be granted some level of elevated status. Chapter 23 of Fósbræđra Saga, in which Bjarni the smith is intentionally commissioned to make a special axe for Tharmođr Berason, suggests as much (Short 2009: 49).

The name of the other weapon mentioned above is *fótbitr,* which translates as 'leg-biter', implying that the blade was exceptionally adept at cutting at an opponents legs. This fighting technique is one of many thought to be common to Viking Age combat, as theorised by William Short in conjunction with the Higgins Armory scholars (2009: 134). In terms of fencing theory this technique would be described as a 'line change', a blade action in which the attacking angle is changed mid-swing to manoeuvre around a prepared defence. In this case, the defence would be an opponent's shield. The attacker would feint an attack to the head or shoulders, forcing the opponent to raise his shield in defence, after which the attacker would alter the attacking line to cut the leg, which was exposed by the shield being raised. Later fighting treatises such as the Tallhoffer's medieval combat manual, one of the main sources for the combat theories, confirm that this was a technique used by warriors in later medieval periods (trans. Rector 2000). The Gunnlaugs Saga, also called The Saga of Gunnlaug Serpent-Tongue provides a second example of this when *Gunnlaugr* cuts of *Hrafn's* leg in a duel (Attwood trans. 1997: 591). There have also been archaeological discoveries of human femurs with bone damage caused by cutting on the lateral side, indicating that the femur owner had received such an attack (Short 2009: 156). This suggests that the sword was balanced, and designed to be able to deliver fast, energy efficient blade actions, making line changes graceful and fast (Pierce 2002: 23). Forging a blade with these particular specifications and design conventions would have also needed exceptional skill on the part of the smith, as well as profound planning before ever bringing hammer to metal.

In stories and poems which include ironworkers, the smith has a distinct role as the creator of either objects with mystical qualities, or objects of exceedingly high quality. The physical evidence for the smith's skills must have been visible in the quality of the objects, and the apparent command of fire and metal which the smith held appear to have lead to a perception of the smith having supernatural abilities. The descriptions of the special aspects of objects made at a smith's forge are often closely related to the qualities desired by society, implying that the veneration of smiths was dependent on the creation of and social interaction with those objects. This suggests that examining material culture associated with smithing in the Viking Age is a potential way to evaluate and examine the status of smiths and their role in Viking Age Society.

Part II: Assessing Status and Product Value
Theoretical Perspectives

Chapter 3: Status and Expressions of Prestige

The question of evaluating the status and role of smiths in Viking Age societies hinges on several terms and associated theoretical perspectives. It follows to define and examine the vital terms in order to best evaluate the research questions starting with status, and social means of expressing status. Anthropologically speaking, status is an old subject which has seen little in the way of development or redefinition. Recent work concerning status is undertaken from economic, or bio-medical perspectives (see Conger *et al* 2010, Hackman *et al* 2010, Glaser and Strauss 1971 for examples). Furthermore, many recent archaeological publications focus on accessing status through archaeology and depend upon pre-existing definitions of status. This being said, status is a broad ranging term which makes an accurate definition "virtually impossible" to make (Benoit-Smullyan 1944: 151).

Status is defined as an individual's relative position within the hierarchy when a community is "ordered in an inferiority-superiority scale with respect to the comparative degree to which they possess or embody some socially approved or generally desired attribute or characteristic" (Benoit-Smullyan 1944: 151). This definition encompasses any form of hierarchy and any means through which status is accessed or achieved. To accommodate the all-encompassing definition, three different forms of hierarchy have been identified; **political status**, **economic status**, and **prestige status**, each provides an umbrella under which specific socially valuable characteristics can be grouped (Benoit-Smullyan 1944: 151). Each form is distinguished by those characteristics, and the contrasting ways through which status is achieved and expressed.

Political status is defined as the degree of influence an individual holds in the making of political decisions, and secular or religious policies. **Economic status** is defined as the standard of living enjoyed by an individual or family unit relative to the community. Historically, these forms of status have been fixed by law or cultural custom so that one could not enter or leave freely (Benoit-Smullyan 1944: 151). Differences of status are theorised to be expressed through "visible marks" and characteristics associated with unequal access to economic resources, such as accents, manners, or dress (Anthias 2001: 369). Theoretical approaches to studying this topic are often marked with a notable preference for explaining social reasons for economic inequality and class separation through material expression. In contrast, the third status form is a matter of subjective material expressions and moral evaluation (Hope 1982: 1012).

The third category of status is **prestige status**. Unlike economic or political status, prestige status is the most difficult to access because it is subject to qualitative, socially accepted criteria. An individual's prestige status is conceptualised to have five chief criteria: a person of high prestige status is an object of admiration, deference, imitation, a source of suggestion, and a centre of attraction (Benoit-Smullyan 1944: 157). Admiration derives from objective characteristic or evaluation of personal achievements. Deference indicates a symbolic expression of another's right to take initiative in social relations, or occupy a special place of honour. Imitation suggests that a person of high prestige becomes a model and their behaviour is deliberately or unconsciously reproduced by others. As a source of suggestion an individual's ideas are more readily accepted by their peers. Finally, an individual of high prestige is a centre of attraction, indicating that there is, to some degree, a contagious component to prestige, which can be achieved through association with a prestigious individual (Benoit-Smullyan 1944: 157).

Social interactions that surround an individual with high prestige status are described through use of the above criteria, but the criteria are not necessarily characteristics of a prestigious individual. The characteristics which determine who possesses and maintains high prestige depend "upon the society's value system" and vary from one culture to another (Benoit-Smullyan 1944: 158). The differences of expression and variation of valuable characteristics between economic, political, and prestige suggest that a large number of distinct hierarchies will arise and interact within a society to formulate the "social skin" that projects one's subjective and objective identity through widely held social values (Smith 1999: 115). Variation of status forms also suggest that an individual could maintain and enjoy different or contrasting forms of status derived from “a small set of occupational characteristics” (Halle 1998: 1013).

An underlying question, reflected in anthropological studies, is why people seek prestige, status, deference, and respect. Early zoological studies examine relative social positioning through ‘pecking order’ social dominance systems in relation to accessing resources, threat/appeasement, and attention models (Schielderup-ebbe 1935). However when applied to upper phylogenetic scales, concepts of dominance and appeasement, or attention based status become more dubious and difficult to justify.

Hierarchies similar to social dominance models of primate social structures have been seen in human interactions, suggesting some degree of behavioural evolution. However, human social hierarchies appear to be formed on the basis of “abstract principles and cognitive evaluations” of valuable personal traits (Barkow *et al* 1975: 554). Suggesting that seeking position within a social structure has changed from being dominance driven into a need to create and maintain esteem through social evaluation of personal characteristics which occur in terms of socially valued traits and social perception relative to the hierarchy. Furthermore, these evaluations are carried out by the self and the other members of a social group, indicating that achieving prestige is a means of maintaining both self and social esteem (Barkow *et al* 1975: 554).

Social evaluations of prestige and status also act as a stimulus for reflection, suggesting that an individual’s prestige reciprocally influences social interactions and perspectives through a cycle of evaluation and reflection (Strathern 1998: 135). Furthermore, this reciprocal relationship is connected to the working memory and socially held perceptions of the people involved, suggesting that it occurs with respect to temporal and spatial factors (Donald 1991: 329). Esteem was managed by influencing perspectives through assertions of prestige within social interactions.

The use of objects in social interaction is a way through which esteem is asserted. The same social perspectives and structures which govern prestige ascription affect the ways that people interact with different objects and the ways they are likely to “experience those objects and hence think about them” (Carrier 1995: 25). For example, councillors from the Booran Oromo people of Ethiopia, Kenya, and Somalia wear marks of office and status during their terms in office. These objects carry meaning associated with their social standing and serve as symbols of their status and influence (Kassam and Megersa 1989: 28). Assuming that the meaning attached to the objects in question was socially connected to status, objects become a means of managing esteem and influencing social perspectives as part of the system of evaluation and reflection.

When examining archaeological materials it is important to consider that, due to their attached symbolism and meaning, objects provide a non-verbal means of managing, and building prestige and status. Management of esteem is a result of the artefact’s developing symbolism and value through the socially constituted processes of “their creation, employment, and abandonment” (McCall 1999: 18). The ability of an object to silently carry meaning, memory, and value in social interactions makes it an efficient mechanism for establishing and maintaining prestige, through the processes of social evaluation. Through the non-verbal quality of the symbolic meaning, artefacts serve to convey the owner’s personal qualities and place within a social hierarchy without continuously asserting their social position (Fletcher 1989: 35, Wobst 1999: 121). Furthermore, the connection between objects and prestige is closely governed by the widely held value systems of the associated culture revealing a continuity of esteem over time through the mobility of symbolism within those social conventions (Clark 2007: 24).

Depending on the social perspectives and attitudes toward the object’s attached symbolism, owning and displaying an artefact served as a short-hand means of maintaining esteem and prestige without constant verbal boasting (Benoit-Smullyan 1944: 157). Furthermore, perspectives of prestige as expressed through artefacts influenced how those artefacts would have been used and interacted with.
It follows to consider the theoretical perspectives of material culture’s ability to carry meaning and symbolism, as well as a means of evaluating status through archaeological artefacts.

Expressions through Material Culture

Material culture, as a scholarly field of study, has a wide and well developed theoretical basis aimed at understanding how humans relate to material objects (Pearce 2000: 1). This development provides both a simple definition and case-specific examples of what constitutes material culture, how it is analysed, and what can or cannot be examined through material culture. Material culture is simply defined as the study of beliefs-values, ideas, attitudes, and assumptions- of a particular community or society at a given time, through the examination of artefacts (Prown 1982: 1). Material culture and the study of artefacts is seen as a resource used to examine societies, working under the assumption “that objects made or modified by man reflect... the beliefs of individuals who made, commissioned, purchased, or used them, and by extension the beliefs of the society to which they belong.” (Prown 1982: 2).

This definition is broad at best, but the breadth is appropriate as it includes any artefacts which can hold social symbolism and different ways that objects accumulate meaning from their associated culture. This definition also reminds us that the physical material should be the most central element to material culture studies, a sentiment emphasised relatively recently (Ingold 2007).

The term material, as it stands, refers to a broad, but not unrestricted, range of objects. The connection to culture comes from the assumption that the “existence of a man-made object is concrete evidence of the presence of a human intelligence operating at the time of fabrication” and use of the object (Prown 1982: 1). This emphasises the primary role of archaeological artefacts in examining social connections and seems to exclude natural materials in favour of those that are obviously man-made. However, natural materials can take on cultural interest through social interaction and the human capacity to select elements of the natural world and transform them by constructed significance (Prown 1982: 2, Pearce 2000: 1). The discrepancy between natural objects and manmade artefacts emphasises the paramount importance of archaeological context when interpreting and examining materials (Miller 1994: 398).

The other side of studying material is the question of what is being expressed, how it is attached to artefacts, and especially how it is observed and demonstrated through material (Hodder 1988: 258). The assertion that objects are the embodiment of cultural beliefs is closely related to their significant and specific ability to carry and communicate cultural meaning with respect to context, indicating that the meaning carried by objects has a special mobile quality that is constantly in transit as the material is moved through social links (McCracken 1986: 71). Furthermore, the meanings are drawn from the "culturally constituted world", emphasising the necessity for an understanding of social context in understanding material culture and overcoming difficulties connected to material culture theory (McCracken 1986: 71). This is especially important for examining iron artefacts and their social context. The mobility of social meaning is central to the social process of object production, attachment of cultural expression, and the social perceptions of the objects themselves as "historical occurrence[s]" that survive to be observed by modern peoples without the same filters that act upon other historical accounts (Prown 1982: 3).

Similarly connected to the problematically broad definition of material culture, is the juxtaposition of cultural expression through conscious and unconscious means, what objects derived from either process truly portray, and how archaeologists can separate the two types of expression. Both means of expression are included in the above definition and can be seen in artefacts. Conscious, intentional form of expression are a problematic and questionable source of archaeological interpretation (Hodder 1988: 254). Works of art, especially high art are a classification of material that shows this problem specifically well. Art often contains iconic and spiritual dimensions, as well as direct and overtly intentional expressions of cultural beliefs (Prown 1982: 2). In a way, the expressions contained in artworks, especially from later historical periods, are directly related to what the artist chose to exhibit. For this reason artworks are thought to be self-conscious and inaccurate sources of cultural meaning when considered without historical context.

Alternatively, commonly used objects have certain unconsciously associated meanings and "are more useful as objective" indexes of cultural expression because their meanings are derived from use rather than intentional expressions and are not subject to the same self-conscious social filters (Prown 1982: 2, Hodder 1988: 258). The nature of the relationship between artefacts, society, and human thought has been central to the development of material culture studies.

The meanings connected to material culture reside in, and stem from, the thoughts of the people associated with them and have a wider temporal, and spacial, existence than the originally associated people (Hodder 1988: 255). Although there is room for exception, most objects are not built with the intention to represent or symbolise, yet the relationship between material culture and thought is not arbitrary (Crawford 1957: 68). In most cases, the meanings and symbols associated with artefacts come through use and experience, following the reasoning that “acting and thinking are linked” (Godsen 2006: 428). This suggests that material culture meanings are closely related to the social context of the item’s use and are therefore not arbitrarily associated with artefacts. Artefacts are constructed and used in social contexts and it follows that they must have a connection to those processes. Meanings and symbols connected to material culture are multi-variant, multi-sensory, and heavily reliant on context and perception, thus suggesting that there must be a functional significance to material symbols (Hodder 1988: 260). Furthermore, much of one’s understanding of the material world comes from their experiences, relationships, and associations formed within that world (Bourdieu 1977).

This reflection of material culture suggests a **reciprocal relationship** between artefacts and society. Simply stated, material culture is produced by existing social dynamics and the “open-ended and socially negotiated” meanings attached to objects makes them simultaneously productive of social relationships (Buchli 2008: 181). This suggests that the socialised processes associated with producing and interacting with objects give them social meaning, and within this dynamic the artefacts work to alter and form social constructs (Miller 1994: 399). This is not intended to imply that there is a “one-way determinism” that connects objects and their associated culture. The nature of this dynamic is fluid and cyclical, with both society and material culture acting upon one another (Lemonnier 1984: 154).

The conceptual difficulties outlined emphasise that the theoretical handling and interpretation of material culture is difficult. Material culture is part of a richly dense, overlapping, and multilayered human experience that spans generations. Similarly the critical themes and theories are layered and dense, "and should be regarded as fuzzy-edged" with no strict hierarchy or order (Pearce 2000: 2). Furthermore, interpretations of material culture are often pervaded by the perspectives of the researchers as "the products of a different cultural environment" than environments which ascribed the artefacts with meaning (Prown 1982: 4). This indicates a necessity for the analysis of supplementary information and a thorough understanding of the theories and terms that will be utilised to analyse materials.

Stated as simply as possible, an approach to understanding material culture requires finely drawn, nuanced study that takes advantage of multiple perspectives, multiple sources of information, archaeological context, and respect to analogous materials (Pearce 2000: 2). Starting with the most basic description of the materials, expanding to a reasonable redaction of the relationship between the object and the perceiver, or society, and finishing with speculation as to the mind and perceptions associated with the object keeping the artefacts central to analysis and subsequent theoretical discussions. This process should be supported by a program of validation aimed at testing the hypothesised relationships, as well as utilising external perspectives and understandings which are archaeologically quantifiable (Prown 1982: 7-8). In this case, the theories surrounding style, function, and design are the most readily available source for evaluating social aspects connected to archaeological material and their associated cultures.

Style, Function, and Design: Reading Artefacts

In terms of archaeological interpretations these three terms are often academically defined with reference to each other. Style has the largest amount of theoretical development through academic publication, often in reference to archaeological material. Function is the second most developed concept, however there are no texts dedicated to addressing it directly and, more often then not, it is discussed within reference to style. Design also has little in the way of dedicated academic texts although “most discussions of style almost inevitably engage with design” (Conkey 2006: 358).

Style is described as a set of artefact “design conventions” or “formal attributes” which are archaeologically seen as the key to the social aspects surrounding the object (Conkey 2006: 358, Boast 1997: 173). There have been nearly thirty years of theoretical development and criticism surrounding style. The earliest consideration of style was focussed on explaining variability and defining “homologous similarities in the identification of types” of archaeological material (Rice 1991: 245). This is a far cry from modern, “socially constituted” conceptualisations of style (Boast 1997: 176).

As the ideas surrounding style developed, considerations for the role of the social aspects of an object’s style have been added to the theoretical framework. Style and decoration were re-situated as a medium of social communication, focussing on an artefact's ability to convey messages throughout its biography, the role of cultural variance on artefact style and form, and the role artefacts have in cultural processes (Boast 1997: 176). This being said, there was, and still is considerable uncertainty surrounding the definition of style and expressions through style in relation to function. Within this definition function and style are considered to have separate but equal importance in determining the form of an object, with function considered to be the “active voice” of an artefact's conveyed message, and style as the “passive voice”, outlining a separation between an artefact’s appearance and use (Sackett 1990: 33). The character and visibility of style may change with social context and is subject to human behaviour suggesting that “style must reside in both functional and decorative attributes” as either active or passive social signals (Wiessner 1990: 107).

The discussion of active and passive voice implies that archaeological attempts at accessing such social relations and perspectives, especially at a temporal level depend on a balance between several procedures. One such academic procedure is the approach of ethno-archaeology, where modern “ethnographic situations” are observed in order to “study the relationship between people and their material world” (Miller 1987: 112). This approach should be used in tandem with the study of the objects themselves in their archaeological context, which provides “a temporal foundation" for examining social evolution, material roles, and symbolism (Miller 1987: 111). Although his arguments concerning style and function are slanted towards modern, archaeological views in which style is exclusively used to make archaeological interpretations, Pierre Lemonnier makes a point that symbolism can be seen in the physical dimension of material through examining "material inferences", visible elements of an object which through social context convey information about the bearer, or owner, mirroring earlier ideas concerning an object's ability to carry messages (1989: 159, Wobst 1999: 121). This suggests that style is archaeologically important because it conveys basic information about raw material extraction, tool production, and artefact disuse as well as, the aspects of an object that interferes in the social field (Wobst 1999: 123).

This being said, in order for style to be useful we have to look at artefacts in terms of their use as well as social meaning as conveyed by style. Furthermore, artefacts are always socialised and that their social context, not the obvious intended use defines an item's function (Boast 1997: 174-175). This suggests that style and function should be thought about as a way of doing, the means by which humans make sense of the world and through which cultural meanings are produced (Conkey 2006: 360). Therefore, style when considered alongside function is an "aspect of our material world that talks and interferes with the social field", bringing to the forefront the object's role as part of social action (Conkey 2006: 361).

This leads to a discussion of object function. As mentioned above, function is always discussed in tandem with style. When discussed independent of style, function is described as an expression of what artefacts are supposed to do (Conkey 2006: 365). This seems like a simple definition, however it includes much more than the basic use of an object. An object's function is not an inherent trait, meaning that the way that an object is used often does not match the way that the maker intended. Furthermore the way that an artefact is accepted and viewed by society is likewise variously realised. Function then is a normative phenomenon integrally caught up in expanded views of how objects are linked to concepts of the world through "cultural praxis, and not just through, but as social action" (Conkey 2006: 366).

This expresses the definite link between style, function, and the social context in which objects are used and experienced. However at this point there is a gap in the theoretical framework in the consideration of how objects are made and the social connection between production and function. These two concepts are linked by design. Design, when considered at its highest expression, is "how an object is conceived of and put together" (Conkey 2006: 363). This emphasises the role of the producer into the equation of style, design, and function. Although the use, value, and social perception of a object are not determined by the maker of an object, taking on separate connotations as it passes through social relationships, the "designs and their making are [likewise] embedded in" social relationships even within the production process (Miller 1987: 115, Deboer 1990).

The role of the producer is still important in how an object is made, the material inferences that are visible though an object's style are determined by the producer and available technologies, although what traits are perceived is determined by the society with which they interact. Furthermore, production "activities are intertwined with the social relations of the producers and people who surround them" suggesting that production processes contribute to the symbolism and social role of an object (Inomata 2007: 129).

Style, Function, and Design are therefore different ways of evaluating the social context, value, and importance of archaeological objects. Considered alone each aspect gives limited information, however if they are all taken into consideration they inform upon each other and allow for full conclusions to be reached. It is important to point out that when considering any implication of a social aspect or symbol that an object held, drawn from observing the style, design, or function of an object, depends/historically depended on social perspective. How the object is/would have been perceived by others, as well as a set of socio-cultural rules that determined what aspects were valued by society (Gell 1992: 47).

Artefacts fulfilled a social function and can be used to evaluate the symbolism and value attached to an object because of the symbolism and implied perspectives of the people interacting with the objects. The importance of socialisation and reciprocal relationships in the style, function, and design of an artefact suggests that examining the evidence of the socialised use of the object in conjunction with the artefact's stylistic conventions can be used to examine the symbolism and value attached to an object.

Chapter 4: Value and the Genesis of Value

The previous chapter suggests that object value is one of the primary layers of meaning attached to objects. Value is a term which should be examined independently because it encompasses different forms and methods through which value is created, ascribed to objects, expressed, and realised. Value refers to the importance or preciousness of something. This definition does not account for the different ways that value is conceptualised. To fully appreciate the depth of value as a term it needs to be broken down into the different value forms. Following this, the inter-relatedness of value forms and the social connections can be examined.

From an academic standpoint, there are four types of value. The first form is **exchange value**. This is defined as the price of an object or commodity at market derived from capital production (Leslie and Reimer 1999: 405). Exchange is considered to be the most quantitative, objective form of value (Orser 1992: 97). However for this reason, it is difficult to observe archaeologically because the relative price of an object is rarely documented and, if present at all, the medium of exchange is difficult to understand in a contemporary context. Mediums of exchange can take different forms, and in historical economies could be used in tandem. Barter systems, raw materials, cloths, furs, precious metals, and coinage would have simultaneously been used as "accounting device[s]" in historical markets (Sindbæk 2006: 306, Ingham 1996: 508). The fluid nature of market systems, and the fluctuation of prices in an active market make it difficult to examine exchange value with accuracy.

The next form of value is **use value**. This is defined as the ability of an object to satisfy a "human want" or need (Orser 1992: 97). This could potentially represent any use. The distinctions between high and low value depend upon how well or poorly an object fulfils its task. Use value is considered to be overtly qualitative and covertly quantitative, depending heavily on context, perspective, and subjective characteristics. Exchange transforms the qualitative aspects of use value into quantitative exchange value as subjective aspects of use value are attached a price and appear in exchange interactions (Orser 1992: 97, Clark 2007: 28). The proposed transfer of qualitative value into quantitative value suggesting that the artefacts which are exchanged, represent use and exchange value in social perspectives (Smith *et al* 2002: 51).

The third form of value is similarly subjective in nature. **Esteem value** is defined as how a person sees an object, or the pleasure or personal feeling an object evokes (Orser 1992: 97). This is closely related to the symbolism ascribed to objects and subject to social perspectives of valuable characteristics. Value is “signified through specific qualities that characterise particular material forms” (Munn 1983: 283). The term *qualisign* has denotes both positive and negative values ascribed to artefacts (Munn 1983: 283). The questionable fourth form of value is **symbolic value**. It could be considered to be a different way of referring to esteem value as it also includes and is related to the meanings attached to objects. Symbolic value and, if they are considered together, esteem value, are created and negotiated by people through social relationships within cultural contexts (Smith 1999: 116).

The process of value creation can be theoretically examined, following the assertion that objects are reciprocally constitutive of social relationships (Renfrew 1998: 3). A term used to refer to the process is “genesis of value”, which can be traced by exploring the “manner in which evaluation of objects impinged on social relationships” (Lesure 1999: 24). It follows to question value creation, and examine how objects are ascribed with value and, by extension, meaning in relation to subjective perceptions and characteristics.

Conservative definition of material culture suggests that objects can have value attached to them through their social interactions and the opinions of the society at large, and that objects hold inherent value, due to the material or production methods. Ascribed value is theorised to be “more transient and variable” than its counterpart because it depends on temporal, social context (Prown 1982: 3). This being said, value perceived to be inherent to an object is still the product of the social context and social relationships that act upon the object, however because “material forms exist over long-spans of time”, potentially many generations, a certain value could continue to be attached to the object or material long after the original context is forgotten (Godsen 2006: 425). Such an object, or medium would theoretically maintain its value as long as there is still a social context that likewise maintains the perception that the object is valuable.

Questioning inherent forms of value is conceptually complex. Some scholars theorise that processes of object production give artefacts an inherent value depending on the resistances that were overcome during production (Gell 1992: 47, Hoskins 1998 cited in Tilley 2006). The difficulty to produce the object, complexity of technical processes, or high subjective opportunity costs connected to production are potential sources of production resistance that could theoretically lead to some degree of value being attached to the resulting object (Gell 1992: 58). However, it has also been suggested that there is neither “constant relation between value, as invested labor” and exchange prices, nor is there a “direct relationship between value ... and utility” (Clark 2007: 27).

This begs the question of how to rectify the juxtaposition of ideas to create an accurate reflection of the genesis of value and meaning in relation to the forms of value. The investment of labor and materials used in object production must have some influence on the use and esteem value of an object. The practice of production is a major factor that needs to be taken into account to understand the “associations and values attributed to objects” (Flad and Hruby 2007: 2). A well made object would potentially be better than an analogous object with less investment, and the process of creating that object could potentially create some meaning for the producer (Tilley 2006: 68). At the same time, “cognitive values arise from their [the objects] manipulation in social interaction”, effectively over writing the “conditions and intentions of production” and the proposed inherent value that comes from them (Clark 2007: 31).

Therefore, inherent value should be considered as an aggregate mobile value and examining ascription of value more directly with this redefinition in mind. Aggregate mobile value is derived from the assertion that value and meaning are attached through socially involved symbolic and cultural processes within the sphere of economic production and associated labor processes (Anthias 2001: 380). The social use and context of use at any “register of value” takes place within a “framework structured by the existence of comparable items of different value”, suggesting that even a short term evaluation of an object or material can influence how the artefact was perceived and moved through social relationships (Lesure 1999: 27). The temporal and mobile quality of production ascribed value can influence the subsequent processes the material is involved in, even if the value is shifted with the movement of the object through the social chain (Foster 2006: 289). This idea suggests that inherent value is actually a different form of ascribed value that, even though it has passed through several production steps and social filters, has survived across spacial boundaries and through several "transformations over time" (Smith *et al* 2002: 51, Hoskins 2006: 78).

