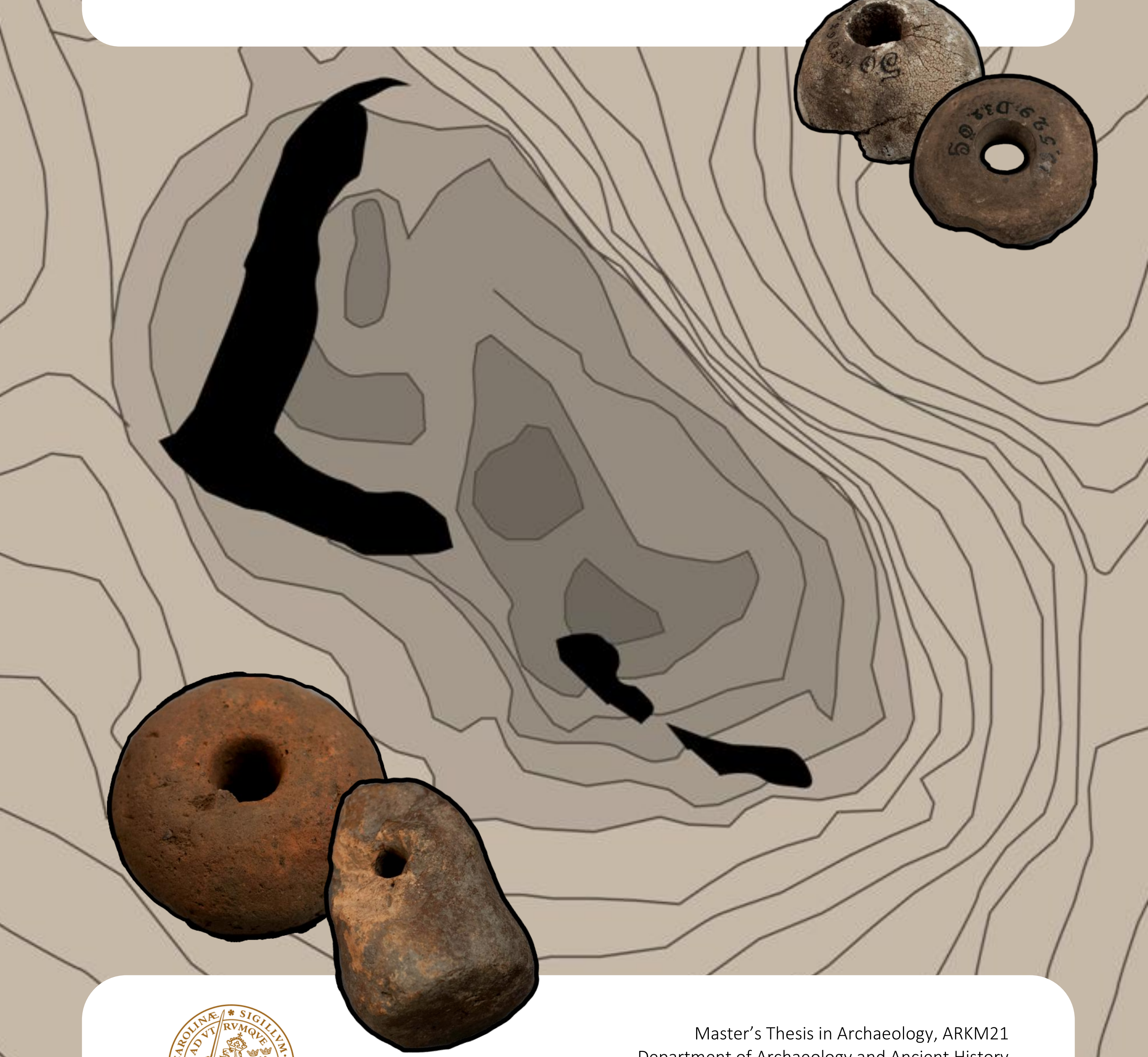
Elevated Crafts

Textile Production at Fortified Hilltop Settlements from the Migration Period



Master's Thesis in Archaeology, ARKM21
Department of Archaeology and Ancient History
Lund University
Spring 2016
Lisa Widegren Lundin
Supervisor: Fredrik Ekengren
Examiner: Deborah Olausson

Lund University

Lisa Widegren Lundin, 2016.

Elevated Crafts: Textile Production at Fortified Hilltop Settlements from the Migration Period
Master's Thesis in Archaeology. Department of Archaeology and Ancient History. Lund University, Sweden. Supervisor: Fredrik Ekengren. Examiner: Deborah Olausson.

Cover: Stylised drawing of Gullborg (based on a field drawing by Bror Schnittger August 1909, ATA) with a collage of finds from the sites discussed in the thesis. Drawing and photography by: Lisa Widegren Lundin.

Abstract

This study focuses on the textile implements, notably the loom weights and spindle whorls, found at fortified hilltop settlements - a specific type of hillfort in Sweden. The sites included in the study are Boberget (Östergötland), Gullborg (Östergötland), Darsgärde (Uppland) and Börsås kulle (Bohuslän). From quantitative analysis of the material, assessing the least possible production range, the study also discusses textile production and its social dimensions within the context of sites that deviate from the ordinary, primarily domestic, settlements during the Migration Period. It was possible for the sites to produce textiles of both simple and fine quality. The context of these sites as central places suggests a specialised textile craft which seems to be representative in nature.

Keywords

Iron Age, Roman Iron Age, Migration Period, Hillforts, Fortified Hilltop Settlements, Textile Production, Craft, Specialisation, Textile Implements, Spindle Whorls, Loom Weights, Central Places, Boberget, Börsås kulle, Darsgärde, and Gullborg.