This is largely due to the "social construction of value" within a society (Flad and Hruby 2007: 10). This social construction is derived from subjective qualities of value that are "variously realised" within a given society (Conkey 2006: 366). Expressions of value, use value or quality for example, are defined by the perceptions of the players along the social chain, either producer or consumer (Foster 2006: 290). Furthermore, the concept of value, especially when used as a status indicator, requires "some degree of human agreement" as to what qualities are valuable, implying that ideas and expressions of value are widely held and constructed by a society at large (Renfrew 1998: 3).

The idea that socially held ideas of value are widely accepted in order to be effective symbols suggests that if artefacts were valued differently "deployed in different social circumstances" or show "gradations of different size, form, composition, or specificity" they would then have been used in different ways (Lesure 1999: 30). Therefore, assessing material and contextual differences serves as a means of accessing value in archaeological assemblages. On a theoretical basis, high levels of differentiation seem to suggest that the artefact marked vertical social relationships between different levels of a hierarchy. The reverse of this suggests that low levels of differentiation indicate horizontal, intra-*strata,* relationships (Lesure 1999: 32).

Therefore, material differences and apparent differences in object value are functional not just within social systems, but social hierarchies. Valuable objects encode social meaning, "cultural values, or even sacred tenets" (Lesure 1999: 24). Therefore when displayed or used objects can maintain, enhance, and create social relationships, or manage levels of prestige and social status (Smith 1999: 116). Archaeologically, much of this rich symbolism derived from social context is lost, however the “structured effects of their meaningfulness” can be measured through archaeological analysis and allow for extrapolation as to those meanings and social roles (Lesure 1999: 25). The suggestion of ascribed value genesis through social production suggests that technology, and a smith’s position within technology was operative in developing the attachment of status, and prestigious expressions associated with iron objects.

Technology in Value Ascription

This brings forward technology in relation to value ascription as a final term to be considered. The earlier discussion of design suggests that technology should be considered because it represents the means by which an object is fabricated and socially constituted (Conkey 2006: 358). Technology itself has a broad ranging definition which encompasses architecture, clothing, art, and even the body. Furthermore, there is a wide range of scholarly works dedicated to exploring and conceptualising technology as an independent form of material culture. Even when considered with a narrow definition, exclusively meaning simple and complex machinery, technology is a powerful cultural actor (Eglash 2006: 329). As an object of social inquiry, technology is problematic because the nature of technology's social involvement is difficult to examine.

It is important to note that early discussions reflect the “liberal and radical discourse” of the times of technological innovation and social change in which they were written (Eglash 2006: 331). In many early conceptualisations, the “social dimension of technologies” are ignored in favour of a purely technical understanding of technology (Lemonnier 1989: 157). As the subject developed the relationship between technology and society became defined and allowed for challenges to standard assumptions regarding technology and the discussion of technology’s role in material culture studies.

One such standard assumption which is challenged through examining social dynamics within technical processes is that of “need-driven technological innovation”, technical innovation is the first answer to a change in material demands (Pfaffenberger 1992: 495). However, studies of history suggest social organisation and reorganisation of human effort was the first response to changing necessity, technological innovation occurs in concert with social coordination, and the people who drive innovation are themselves part of technology. Technical processes occur within socialised contexts and entail social relationships, suggesting a route through which artefacts are ascribed social meaning and value (Dobres 2000: 127).

The importance of social aspects of technology creates a necessity to separate and re-define terms in order to conceptualise technology. When considered as a social process, technology is composed of three indispensable components; **techniques**, **socio-technical systems**, and **material culture** (Pfaffenberger 1992: 497). Techniques refer to the physical system of material resources, tools, operational sequences, skills, and specific modes of work coordination used to fabricate objects. It would be tempting to equate techniques with technology, however a technological system is the result of all techniques within the context of social interaction (Lemonnier 1984: 151).

The concept of socio-technical system refers to the distinctive technological activity which stems from the linkages between social coordination of labor and techniques (Pfaffenberger 1992: 497). It is through these social contexts that an object takes on social meaning and value. Furthermore, socio-technical systems are imprinted with the cultural context from which they originate because the system builders draw upon existing social and cultural resources in organising the system, but through re-organisation those same resources are modified in order for them to work within newly constructed systems. This suggests that socio-technical processes are inevitably sociogenic: society and social change are both the root and result of technological system building (Pfaffenberger 1992: 500).

Socio-technical systems are theorised to be one of the primary ways through which people produce their social world, especially in reference to material culture (Pfaffenberger 1992: 500). This re-enforces the idea that material culture, especially the evidence of technical processes within artefacts, is an important means of archaeologically accessing the social aspects attached to objects. In the case of Viking Age iron, with a foundation in understanding of the socio-technical system through which an artefact was fabricated and the social contexts of the technical processes within the system. In order to better understand how this construction occurs within social contexts it is useful to examine some of the socialisations that can be attached to technological processes.

The most obvious socialisation of technical processes is through the aforementioned organisation of labour. A reorganisation of efforts will directly alter the inter-personal relationships within the system. This could be expected to influence the associations and meanings attached to objects that are involved in the process. Furthermore, Ritual, used to denote a process which is strictly followed although it may involve steps that are not integral to the process, has a significant role in socialised production as a mechanism for organising labour under conditions of stateless or local autonomy, without the documenting the process (Pfaffenberger 1992: 501). The performance of a ritualised process and the roles of individuals within that process, influence the perception of the technology and the objects produced. This suggests that manufacture was a “symbolically charged act” which could ascribe meaning to associated artefacts (Carter 2007: 99, 100).

Ethnographic studies of modern iron smelting traditions suggest that metallurgy is a highly ritualised process which cannot be distinguished as being either “symbolic or technological” (Håland 2004: 11). Historical metalworkers probably lacked a purely scientific understanding of metal and the behaviour of metal on a chemical level. This suggests that iron making and iron working was a non-scientific process in which “various activities related to ritual” were employed in such a way that they could not be “distinguished as technique or magic” (Håland 2004: 11). That is not to say that metal workers had no understanding of metals. On the contrary, it would take a great understanding of the iron properties to forge anything useful. This knowledge and understanding was likely to have been based on experience and the specific steps within the technical process.

Therefore, the quality, ascribed value, and social perceptions of the objects produced in a technical system would have depended on the knowledge of the producer, shown through the ritual process and the resulting object (Gell 1992: 47). An ability to produce socially valuable and high quality artefacts through "esoteric knowledge" would also confer heightened status on the craft producer, enhancing their "role as an important member of the community" (Flad and Hruby 2007: 7). This suggests that the first step to evaluating the value and symbolism attached to iron objects is an examination of Viking Age smithing technology and the position of the ironworker within the techniques and processes involved in making iron artefacts.

Part III: Technology and Technical Skill as Part of Social Status

Chapter 5:
Background of Iron Smelting and Smithing

As outlined above and indicated by Scandinavian myth and legend, the status of Viking Age smiths was closely connected to the quality and value of the objects which they produced, the position of the smith within the socio-technical production system, and the role of those objects as prestige management mechanisms. It follows to suggest that examination of the current understanding of the iron smelting, as demonstrated in Fig. 5.1, and smithing technology, aimed at understanding how objects were fabricated and ascribed with value in the Viking Age, will allow for the status and social role of smiths to be evaluated (Wayman 2000: 260).

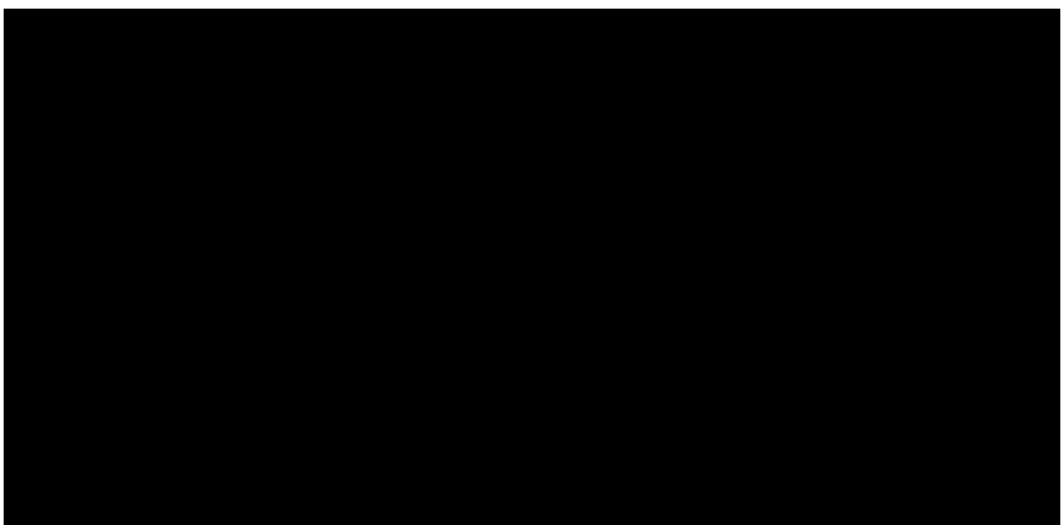


Fig. 5.1 Demonstration of smelting. (after Gansum 2004: Fig.4)

Understanding this will allow for an evaluation of the genesis of iron value throughout the early stages of production, and how value ascription influenced artefact biography and consumption. Our current understanding of these processes has recently been enriched through advancements in archaeological techniques involved in deciphering “knowledge of the chemical, thermal, and mechanical history of the object” and improving the current understanding of the social “history of technology” (Wayman 2000: 260). The technological processes in question can be broken into three general steps: acquisition of raw material, processing needed to produce the iron and/or iron alloy, and the conversion of metal into final shape. Each of the three steps included techniques which were vital to the value which was ascribed to iron.

Procuring and Preparing Raw Materials

Procuring and preparing the raw materials which were necessary for making iron was the first important step in the technological production processes. Our current understanding suggests that this step, and the subsequent smelting processes were not as technically involved as smithing itself. However, the knowledge necessary to locate and prepare materials which were capable of producing iron, and the labour involved in these technological stages suggest that they were vital in the over-all processes common to the Viking Age.

Although the techniques of smelting and smithing were introduced to Scandinavia much earlier than the eighth century, the Viking Age is thought to be a dynamic period for iron production. In Sweden there is evidence for the introduction of iron technology in the Bronze Age, as early as 550 BC (Eriksson 1960: 267). In Norway and Denmark the earliest iron evidence is from the pre-Roman iron age (Stenvik 2003a: 77). Early publications suggest that Denmark was the first major Scandinavian area of iron industry, with its close connection to continental iron making centres such as Wolkenburg, Germany (Spazier 2003: 37). Through similar cultural connections, and the migrations of the Swedish Östrogoths, iron use spread into Norway and Finland. It is theorised that in these early historical periods iron was used for agricultural technologies on a “home-craft, limited scale” (Eriksson 1960: 267). Fig. 5.2 shows the theoretical spread of iron technology into Scandinavia, as well as the areas of iron producing bogs.

The primary raw material which was used for iron production in the Viking Age was bog iron. Bog iron is a form of iron ore which forms in subterranean deposits close to the surface of bogs, marshes, and lake beds. It is commonly accepted that all iron and steel objects from Viking Age Scandinavia and Northern Europe were made from iron reduced from deposits of bog iron ore, lake iron ore, or red soil (Bartolotta *et al* 1988: 30, Buchwald and Wivel 1998: 79). These three forms of iron are the same in terms of their chemical composition and natural formation, therefore bog iron was essentially the only source of iron in Viking Age Scandinavia. Archaeometallurgical studies of Viking Age iron chemistry and micro-morphology display trends associated with bog iron formation, confirming this assertion (Photos-Jones *et al* 1998: 15). It follows to suggest that all iron objects which were produced at a smith's forge in the Viking Age went through the same early stages of production. The traditions of *jernvinne* or domestic iron work, and industrial production, meaning ironmaking for trade instead of personal consumption, were based on reducing bog iron in small furnaces with charcoal as the primary form of fuel until the Middle Ages (Johansen 1973: 84, 85).

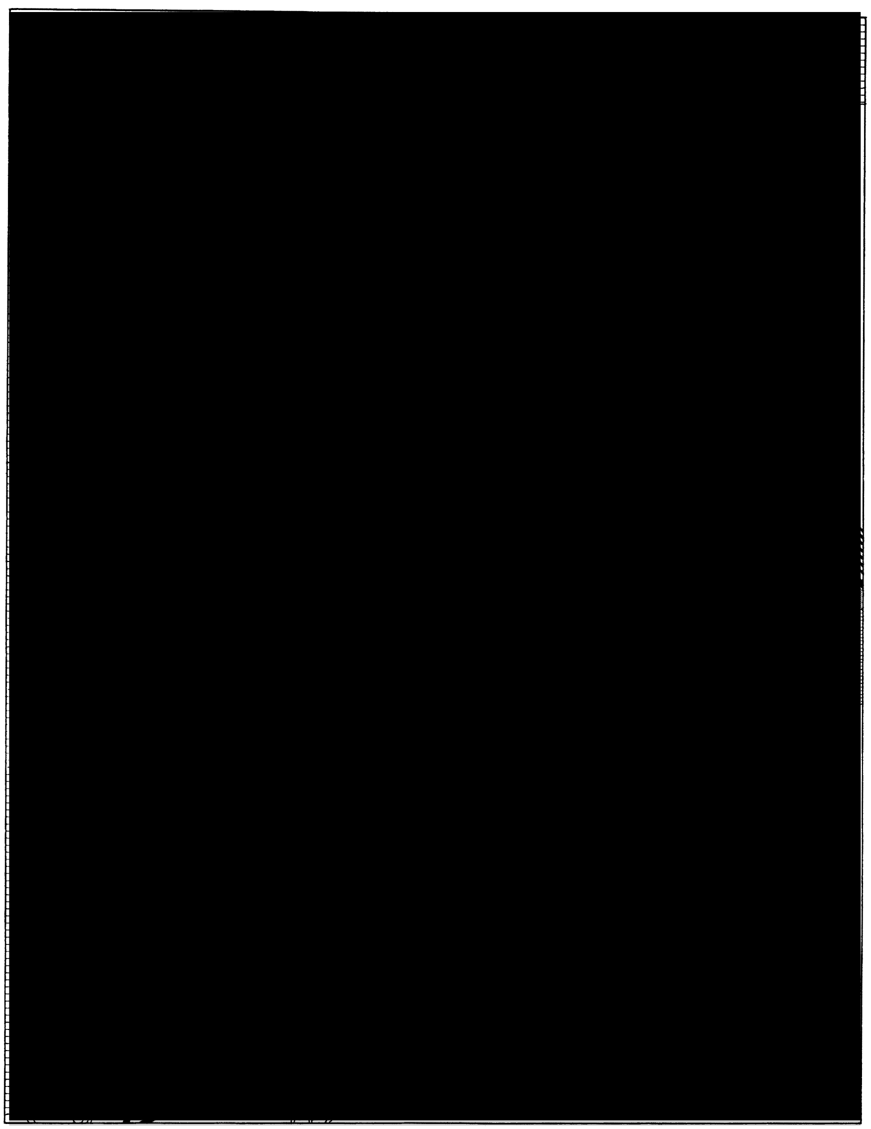


Fig. 5.2 Distribution of bog iron and spread of smithing technology. (after Erikkson 1960: Fig 1)

Samples of Viking Age iron show a general trend of heterogeneous quality, partially due to the conditions of natural bog iron formation. Bog iron requires a number of conditions in order to form into deposits which were usable for iron smelting. Those requirements include: a soluble supply of either ferric (Fe^{3+}) or ferrous (Fe^{2+}) iron, a subterranean flow of acidic water, often from decaying organic matter and/or rainwater, which seeps iron ions into areas with oxidised soils resulting in the formation of ferric iron oxyhydroxides which often contains a high proportion of organic matter (Hall and Photos-Jones 1998: 58, 59). This combination of elements creates accumulations of usable bog ore within receptive soil (Espelund 1991: 41). Favourable iron deposits are formed without excessive contamination or impurities in the iron chemical structure. The quality of ore deposits depend on variables, such as local soil conditions, soil porosity, and the concentration of soluble iron ions (Buchwald and Wivel 1998: 79). Current studies into iron sourcing depend upon comparing the chemical fingerprints and microscopic petrographic analyses, imprinted within iron and slag samples to geological chemicals from Scandinavian regions, in order to trace the trade patterns which were responsible for moving iron through the Viking world (Lyngstrøm 2003: 23). Due to evidence of dramatic localised ore quality variation, early studies of Danish iron production in the Migration Period and Viking Age debated the suitability of native Danish iron for utility objects and weapons compared to other Scandinavian counterparts (Nørbach 2003: 67).

Before iron smelting could take place, the necessary raw materials had to be located, excavated, and roasted to prepare them for efficient reduction. Furthermore, charcoal had to be prepared by collecting and roasting wood in underground pits. These processes were not difficult on a technical level but were labour intensive, time consuming, and entirely necessary for the other techniques to occur. In order to make usable quality iron, the ore had to be prepared in specific ways to maximise the efficiency of the process, suggesting that there was a level of technical skill and esoteric knowledge involved in locating and preparing raw materials.

Bog iron deposits typically precipitated between 10 to 50 centimetres below the surface of the bog soil in thin layers, suggesting that discovering, identifying, and excavating the ore was the first labour intensive action in the process (Johansen 1973: 85). Excavated bog iron appears as small deposits of coarse, lightly coloured gravel. Modern sciences can locate sub-surface deposits and determine the suitability of the ore with relative ease. However, without the benefit of modern techniques, Viking Age iron workers would have relied on their senses and experience to find ore which included a sufficient percentage of iron oxide to produce any quantity of metallic iron, and distinguish from different quality ores, and styles of mineralisation (Hall and Photos-Jones 1998: 65). Theoretically, craftsmen could have identified different qualities of bog iron by colour, grain size, and taste (Stenvik 2003a: 79). Furthermore, in order to properly prepare the ore so that it would produce metallic iron, any latent moisture must have been removed by roasting excavated ore in a fire. The presence of latent moisture suggests that freshly excavated ore carried a great deal of extra weight in the form of extra water and non-ferric minerals. Therefore, roasting and smelting was performed close to the origin of the raw materials (Johansen 1973: 87). It has been suggested that locating intensive iron smelting activities close to the material sources had a direct influence upon Migration Period and Viking Age settlement patterns in bog ore rich areas (Johansen 1973: 86).

Systematic studies of place-names in Norway have been used to indicate what activities were associated with the area in the past. This principle holds true for iron working activities, including the earliest stages of production. For example, the place-name *Malmtektbua* translates to “the hut at the digging place for bog iron” and indicates the importance of bog iron sources in settlement (Stemshaug 1991: 116). Several other place-names indicate iron working locations. These include the terms for slag, *Slagg-/ sinder-/sindre-*, and iron, *Jarn-/Jern-/ Jenn-og/ Jønn*. These terms often are the first word of a longer phrase. For example, *Slaggtjerna* translates to ‘the slag ponds’, and *Slaggbekken* translates to ‘the slag brook’ (Stemshaug 1991: 116). Spatial analysis of place-name evidence is often the primary step to evaluating the location of smelting activities within an existing landscape and explaining the nature of those activities.

Preparing Fuel

The preparation of fuel was one of many intensive steps which were vital in determining the eventual quality of the resulting iron bloom (Martens 1982: 39). This involved cutting down trees, building a furnace, and roasting the wood into charcoal (Prestvold 1996: 50). Collecting driftwood along the fjord coasts has been suggested to be another method of procuring wood for charcoal preparation. The general process of preparing wood for fuel required a considerable investment of time but not necessarily labour. It has been theorised that the entire process of preparing charcoal took close to two weeks to perform properly (Bartolotta *et al* 1988: 31).

Preparing charcoal would have involved roasting cut or collected wood in an anaerobic kiln for an extended period of time. These kilns appear in the archaeological record in the form of "semi-spherical depressions with a diameter between 1.5 and 5 metres" (Johansen 1973: 87). Kilns are commonly identified by distinctive layers of charcoal within the soil strata averaging 2.5 metres deep, indicating a dedicated burning pit. Kilns often feature flagstone lining, however this feature appears not to have been a ubiquitous trend, occurring on an individual basis. It has been calculated that the average charcoal kiln would yield 2 cubic metres of usable charcoal in a single roasting (Bartolotta *et al* 1988*:* 31). This step would have been particularly vital to smelting because charcoal was a more efficient fuel source than unprocessed wood. It could easily fit into a small smelting furnace, and would potentially burn at a higher temperature than wood. The increased temperature would have made the smelting episode more efficient, yielding higher quality iron blooms.

Recent research has identified alternative sources of fuel that were used in conjunction with charcoal (Mikkelsen 2003: 45). Impressions in slag samples from Danish smelting pits suggest that straw and heather branches were used as fuel. These materials, straw especially, are suggested to be particularly useful sources of fuel. Straw, fresh twigs, and heather branches would have been readily available, easy to handle, and would have reduced to fine ash or carbon dust during firing. The presence of impressions indicates that these alternative fuels were fresh when they were used. Impressions were formed when liquid slag came in contact with fresh straw. The fresh straw and heather would have held its shape, creating the impression which was preserved when the slag cooled and the straw burned away. Using freshly harvested straw would have provided a longer burning time, apparently without reducing the burning temperature in the same way as un-roasted wood. Furthermore, contrast between straw and heather indicate differing season in which firing occurred, dictated by the availability of either one source or the other (Mikkelsen 2003: 46).

Calculations made by Tylecote suggest that 7.2 kg of fuel, either charcoal or straw alternatives, would have been needed to produce .45 kg of iron and 1.8 kg of slag (1962: 190). Further calculations suggest that the yield of charcoal from a single kiln could fuel close to fifty smelting episodes, potentially more if alternative fuel sources were used in conjunction with charcoal. It is unlikely that coal was used as a fuel source because it contains sulphur, which serves to weaken the iron if absorbed (Jones 2001: 10). Considering the high fuel to iron ratio, a result of significant heat loss during firing and the "minimal/ variant" yield of metal, transporting raw materials over long distances would have been an inefficient use of time and energy (Johansen 1973: 87). The quantified weight reduction implies that raw materials and fuel would have only been transported over short distances, and smelting would have been performed close to the source of the raw materials. This re-enforces the earlier suggestion that smelting and preparation activities had an influence on settlement pattens in areas with natural bog iron deposits.

Smelting Activities

Once ore and fuel was excavated and properly prepared, the formal smelting process could be performed. Examining this step is important for understanding the genesis of value of iron. Furnace efficiency and the specific steps of the smelting process contribute directly to the quality of the resulting iron bloom, which is vital for the use value of any object forged from that iron. Furthermore, the quality of resulting iron speaks directly to the knowledge and skill of the ironworkers involved in the process.

Smelting is the process in which iron samples, also called blooms, were formed through "the combustion of charcoal and reduction of iron ore" within the same reactor (Espelund 1991a: 76). Most studies suggest that furnaces fired at around 1050 to 1200 ˚ C, depending on the furnace construction (See Fig. 5.3 for a diagram of a smelting furnace and proposed temperature areas). At high temperatures the mineral components of the iron ore melt and either run through a hole in the side of the furnace wall or collect in the bottom of the furnace to be removed later (Bartolotta *et al* 1988: 25). The method of removing slag greatly influences the morphology of the slag as it cools, providing some evidence of production methods (Jones 2001: 10). Anglo-Saxons used the term *gangue* to refer to the worthless rock which surrounded the desired metal (Rapp 2009: 143). These mineral by-products are known as slag, and are often the best indicator of smelting site location, smelting efficiency, and iron quality.

[redacted]

Fig. 5.3 Diagram of smelting furnace. (after Magnusson in Roesdahl and Wilson (eds) 1992: Fig 1)

Generally speaking iron ore is around 85% iron oxide, Fe_2O_3, 10-12% Silicon oxide, SiO_2, and 1-3% Aluminium oxide, Al_2O_3, with traces of other elements (Espelund 1991a: 76). In order to produce any iron, the percentage of silicate minerals cannot exceed 25%, any higher than this the ore will not contain a high enough concentration of iron for blooms to form. Slag receives most, if not all, of the mineral components from the ore, as a result it is a compound known as Fayalite, Fe_2SiO_4, mixed with other trace elements (Espelund 1991: 37, 38). Modern chemical science establishes that the melting point of fayalite is around 1150-1170° C (Rapp 2009: 144). The ratio of slag silicon oxides to other elements in select samples appears to be higher than average. This increased percentage suggests the application of a silicon rich flux in the reduction process (Chirikure 2006: 148). Flux is a general name given to an additive used in direct firing methods which reduces the melting point of the silicon slag minerals, allowing them to reduce at a lower temperature (Rapp 2009: 144). The use of flux in Viking Age direct smelting would have assisted in the reduction of the ore's mineral elements, resulting in lean slag and pure iron.

As the mineral components reduce a principle known at the "sticking effect" occurs: iron particles while hot, remain solid and coalesce into a small lump of metallic iron (Espelund 1991a: 76). Iron blooms never reached fully molten conditions and formed as semi-solid lumps as slag rend away. As they formed and rose to the top of the slag, blooms could have then been removed from the top of the furnace with smithing tongs (Buchwald and Wivel 1998: 73). The metallic iron produced through the direct reduction of slag typically had a concentration which was five times that of the original ore, depending on the efficiency of the process and the temperature achieved in the furnace interior (Rapp 2009: 143).

Furnace Design

The knowledge and skill of the smelters governed the overall efficiency of the process. Not only though the preparation of fuel and ore, but the construction of the furnace. These particular aspects appear to have been dedicated in order to control, or maximise the internal temperature of the furnace (Chirikure 2006: 147). As already mentioned, the internal temperature would directly translate into an efficient smelting episode and pure iron blooms. If the internal temperature was not high enough to reduce the slag homogeneously, small amounts of slag would become included in the iron bloom, resulting in soft, spongy metal. Although temperature was important, there were factors which could result in lower quality iron. Many conditions for making quality iron such as the raw ore grain size and fuel to ore ratios could be easily controlled. However, other factors would act during the firing process and influence the resulting iron quality, although they could not be directly observed or controlled.

Efficient reduction of slag depended upon the interior heat equilibrium inside the furnace. Modern blast furnaces regulate interior equilibrium by stirring the reducing ore, and maintaining a consistently high temperature. In Viking Age smelting furnaces any small area of the furnace interior could create pockets of heat and local temperature equilibrium, resulting in areas where slag was shielded from high heat and incorporated into the iron blooms (Buchwald and Wivel 1998: 76). If the furnace was built with an irregular interior surface, or was fired with a low temperature, the quality of iron blooms could have varied wildly in an individual smelting episode. Published studies suggest that most iron blooms contained heterogeneously carburised metal with “haphazardly distributed” inclusions, and only one third of iron blooms contained purely ferritic iron. This suggests that uncontrolled interior equilibrium was common to Viking Age furnace designs (Pleiner 2003: 183).

[redacted]

Fig. 5.4 Smelting shaft furnace remains. (after Gansum 2004: Fig 3)

The uncertainty of interior furnace dynamics suggests that both adherence to specific furnace design and strict repetition of proven smelting procedures were important for consistently producing high quality iron. Archaeological furnace remains suggest that three furnace designs were employed in the Viking Age. The remains of a Viking Age furnace is seen in Fig. 5.4. The first and earliest is identified as a “flag-lined bowl furnace" (Martens 1982: 31). This type of furnace was used in the seventh and eighth centuries, shortly replacing the Roman style "rosette-shaped" shaft furnaces common to earlier time periods (Stenvik 1991: 101). A flag-lined bowl furnace was composed of a shallow bowl shaped pit, which featured a bottom which was lined with flag-stones, and an inner clay lining. With the exception of an open front flag-lined bowl design employed in later periods, these furnaces featured neither a dedicated slag outlet nor an air inlet (Martens 1982: 31). The inclusion of these two design features would have been an important improvement because it allows for an air current directly into the furnace coals, as well as a method for extracting slag from the base of the furnace. This would have made smelting more efficient by increasing the firing temperature, and the number of firings which could occur in an individual furnace before it would have to be abandoned due to slag build up.

[redacted]

Fig 5.5 A general shaft bloomery furnace reconstruction featuring a bellows/air inlet, and tap arch as a slag outlet. (after Jones (ed) 2001: Fig 9)

In the early Viking Age, flag-lined bowl furnaces were gradually replaced by the shaft furnaces common to most Northern European iron working traditions (Fig 5.5). The majority of Scandinavian shaft furnaces examples were constructed with stone walls and clay lining. Shaft furnaces had a height to diameter ratio of one to one, indicating that the shaft was as wide as it was tall (Martens 1982: 33). It is important to mention that finding the remains of an intact furnace shaft is uncommon (Fig 5.4). For this reason flag-lined bowl and shaft furnace are distinguished from one another by examining the consistency and quantity of slag deposits associated with furnace remains. A slag deposit with low density, small, irregular slag pieces indicates either a flag-lined bowl furnace or a particularly inefficient shaft furnace. In contrast, high density, distinctly shaped slag indicates the use of a more efficient shaft furnace (Martens 1982: 33). Although the identification of shaft furnace remains usually depend upon slag pits, differences between the remains suggest that shaft furnaces were commonly constructed with differing features. For example, the presence of slag flow outlet or an air flow inlet was heterogeneous, appearing in many but not all furnace remains (Martens 1982: 31). As with the flag-lined bowl furnace, the presence and use of such an opening would have increased the over all efficiency of the smelting process.

In Viking Age Norway there appears to have been a furnace style which does not match the European shaft furnace tradition, although it is a type of shaft furnace. This type of furnace featured stone walls with clay lining, similar to other shaft furnaces, .8 metres deep with a diameter between .8 and .9m. There is evidence for consistent use of slag flow outlets connected to open slag pits. Slag would have flowed away from the main furnace and dissipated its heat in an open pit. These features allowed for frequent reuse of the furnace. Furthermore, there is evidence for regular design features intended for a natural air draft into the furnace interior, allowing for more oxygen to reach the charcoal and increase the overall firing temperature (Stenvik 2003a: 78).

The pronounced evidence of inconsistencies and variation between raw materials, furnace types, and iron samples suggests that the quality of iron in the Viking Age was highly dependent upon the skills, knowledge, and techniques of individual smelters. The physical bloom which was removed from the top of the furnace would have been the primary evidence of the smelter's technological skill and knowledge for both the members of the community which were involved in the process, and a potential consumer of the metallic iron. Furthermore, the quality of the iron bloom, through the perception of the production techniques and iron qualities, would have been the first episode of value and meaning ascription attached to the iron itself.

Iron Characteristics and Quality

Iron blooms formed as semi-solid lumps of metal as the iron particles coalesced together and the slag rend away. The small size of iron blooms allowed smelters to remove the iron blooms from the top of the smelting reaction with smithing tongs as they formed. The blooms, still hot from the furnace, could then be hammered against an anvil stone into a billet or ingot, or cooled for transportation (Espelund 1991a: 76). Samples taken from available iron objects confirm that most objects were constructed from several smaller pieces of varying quality iron from differing origins. This includes the famous, innovative Ulfberht swords, which show evidence of having been constructed from several smaller pieces of iron which had been carefully selected and refined (Fig. 5.6) (Gorman 1999: 1, Williams 1977: 81).

Fig. 5.6 Diagram of proposed blade construction. The arrow indicates sword cross-section in relation to possible construction layers. Theoretically each layer represents a different quality of iron. (after Williams 1977: 81)

Theoretically, iron quality would have been vital in determining how an iron billet was selected, distributed, and used. An analysis of a double sided knife from the furnishings of a Danish Viking Age grave suggests that the knife was forged from several layers of different quality iron. Locally sourced iron was used to forge the exterior flanks, yet the core and cutting edges were forged from harder, leaner iron. The chemical compositions of these layers were compared to the chemical profile of regional slag samples revealing that the higher quality metal was imported from Norway, which implies that it was intentionally selected for its high quality (Lyngstrøm 2003: 23).

Generally speaking, there were four types of iron available for use which could be identified on the basis of differing characteristics. Ferritic iron is chemically pure iron, containing no alloying elements. Phosphoric iron contains between .05 and .5% phosphorus. The presence of phosphorus has two major affects on the behaviour of iron (McDonnell 1989: 375). The first is that it facilitates the transfer of heat through the metal. This trait was necessary for solidly welding several pieces of iron together in order to forge large objects. The second effect of phosphorus is that it may block the diffusion of carbon into the iron chemical structure, preventing the production of steel and embrittling the iron (Godfrey *et al* 2003: 191). The third type of iron alloy is steel, which contains a percentage of carbon, usually between 1% and 2%. This leads to a metal which is harder and more brittle than iron. Steel was often used to manufacture blades and cutting edges, because the additional hardness added strength to the blade, and made the cutting edge sharper and more capable of holding a sharp edge. The presence of carbon only increases the iron quality in a certain degree. Proper forging technique and heat treatment, known as tempering, is needed to take full advantage of a carbon rich iron by systematically forming and breaking down crystalline iron carbide molecules into a regular structure, ensuring a spread of strength and flexibility. The fourth type of iron is particularly deceptive. It is identified using piled or banded structures composed of different purity and alloyed iron, which is problematic because piling is a welding technique in which several pieces of iron are welded together into a larger object. On a microscopic level, it is difficult to distinguish between intentionally piled iron and iron which has been banded accidentally (McDonnell 1989: 375).

The properties of iron blooms and accurate identification of those characteristics would have been necessary for determining how to best use an iron sample. Alongside the efficient furnace features there is evidence for techniques which were intended to control the properties of the metals, both during smelting and before forging. For example, some sites contain burned bones in association with the furnace remains and slag deposits. This suggests that animal bones had been mixed into the charcoal and other fuel materials during firing, see Fig. 5.7. The coal from burning bones acted as a catalyst for the penetration of alloying elements, such as phosphorus, calcium, and carbon, into the iron, resulting in strong carbon steel rich with beneficial alloying elements (Gansum 2004: 41, 43). A small house on a Swedish Migration Period farm complex known as Gene confirms this. The house was built away from the other farm buildings, and contained the remains of four forges as well as one fireplace located outside the house's walls. Within the smallest of the furnace features there were clay samples, and one hundred and fifty six burned animal bones. This combination of evidence shows that it was an ironworking furnace and bones regularly were used in the ironworking process (Gansum 2004: 44).

Fig. 5.7 bone-coal and calcified bones indicating use as fuel. (after Gansum 2004: Fig 1)

Interpretation of this particular site concludes that the use of bones is evidence of the union between ritual, technology, and symbolism in iron production (Gansum 2004: 44). The chemical connection between the bones and iron quality would have been unknown to the iron workers and community alike, however the results would have been obvious in observable iron properties, and reflected in "the qualities of the products" which were made with the iron (Grandin and Hjärthner-Holdar 2003: 35). Evidence of animal bones use in ironworking is relatively uncommon, suggesting that this particular technique was held on an individual basis and directly controlled by the ironworker. The association with the ritualised technical process and the smith's control of that process would have led to ascription of meaning and value to the iron with respect to the smith (Gansum 2004: 43).

Identification of iron properties and quality would have also been important to the ascription of value to iron, and would have been included in the knowledge of the ironworkers intending to use the smelted iron. It is theorised that blacksmiths would have preferred softer, “low-carbon wrought iron for the majority of his work” (Buchwald and Wivel 1998: 83). Considering that most larger objects, including weapons and farm implements, would have been constructed from several smaller iron blooms forge-welded together into a larger iron billet. This preference can be extended to iron samples with a fair amount of phosphorus because it assists in the welding process. Intentionally using phosphorus rich iron would have resulted in objects with fewer weak points caused by incomplete welding.

There is a great deal of evidence which suggests that ironworkers deliberately took steps to display the quality and purity of their iron. Depicted in Fig. 5.8, iron samples from Jutland, Denmark indicate that iron blooms were hammered flat and intentionally bent in order to display the metal quality. Flattening iron billets displayed any impurities and slag inclusions within the structure of the metal (Lyngstrøm 2003: 22). Some iron billets appear to have shaped into a spatula shape, which has been suggested to represent a mark of quality for long distance trade into the wider Scandinavian world (Lyngstrøm 2003: 23). Furthermore, loaf-shaped blooms from Norwegian contexts show evidence of having been intentionally split along the surface to show the metal's internal

Fig. 5.8 Iron currency bars.
(after Roesdahl and Wilson 1992: 92)

structure (Pleiner 2003: 186). The presence or absence of slag inclusions and impurities would then correspond to the hardness of the metal and the difficulty, or ease, of working with the metal. In turn, this would determine how the iron billet was used in object production.

Fig. 5.9 Slag samples of different types: undiagnostic slag (left) and Tap/flow slag (right) which indicate methods of slag extraction. (after Jones 2001: Fig 14 and Fig 15)

Most of the evidence used to analyse the early steps of Viking Age ironworks, especially smelting, comes from archaeo-metallurgical data drawn from slag deposits. Slag is often more prevalent and numerous in ironworking sites than iron objects themselves, and serves as a readily available resource for chemical analyses (Jones 2001: 11). Slag in its various forms, such as rake slag, tap slag, or block slag (Fig. 5.9 for examples), also carries indicators of the production technology which complement data drawn from iron objects (Jones 2001: 11). Not only does slag inherit the oxide byproducts from the iron ore but often carries inclusions from the furnace in the form of ash, and clay from the furnace walls (Bartolotta *et al* 1988: 23). Recent studies, drawing upon the idea that the trace elements within iron ore “provide a fingerprint” of where the ore was formed and correlate with the chemical profiles of slag and iron objects, theorising that comparing the data samples will allow for examination of distribution patterns by comparing iron sources to the final object deposition (Lyngstrøm 2003: 23, Buchwald 2003: 171). Through extensive experimentation and data sampling it has been concluded that the ratios of silicon oxide to iron, silicon oxide to aluminium oxide, aluminium oxide to calcium oxide, and potassium oxide to magnesium oxide are the best indicators of iron source because the ratios of these elements were not significantly different between raw materials and iron objects (Buchwald and Wivel 1998: 77, Buchwald 2003: 175). Slag analyses represent some of the most significant advances in the current understanding of ironworking. Other current studies include methods of modelling and characterising ancient smelting activities using archaeo-magnetic mapping (Abrahamsen *et al* 2003: 205), and mineral magnetism (Mighall *et al* 2009: 130). Other current studies include methods of modelling and characterising ancient smelting activities using archaeomagnetic mapping (Abrahamsen et al 2003: 205), and mineral magnetism (Mighall et al 2009: 130) which provide new insight into identifying patterns of past ironworking. The compositions of tap and other slags are shown in Fig 5.10 and those of smithing and smelting slags are shown in the ternary diagram in Fig. 5.11.

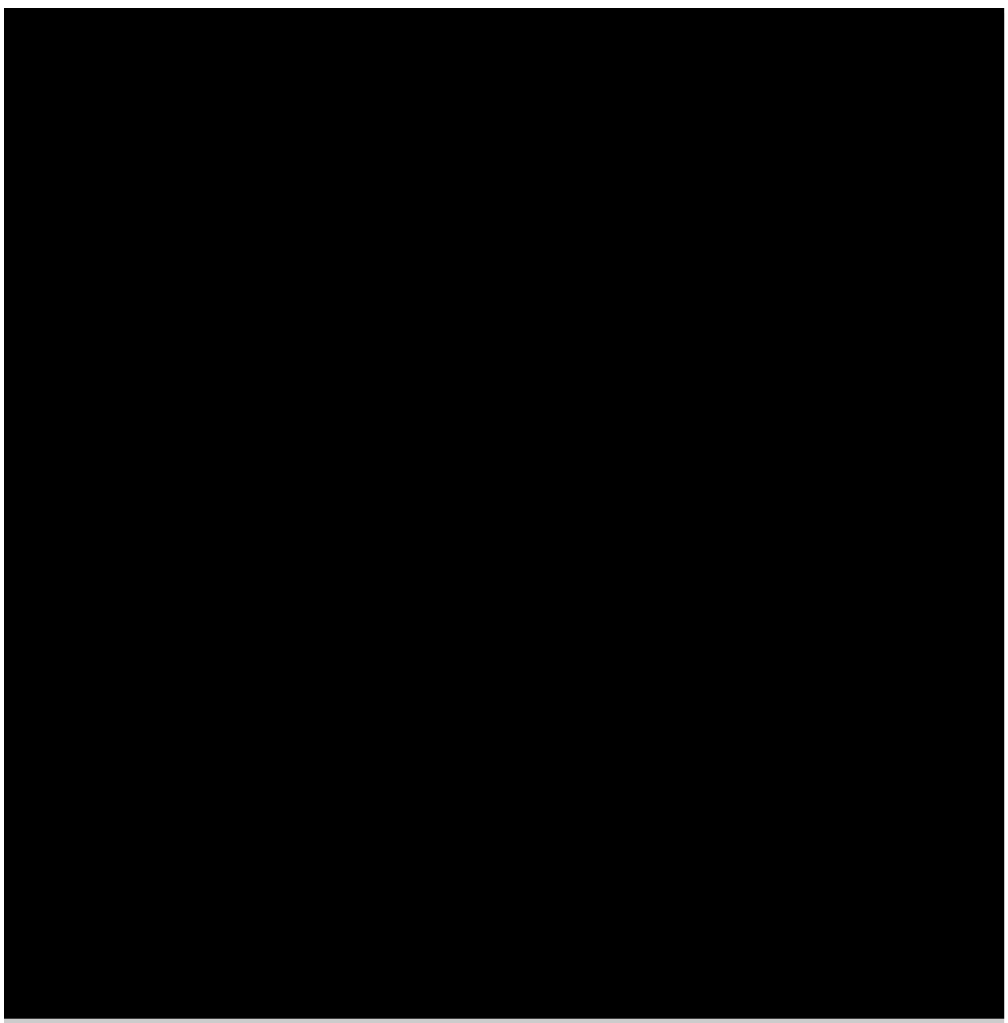


Fig. 5.10 Data drawn from a number of Norwegian slag samples, including contextual information, internal structure, and post-analysis classifications. They indicate the potential use of slag analysis. (After Bartolla *et al* 2008: table 1 and table 2)

[redacted]

Fig 5.11 Ternary diagram indicating the proportion of iron oxide, aluminium oxide, and silicon oxide in pre-modern smithing and smelting slag samples. Smelting slag samples predominate around Optimum 1 and smithing slag predominates around Optimum 2, indicating higher proportions of iron in smithing samples. (After Rehren *et al* 2007: Figure 2A)

Evidence of Smithing Activities

The most substantial source of data for Viking Age smithing technology is the quantity of iron objects excavated from contemporary furnished graves (Wright 2010: 131). This trend is a result of the intentional deposition common to Scandinavian funerary rites, in which the diseased was buried with their personal possessions by their relatives and the community. Metallic objects within grave furnishings are most likely to survive into the archaeological record, see Fig. 5.12 for examples of archaeological ironworking tools. However, in comparison with iron extraction sites and by-products, direct evidence of forging activities is relatively lacking. With few exceptions, forge foundations and smithing slag are rare in the archaeological record. The exceptions appear to be high status complexes and early urban centres. Mentioned in Chapter 1, the examples of forge foundations which have been excavated at Yeavering and Lake Tisso support this assertion (Wright 2010: 133). However, given the importance of iron as a trade commodity on the rural and urban economies, and the widespread demand for iron objects, it is unlikely that all iron objects from the Scandinavian world were forged in central places (Jørgensen 2002: 139, Martens 1982: 43).

[redacted]

Fig. 5.12 Variety of smithing tools from Staraja Ladoga (horizon E3) St. Petersburg, Russia.
(after Magnusson in Roesdahl and Wilson (eds) 1992: Fig 2)

The variable nature of bog ore formation, and smelting activities would have made centralised control of iron difficult (Callmer 2003: 356). A case could be made for weapons and armour being centrally controlled through the attachment of skilled smiths to noble houses and their retinues, however a similar case for central production of common iron tools would be considerably weaker (Arnold and Munns 1994: 473, Smith 2005: 187). The most likely scenario is that the iron economy of the Viking Age was an intertwined system of independent smiths periodically visiting iron producing areas and attached smiths making a living by producing prestige goods in central places, under the careful eye of patrons (Blindheim 1982: 8, Callmer 2003: 356). Independent producers, unfettered by centralised control would have produced subsistence or utilitarian goods, and performed repairs for unspecified consumers. Attached specialists, who were potentially the smiths with the highest degree of skill, produced the higher quality prestige objects in return for support from a noble or wealthy patron (Smith 2005: 202). In this case, distribution of the quality goods was controlled by those social elites who oversaw the production processes (Arnold and Munns 1994: 476). In later time periods, as small scale smithing became less of a “high risk activity” and urban centres became more prominent, centrally located smithing of more mundane objects and evidence of smithing activities became more common (Budd and Taylor 1995: 139, Giles 2007: 398).

In addition to the aforementioned rare furnace, evidence for the location of smithing comes in the form of slag samples. In contrast to smelting slags, which are the product of the primary, direct smelting, smithing slag types are the product of consolidation of iron blooms by hammering heated billets against an anvil to expel large pockets of residual slag. Slag produced in this manner is often flat, rusty, and magnetic, indicating that a percentage of iron was forced into the slag from the force of the hammering (Chirikure 2006: 147). The internal equilibrium concept mentioned above suggests that the efficiency of this secondary iron refinement is largely determined by the heat at which the iron is fired before hammering. Not only will a higher firing temperature increase the likelihood that the slag within the iron sample would become molten and easily hammered out, but it will also bring the metallic iron closer to melting point, making it softer and increasing the chances that the iron will expel its slag inclusions with minimal resistance. Similarly to the efficiency of the smelting furnace, refining iron samples to a sufficiently high quality was highly dependent upon the smith and his ability to identify metal temperature by visual cues alone.

Another common by-product which can be used to identify smithing activities is hammer scale. Hammer scale is formed as small amounts of metallic iron attach to the contact surfaces of the anvil stone and hammer during the forging processes. The iron rapidly cools when struck against the surface of the anvil and flakes away from the iron in thin layers (Bartolotta *et al* 1988: 25). Flat slag and hammer scale are two sources of evidence for distinguishing between smelting and smithing, and examining these by-products in conjunction with available information from objects themselves can be provide evidence for how iron was worked into objects (Fig 5.11 for an example of slag analysis)

Smithing Techniques

The first two obvious steps in forging an iron object would have been the initial hammering for refinement and basic shape, which produced tap slag and hammer scale, and piling/forge-welding, necessary for combining several smaller pieces of metal into a suitably large amount of iron. The size and intended shape of the object must have a large amount of sway in the extent with which these steps were exercised. Smaller household objects would need less early work than larger ones (Buchwald and Wivel 1998: 83). Therefore, smiths probably planned their works in advance, and selected metal billets depending upon the metallic properties and how those properties would interact in the final object. The influence of phosphorus in forging has been mentioned above and is an example of a property which would be vital for forging quality objects (Buchwald and Wivel 1998: 83).

Once a sufficient amount of iron was selected and forge-welded together the actual formation of the intended object could occur. Samples taken from early Iron Age Baltic axes suggest that early iron smithing techniques were similar to earlier bronze working techniques (Peets 2003: 111). Although archaeo-metallurgical samples are difficult to obtain because of the size and thickness of the metal as well as the reticence of museums to have samples taken from iron objects in their collections, these samples indicate that axes were forged by shaping a flat iron sheet around wooden shafts and welding the edges of iron together, similar to bronze axes from earlier historical periods (Peets 2003: 112). Similar techniques appear to have been used to forge Viking Age spears, suggesting that the techniques, although potentially more advanced were similar to earlier metalworking counterparts (Scott 1974: 12). Techniques such as welding, stretching, bending, piercing, cementing, hardening, and tempering would be included in producing iron objects of any kind (Peets 2003: 115).

Although early techniques appear to have mimicked bronze technology, iron is notably different than bronze in terms of its general qualities (see Fig. 5.13). This would have created difficulties for early smiths to utilise iron and would have required increasingly more intensive, specialist skills and planning to overcome (Bradley 1988: 253). The iron property which had a strong influence on the production process is the high melting point of iron compared to bronze and its alloy metals. Bronze, with its lower melting point requires less heat to bend and shape. Attempting to use bronze-working techniques, with a relatively low working temperature, to shape iron would cause "local thinning in the region of deformation", creating weak points in the metal (Scott 1974: 12). This implies that forging high quality iron objects requires more efficient heat sources, involved more work, and a competent craftsman. Distinct fractures along welding points in early weapons suggests that the techniques necessary to best work iron had been developed over time, in order to create the weapons found in association with later time periods (Dinnetz 2003: 107). Furthermore, quality variations within objects which are roughly contemporary suggest that extensive knowledge of the best iron working techniques were held by few, learned through apprenticing under a competent teacher, and honed through years of practice (Callmer 2003: 358). Not only would these include the techniques for shaping iron into the desired design, but would involve the knowledge of how iron would act during heating, and when in that process it would be best to shape the metal in order to yield the highest possible quality and value.

[redacted]

Fig. 5.13 Early iron working diagram resembling bronze stretching techniques. (after Scott 1974: Fig. 3)

Given available materials, pattern-welding, the steps of which are depicted in Fig. 5.14, appears to have been the most common method of forging high quality weapons in the Viking Age. Pattern-welding is a forging technique in which between three and seven layers of iron with differing degrees of strength and quality were welded into a rod and twisted to disperse the different layers of metal (Maryon 1960: 28). This technique effectively gives the balance of tensile strength and flexibility through evenly dispursing the strength of pure, carbon rich iron, and the softness of impure, low-carbon iron which was necessary for as effective weapon or farming implement (McDonnell 1989: 375). Forging a sword or spear which was sufficiently sharp, strong, and flexible to be durable and effective would have represented the application of all of a smith's skill and experience. The obvious combination of hard and soft iron layers within samples taken from pattern-welded artefacts implies that the iron samples were intentionally selected for their individual quality. Not only would pattern-welding have required knowledge necessary for identifying different qualities in iron samples, but welding those iron billets together and shaping them into a weapon would have required sufficient temperature control and all of the complex smithing techniques mentioned above (Jones 1997: 1). This suggests that techniques for iron identification and forging were vessels of value ascription during the Viking Age.

[redacted]

Fig. 5.14 Diagram of Pattern-welding processes. Layering, twisting, and shaping the blade. (after Redknap 2000: 132 i-vii)

[redacted]

Pattern-welded iron is close to one and a half times stronger than wrought iron. This proportion would have been greater given iron layers of higher quality (Sherby and

Wadsworth 2001: 348). In many cases, after the weapon was shaped from the pattern-welded blade core, high carbon iron would have been welded to the blade-core to serve as strong cutting edges and provide additional tensile strength. Heat treatment in the form of cycles of heating and cooling at different rates would take advantage of the carbon in the metal to make steel, which could be up to five times stronger than normal iron (Sherby and Wadsworth 2001: 348). It appears that the technology necessary for forging and working high carbon steel similar to true damascus steel, which is often mistaken for pattern-welded steel, was unknown until later time periods (Ranganathan and Srinivasan 2006: 69). Therefore, a pattern-welded weapon was the highest quality object one could own, both in terms of the amount of effort put into the fabrication and the object's use value.

In an exercise in experimental archaeology, J. Anstee attempted to replicate the pattern-welded sword which was found in Nydam bog, Denmark using techniques approximately appropriate to the Viking Age (1956). Over twenty eight hours and one hundred twenty eight individual welding heats were necessary to complete the pattern-welded blade core alone. To complete the sword and hilt fabrication, the entire experiment took seventy five hours. The forging of a pattern-welded sword "which would not bend or shatter" would have represented "pinnacle of the smith's art" and skills (Bartolotta *et al* 1988: 32). This being said, in order to forge objects with a similar use value to swords, similar care and skill would have gone into the fabrication of other weapons such as knifes and axes, utilitarian objects, and even simple rivets. If each technique in the process represented a register of value, pattern-welded weapons would have accumulated a great deal of value.

Performing chemical and petrographic analyses on iron objects in order to generate archaeo-metallurgical data from the internal structure of the metal is particularly difficult, although such iron sample data is particularly useful for elucidating smithing technology, especially in relation to potential ore sources and waste products (Photos-Jones *et al* 1998: 15, Wayman 2000: 260). An example of the use of such data comes from a sword from Sweden, contemporary to La Tène periods in Europe. Chemical analysis of the metal indicates that the sword was made from a piled collection of "homogeneously, harden-able" mild-carbon iron with a tang composed only of low-carbon iron. This suggests that strong metal was intentionally selected to forge the blade and recognised as a different quality to the metal which was used to forge the tang (Dinnetz 2003: 107). Although such data is clearly useful, museums are rarely willing to compromise the tenuous conservation state of iron objects within their collections by taking samples from the object's interior (Rehren *et al* 2007: 211). The only exception to this trend is if the object is already damaged and/or recently excavated, supplying much of the data drawn from iron objects.

Interpretation through Anthropology and Ethnographic Studies

The amount of skill and knowledge required to smelt and smith iron into objects with high quality suggests that the entire process was important in accumulating the initial use and esteem value of that object. Furthermore, the perception of the object at each step of production, along with the work and knowledge involved in the process would have built the prestige of the ironworkers who were performing and controlling the processes.

Fig. 5.15 Map of Njanja territory.
(after Chirikure 2006: Fig. 1)

[redacted]

Modern ethnographic evidence from East African rural iron-working cultures suggests that the knowledge of iron smelting and smithing held by village masters, and the social performance of iron-working ascribe both symbolism into the metal and status upon the workers. The Njanja people from Zimbabwe, Africa have practiced well-organised, industrial ironworking through most of their known history (See Fig. 5.15 for a map of Njanja territories). Their ironworking is believed to be of higher quality than historical European counterparts, (Chirikure 2006: 142). Master smiths oversee a complicated labour-shift system and exploit high quality haematite iron ore, seen in Fig. 5.16, to simultaneously produce lean metallic iron in close to twenty different furnaces. The use of a labour system implies that including several community members in the process is vital to the success of the iron-working. Viking Age smelting activities were on a relatively small local scale compared to the Njanja, suggesting that the necessary labour could be easily be obtained from a small community of neighbouring farms, perhaps up to three of four families with a master dictating production techniques (Bartolotta *et al* 1988: 31). The involvement of community members in even the early stages of iron production would have been central to the development of symbolism attached to iron.

It is important to note that Njanja iron-working masters and their communities have little knowledge of the internal conditions and chemical science of their iron-working techniques (Chirikure 2006: 142). This suggests that the strongest evidence for the expertise of a smithing master is the steps performed during the process, and in the observable quality of the resulting iron and objects forged with that iron, similar to assertions about Viking Age smiths.

[redacted]

Fig. 5.16 Haematite blocks and furnace slag. (after Chirikure 2006: Fig. 3 and 6)

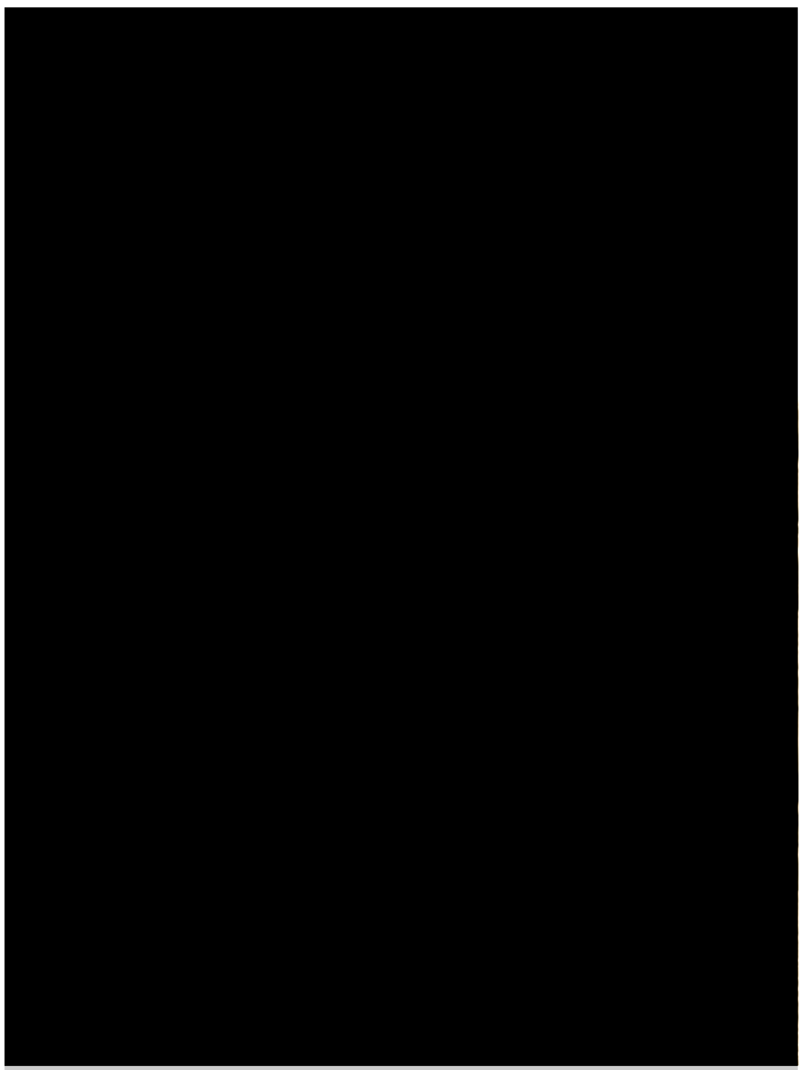
Analysis of the Njanja techniques indicate that they are particularly efficient. Slag from smelting is often free-flow, indicating that the internal temperature of the furnace is extremely high and that flux is used in the process to act as a heat catalyst, the combination of these elements allows the mineral components of iron ore to fully melt down and flow away, leaving only metallic iron in the furnace. This slag, depicted in Fig. 5.16, is consistently "Wüstite free" indicating that there is little to no iron remaining in the slag, and little slag remaining in the iron blooms. The leanness of slag implies that the furnaces built and operated by Njanja masters are very efficient and yield high quality iron (Chirikure 2006: 148, 149). The combination of a lack of scientific knowledge and high efficiency suggests that consistent repetition of quality iron production depends heavily upon a strict adherence to the specific steps used in previous smelting episodes. This could be seen as a ritualisation of the process because the steps are followed but the scientific reason behind them is not understood by the ironworkers.

This ritualisation is an avenue for symbolic association to be attached to iron objects, especially if there is association with tradition and representational design elements, as well as the techniques (Levy 1999: 208). Within East African cultures, Njanja included, which still practice traditional forms of ironworking, there is a clear connection between ritual, magic, and technology, so much that considering them separately is nearly impossible (Håland 2004: 11). This suggests that smelting and smithing had a strong association with either a certain occult knowledge or supernatural power held by the smith, derived from their role as a craft and ritual specialists (Giles 2007: 399). The metal develops social qualities through the association with ritual techniques and the social perspective of the ritual which caused the high quality of the iron (Gansum 2004: 41). Fig. 5.17 depicts a large community furnace use by modern African cultures, showing the involvement of many workers within the smelting process.

The symbolism and qualitative aspects attached to iron, in conjunction with the quality of the metal itself, would then influence how iron was consumed, and how the objects made with iron were consumed and perceived. The deliberate consumption of iron of varying quality has already been mentioned, yet the symbolism and value ascribed to the iron would accumulate in that of the final object and, in turn, influence how the iron object would be consumed and deposited. Ironworking tools in the Garton

Slag Pit site suggests that there was a visible relationship between iron and agriculture, evident in the deliberate, careful placement of the tools within the deposit (Brewster 1980: figs 215, 216, 218, and 219 cited in Giles 2007: 396). Therefore, careful examination of iron objects in archaeological deposits could be a method of evaluating the prestige symbolism and aggregate, relative subjective value of those artefacts. Utilising informed understanding of the technology involved in creating iron artefacts would suggest that examining the value of those objects is also a method of evaluating the role of the smith in the process and social interaction surrounding the iron artefacts made at the forge.

Fig. 5.17 Modern large community shaft-furnace, emphasising social interaction within the process. (after Håland 2004: Fig. 5)



Part IV: Case Studies

Chapter 6:

Case Study: Luistari Cemetery, Finland

Background

The first case study which will be used to examine the value and prestige of iron objects in Viking Age contexts is Luistari, a Viking Age cemetery in the Eura Region of Finland (See Fig. 6.1). Luistari has been selected as a case study because the graves represent a continuous multi-period sample of rural funerary deposits. This allows for an evaluation of iron objects using consistent contextual variables, such as grave setting, and associated material culture. Observing trends within the assemblage which are shared throughout multiple time periods in light of our understanding of iron value ascription allows for conclusions to be drawn concerning the status of smiths in Viking Age Finland.

[redacted]

Fig. 6.1 Map of South-Western Finland. Including the location of Luistari (#1) in relation to local Archaeological sites. (After Lehtosalo-Hilander 1982: 8).

The graves at Luistari were first discovered in the spring of 1969 when the municipality of Eura began work on a drainage system in the town of Kautta along the Eurajoki river. There had been reports of prehistoric and early iron age sites in the area, such as the Kautta hill-fort, however the locations and dating of these sites was uncertain, and no formal excavations had been carried out. Upon uncovering a “silver-ornamented sword” (See Fig. 6.2) with a digging machine in a partially planted field, the drainage work was halted and rescue excavations began that summer, revealing a large inhumation cemetery (Lehtosalo-Hilander 1982: 8). Pirkko-Liisa Lehtosalo-Hilander and a team from the University of Helsinki’s archaeology department returned in the summer of 1977 to continue the extensive excavation. A minor, yet important, follow-up excavation was undertaken in 1979. The total area excavated by Lehtosalo-Hilander covered 2000 m^2 at the time excavations concluded. However, judging from trial excavations Lehtosalo-Hilander concluded that the cemetery may have covered twice that area, close to 4000 m^2 (Lehtosalo-Hilander 1982: 8).

[redacted]

Fig. 6.2 Luistari excavation is progress and the first silver-ornamented sword *in situ*.
(after Lehtosalo-Hilander 1982 1 and 2)

The excavations thus far have yielded 430 inhumation burials, deposited in multiple historical periods. Of the 412 graves which have been assigned grave numbers, a result of several instances of graves with multiple inhumations, 182 of which were furnished with grave goods. Fig. 6.3 shows a complete site map of the Luistari graves. Of these, 36 graves date to the Merovingian period, 117 to the Viking Age, and 26 to Post-Viking Age periods of Finnish history.

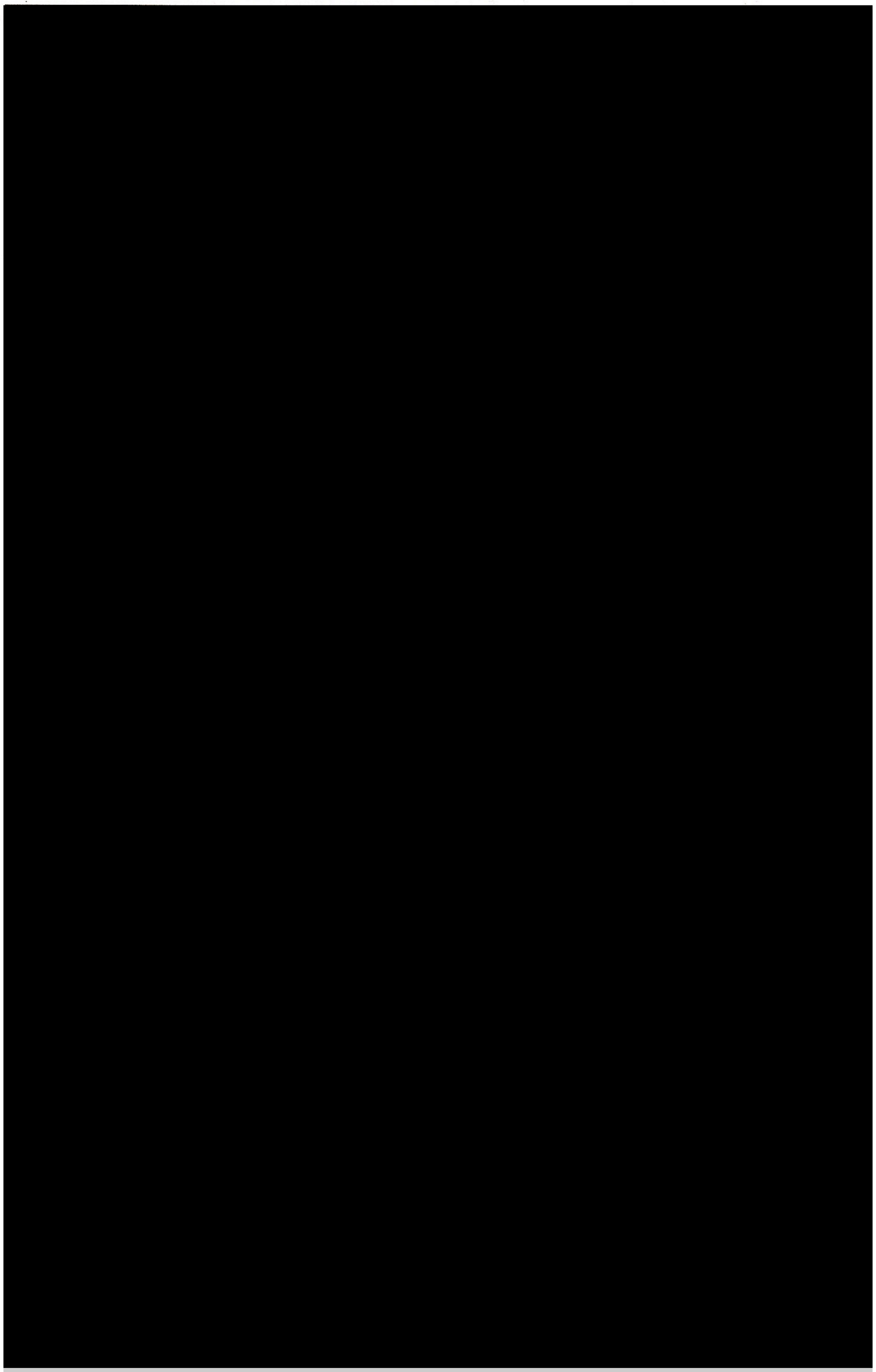


Fig. 6.3 General Luistari site map. (after Lehtosalo-Hilander 1982: 8)

In Finland there are differing opinions of when these time periods began and ended. The Merovingian period began between 550 A.D. and 600 A.D., depending on the publication (Kivikoski 1939: 238, and Cleve 1943: 170). This period is also known as the late Migration Period and is contemporary to the Vendel period in Sweden (Lehtosalo-Hilander 1982a: 11). The Viking period is considered to “begin later and end earlier in Finland”, starting between 825 A.D. and 850 A.D., and ending around 1025 A.D. (Cleve 1943: 172 and Sarvas 1972: 50). The period which follows the Viking Age, known as the “Crusade Period”, is unique to Finnish history. Beginning in the end of the Viking Age and ending around 1150 A.D., this was when Swedish nobility embarked on a series of crusades aimed at converting Finland to Christianity. The documented summary date is not matched by archaeological remains, as “graves furnished in heathen fashion” from Western Finland have been associated with later dates, suggesting that pagan funerary rites endured beyond the formal Finnish Crusade period (Lehtosalo-Hilander 1982a.: 12).

Although the excavation of the Luistari graves is not complete, with the extended area of cemetery being safe from immediate building threat, the graves which have been thoroughly excavated suggest that Luistari is a well encapsulated case study for examining localised object consumption throughout the entire Viking Age. The evidence from the Luistari graves shows consistent grave furnishings through several distinct phases. The use of the cemetery for burials throughout the Viking Age, as well as time periods immediately preceding and succeeding suggest that it is ideal for drawing conclusions from the associated assemblage of artefacts. Furthermore, the excavation which has been performed, although not perfect, was extensive. This allows for the maximum amount of data to be presented for examination, and limits the number of elusive variables which could influence interpretation of the artefacts.

Artefacts and Evidence

The artefact assemblage from Luistari represents a wide range of different objects. The majority of artefacts which can be dated, by chemical methods or by stylistic distinctions were deposited during the site’s four Viking Age Phases. These phases are identified within table 6.1. Phase V-I and V-II correspond to the “earlier

Viking period", and Phase V-III and V-IV correspond "to the later Viking Age" (Lehtosalo-Hilander 1982b: 7). The approximate date ranges for each of the four Viking Age phases, with a considerable margin for error in between, is also contained within the table.

Table. 6.1 Phases and Approximate date ranges from Luistari Graves.

Phase	Abbreviation	Approximate Date Range
Viking I	V-I	825-900 A.D
Viking II	V-II	900-950 A.D.
Viking III	V-III	950-1000 A.D.
Viking IV	V-IV	1000-1025 A.D.

Furthermore, there are several additional phases with considerably limited associated information. M-I and M-II represent the earlier stages of the Merovingian period and have incomplete data. Phase M-III has the most complete data from the pre-Viking Age periods and shows continuity with V-I, suggesting that there was no gap in the cemetery's use between these two periods. The final phase, identified as FP or Final Period, represents graves from after the Viking Age. They are distinguished from the V-IV materials on the basis of artefacts and their superposition relative to other graves. Artefacts which are datable to the Final Period have been found associated with weapons typical of the Viking Age, suggesting a fluid boundary between the two periods (Lehtosalo-Hilander 1982b: 7). Judging from similarities within the artefacts, it appears that the transition between most phases was gradual.

The artefacts from Luistari are not all of Finnish types and provide primary evidence for the wide connections between rural Finland and the rest of the Viking Age world, as well as the "social differentiation, circumstances, population, and nature of the community which used it [the cemetery]" (Lehtosalo-Hilander 1982b: 7). However, the artefact collections can be used to examine the wealth and value ascribed to those objects, expressed through their place as funerary furnishings. It is important to keep in mind that these are not objects placed within the graves, or necessarily selected, by the people with whom they were placed. Lehtosalo-Hilander suggests that the inclusion of grave goods was a display by the close relatives of the deceased showing the funeral guests "how splendidly" they could furnish the grave (1982b: 21). It is also likely that these objects are an expression of how the community viewed the deceased, and the included objects allowed the people involved in the burial process to establish and assert their perspective of the individual, or in some cases pair, being buried. The symbolism of the personal belongings was as important for the community as much as it is for modern archaeological understandings (Symonds 2009: 62).

The iron artefacts from Luistari range from fine swords and spearheads such as those depicted in Fig. 6.4, arguably the most valuable personal possessions, to mundane household items, such as tools or nails. These iron objects do not appear in isolation. They are often found with bronze jewellery pieces, beads, animal bones, and even the odd piece of slag. Furthermore, many of the artefacts appear in association with stone settings, wooden chambers, or other wooden constructions, suggesting that there was a great deal of effort involved in the burial process. Lehtosalo-Hilander concluded that the grave constructions could also be a signal of the social position and prestige of the people buried within them (1982b: 22). Constructing chambers and using wooden constructions potentially shows care and effort, as well as implying a degree of funerary ritual process which would have carried important imagery and symbolism for the community involved in the funeral. With careful consideration, examining grave constructions could be vital to discussing status attached to the artefacts.

Table A.1 in the appendix represents the artefacts from the Viking Age contexts in association with their respective grave numbers and grave constructions. They are also classified on the basis of gender; either male, female, double, or child. This chart represents the same data from a similar chart from the third volume of Lehtosalo-Hilander's publication on Luistari (1982b: 41-43). In order to assist with analysis of the data, the chart was transcribed into digital format, from which subsequent graphs have been generated. Following Johan Callmer's earlier model, Lehtosalo-Hilander's original chart was used to examine the wealth and status of the local Viking Age community by assigning a number of value units, representing relative value or potentially price, to each artefact classification, and correlating the data from the majority of the excavated graves (1977: 105-106, 1982b: 37). Estimating wealth in this way is difficult because, as mentioned earlier, exchange value and absolute market price is very difficult to establish. The exchange value of any object is subject to any potential seasonal or day-to-day market changes, and other economic pressures. However, for the purposes of examining local artefact use as prestige management and relative value, this data is usable. Lehtosalo-Hilander calculated the wealth figures by examining the price ratios of different items found within roughly contemporary textual sources from various regions in relation to one another (1982b: 37-38). These ratios were applied to specific artefacts and artefact types within the Luistari graves in order to assign each artefact with a value relative to the proportions of other present artefact types. Therefore, although they are not an accurate representations of the artefact's exchange value in the wider Viking world, the artefact values could be used to examine status trends with respect to subjective forms of value and ascribed prestige within the community which used the artefacts (Lehtosalo-Hilander 1982b: 38).

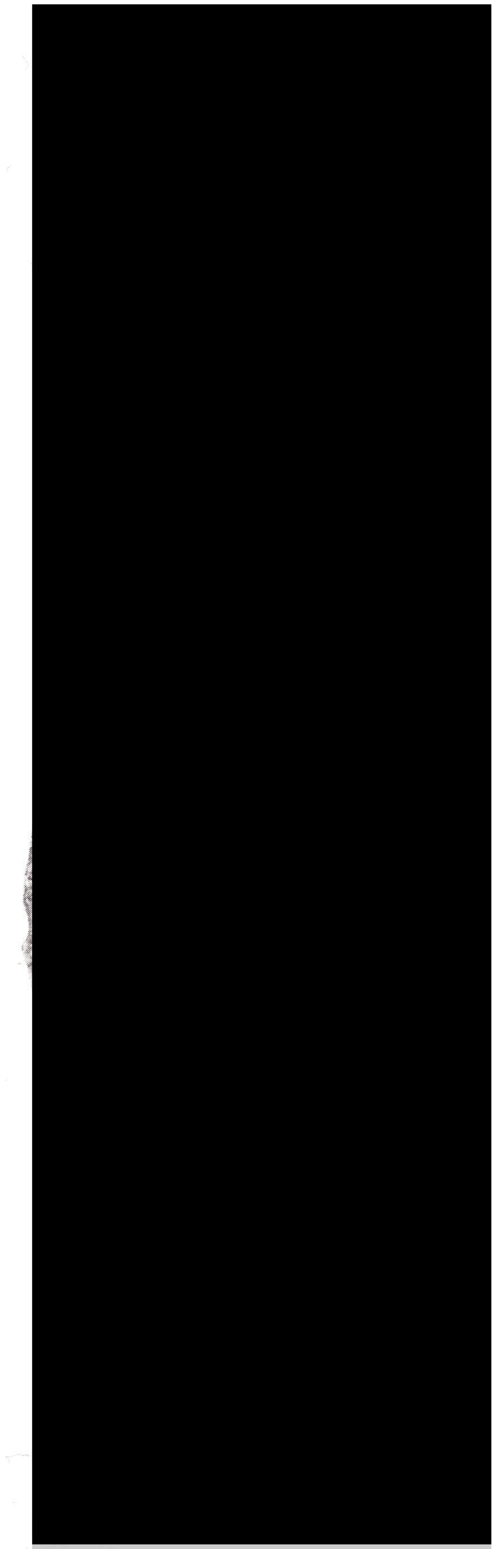


Fig.6.4 Examples of spearheads and swords from Luistari 207. (after Lehtosalo-Hilander 1982: Plate 62)

Analysis and Discussion

With respect to context, the iron artefacts which were buried in Luistari's Viking Age graves display the prestige of the person they were interred with. The theories drawn from earlier chapters suggest that the prestige or esteem value ascribed to the object, as it was used, was closely attached to the quality and use value of the object. The relationship between these two elements, prestige display and associated value, suggesting that examining the general trends and associations between the artefacts and their contexts can establish iron artefacts as prestige management objects and, by extension, expressions of the smith's status.

Of the artefacts excavated in Luistari the most common iron object was the spearhead. There were more than 50 spearheads from 38 individual graves from Viking Age contexts alone, some of which either contained two spearheads, or were double graves and thus included two or three spearheads, for example grave 215 was furnished with two spearheads depicted in Fig. 6.5 (Lehtosalo-Hilander 1982a: 19). The spear has been suggested to be the most common and important part of the Viking Age warrior's equipment, in some regions above the sword. In the Luistari graves, spears appear in burials from all phases of the excavation (see Appendix Table A.1). Furthermore, there are several different types of spearhead represented in the assemblage, suggesting that if some of the spearheads are locally fabricated there could have been multiple uses or preferred styles of spearhead.

It is from this group of artefacts that evidence of the skill of the smith in weapon production is clear. Several spearheads, designated as a variant of type E with ornamented grooves appear in Viking Age graves (Lehtosalo-Hilander 1982a: 26). These spearheads may have held the highest esteem value of any other weapons in the assemblage due to the addition of obvious ornamentation, suggesting that they were intended to be visual displays of prestige. Two of the five appear to have been forged with damascened iron. Furthermore, these two are among several which appear to be of similar construction. As mentioned above, damascened is a term used to refer to pattern-welded metal because it appears to have rippling within the metal itself, a trait seen in true damascus steel from Damascus in modern Syria and areas of India. It is held that pattern-welding techniques were unknown to Finland during the Viking Age (Salmo 1938: 252). Although these weapons may have not been locally made, its consumption in this area of rural Finland suggests exceptionally high value ascribed to this spearhead as it potentially was imported or acquired far afield. This follows Colin Renfrew's distance decay models which state that the distance which an object appears to have traveled for use from its source is a function of how subjectively valuable it was in its context (1969: 157).

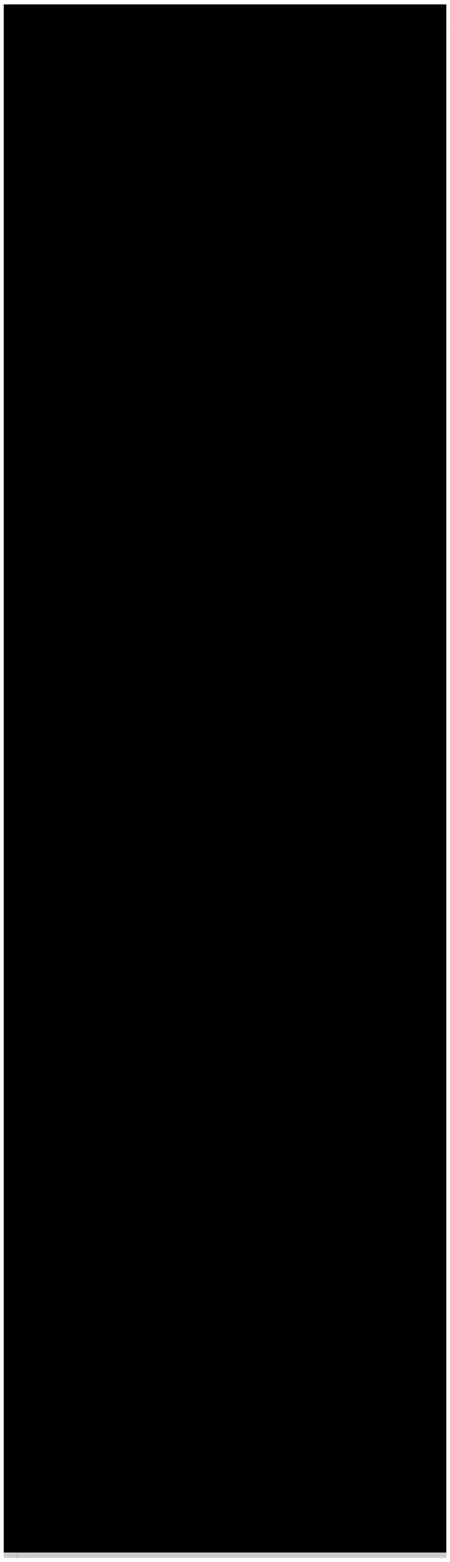


Fig. 6.5 Two spearheads from Grave 215. (after Lehtosalo-Hilander 1982: P63)

Compared to spears, the sword is a less common weapon, potentially reflecting popularity, or availability of the weapon or smiths who could make a sword. It is possible that some of the swords from Luistari were not locally constructed and are subject to the same distance decay principle as spearheads. The high value of swords is reflected in Lehtosalo-Hilander's assignment of 40 value units to swords in the assemblage (1982b: 41). Of the total number of graves, only eight swords were uncovered, two of which can be seen in Fig. 6.6. Furthermore, it appears that four of the eight swords from Luistari bear inscriptions of pattern-welded metal and/or varying degrees of silver ornamentation (Lehtosalo-Hilander 1982a: 13, 15). Judging from the relatively high degree of ornamentation and rarity, it is likely that the sword was the most valuable weapon a person could carry, a trait possibly enhanced by the localised rarity of the weapon type. Further evidence for this comes in the form of the objects which each of the swords were associated with. Nearly all of the graves which contain swords also included other objects of significant value and prestige. All but one of the graves which were furnished with a sword also contained at least one spearhead, in some cases two (see Appendix Table A.1). With one exception, every grave which contained a sword also included a set of shears, potentially reflecting either a degree of personal hygiene, local sheep cultivation, or sewing associated with a high status individual (Lehtosalo-Hilander 1982a: 58). There were also bronze brooches, finger-rings, silver coins, and small bronze spirals which were thought to have been decorative cloak attachments were found within the graves as further displays of prestigious grave furnishings. Furthermore, all but one sword was accompanied by an animal, either a cow, a sheep or goat, or a dog (Lehtosalo-Hilander 1982b: 60-61). This being said, the exceptions to the general observations suggest that the graves should be considered in their entirety before decisive conclusions can be drawn.

Fig. 6.6 Two swords from Grave 15 and 17. (after Lehtosalo-Hilander 1982: P4 and P5)

[redacted]

The other major contextual features from Luistari graves are the stone settings and evidence of wooden constructions. Lehtosalo-Hilander suggested that these are evidence of status and prestige displays within Luistari's funerary context (1982b: 22). Examining these in conjunction to the objects contained within the grave can provide further evidence for the prestige attached to iron objects through close association.

The first group of supplementary evidence is drawn from the presence of stone settings and grave markers associated with burials. The graves of Luistari appear to have been marked by stones or wooden grave markers throughout the site's history. This is evident in the presence of either a stone marker or obvious post-hole feature associated with individual graves. Although these were potentially important symbols for the relatives of the buried individual, there does not appear to be a clear correlation between grave markings and the furnishings inside the grave (Lehtosalo-Hilander 1982b: 24). It appears that this is the same for stone settings inside the graves. Some of the most richly furnished graves were associated with either grave markers or stone settings. However, a number of richly furnished graves were not associated with a marker or setting (See Fig. 6.7 for diagrams of stone setting examples). It is important to note that there was considerable damage done to many of the Luistari graves due to field ploughing and other farming activities (Lehtosalo-Hilander 1982b: 22). This taphonomic activity could have displaced grave markers and stones making association difficult to establish. Another potential explanation is that the use of stone settings gradually fell out of custom throughout the Viking Age. In either situation, grave markers can not be closely associated with any specific artefact trends.

Fig. 6.7 Diagram of Luistari stone settings in two graves. (after Lehtosalo-Hilander 1982: 22)

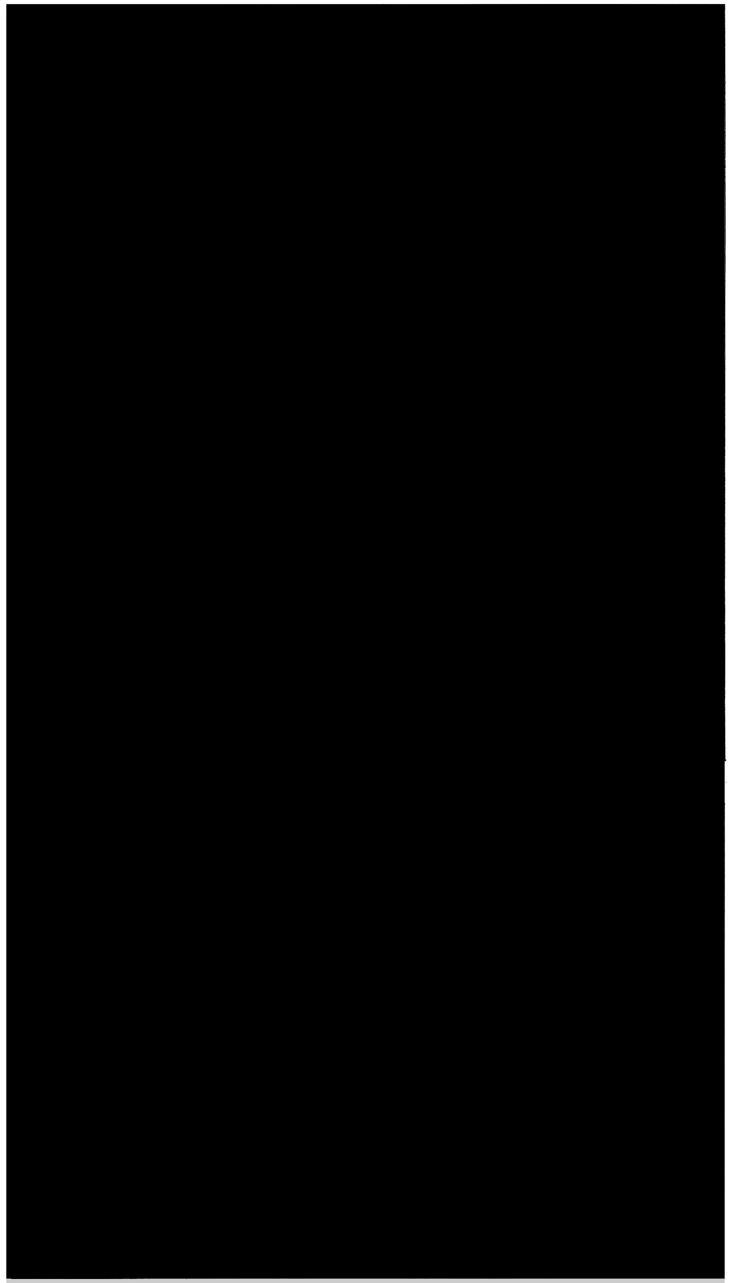


Fig. 6.8. Site map of wooden construction graves separated by Phase.
(after Lehtosalo-Hilander 1982b: Fig. 3)

Evidence for grave chambers or wooden constructions is potential source of contextual information which can inform upon the prestige associated with a grave and its furnishings. Fig. 6.8 shows a map of graves containing wooden constructions, divided by phase. These wooden constructions appear as organic stains in the grave soil matrix and appear in various patterns and for this reason Lehtosalo-Hilander separated chambered graves and ‘Other constructions’ as categories on the wealth chart (1982b: 26). Following earlier definitions 'Other constructions' refers to graves which contained any evidence of wooden constructions in which the grave was placed which did not match traditional chambers (Gräslund 1980: 7-12). It was suggested that chambers and wooden constructions can be evidence of status display within the graves. This follows Jan Peder Lamm's conclusions regarding similar chambered graves from Birka (1973: 64-75). Chambers were assumed to be a major feature of the burials of the Swedish ruling class, constructed in order to accommodate ample grave furnishings. There has been an argument that constructions, but not necessarily chambers, were a Finnish tradition independent of Swedish cultural diffusion (Lehtosalo-Hilander 1982b: 24).

Charts 6.1 through 6.12, generated using Lehtosalo-Hilander's data from Appendix Table A.1, represent the total value units from each grave in the collection separated by phase and construction type, and colour coded by gender as determined by artefacts (1982b: 41-43). An examination of the data suggests that it is unclear if chambers and constructions are a status indicator. Similar to stone settings, there are rich graves associated with chamber remains as well as richly furnished graves without chambers (Lehtosalo-Hilander 1982b: 26). However, examining the individual trends and attempting to explain them could potentially clarify the issue. The chambered graves in the first two phases of the Viking Age generally appear to be the most richly furnished grave types. However, chambers appear to fall out of fashion in the later Viking Age, with only five chambered graves from both Phase V-III and V-IV. In addition, the graves furnishings seem to have reduced from the earlier two phases. Almost in contrast, graves with other forms of construction were relatively few in the early phases, but increase in both number and over-all value in Phase V-IV (Lehtosalo-Hialnder 1982b: 27).

Chart 6.1-Phase V-I Chambered Graves

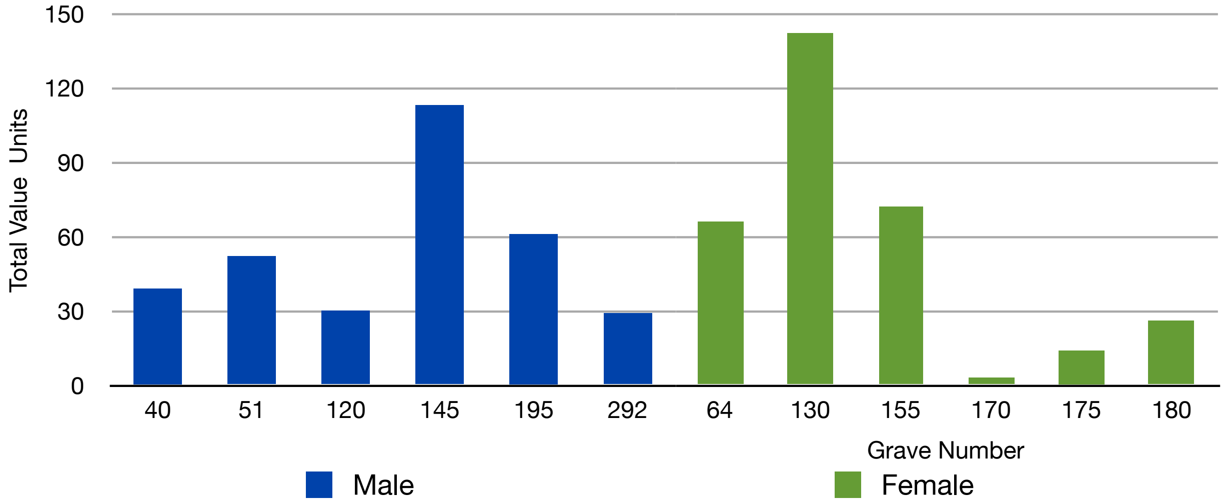


Chart 6.2-Phase V-II Chambered Graves

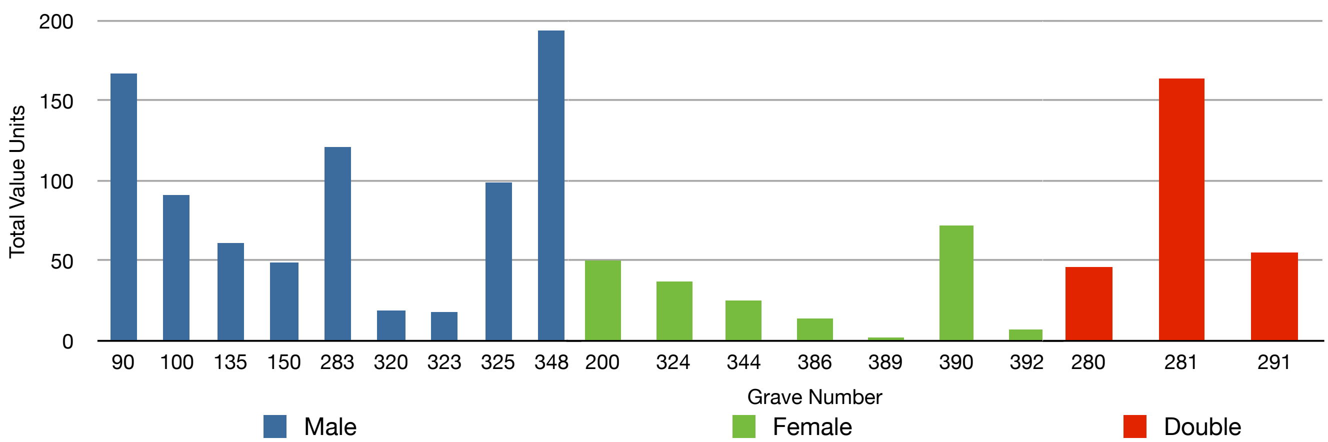


Chart 6.3-Phase V-III Chambered Graves

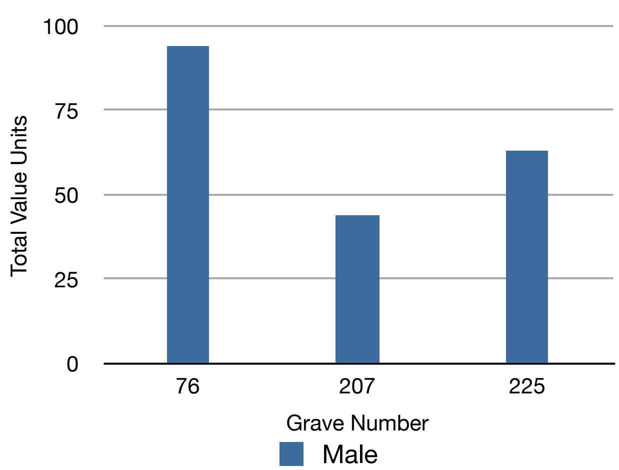


Chart 6.4-Phase V-IV Chambered Graves

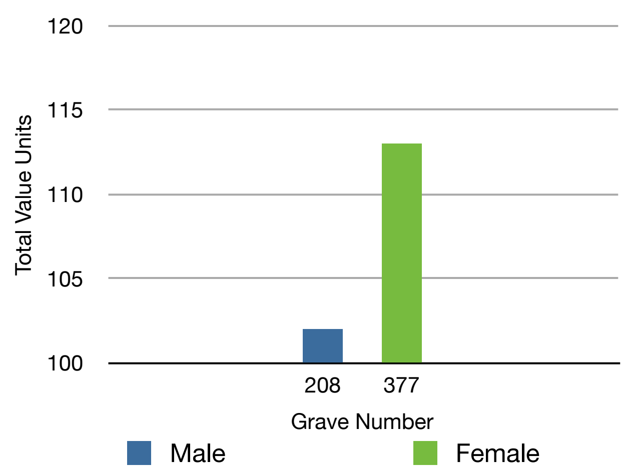


Chart 6.5-Phase V-I Other Constructions

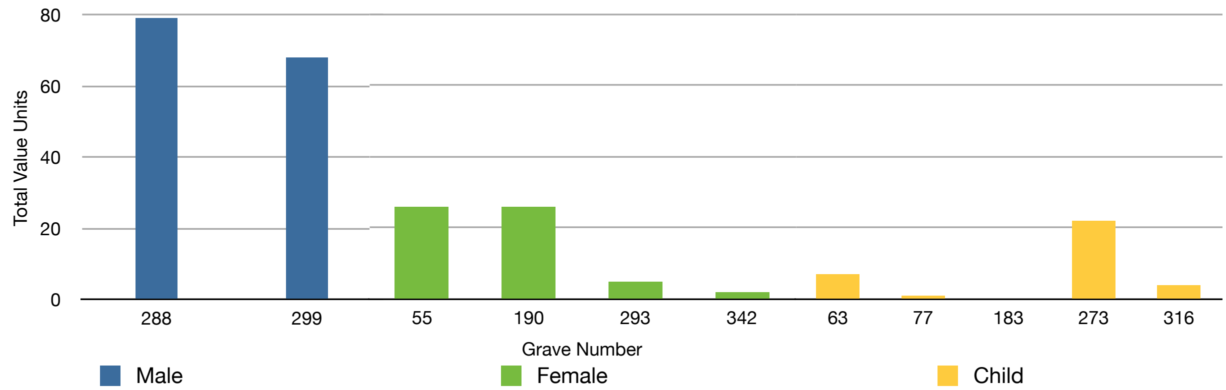


Chart 6.6-Phase V-II Other Constructions

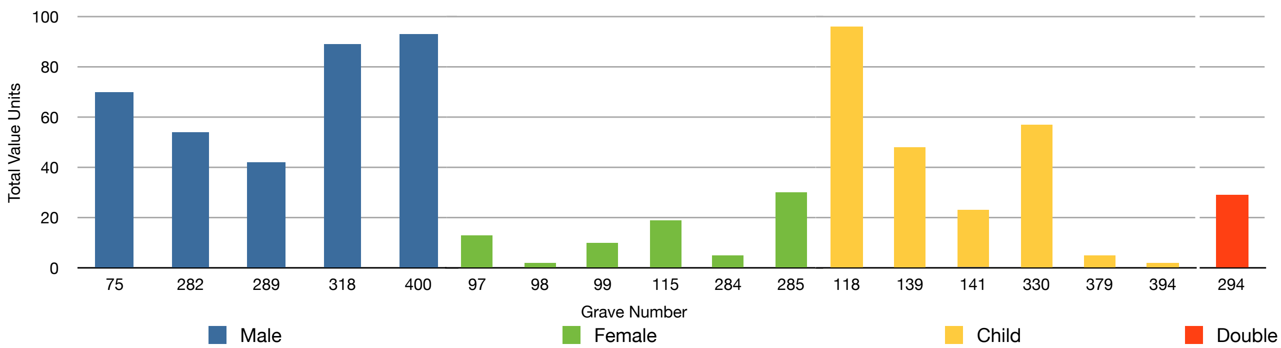


Chart 6.7-Phase V-III Other Constructions

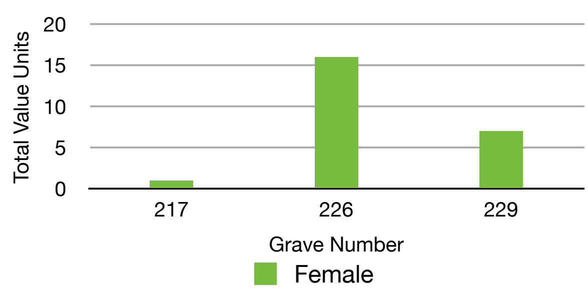


Chart 6.8-Phase V-IV Other Constructions

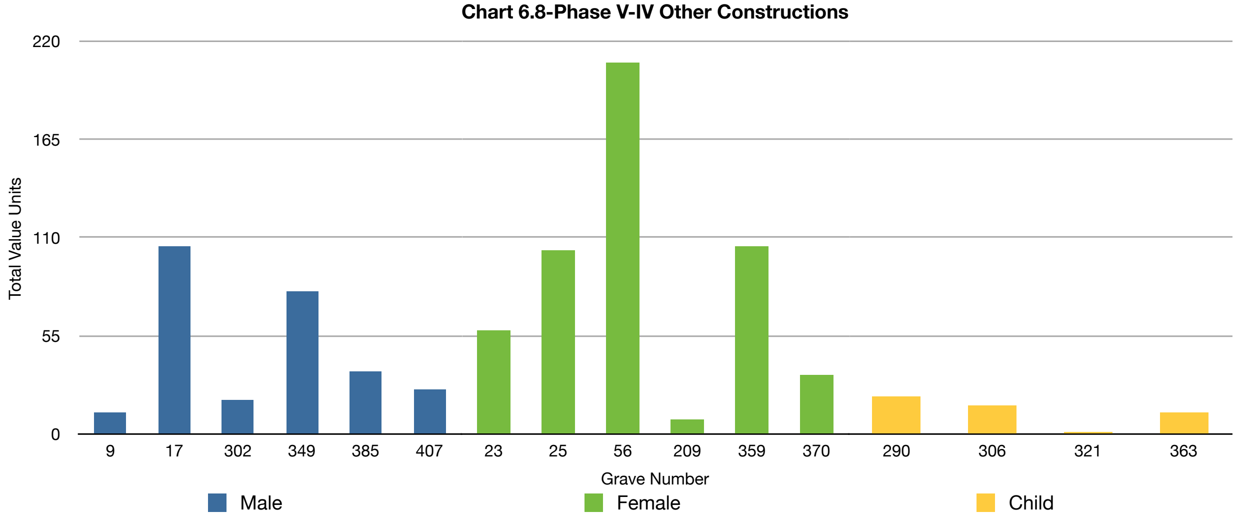


Chart 6.9-Phase V-I No Construction

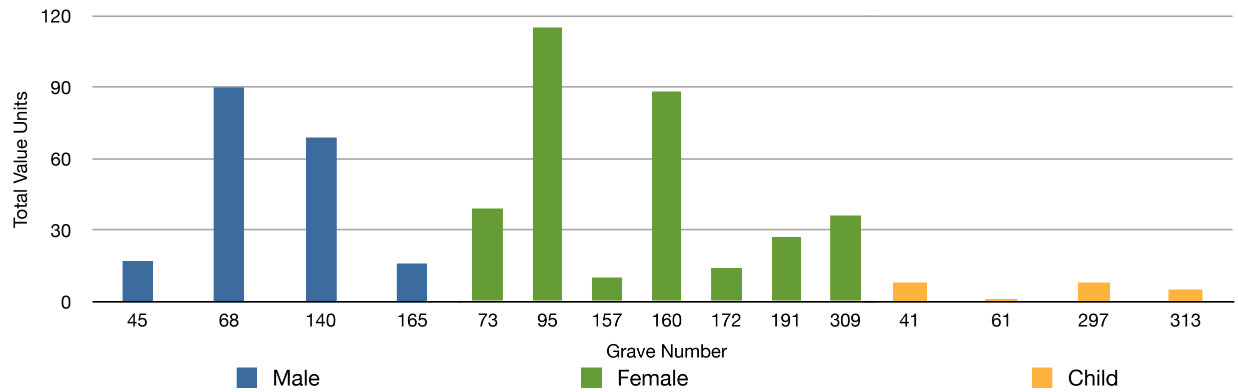


Chart 6.10-Phase V-II No Construction

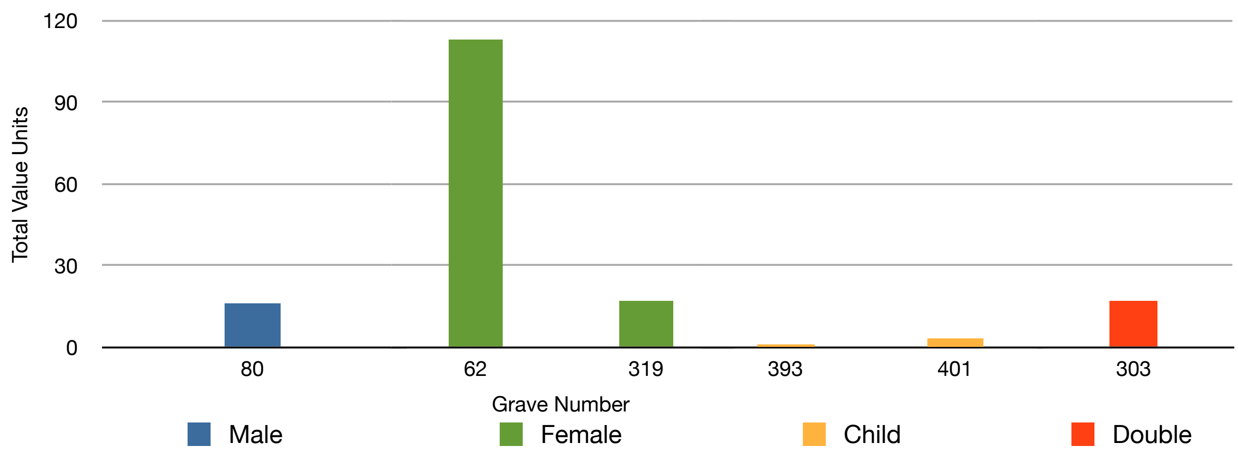


Chart 6.11-Phase V-III No Construction

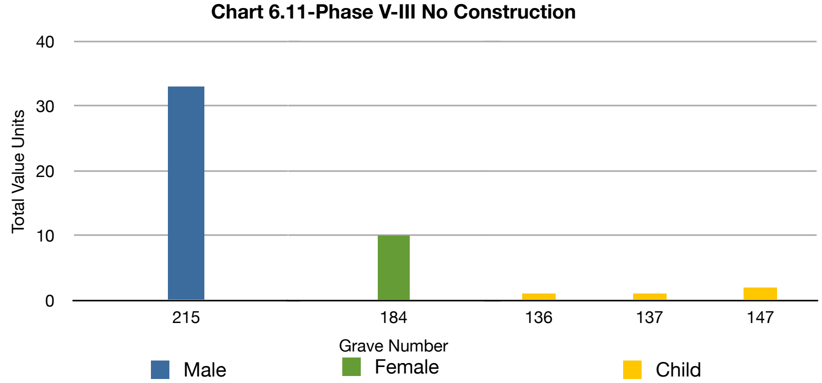
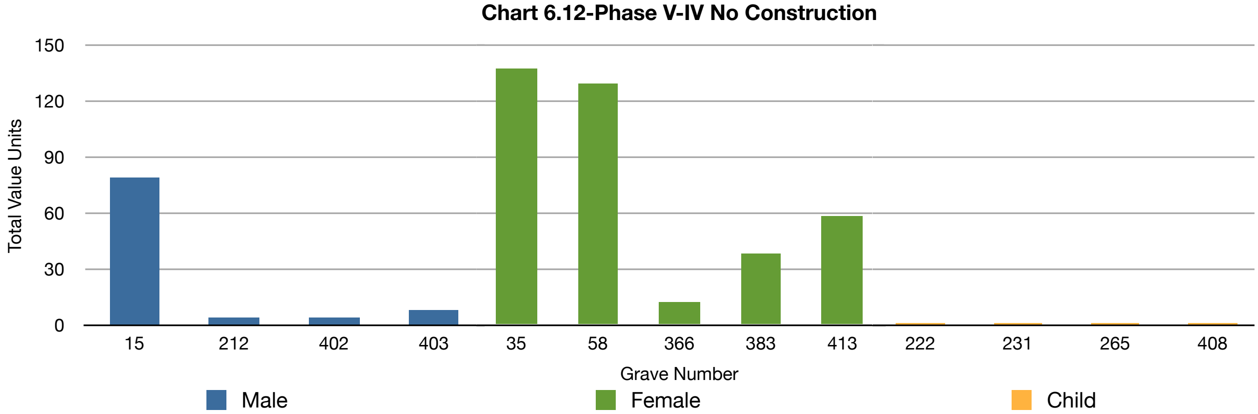


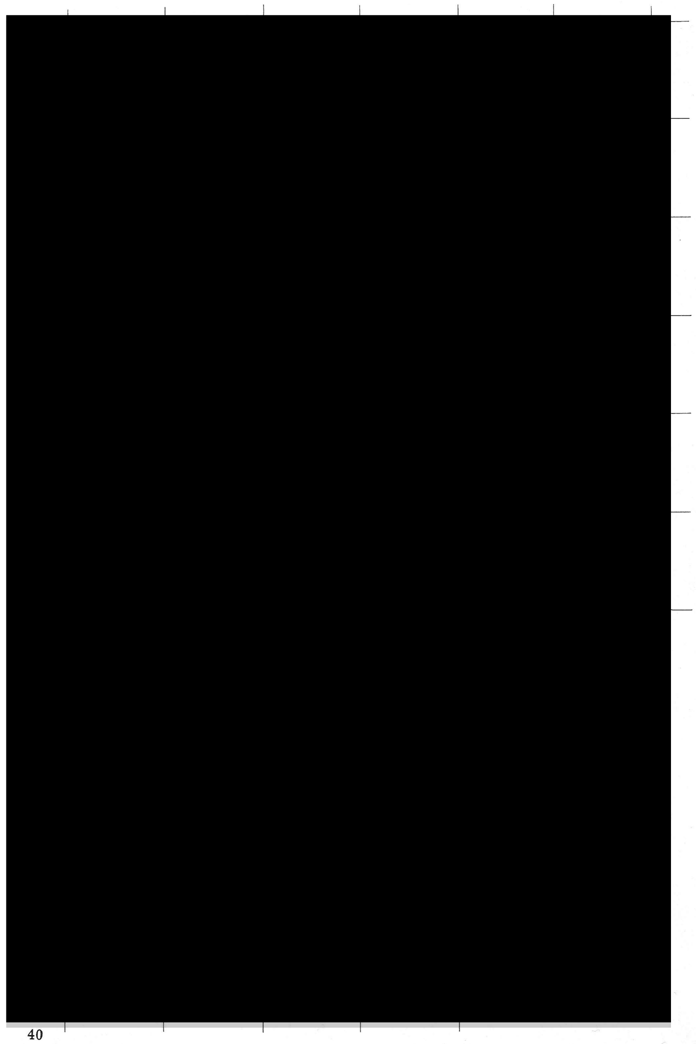
Chart 6.12-Phase V-IV No Construction



Therefore, chambers and constructions can potentially be seen as a signifier of status. The fall off of chambered graves does not necessarily argue against this interpretation. If Gräslund's assertion that chambers were a tradition of Swedish social elites or those of Swedish extraction holds true then the decrease of these chambers could be a sign of those social elites being acculturated to local traditions and adopting local funerary practices in the later half of the Viking Age (1980: 7). There is evidence which suggests that the populations of many areas of modern Finland were of direct Swedish descent. Considering the political disunity of Finland during the Viking Age, it is likely that wealthy Swedish aristocrats were living in the Luistari area, perhaps through landownership or marriage, and were practicing their traditional burial practices until the later generations became acculturated and were buried with native grave constructions (Talvio 1982: 245-246). In this case, chambers and wooden constructions were integral to the funerary display of prestige and is as a sign of status.

An alternative source of evidence for prestige display are animal remains which were associated with many graves. See Fig. 6.9 for a site map of graves containing animal remains (Lehtosalo-Hilander 1982b: 29). Within the Luistari graves three animal species were commonly buried as part of the grave furnishings (see Appendix Table A. 1). These species were cows, caprines, and dogs. Caprines are either sheep or goats, however the skeletons of sheep and goats are nearly identical, necessitating the use of a more general term. The presence of "meat-producing' animals, such as caprines and cattle, is assumed to have been an integral part of the funeral activities associated with the wealthiest individuals. Lehtosalo-Hilander suggests that the funeral guests would have eaten the meats as part of the funeral rites, and the cranium and potentially other post-cranial bones, were buried with the deceased individual (1982b 30). A potentially accurate interpretation involves the furnished grave with wooden constructions being open and visible while funeral guests cooked and feasted on an animal. After the meal the cranium and bones of the animal were deposited in the grave before the physical covering of the grave took place. The donation of an animal would have been an exercise in prestige building for the donor, who was potentially a relative or close friend of the deceased. Alternatively the animal could have been drawn from the estate of the deceased. In either case the consumption of the animal was associated with asserting prestige and affluence within the funeral, either for the deceased or individual members of the community.

Fig. 6.9 Site map of graves with animal remains. (after Lehtosalo-Hilander 1982b: 40)



Lehtosalo-Hilander suggests that perhaps the animal's cranium was considered to be the "share of the dead", where as the meats were the share of the living (1982b: 30). This follows the suggestion that the inclusion of meat-producing animals was involved with superstitions of providing the dead with food for the afterlife, with the head providing a "substitute for the whole animal" (Lehtosalo-Hilander 1982b: 30). It is important to note that bones were relatively rare and that often the only evidence was the animal's teeth. This suggest that other bones could have been buried with the cranium and deteriorated within the archaeological matrix along with the non-dental cranial bones. This does not necessarily detract from Lehtosalo-Hilander's argument of funerary feasting, but opens the special status of the skull to consideration along with other data drawn from the animal bones.

Generally speaking, within the Luistari assemblage cattle are associated with male graves, and caprines are associated with female graves. It is important to keep in mind that most other Viking Age cemeteries which are associated with animal remains have no clear association between sex and the species present. For example, in western Swedish Viking Age cemeteries horses, dogs, and sheep are the most common species of animal found associated with graves, however there was no clear connection to the sex of the individual with whom they were buried (Andrén 1978: 63-64). This implies that perhaps the association between sex and animal species was a local tradition derived from more native Finnish or Saami practices, two ethnicities argued to have a strong presence in the local culture (Zachrisson 1985: 21).

In contrast to the meat-producing livestock, dogs appear to have been buried as companions to their masters. Generally speaking dogs were most often associated with male burials with either chambers or wooden constructions. Within the graves which dogs were buried they were most often located within the grave constructions at the foot of their master (Lehtosalo-Hilander 1982b: 29). Although the presence of a dog is not necessarily associated with richly furnished graves, owning a well trained dog and having it accompany an individual to the grave would have been an assertion of prestige, similar to the other grave furnishings. The data, with little room for exception, suggests that most burials which included dogs also included rich furnishings. Appendix table A.3 contains the same data derived from Lehtosalo-Hilander's table of wealth in the Viking Age, selected for graves containing animal remains. All but three of the twelve dog graves include some form of iron weapon. Five of the graves include multiple weapons. Two of the three exceptions are female graves which were richly furnished with other objects (Lehtosalo-Hilander 1982b: 41-43). Furthermore, five of the dog burials also included cattle remains, suggesting that although they were both signs of prestige assertion, they filled different roles within the funerary activities.

Through examining the associations between iron objects, constructions, and animal remains it seems that they were all forms of prestige management and assertion, especially considering that they would have been experienced in tandem during their respective funerals. The grave furnishings, grave constructions, and present animals each would have asserted the prestige and wealth of the individual with whom they were associated. This re-enforces the idea that iron objects, especially weapons were a highly valued personal artefact, and the display of that object in death and potentially in life, would have built and asserted the status and prestige of their owner. Following on the earlier theories concerning the association between smiths and iron objects, even in rural Finland smiths were valued members of society. That social position is visible through evidence of the ways that the community viewed and used objects which were made by the smith.

Chapter 7:

Case Study: Kaupang in Skiringssal, Norway

Background

The second case study which will be examined is Kaupang. Kaupang is the name of the urban settlement within the wider central-place of Skiringssal, located on the shores of the Oslofjord in Norway (see Fig. 7.1 for a map of the Oslofjord and locations of major sites). Kaupang is a site which has been extensively excavated within the twenty-first century, utilising modern standards of excavation and publication, making it an ideal source of information about life in Viking Age urban centres. Where Viking Age smiths are concerned, Kaupang, and its environs provide an important counter point to the rural cemetery of Luistari. Examining similar artefacts to the Finnish data allow for an examination of smiths, not only in relation to urban contexts but within the wider Viking world.

In contrast to Luistari, which was unknown until an accidental discovery, research into Skiringssal, and by extension Kaupang, have been ongoing for close to two centuries. The site itself has been known of from historical sources as early as the Ninth century. It was referred to in the travelogue of Othere, as translated by J.F. Neikter, and several other contemporary documents (1802: 1-3). Many of these documents refer to Skiringssal as an urban site, a seat of royal power, a major pagan cult centre, and an assembly place for a large territory around the Oslofjord (Skre 2007: 13). Formal academic research started with Gerhard Schøning in 1771, and furthered by

[redacted]

7.1 Map of the Oslo fjord and major sites. (after Skre 2007: Fig. 1.1 by Julie K. Øhre Askjem)

Jens Kraft in 1822 and Gerhard Munthe in 1838. These three scholars theorised the location of Skiringssal using historical documents and literature (Skre 2007: 14). Archaeologists began systematically searching for the site in the mid-Nineteenth century, starting with Peter Andreas Munch in 1850 and 1852, and furthered by Nicolay Nicolaysen in 1868 and Gustav Storm in 1901. The major breakthrough into the site was Charlotte Blindheim's 1950 and 1974 excavations of the major cemeteries north of the urban centre. Major excavations have been carried out recently, spurred on by new advancements in archaeological understanding and interest in Viking urban sites. The Kaupang Excavation Project, conducted by Dagfinn Skre and the University of Oslo, was planned through the 1990's and carried out between 2000 and 2002 (2007: 13). This excavation uncovered many of the buildings of Kaupang's central urban area and many artefacts associated with the remains of the excavated houses. Skre's excavations firmly established the location of one of the major Norwegian towns of the Viking Age.

The combination of evidence from several cemeteries and a major urban centre gives a unique opportunity to compare the localised consumption of iron objects in domestic and burial contexts, and draw conclusions as to the social importance of smiths in a setting far removed from the rural Luistari cemetery. When compared to other Viking Age sites Kaupang can elucidate wider trends and traditions within the Viking Age societies. This includes the question of smiths and their position within Viking Age societies. There was a wealth of iron objects excavated from the cemeteries outside of the central urban area, as well as valuable information from the town buildings themselves.

[redacted]

Fig. 7.2 Barrow cemetery north of Kaupang.
(after Skre 2007: Fig. 16.1 by Anne
Engesveen)

Artefacts and Evidence

The evidence from Kaupang and its environs is extensive, consisting of artefacts from 407 graves, 148 of them including iron objects, excavated from eight cemeteries (Skre 2007: 103). Furthermore, there is considerable information drawn from the town itself in the form of house foundations, hearths, and associated finds. It is this contrast of domestic and funerary excavations, as well as the wealth of information that makes this site exceptionally valuable to studies of Viking Age societies. The cemeteries (see Fig. 7.2), as mentioned above, were primarily excavated and published by Blindheim, in conjunction with several other scholars (Blindheim *et al* 1981, and Blindheim *et al* 1995). The cemeteries include two major, extensive barrow cemeteries at Nordic Kaupang and Lamøya, a flat grave cemetery at Bikjholberget, and at least five additional lesser burial areas (Skre 2007: 65). The assemblages from the previous excavations were collected into a single comprehensive catalogue by Skre in Kaupang in Skiringssal, the first volume of the definitive publication series on Kaupang (2007: 103-108). This data is included in appendix table A.2.

Grave number Ka. 4 (table A.2 after Skre 2007: 104) is an example of one such artefact collection from chart A-2. This grave, located in the Nordic Kaupang cemetery, dated on the basis of artefact styles to 900-950 A.D., was originally excavated by Nicolaysen and published by Blindheim *et al* (1981: 201). This grave contains a double edged blade, with an Ulfberht inscription along the upper portion of the blade, close to the handle. Weapons with inscriptions were arguably the most sought after weapons of that time period, valued for their extremely high quality and identified by the distinctive inscription (Stalsberg 2010: 452). Other iron objects from grave Ka. 4 include a second sword without an inscription, a spearhead, an axehead, a shield boss, a sickle, and 20 rivets. These were associated with two weights of different shapes, a copper alloy key, a soapstone vessel, two hone stones, an egg-shaped stone, and four pieces of flint (Skre 2007: 105 originally from Blindheim *et al* 1981: 201). This grave is one of many burials which were furnished with such a collection of grave goods. The appearance of what appears to be a semi-complete warriors kit suggests that the individual was a wealthy, well traveled warrior. The fact that there were two swords, one of them a rare

Ulfberht sword, included in his belongings suggests he was especially wealthy, and that the community that buried him was interested in expressing that wealth (Gorman 1999: 8). Furthermore, there were a number of rivets, often associated with a boat burial. However, the fact that there were only twenty implies that there could have been some other wooden construction, perhaps a coffin similar to some of the Luistari graves. In either scenario, he was buried with care and cremated with his personal belongings.

The additional data from the houses from the excavated areas of Kaupang's urban area hints at the active role of smiths within the Viking Age community. In general, this evidence is problematic because there is very little in the way of artefacts related to iron working. The available evidence comes in the form of crafting waste, nails, and hearth foundations from the remans of two buildings.

Fig. 7.3 Diagram of building A200. (after Skre 2007: Fig. 10.12 by Julie K. Øhre Askjem)

Building A200 (see Fig. 7.3) is the first example. The number of artefacts from this building were few, however there was a considerable amount of crafting waste. There is evidence for glass bead production, as well as bone pieces, flint, burned clay, beads, ceramic sherds, whetstones, crucible fragments, and a spindle whorl. There were also ten iron nails found, assumed to belong to the interior house structure, and small waste pieces of amber. It was concluded that this is typical settlement material with evidence of amber and glass bead production taking place within the household (Skre 2007: 205).

Fig. 7.4 Diagram of A302. (after Skre 2007: Fig. 10.17 by Julie K. Øhre Askjem)

[redacted]

The other building which shows relevant evidence is A302 (see Fig. 7.4). This house was excavated in Plot 3A, in association with Period II, sub-phase 2. Relative to other archaeological contexts this is within the Viking Age and roughly contemporary to the active periods of the cemeteries (Skre 2007: 207). There were 700g of slag, 300g of burnt clay, and a number of furnace fragments excavated within the walls, with more slag, clay and furnace pieces in other phases. It is important to note that much of this evidence was associated with the building's hearth. There is also typical settlement waste associated with A302. This suggests that the building was not, through itself, a smithing workshop, but rather it was a home where smithing took place (Skre 2007: 207).

[redacted]

Fig 7.5 Site plan of Kaupang Excavations, showing building A200 and A302 in relation to the others. (After Skre 2007: 197 by Julie K. Øhre Askjem)

Analysis and Discussions

The cemeteries surrounding central Kaupang show a great deal of variety and a relatively high proportion of valuable goods, most dating to the ninth, tenth and eleventh centuries. The graves at Kaupang are a mix of contemporary furnished cremation barrows, inhumation barrows, cremation and inhumation level-earth graves (Skre 2007: 103-127). The trends seen in the graves and their grave goods are similar to those seen in other important Viking Age central places, although the term ‘typical’ is not appropriate for any Viking Age burials.

Iron objects in many forms appear in practically every furnished grave. It could be argued that this is the result of either the burning episode associated with the cremation burials destroying much of the organic material, or the general preservation of iron and other metals compared to organic materials. However, the fact still remains that there are many iron objects within Kaupang’s graves. Several graves dating to different time periods have iron objects including weapons, tools, and rivets in common, suggesting continuous trends of artefact use.

Similarly to Luistari some of the most richly furnished graves include many iron objects associated with animal remains. Of the graves published in Skre’s catalogue (Appendix Table A.2) there are two which included definite animal remains. The inclusion of a potentially productive animal such as horses suggest that the people who were buried were affluent. The iron objects were also expressions of wealth and status.

The first grave is Ka. 252 (see Appendix table A.2). Found in the Bikjholberget flat grave cemetery and dated to between 900 and 950 A.D, this grave was furnished with one double edged sword as well as the remains of a second sword, a spearhead, an axehead, a shield boss, eight arrowheads, up to six knives, a sickle, a strike-a-light, scissors, an iron lock, some stray iron fragments, and 135 nails and rivets. Of the 185 artefacts found within the grave, 159 of them are iron. Along with the iron artefacts there was a soapstone line-sinker, a fishing hook, four glass beads, one amber bead, several flint pieces, a soap stone vessel, and several equine teeth. It was suggested that this was an inhumation boat grave, based on the lack of charcoal or a burning layer and the presence of several nails (Skre 2007: 116-117 originally in Blindheim *et* al 1981: 217-218).

[redacted]

Fig. 7.6 Horse equipment from Kaupang Grave. (after Skre 2007: Fig 5.3 by Eirik Irgens Johnsen)

The second grave, or series of graves, depending on interpretation, is even more intriguing. Also from Bikjholberget, this grave consists of three roughly contemporary, and richly furnished burials within the same grave, suggesting that either it was repeated reuse of a single grave plot, or a triple burial. With that evidence in mind the graves have been given three different grave numbers; Ka. 294, 295, and 296, (see Appendix Table A.2) however the close association between the three allows for them to be discussed together (Skre 2007: 122-123 originally in Blindheim and Heyerdahl-Larsen 1995: 22-24). Grave Ka. 294 was dated on the basis of artefacts to between 900 and 950 A.D, Ka. 295 was dated to between 900 and 1000 A.D., and Ka. 296 was dated to 850-950 A.D. The artefacts which are datable on the basis of style and design have dates which overlap between all three graves, suggesting that there is a chance of them being contemporary with one another. Lacking skeletal information the relationship between these three individuals can only be speculated, however information from the artefacts is more concrete (see Appendix Table A.2).

Grave Ka. 294 has suggested to be a double boat burial, with the second individual being an infant (see Appendix Table A.2). Inside the grave there was a matching set of gilded oval brooches, and a trefoil brooch, indicating that the main burial is a woman and suggesting it could be a mother and child burial. Iron objects from this grave included an iron handle potentially from a tool of some kind, two iron rods, a knife, and an iron sword-beater (Skre 2007: 123 originally in Blindheim and Heyerdahl-Larsen 1995: 22-24). The sword-beater is particularly telling, suggesting that this woman was involved in processing textiles, an observation supported by the presence of a wool textile. There were also 29 glass beads, a silver bracelet, a ring which has been suggested to be a horse bit, and several animal teeth (Skre 2007: 123 originally in Blindheim and Heyerdahl-Larsen 1995: 22-24). The teeth have not been identified in Blindheim's publication, however they do indicate the presence of an animal within the grave furnishings.

Grave Ka. 295 contained with an array of weapons and a number of smaller items (see Appendx Table A.2). The warrior kit included a sword, two axes, a javelin head, five arrowheads, a scythe, and iron frying pan, an iron object assumed to be a horse or dog collar, and two knives. There was also a soapstone vessel, three glass beads, a two spindle-whorls and a pottery sherd. However, the notably different finds from grave Ka. 295 were the remains of a horse and horse equipment, depicted in Fig. 7.6 along with other artefacts. These came in the form of equine skeletal elements, strap ends, and 32 iron rivets with copper alloy coating (Skre 2007: 123 originally in Blindheim and Heyerdahl-Larsen 1995: 22-24). These finds suggest that not only was a horse buried as grave furnishing, but it was buried with its own set of furnishings, adding to the prestige display of the person it was buried with.

The final burial, grave Ka. 296, has been identified as a woman on the basis of a matching set of oval brooches (see Appendix Table A.2). However, there are artefacts which suggest a more complex interpretation. The iron objects which appear in grave 296 are similar to those in 294. An iron sword-beater, iron staff, and two iron brackets suggest some degree of domestic importance, however there was also an axe head, shield boss, and a horse bit (Skre 2007: 123 originally in Blindheim and Heyerdahl-Larsen 1995: 22-24). These suggest that this could be a double burial, or this individual was a particularly capable woman. Other artefacts included a copper alloy basin with a runic inscription, a copper alloy ring, one arm of a tweezer-shaped copper alloy object, a gilded copper alloy rod, an egg made stone, a hone, hand made pottery, and the skeleton of a dog (Skre 2007: 123 originally in Blindheim and Heyerdahl-Larsen 1995: 22-24). The combination of artefacts and dog remains suggests that this was a person of high esteem and prestige. The dog remains suggest a certain personal quality compared to other animal remains typically found within Viking Age graves.

The three graves in conjunction represent a particularly wealthy grave. Figure 7.7 is an artist's rendering of this particular grave as it may have looked during the funeral. The presence of a horse and dog re-enforce the suggestion that iron objects indicate status because, as suggested by Lehtosalo-Hilander in reference to Luistari, the animals also served as a status display (Lehtosalo-Hilander 1982b: 29). Furthermore, the iron objects in association with other personal belongings, especially the wealth of copper alloy artefacts associated with grave Ka. 296 continue to establish iron objects as a prestige management object. Their use in a grave along side other high value objects suggest that they have been used, and were viewed in similar ways because the final episode of use was identical for both kinds of objects.

This could be extended to the graves that were associated with iron objects, but not other types of objects.

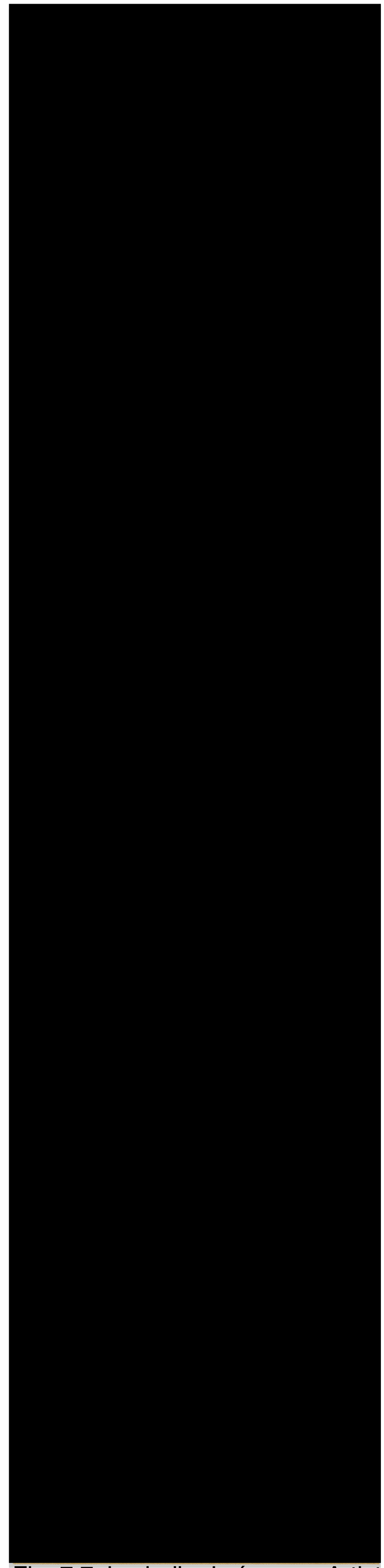


Fig. 7.7 Þorhallur Þránsson. Artist rendering of triple boat burial. (after Skre 2007: 5.2)

The cemeteries of Kaupang contained graves which were furnished with only, or mostly iron objects. By extending the idea that iron objects manage prestige through display to the comparatively poorer graves suggests that iron objects, especially weapons were the primary display of status. Following the earlier assertions concerning the relationship between prestige management through iron object display and smith status, smiths in the Skiringssal area must have been important members of society indeed. However, the information from Kaupang's building foundations suggest that there is much more to smithing in the town than just prestige management.

The data from Kaupang's buildings is vital to understanding the active role of smiths in the Viking Age. However, it is also problematic because the information available does not provide a complete picture, leaving much room for interpretation. Of the two buildings described above, only one provided evidence of direct smithing taking place on site, and even then within a dedicatedly domestic structure. Furthermore, most of the evidence comes in the form of slag and nails associated with the structure. Evidence from the cemeteries implies that smithing must have occurred within the town. However, the available evidence seems to suggest that smithing occurred in only one structure, which seems unlikely given the wealth of iron within the cemeteries, and the importance of the site as a commercial centre. Therefore, there was a more complex model at work in Viking Age Kaupang.

The site of Lundeborg in Denmark has shown evidence for being an important central location, similar to Kaupang. The excavations have revealed evidence of craft-working in the form of tools and craft waste materials which are similar to the evidence from Kaupang. In addition to the crafting evidence there were approximately 8000 nails found in association with buildings and ship repair. In such a town a smith would have been important for making nails for these large scale construction projects, and for repairing the tools associated with crafting (Skre 2007: 447). Evidence from Kaupang was similar to evidence from Lundeborg in these respects, suggesting that smiths were important for making nails to be used in ship and building construction in Kaupang. The limited number of nails found in association with Kaupang's buildings supports the analogy. The single smithing site found within building A302 could have potentially been the source of nails, rivets, and iron tool repair. However, larger iron objects, especially weapons may have required a more substantial furnace for construction suggesting that A302 was not likely to be where spears and swords were forged. The question then becomes where is the evidence for the forging of larger, more valuable iron objects, and why is there such limited evidence for direct smithing.

Clues to the second question can be found by referring back to the cemeteries. Two graves in particular contain evidence of smithing, more specifically smithing tools. Grave number Ka. 264 is a boat grave found within the Bikjholberget flat grave cemetery (see Appendix table A.2). The grave goods included a warrior kit consisting of a sword, spearhead, axe, knife, and strike-a-light. There were also several copper alloy ornaments such as buttons and strap ends, and several pieces of hack silver. The object which is most relevant to the question of smithing is the remains of a forging hammer (Skre 2007: 118-119 originally in Blindheim and Heyerdahl-Larsen 1995: 79). Finding a hammer in conjunction with a set of personal belongings suggests that it was seen as an important personal possession, and was important in re-enforcing the social perception of the person they were buried with.

Grave number Ka. 298, also from Bikjholberget, supports this assertion (see Appendix Table A.2). A forging hammer, and smiths tongs were found associated with a warriors kit and several copper alloy objects of presumably high value. This grave is similar to the aforementioned triple boat grave of Ka. 294-296, in that it appears to have been three individuals buried within the same boat (Skre 2007: 122-123 originally in Blindheim and Heyerdahl-Larsen 1995: 26-28). Again, the association with a carefully buried boat burial and a high status set of grave furnishings implies that forging tools were seen as personal possessions, similar to the way that sickles and shears have also been found in graves. For this reason, tools should not be expected to be found in association with where they were used, but instead Viking Age peoples associated them more closely with the iron workers who used them.

This being said, the question of where the majority of high value iron objects were made remains to be addressed. Part of the limitation is in the evidence uncovered in the excavations, although the available evidence was invaluable in examining the lives of people in the Viking Age urban centre. Skre classified Kaupang as a central place under very strict criteria, including; the presence and association with petty kings, kings, or chiefs in literature, evidence for secular importance, a *thing* or assembly site, halls associated with cult activity instead of residence, and rich archaeological finds (2007: 48). Following this classification, central, secular authority must have been somewhere in the general Skiringssal area.

Fig. 7.8 Map of Husby site and concentrations of finds. (after Skre 2007: 227)

The locus identified as Husby was one of the many buildings excavated within the Skiringssal area. Husby is the remains of a Viking Age long hall excavated within the Kaupang urban area, depicted in Fig. 7.8. The artefacts found within the structure include glass beads, weights, spindle whorls, silver and bronze ornaments, a gold wire pendant, and several silver coins which date to after 1000 A.D., suggesting an aristocratic connection (Skre 2007: 239-240). It has been argued that Husby was the local royal, secular authority centre for the area. This is re-enforced by roughly analogous halls from the Lake Tisso complex and Viking Age excavations at Uppsala which have similar structural features and associated artefacts (Skre 2007: 232). The excavation of Husby was limited to the hall's walls and immediate exterior and did not reveal any forge or smithing structures. However, assuming that it was part of a complex similar to Lake Tisso, there could potentially be a forge nearby. Furthermore, locating dedicated high status production sites, many of which have yet to be identified, is a means of locating expressions of “socio-political power” (Prestvold 1996: 54).

Following the speculation that high value objects were forged under the control of a central authority, it is likely that the permanent smithing workshop has yet to be excavated close to Husby long hall. This would have been where an attached specialist would have worked. Although far from proven, this suggests that there was a dualism within the smithing activities at Kaupang, with a highly skilled, attached specialist producing high status, high value weapons and iron objects under a local secular patron, and a less prestigious, yet important independent smith making nails, rivets, and carrying out tool repair in less extensive facilities. Although this smith may not have produced prestige management objects, it was important to the community of the urban centre. The nails and rivets made would have been useful for constructing houses and constructing ships and small boats. Furthermore, the household objects which could have also been produced and repaired would have been invaluable to the society, making the independent smith a valuable, prestigious member of the Kaupang community (Smith 2005: 197).

Comparing Luistari and Kaupang

The evidence examined from the two selected case studies supports the idea that smiths in the Viking Age were important members of their respective communities. However without further comparisons and wider discussions of analogous trends, conclusions from the case studies can only be applied to the immediate area surrounding the case study sites. In order to establish the role and status of smiths in the Viking Age world various other factors and comparisons should be drawn, with respect to the terms and theories defined in previous chapters.

The first discussion point to examine and establish the role and status of smiths in the Viking Age is to compare evidence from Luistari with evidence from Kaupang. As mentioned above, in rural Luistari it appears that smiths were important members of society because they would have been the producers of valuable prestige managing artefacts and tools of high use value. This status was derived from the important role which a smith would have played as the controller and vital piece of contemporary smithing technology. The smith's role and skill would have been visible in the apparent value which was ascribed through the technological process and through how the artefacts were consumed and used in their social contexts.

The evidence from Kaupang suggests a very similar trend to Luistari, made more complicated by Kaupang's status as an important urban central-place, compared to the rural setting of Luistari. Although relatively limited, the direct evidence of smithing from Kaupang elucidates the smithing operations and iron economy which were functioning during the Viking Age. In comparison, the only evidence of direct ironworking from Luistari is a number of slag sample located within several of the graves. The presence of slag signifies that some measure of ironworking, probably smithing if not smelting as well, was occurring in the general area, utilising locally extracted bog iron. Lehtosalo-Hilander suggested that most of the spearheads and non-pattern-welded objects found in the Luistari graves were made locally (1982b: 70). This being said without a hearth, forge, or large slag deposit similar to Kaupang, examining the extensiveness of smithing activities in the area depend entirely upon the slag samples found within the graves, and any conclusions are speculative at best.

The presence of slag within graves is the subject of much debate, centring around the question of intentional or accidental deposition. On one hand, the presence of slag has been explained as having been accidentally moved into the cemetery matrix from previous or contemporary smithing activities. On the other, there is the suggestion that slag was intentionally included with the grave goods because of the symbolism attached to ironworking and slag as a by-product of the socialised ironworking processes (Lehtosalo-Hilander 1982: 41). Oddly enough the second interpretation seems more accurate. There appears to be no centralised deposition pattern suggesting that accidental deposition from a nearby forge or furnace was unlikely (Lehtosalo-Hilander 1982: 41). They appear in a broad, even range suggesting intentional deposition, potentially connected to the symbolism associated with ironworking and ironworkers and pseudo-supernatural beings. Depositing slag within graves could have been a means of "harnessing metaphors" which were connected to ironworking processes (Giles 2007: 400). This being said, slag could potentially be a means of examining the symbolism attached to smiths and smithing, however information is fairly limited and the presence of slag can concretely be taken as a sign that smithing was occurring within the Eura region, if not within the Luistari settlement. This being said, other artefacts from Luistari which appear to be parts of larger trends elucidate smithing in Finland's Viking Age.

[redacted]

Fig. 7.9 Detail of Luistari spearhead decorations. (after Lehtosalo-Hilander 1982a: Fig. 12)

The decorated spearheads from Luistari, mentioned above, are part of a larger regional tradition which primarily reflects the connection between Finland and the wider Viking world. However, examining Baltic spearheads with knowledge of contemporary smithing in mind can elucidate how some of the most valuable objects were used and viewed in the region. Three of the Luistari spearheads show this connection specifically (See Fig. 7.9 for two examples). Two of the three were excavated from Grave number 349 and the third is from grave 407 (see Appendix Table A.1). All three show silver engraved interlacing animal patterns which are similar to examples from Estonia, Latvia, and other Scandinavian countries (Lehtosalo-Hilander 1982a: 33-35). These in particular are important because the decoration is a tradition brought in from the west. There appears to have been no local method or style of decoration to match.

Discovering spearheads with this type of silver engraved decoration in Estonia, Latvia, and Finland shows the strong connection which the Baltic Sea had with Western Scandinavia.

Fig. 7.10 Details of Ringerike style decorations from the Baltic.
(after Lôugas 1993: Fig. 2 and Fig. 3)

[redacted]

The style of decoration is significant for examining the nature of that connection. Generally speaking the decorations are in the Scandinavian art style known as Ringerike, consisting of stylised interlocking animals, however "runic style", also identified as Urnes style animals also appear on Finnish examples (Lôugas 1993: 217). It appears that the majority of Ringerike spearheads were decorated with various sub-styles of Ringerike style, and were found in Estonia and Latvia (See Fig. 7.10 for examples of Baltic spearhead decoration designs). In contrast, spearheads with Urnes animals appeared primarily in Finland in areas such as Luistari. This apparent separation of decorative styles, and the existence of three Ringerike sub-styles lead Lôugas to conclude that Estonian and Latvian examples were locally produced spearheads with decorations imitating Scandinavian patterns, leading to the stylistic differences (1993: 219). Finnish examples with Urnes animal patterns were suggested to have been imported from Sweden, as Finnish merchants were thought to have been in control of the Eastward trade routes (Odner 1985: 4, Dixon 1998: 60). However, compared to other regions of the Baltic sea, Finland has the widest diversity and abundance of decorated spearheads (Lôugas 1993: 217). If diversity of decoration is an indicator of local production, it follows to consider the possibility that the Eura region and other rural areas of Finland may have had localised production of spearheads, with perhaps stronger Swedish stylistic influences. The adoption of Scandinavian style into locally produced spearheads is potentially a means of enhancing prestige through importing foreign cultural practices (Harrison 2000: 663). This being said, without direct evidence of smithing in the area any suggestions concerning local smithing activities are speculation at best.

In contrast, evidence from the buildings in Kaupang shows direct smithing activities through mass slag deposits in association with the hearth of building A302 (Skre 2007: 207). As already mentioned, there is a lack of permanent smithing fixtures such as anvils or furnaces, but the presence of slag in large quantities suggests that some degree of smithing was occurring within the town centre. The degree with which that smithing was occurring is potentially the subject of debate because it is unlikely that large iron objects such as swords, spearheads and armour were forged in a converted hearth. The complicated skills necessary for forging high quality weapons required more extensive, dedicated facilities. Following the example of Lake Tisso, it is likely that a more talented ironworker was working as an attached producer close to the centre of authority characterised in the Husby hall. The tradition of attaching a specialist to secular authority was potentially a means of maintaining trade secrets by keeping a skilled ironworker under employ and effectively controlling the distribution of prestige managing, high value goods (Harrison 2000: 664). The association with social elites potentially enhanced the esteem of the smith, just as association with a skilled smith enhanced the esteem of the elite as the provider of high value weapons, derived from the direct relationship between skilled crafting and social power which was defined in terms of authority, prestige, and worth (Helms 1993: 14).

On the other side of the spectrum, the available evidence suggests that iron objects of low prestige, but not necessarily low importance were being produced within Viking Age towns by what seems to have been an independent blacksmith operating out of his home. Again, judging by the relatively limited facilities, it is likely that this particular smith was producing and repairing tools, and making nails and rivets for construction (Light 1987: 658). These objects do appear within graves and can be taken as personal possessions, in the case of tools and simple objects. Objects like these would have been important for life within Kaupang and its environs. Farming tools would have been valuable for efficient agriculture, carpentry tools and nails would have also been important for building, and maintaining houses and ships. It is also likely that urban smithing activities were important for supporting rural smelting communities (Jørgen Benedictow 1996: 155). Furthermore, the necessity to maintain these important tools would have caused a demand for smithing skills (Giles 2007: 406). The association between farming tools and weapons within graves which surrounded areas which seemed to have been focussed on trade and agriculture rather than warfare, suggest that weapons were symbolically important for prestige management in the social dynamics of those societies.

The population density of Kaupang has been estimated to have been around 200 people on average, perhaps as high as 500, and close to 800 during the tenth century (Skre 2007: 65). Such a large number of people living within the town appears to have been enough to support the production and presumably the sale of low exchange value iron objects. Smithing in general has been suggested to have been a “high-risk” activity both from the dangerous work environment and general durability of iron objects (Giles 2007: 399). The presumed importance of even basic iron objects made the smith an important member of the community and potentially enhanced prestige attached to the smith.

Part V: Discussions and Conclusions

Chapter 8:
A Wider Perspective

The evidence from Luistari and Kaupang suggests that smiths in these areas were important members of their respective communities. Evidence drawn from graves and domestic contexts suggest that the role and prestige of ironworkers was closely related and derived from the importance and value of iron objects which they produced. This appears to have been true for the producers of both mundane and high value artefacts. Evidence of local production of iron artefacts from the selected assemblages, through revisiting the artefact groups and individual artefacts, implies that this assertion can be applied to smiths operating in the areas surrounding the case study sites.

The swords excavated from Luistari and Kaupang provide evidence which could be interpreted as evidence of the degree of local production. The blades of Luistari differ in their dimensions, ranging from a length of 614 mm from grave 283 to 858 mm from grave 348, which suggests differing sources or manufacturers. Furthermore, as mentioned above several swords bear pattern-welded inscriptions along the blade, indicating foreign manufacture (Lehtosalo-Hilander 1982a: 13). The sword from grave 17, depicted in Fig. 8.1, was adorned with a silver ornamented, five part knob Petersen type S hilt (1919: 142-149). The ornamentation is evidence that this sword originated from Frankish territories as it was decorated with motifs similar to contemporary Carolingian styles (Lehtosalo-Hilander 1982a: 17). Similarly the blade design was distinctively different to the other Luistari weapons. The blade of the grave 17 sword had a shallow fuller, and relatively equal width along the length of the blade. This contrasts with the clear tapers of other Luistari swords (Lehtosalo-Hialnder 1982a: 17). This indicates that other blades were potentially made at forges closer to Finland, judging from their clear separation of design from the notably foreign grave 17 sword.

[redacted]

Fig. 8.1 Silver ornamented sword from Luistari Grave 17. (after Lehtosalo-Hilander 1982a: Fig. 3)

Other swords show little evidence for the location of their manufacture within the blades themselves. However, three swords in particular bear a notable local hilt type which indicates some degree of manufacture, at least of the hilts if not the blades as well. The three in question bear a distinctive type X hilt, as identified by Petersen, with a semi-circular one-part knob design (1919: 158-167). Studies of this type in particular indicate that they are primarily a Baltic design. In fact, nearly half of swords of this type or earlier variants have been found in the Satakunta region of western Finland (see Fig. 8.2), an area which contains the smaller Eura region and Luistari itself (Lehtosalo-Hilander 1982a: 13). Therefore, several of the Luistari swords were modified with local ornamentation, even if they were not locally produced.

One of the three X-type blades was found alongside a spearhead of a unique design, suggested to be of local origin. Luistari Grave 283 contained an X type sword, and a spear head thought to be unique to Finland, although stylistically similar to spearheads from Latvia (Lehtosalo-Hilander 1982a: 14). The dating of this spearhead implies that the sword was one of the earliest type X swords from this time period. The combination of a unique spearhead associated with a localised sword hilt type suggests that they were produced somewhat locally. Considering that hilt style was potentially one facet of asserting one's individual esteem, through modifying a prestigious weapon. The local smith who attached and modified what could be either a local or a foreign sword blade into a complete weapon could have been given accolades due to his role in the prestige management aspects of the weapon, developing the prestige of the smith on a local level.

[redacted]

Fig. 8.2 Distribution map of X-type Hilts in Finland. The large collection in the Eura region indicates the Luistari cemetery. (after Lehtosalo-Hilander 1982a: Fig. 2)

The many swords from Kaupang potentially reflect a similar trend, although the information is limited due to the focus of the publication history. Many of the swords contained in Table A.2 were identified as Petersen H type, or a Wheeler type I or II. In fact, this appears to have been the most common type, and was potentially a native

Norwegian style (Oakeshott 1960: 135). Furthermore, a sword from Kaupang grave Ka. 300 featured a single bladed sword with a Petersen type H. Single bladed swords were a notably Norwegian blade design, indicating that many of the swords bearing type H hilts would have been either manufactured, or completed locally.

The wealth of spearheads from Luistari are even more telling of localised manufacture. As mentioned above spearheads were the most numerous large artefact of the Luistari assemblage, surpassed only by glass beads which were found in fewer graves than spearheads. The spearheads were grouped into no less than fifteen distinct types, with various differentiations of design within each typological grouping (Lehtosalo-Hilander 1982a: 19-37). The variety of spearhead types appears to have spanned the entirety of the site's phases, with earlier barbed *angons* being characteristic of the Finnish Merovingian period and very early Viking Age, giving way to the diverse styles more typical of the Viking Age. This being said, the Viking Age spearheads are widely varied in form including: tanged and socketed blades, leaf-shaped and shouldered blades, fullered and diamond cross-sectioned blades, and the decorated spearheads mentioned above. It is likely that the different types of spearhead had different origins and makers; potentially many of them were local, as suggested in the earlier discussion of the Ringerike style decoration. It follows to suggest that the different styles and sizes of spearhead represent different degrees of difficulty to produce, developing over time. This indicates that local smiths were certainly producing the most common weapon of the time period. These trends are widely seen in the other regions of Finland reflected in Fig. 8.3 (Lehtosalo-Hilander 1982a: 39).

The tools excavated from Luistari reflect similar trends of local production, and can be potentially allocated to the immediate region, as it is unlikely that they traveled far from the farms or houses from which they originated. Following the distance-decay model mentioned above, local versions of farm tools were potentially readily available, limiting the distance simple tools would have travelled (Renfrew 1969: 157). The knives from Luistari's graves appear in various types, similar to the spears, indicating a variety of producers, or techniques involved in their production.

[redacted]

Fig. 8.3 Table of Spearheads from Finland. (after Lehtosalo-Hilander 1982a: Table 2)

Axeheads show a similar trend, although they are less numerous than other tools, with only six appearing in the Luistari graves. A series of axeheads, described in more detail below, indicate that there was some degree of trade in axeheads during the Viking Age. It appears that they were imported from Norway to Denmark for trade. It is likely that they were of a higher quality than native made axeheads and thus represented a more valuable alternative to the native tools and, as a result, were traded over long distances. A detailed examination of the quality of these axeheads has not been carried out, and as a result the nature of their importance as a trade item, or the extensiveness of axehead trade is speculation. This being said, the axeheads from Lusitari are very similar to other Baltic axes, classified as “Finnish-Russian” style (Lehtosalo-Hilander 1982a: 53). The evidence of a localised Baltic style indicates that they were produced in the general region, suggesting a close association between regionally local smiths, the tools which they produced, and farmers. Axes have been suggested to have held special symbolism and value, as a tool which could also be easily used as a weapon, potentially adding to its use value (Peets 2003: 111).

Although the same cannot be said for other forms of farm tools, the appearance of these tools such as sickles, scythes, and shears in association with more complicated and prestigious weapons suggests that they were also seen as valuable personal possessions. It is also likely that farm tools were not as widely traded as weapons, or axeheads and thus were potentially locally produced. Furthermore, the Luistari farm tools show morphological differences, similar to the spearheads (Lehtosalo-Hilander 1982a: 65). Furthering the idea that smiths were important in rural communities due to their ability to make and maintain tools of high use value.

Evidence of the consumption patterns of those artefacts can be used to assess their position within the social relationships which engaged and were engaged by smithing related artefacts, and the meaning ascribed to artefacts through those social interactions. The iron artefacts found within the graves of both Luistari and Kaupang support this theoretical perspective, especially when considered with respect to context and interpretations of the social interactions which surrounded their deposition within the graves. Much of the associated material and contextual information suggests that there was some degree of funerary process which involved the deceased individual and its furnishings being visible to the community in an open grave. The presence of wooden constructions in many graves implies this. Publications which approach the topic of grave chambers and constructions suggest that such constructions were built to partially accommodate the amount of furnishings which were intended to accompany the dead person into their grave (Lamm 1973: 64-75).

It follows to consider that the presence of furnishings was an important mechanism for asserting the prestige of the deceased and their family in the perception of the community, suggesting that grave constructions had a similar social function (Renfrew 1986: 144). Furthermore, the archaeological association between valuable artefacts and grave constructions can be taken as evidence of the esteem management symbolism attached to the artefacts. Charts 6.1 through 6.12, with consideration for apparent fall off of properly chambered graves, suggest that in the Luistari material assemblage there is a clear correlation between the wealth of artefacts contained within the graves and wooden constructions which accompanied them. The presence of large quantities of nails and rivets within the graves from Kaupang's various cemeteries suggests that the major form of construction which accompanied the dead were boats of various sizes. Graves such as those mentioned in Chapter 7, and contained in Skre's catalogue, suggest a similar correlation between the highest status objects and boats (2007: 103-108). Therefore, there may have been a similar social function as visual displays of prestige within the funerary process. However, wooden constructions in relation to artefacts is not the limit of evidence suggesting the socialised funeral rituals.

As mentioned in Chapter 7, there were the remains of many animals found within the graves of both Kaupang and Luistari. Between both sites, these remains represented several species include; cattle, caprines, dogs, and horses. The animal bones were "always in the graves and not on top of them", placing them as part of the funerary activity and not part of any "later memorial" events (Lehtosalo-Hilander 1982b: 30). This suggests that the graves were open for much of the funeral itself, especially if the assertion that the meat bearing animals were also associated with a funerary feast. Following this suggestion, the original deposition of the animals within the graves would have been associated with the grave before the physical burial. The inclusion of either a horse, dog, cow, or caprine was a visual display similar to the other grave furnishings. Appendix Table A.3, is an excerpt from the larger Table A.1, and contains only the information from Luistari graves with animals. Similar information is seen in Appendix Table A.2, Skre's catalogue of Kaupang. These show a correlation between high status iron objects and animal remains, in that nearly all grave which contain animal remains also contained one or more valuable iron objects. The presence of the animals, and the act of placing the animals within the graves was closely associated with the prestige of the person with whom they were buried, and was a way of asserting that status through visual displays within an open grave prior to the final burial.

The inclusion and association of these different sources of evidence can be seen as an episode of deposition as a social exercise in itself, and evidence of object symbolism. This funeral process and association/ practice of prestige management through artefact use suggests that the objects were in fact closely associated with prestige as objects with use and esteem value, and by extension the social relationships which entailed self and public esteem during the acts of using and wearing the artefacts. Considering that the same techniques and socio-technical system acted upon iron objects to some degree to ascribe meaning and value to the objects, some degree of prestige must have been attached to smiths and ironworkers because of their invariable inclusion and role within the value and symbolic ascription process. Re-enforcing the idea that a smith's role and prestige within their community was derived from this role of a producer of both prestige management objects and objects of high use value. Furthermore, this appears to have been true for smiths operating within rural areas and cities, evident in the similarities between the Luistari and Kaupang assemblages.

The question of smithing within Viking Age cities, and the assertion that even smiths who were producing simple utilitarian objects had an important role in their respective societies can be further elucidated by examining other Viking Age urban centres with other case studies in mind. This will potentially establish if the proposed theories were specific to Luistari or Kaupang with their contextual individualities, or can be applied to wider Viking Age societies.

An example of a contemporary town which can add to the discussion, and provide additional evidence is Dublin. Dublin, the modern capital of Ireland was an important central-place for the Irish Sea area starting in approximately 841 A.D. and continuing through the Viking Age into to the modern day. Throughout its history Dublin saw many periods of conflict, in which the town and its inhabitants saw both Scandinavian and native rulers. These periods can be roughly grouped into four broad phases of occupation, identified by the wars which resulted in the town changing hands and characterised by the activities which occurred during the timeframes (Wallace 1992: 2). The time period which began with the re-establishment of Dublin in 917 A.D. and lasted until the defeat of the Scandinavian Dublin armies at the battle of Tara in 980 A.D. represents the earliest stratigraphic layers from the excavations at Fishamble Street, Christchurch Place, and High Street in modern Dublin (Wallace 1992: 2).

Fig. 8.4 Map of Dublin sites. (after Halpin 2008: Fig. 1)

[redacted]

The excavations in Dublin carried out by the National Museum spanned from 1962 to 1981 in which the early tenth to mid thirteenth century occupation layers were uncovered under several loci within the city centre (see Fig. 8.4). The excavations recovered remarkably well preserved houses and 606 preserved artefacts (Halpin 2008: 1). Furthermore, there appear to have been contemporary cemeteries close to the urban centre, the most famous of which being the Kilmainham/Islandbridge cemeteries which yielded weapons from several warrior graves (See Fig. 8.5). Unfortunately, some of the weapons which were unearthed have since been lost. This implies that Dublin was similar to Kaupang in many respects. They were both centres of commercial activities and secular authority, with cemeteries associated with the city's periphery. The archaeological assemblages from within the cities have a distinct difference which is particularly telling of the degree of smithing being carried out within Dublin and, when compared to other sites, the Viking world.

Unlike Kaupang, there were a handful of larger weapons found within the preserved houses. Fig. 8.6 depicts the pronounced difference between Dublin weapons in graves and domestic contexts. Generally speaking, finding complete or damaged weapons, within domestic contexts is quite rare and problematic. The most likely interpretation is that the weapons were somehow lost within the house, which is counter intuitive considering the size, importance, and general value of weapons (Halpin 2008: 3). Nevertheless, the weapons found in Dublin show a similar trend to Kaupang and Luistari in that their physical make up implies that they were highly valued objects. Two weapons in particular have design elements which display the degree of skill involved in their production. The first artefact is one of the twenty-nine spearheads found within the town. This spearhead, designated DWP 595 is a socketed, shouldered blade which was excavated from the site at Christchurch. An x-ray scan (see Fig. 8.7) of the spear blade revealed a visible rippling pattern, suggesting that the spearhead was forged using pattern-welding techniques (Halpin 2008: 136). Furthermore, the blade's cutting edge appears to have been forged using hard steel, implying that the smith who made this particular weapon was skilled at identifying metallic qualities, and using those metals to the greatest effect.

[redacted]

Fig. 8.5 Water colour of Kilmainham/ IslandBridge weapons. (after Plunkett in O'Brien 1998)

[redacted]

Fig. 8.6 Histogram of Dublin weapons grouped by context. (after Halpin 2008: Fig. 1)

The second weapon which shows the value attached to weapons by the people of Dublin is a sword which was inscribed with a series of letters, similar to the Ulfberht swords found elsewhere. Of the swords found within Dublin this is the only complete sword, the others appear to have been damaged, were fragmentary, or appear as hilt fittings composed of both iron and non-ferrous metals (see Fig 8.8). The inscribed sword, designated DWP 609, was excavated from an 11th century context at Christchurch. Under radiographic scan the blade showed no evidence of having been pattern-welding. The inscription, forged from what appears to be a non-ferrous metal reads SINIMIA(I)N(I)AIS or S.N.M.A.N.A.S (see Fig. 8.9), depending upon interpretation (Halpin 2008: 155). The tradition of inscribing a sword blade with letters, which can have a variety of meanings, appears to have been a common mark of quality. Furthermore, the use of this method of visible signature suggests that the smith was adopting the style of the famous Ulfberht sword makers in an attempt to access the prestige associated with those high quality weapons, a trend seen in many obvious forgeries as well as imitations (Gorman 1999: 10, Stalsberg 2010: 452).

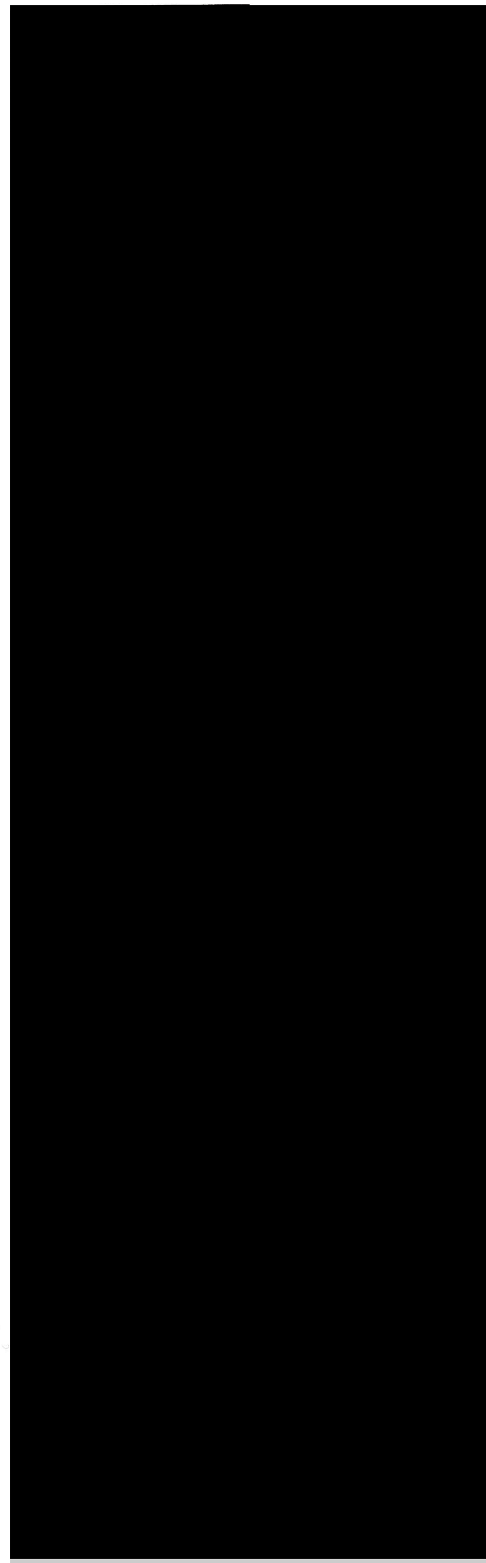


Fig. 8.7 X-ray scan of Dublin pattern-welded spearhead. (after Halpin 2008: Plate XVIII)

The presence of these two high value weapons in Dublin implies that they were certainly the prized weapons of fortunate members of Dublin’s Hiberno-Norse community. Although there is little published

[redacted]

Fig. 8.8 Dublin sword fittings. (after Halpin 2008: Pl. XXIV/XXV)

Fig. 8.9 Detail of Dublin sword inscription. (after Halpin 2008: Pl XXII)

[redacted]

evidence for direct smithing in the town there is potential that they could have been forged within the town. Alternatively, the weapons could have been imported from abroad. A series of axeheads, depicted in Fig. 8.10, found attached to a length of spruce wood in Denmark show that there was a practice and market for importing iron weapons from neighbouring areas. Evidence for this is the fact that spruce wood was not native to the area in which the axeheads were found, but rather were native to Norway and Sweden (Roesdahl and Wilson 1992: 250). In either interpretation, the rare weapons, and weapon fittings from Dublin were arguably valuable, prestigious possessions, suggesting that the local view of skilled smiths was derived from, or connected to their role in making these weapons. This being said, the question of local production versus export, and problematic context do not inform upon the role of local smiths. In contrast, other artefacts from Dublin are far more informative.

[redacted]

Fig. 8.10 Axeheads attached to wood found at Gjerrild, Denmark.
(after Sawyer in Roesdahl and Wilson (eds) 1992 Fig 2/ 93)

One of the most common artefact groups found in the Viking Age layers of Dublin were arrowheads of various shapes and sizes. Arrowheads and other archery related objects are generally under-represented in Viking Age graves, partially due to the fact that an archery kit is primarily composed of organic materials which, with few exceptions, do not survive into the archaeological record. The volume of arrowheads found within Dublin's habitation layers is evidence that archery was indeed an important part of life and/or warfare of the age. The under-representation in funerary contexts suggests that arrows were considered an impersonal, alienable object which was not necessarily associated with an individual warrior who carried them (Halpin 2008: 3). In contrast, arrowheads seem to be somewhat over-represented in the domestic context of urban Dublin. This is potentially related to the throw-away nature of the weapon, but also because arrowheads are potentially small enough to be lost or abandoned in a household when larger, more personal weapons were too large to be misplaced (Halpin 2008: 3).

As already mentioned, the arrowheads from Dublin appear in various types. Each of the types is proposed to have had specific and differing functions. Specifically, there were eleven categories of arrowheads described in table 8.1 and depicted in Fig. 8.11.

Type Number	Description	Proposed function
Type 1	tanged leaf-shaped/ shouldered blades	both hunting and military
Type 2	socketed leaf-shaped/ shouldered blades	military use
Type 3/3A	tanged triangular blades	multi-function, mostly military
Type 4	socketed triangular blades	military use, determined by context of analogous arrowheads
Subtype 4A	socketed triangular blades with long blades	multi-purpose
Type 5	socketed with long shanks	incendiary arrowheads, designed to bear flammable material
Type 6	tanged bodkin blades	military use
Subtype 6A	tanged short, pyramid bodkin blade	military use, different from other bodkin types
Subtype 6B	tanged bodkin blades without stop	function is open-ended
Type 7	socketed bodkin blades	purely military design

Table 8.1 Typology and proposed function of Dublin Arrowheads, generated using descriptions in Halpin 2008: 81-125

[redacted]

Fig. 8.11 Diagram of Dublin arrowhead typology. (after Halpin 2008: Fig. 21)

As seen within table 8.1, most of the arrowhead types appear to have been dedicated or designed for military uses. The most common type is type 7, the socketed bodkin arrowheads. Representing 52% of the total number of arrowheads, 273 of these arrowheads were found in Dublin (Halpin 2008: 121). Arrowheads such as these have been proven to be the most effective arrowhead design for penetrating body armour, especially Viking Age mail, commonly known as chain-mail or ring-mail. This suggests that bodkin arrows, or arrows of similarly deadly design carried a high use value as effective weapons of war. Type 5 , seen in Fig. 8.12, are also an interesting arrowhead design. They appear to have been purpose built for bearing flammable materials to a target without burning the wooden arrow-shaft (Halpin 2008: 111). The diversity of arrowhead styles and designs characterised through gradations of size, form and composition is a potential signifier of the “gradations of value” and prestige attached to arrowheads (Lesure 1999: 30). Although arrowheads would essentially be delivered through the same means, the variety of forms implies differing functions. An arrowhead with broad blade, or leaf-shaped blades would have a different strength in battle than bodkin points. Furthermore, some of the arrowhead varieties would be more difficult for a smith to forge, for instance type 1 arrowheads and the long-shanked type 5

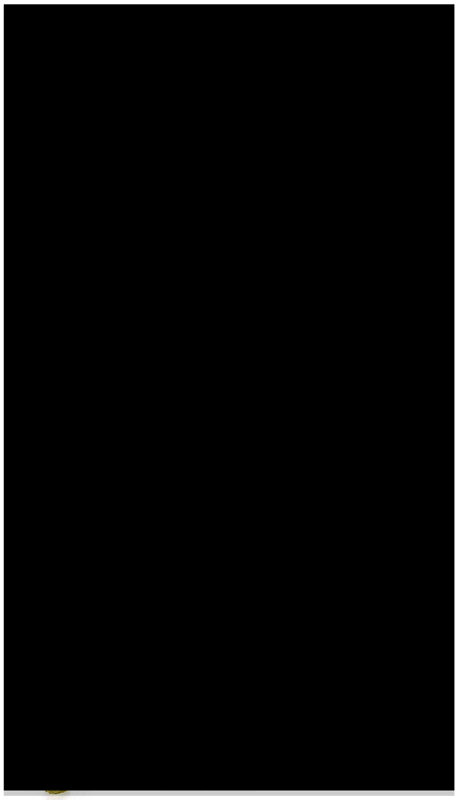


Fig. 8.12 Long-hafted arrowheads.
(after Halpin 2008: Pl. XV)

arrowheads would have required considerable skill to make in order for them to fly with any accuracy (Halpin 2008: 128). Judging from the assemblage of apparently armour-piercing arrowheads and the historical perspective that native irish warriors did not commonly wear armour, Halpin concluded that the Hiberno-Norse Dubliners were arming themselves for fighting farther afield than Ireland (2008: 179).

There is potential that, although the arrowheads could have been intended to be used abroad, smiths were producing them within Dublin. However, evidence for or against this assertion is limited. This being said, there is potential that further evidence of smithing is in areas not yet excavated. A study of the manufacture of arrowheads has not been carried out, and direct evidence of smithing within the town is limited to slag deposits similar to those in Kaupang (Wallace 1992: 201-203). Unlike Kaupang the house construction appears to be an entirely, or mostly metal free, utilising carefully formed interlocking beams to support the building's roofs (Wallace 1992: 41). Fig. 8.13 depicts one proposed metal-less method of Dublin house construction. It has been suggested that the buildings in Dublin were built by specialist carpenter/builders. This conclusion was drawn from evidence that most of the 200 buildings were of nearly identical construction (Wallace 1992: 7). This suggests that independent smiths from Dublin would have been repairing carpentry and farming tools, yet they were producing arrowheads rather than nails and rivets. This is further supported by other small iron finds from the town, which are mostly small household objects such as shears and knife blades, and various small types of nails (Walsh 1997: 138-140).

Fig. 8.13 Diagram of proposed nail-less Dublin house construction. (after Wallace 1992: Fig. 27)

[redacted]

Tool kits and Evidence of Independent Production

It is important to note that a volume dedicated to the small finds, similar to Skre's Things from the Town, has yet to be published for Dublin's assemblage (2009). However, the available evidence seems to suggest that smiths in Dublin had an importance very similar to those in Kaupang as the producers of important and vital iron objects, although this was expressed through the production of arrowheads rather than nails. In Dublin it appears that smiths were socially associated with equipping local warriors with weapons, repairing tools, and forging rivets for boat repair, assuming that the urban smiths who were producing arrowheads and small objects were working with limited facilities and were independent producers. Similar to Kaupang these smiths would have been important members of the community, with their prestige being derived from their role as producers of objects of high use value, and maintenance of objects which were vital to the livelihood of farmers, carpenters, and shipwrights.

A grave from the Sproge Parish churchyard in Gotland, Sweden provides evidence for the close social relationship between smithing and carpentry which must have been important for daily life. The grave was furnished with a wooden tool chest full of tools and iron exchange/ currency bars dating to c.1000 A.D. Judging from the variety of tools which were contained within the tool chest this individual must have been particularly skilled (see Fig. 8.14). The wooden chest included smithing tools, carpentry tools, and shipbuilding tools (Graham-Campbell and Wilson 1980: 415-416). Although it appears that the person buried with these tools was not necessarily a dedicated smith but more of a shipbuilder and joiner, it does show that there was an important relationship between smiths and woodworking (Roesdahl and Wilson 1992: 250). It appears that throughout the Viking world the close association between ironworking and woodworking defined the social role and the basis for the status of independent smiths.

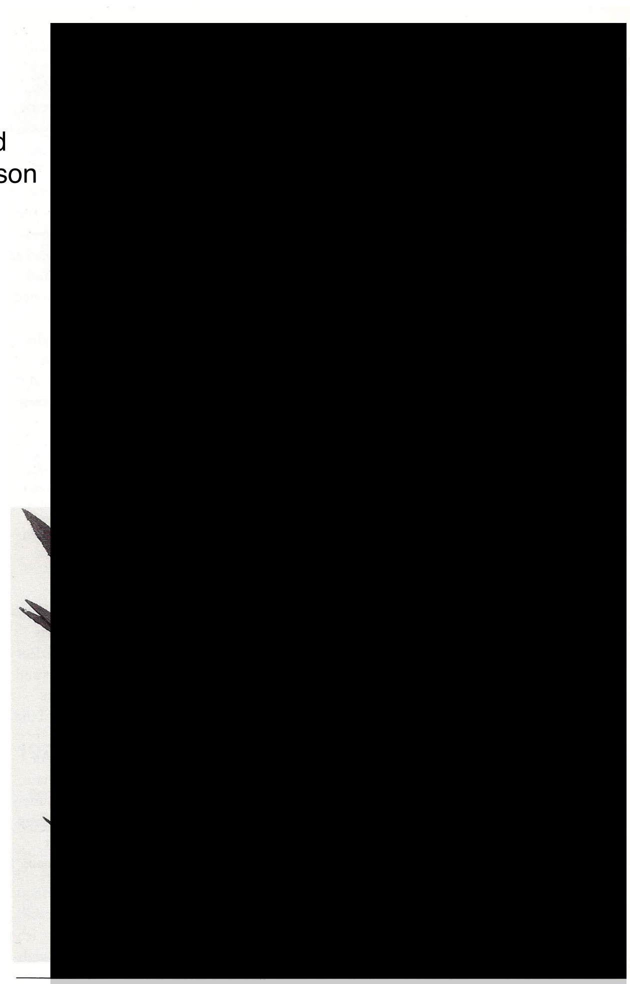


Fig. 8.14 Smithing tools from Telemark, Norway and Sproge churchyard, Sweden. (after Roesdahl and Wilson 1992: 94 and 95)

There is a limit to discussing the status of independent smiths in the Viking Age. As mentioned above, there is an issue with determining if any direct smithing occurred in Luistari, Kaupang, and Dublin, derived from the general lack of more permanent smithing fixtures and tools in association with a slag deposit and other manifestations of production activities (Feveile and Jensen 2000: 10). The general presence of tools, especially smithing tools such as tongs and hammers, in graves suggests that they were seen as a personal object, associated with the individual who used them. Considering the importance of the tools it is likely that they would not be forgotten or abandoned, even if damaged. An object which could be expected to have been found in relation to slag deposits, and proposed smithing sites is an anvil. Next to a hammer and a pair of tongs, the anvil is one of the most basic pieces of smithing equipment which an individual would need to make even the most basic iron object. It appears that anvils of the time were relatively small and portable, enough to be also seen as a piece of personal property.

A grave from Byglang in Telemark, Norway supports this. This tenth century grave was furnished with fifteen individual smithing related items, several of them were unfinished weapons (Roesdahl and Wilson 1992: 250). The tools within the grave included a large set of tongs, a pair of plate shears, three hammers of differing sizes and shapes, a chisel, and a rectangular anvil stone (see top of Fig. 8.14). There were also four swords, four spears, seven axes, two shield bosses, and thirteen arrowheads, all proposed to have been made by the smith buried in this grave. It appears that the smith which owned these tools was the master of many elaborate techniques (Roesdahl and Wilson 1992: 250). The presence of an anvil provides evidence for the general small, portable design of contemporary anvils and suggests that anvils were seen as personal possessions of the smith. This particular grave has been suggested to be the wealthiest smith grave from Norway. The swords, spearheads, and other weapons make it obvious that this individual was highly skilled, and potentially would have been under the employ of a local Jarl or petty King as an attached producer. This certainly insists that the smiths which mastered the most elaborate skills and were able to forge prestige management objects such as weapons were seen as prestigious themselves, as reflected in the large amount of potentially high value objects with which his grave was furnished.

Evidence from the wider Viking world appears to support the assertions that smiths were certainly valuable, important members of contemporary society. The status and importance of smiths appears to have been derived from their role as a producer and maintainer of either, high value prestige management goods, or highly important domestic objects. Furthermore, these trends appear to have been relatively widespread through out the societies of the Viking Age, such as those at Kaupang, Birka, or Hedeby (Fig 8.15) although the expression of smithing economies appears to have differed depending on the locality in question.

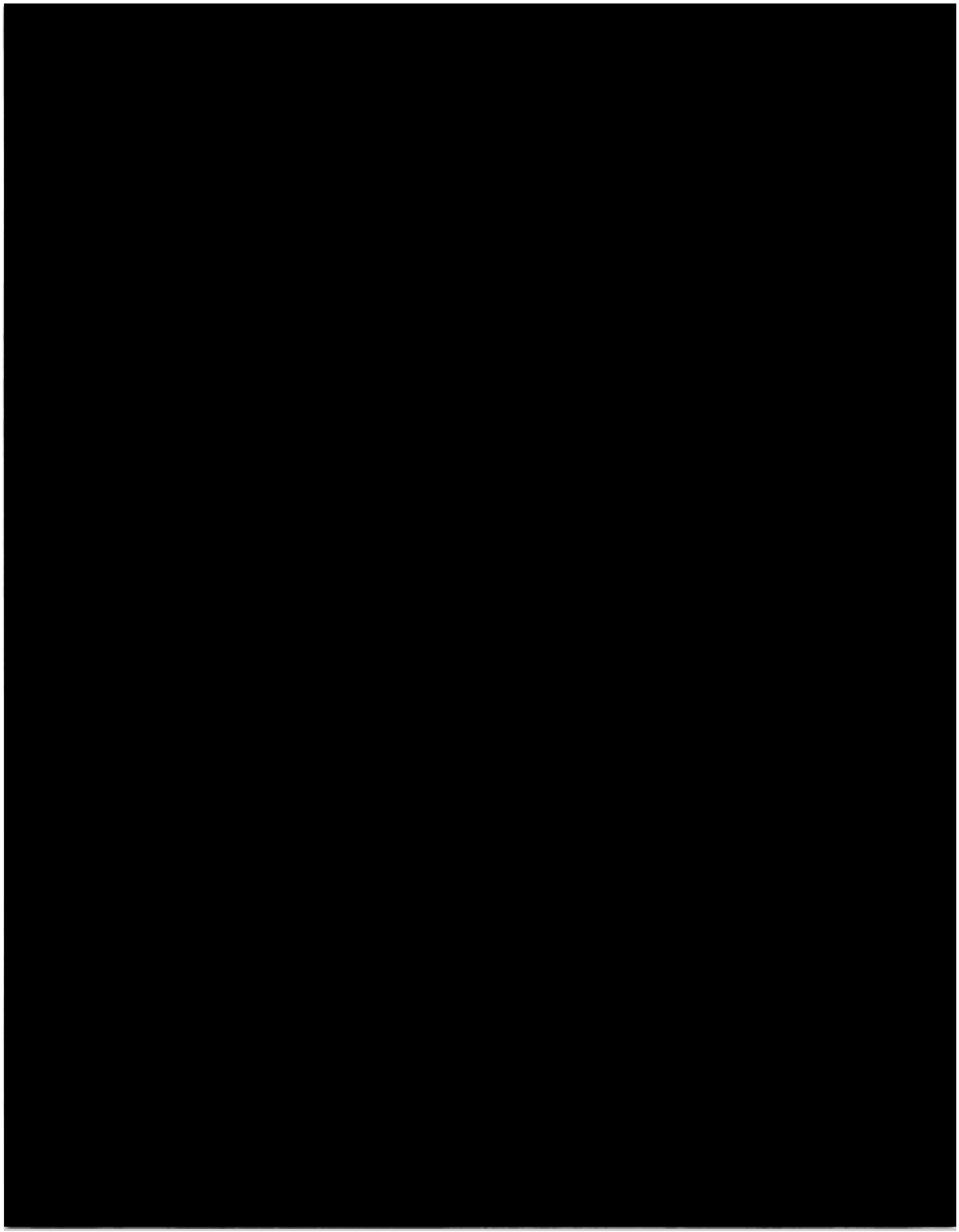


Fig 8.15 Map of major Viking Age sites in the coastal districts of the North and Baltic Seas including: Kaupang in Skiringsal, Haithabu/ Hedeby, Birka, and Luistari among others. (After Jankuhn 1982: Fig 19)

Conclusions

Having examined the data available from two major Viking Age sites and discussed them with respect to the wider Viking world the research questions formulated in Chapter 1 can be addressed. The first question: What is the apparent social role of smiths and other ironworkers in the Viking Age? Judging from the available evidence Viking Age ironworkers were valuable members of their local communities because they were the primary producer of iron objects which held use and esteem value, in both rural and urban contexts. This conclusion is alluded to in the literature which is either directly contemporary with, or derived from the Viking Age. Smiths which appear in almost any form of Scandinavian literature from the Early Medieval period forge objects which hold pseudo-magical properties or are simply of a high quality. Furthermore, the smith is often depicted as a pseudo-supernatural, or at the least, highly skilled individual as a result of the qualities of their products. The limited evidence of direct smithing suggests that, although similar techniques were employed by most smiths, there were differing degrees to which smiths practiced and produced objects.

This brings forward the second research question; How did the social role of smiths manifest in contemporary material culture? Artefacts from Viking Age sites such as Luistari and Kaupang suggest that this social role as producers of high quality objects and tools manifested in many different ways. The first of these is in evidence of the smithing techniques which can indicate design conventions, quality, and the technical processes. This is often easily seen through archaeo-metallurgical analyses. The swords and spearheads from Kaupang, Luistari, and well as Dublin, which show evidence of pattern-welding are an example of this practice. X-ray scans of these weapons clearly show that they were forged using the most sophisticated iron-working techniques of the age. However, this does not necessarily apply to all iron objects. Many are not studied using either radio-metric scans or other form of chemical analysis. However, the fact that Viking Age tools and nails were made using iron, and the context of their deposition could be manifestations of the smith's position within their respective communities.

The socialised function of high status weapons is visible in archaeological data in the consumption and depositional patterns of the objects and this is another manifestation of the smith's role in Viking Age societies (Smith 1999: 116). Evidence from case studies of Luistari and Kaupang supports this assertion. Weapons, especially spearheads and swords, which were symbolically "inscribed by the social processes of their creation" and use, were used to assert the esteem of their owner as grave goods (McCall 1999: 18). The status of these objects is supported by the association with other forms of prestige management, other high status objects, and specific contextual information. During the funerary activities in which these weapons were deposited within their respective graves they would have impacted the funeral guests, silently reminding them of the prestige and status of the weapon's owner (Hoskins 2006: 76, Fletcher 1989: 35).

The suggestion of artefact consumption and deposition in relation to associated value brings forward the third research question: What factors appear to have influenced the smith's role within society? Through technical knowledge and expertise, the smith was essentially in control of the use and ascribed value of any artefact which was produced through the the reciprocal social dimension of technologies in which the smith was an integral part (Lemonnier 1989: 157). The entire process, whether it resulted in a high status weapon or a farm tool, would have been dependent upon the expertise and knowledge of the smith, and the objects would have been marked with the "gestures and habits of their production" as expressed in the smith's techniques (McCall 1999: 54). Even those technical steps which seemed outlandish in relation to the process, influenced the perspective held by the wider population derived from reflections on techniques through "implicit or explicit classifications of materials [treated], of the processes brought into play, of the means and tools employed, and of the results obtained" (Lemonnier 1984: 156). In the case of iron, these ideas would have been represented in the qualities of smelted iron, the ritualised and technical processes which went into efficiently excavating, roasting, smelting, and forging objects, and the visual quality of the resulting weapons or iron objects. Furthermore, as iron passed through more sophisticated technical processes necessary to produce the highest quality weapons and the social relationships therein, it would have accumulated esteem value along with the use value from the artefact's quality (Gell 1992: 54).

High value objects, especially those with considerable esteem and symbolic value, would have been "part and parcel to the creation" and assertion of the esteem and influence of persons of renown through the attached symbolism and social interactions the object passed through (Tilley 2006: 63, Kassam and Megersa 1989: 28). The role of the weapons as prestige management objects would have been linked to the perspectives of the smith, and would have therefore enhanced the prestige of the smith who produced them (Tilley 2006: 68). Therefore, the technical expertise of a smith caused him to be an object of admiration, deference, imitation, and suggestion within their respective communities (Benoit-Smullyan 1944: 157).

This appears to have been true for smiths who produced prestige management objects for the social elite, and smiths who produced and maintained tools for their communities and peers. A local smith would have been vital for maintaining and repairing tools, as well as re-supplying other craftsmen. Archaeological evidence from Luistari, Kaupang, and Dublin suggests that in cases where smiths were producing iron objects on a small, household scale their social role and technologies were important within to the social relationships between themselves and other craftsmen, farmers, and technical agents, and expressed through the artefacts within those social relationships, even if they were not objects of high esteem value and maintenance (Dobres 2000: 127, Jørgensen 2002: 139, Neilen 2002: 179). These seemingly mundane objects would have been marked with the use value associated with the early technological processes, however they would have passed through considerably simpler production processes and would have not been attached with similar esteem value as weapons.

In cases when a particularly skilled smith capable of making high quality weapons and armour was taken into the retinue of an elite patron, their prestige was reciprocally enhanced by the association between a patron and the smith as a producer of high status objects. These objects could be used for prestige management and as prestige currency, enhancing the prestige of the social elites through the exchange of these high status objects (Smith 1999: 116). Prestige management objects would have been important for the objectification of self in these political exchange situations; they would have demonstrated the owner's esteem, power, and place within their respective social hierarchy (Clark 2007: 24). The smith, and previous ironworkers would have been integral to this social importance as the producers of these prestige and esteem maintenance objects (Barkow *et al* 1975: 555).

It can be concluded that the status and importance was invariably derived from their role as a producer and maintainer of iron objects which were important in various ways, as well as their vital role in the technical processes which affected every iron object produced in the Viking Age. The comparison between rural Luistari and urban Kaupang only suggests that the social role and status of the Viking Age smith was similarly realised across temporal, regional, and cultural boundaries. Further studies examining contemporary sites from other areas, such as Hedeby, and the region around Denmark and the Carolingian borders, in comparison to other case studies would be a means of establishing cross-cultural Viking Age trends. These would allow for comparison between Scandinavians and their contemporaries, and could further the discussion to a pan-european scale.

While this volume is not definitive, it provides a suitable methodology and vantage point for viewing the social structures within the lives of Viking Age peoples in new light. The carefully considered use of Scandinavian literature as starting point for identifying the attitudes and truth values widely held by the societies in which composed them is not commonly seen in academic works, with the exception of literature-centric works. The combination of material culture theories, ethno-archaeological studies, and current studies of Viking Age ironworking technologies in order to explain ascribed value forms and artefact consumption patterns represents a precedent for linking our understandings of those technologies with the Scandinavian cultures who produced them. Future studies can use the careful method of theoretical material evaluation, as well as the understanding of socialised Viking Age iron production technical systems to evaluate the societal contexts of archaeological iron objects. Furthermore, examination of Viking Age artefacts from different sites with similar archaeological material and measurable contextual variables with this theoretical framework can establish pan-Scandinavian cultural trends concerning ironworkers in their respective societies.

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