Acknowledgement

I want to thank my supervisor Fredrik Ekengren who has been incredibly positive and interested throughout the writing process which has improved especially my initial approach to the study. Moreover, I want thank Lotta Fernstål at the Swedish History Museum for helping me access the material and for being very positive when approached with enquiries. I also want to thank Michael Olausson for letting me be part of the excavations at Runsa and for being helpful with his expertise regarding hillforts and for sharing documentation from Börsås kulle. Another thank you is aimed towards Eva Andersson Strand who took time to meet me and give me an introduction and offered support regarding the textile-related research and with the analysis of the material. I especially want to thank Laura and Stevie for helping me check the language of this thesis. Also I'd like to thank my fellow students of archaeology from both Lund and Stockholm, from all of my studies during and before this thesis, who has made the years of studies even more fun. I want to thank my mother Helena, and Stefan for letting me live with them during my year off before writing this thesis; otherwise I would not have been able to have the mental energy and motivation to go through with it. I also want to thank my grandmother Barbro for letting me live with her during the 2014-2015 excavations at Runsa borg and while researching for this study in Stockholm. Conclusively I also want to thank the staff at *Vitterhetsakademiens bibliotek*, *Antiquarian Topographical Archives* and *Lund University Library* for being helpful and patient in the search of documents and literature.

TABLE OF CONTENTS

LIST OF ABBREVIATIONS

ATA	–	Antikvarisk-topografiska arkivet (Antiquarian Topographical Archives)
CTR	–	The Danish National Research Foundation's Centre for Textile Research
FMIS	–	Fornminnesregistret (Register of Ancient Remains)
RAÄ	–	Riksantikvarieämbetet (National Heritage Board)
RAÄ 2:1	–	Registered remain, sequence of numbers within specified parish. Ex: Ed 2:1.
SAOB	–	Svenska Akademiens Ordbok (Dictionary published by the Swedish Academy)
SHMM	–	Statens Historiska Museer (National Historical Museums)

1 INTRODUCTION

The topic for this thesis concerns the textile production of the fortified hilltop settlements of Sweden. I will look at material from four sites: Boberget, Gullborg, Darsgärde, and Börsås kulle. My interest for hillforts was born at my first experience with field archaeology. I participated in the research excavations at Runsa borg in late spring 2011. The following semester I wrote my bachelor thesis which looks at the relationship between hillforts and sites with the place name Stenby, in which *sten-* is a reference to the hillforts (Widegren Lundin 2011). Since then I have participated in the excavations at Runsa borg in 2012, 2014 and 2015. For a course in 2014 I also did an access analysis investigating the relationship between private space and open spaces of the ringforts Eketorp and Ismantorp, something I hope to expand on in the future.

For a seemingly straightforward category of sites, the hillfort research tradition in Sweden is filled with complexity. One of the reasons for this is the difficulty of definition and finding terms that can both differentiate and relate between the sites. Also, although there are over 1000 sites, they are one of the least investigated categories of sites that exist in such high numbers. This is partly due to their removed locations, resulting in the fact that contract archaeology rarely has had to deal with them, and partly because excavating them is a substantial work effort that has put off researchers from starting new investigations at hillforts for some time. Now, interest in hillforts is renewed in Swedish archaeology.

The traditional interpretation of hillforts is that they're fortified places associated with chaotic times and violence, or elite settlements that have an impact on the lands surrounding them. When mentioning people associated to a hillfort it is often a chieftain or bands of warriors connected to the theme of conflict and war that gain visibility (Johansen & Petterson 1993: 29-32, Johansen 1997: 115-117, Carlsson 2005: 174-176, Andrén 2006: 37, Olausson 2011c: 243). I do not think that these aspects are necessarily wrong; they might be idealised and the themes of conflict and violence are part of the Iron Age mental landscape, but I do not believe those interpretations represent the hillforts as a whole. I contend that it is wise to hold a pluralistic perspective on the hillforts in order not to exclude views that otherwise might be overlooked with a traditional conflict-perspective. Åsa Wall introduced a new perspective in which she sees the hillforts, or henged mountains, of the early Iron Age as parts of a mythical geography relating to earlier hillforts of the Bronze Age (Wall 2003: 186). Hillforts are places are of special nature, being monumental in their construction and located on places quite difficult to reach. It would be interesting to see how this extraordinary quality reflects in activities performed on the sites. Textile production seems to be an important element at these sites since there are some type of textile related find category at almost all the sites that have produced finds (Olausson 2010: 7, 2014b: 188) and could provide a foundation for discussing organisation of production, status identity and crafts in general within the context of hillforts and provide an insight to the character and functions of these sites.

1.1 Aims and Research Questions

The aim of this thesis is to find out more about the character of textile production at the fortified hilltop settlements; how it works as a social function and how it manifests at the different sites. It will also deepen the understanding of the fortified hilltop settlements and add to the discipline of hillfort study.

I. Which type(s) of textiles could be produced with the material found at fortified hilltop settlements?
II. In which spaces within the fortified hilltop settlements can we locate the presence of items related to textile production – why there?
III. What role did textile production play in the function of the fortified hilltop settlements?

1.2 Hillfort Research in Sweden

In Sweden there are close to 1300 ancient remains classified as hillforts registered at FMIS[1]. Of these, few have been extensively excavated. They are most common around Lake Mälaren, Östergötland and northern Småland, on Gotland, Öland, and the west coast. Södermanland is the region with the densest presence of hillforts, with over 300 (Wall 2003: 19). The so-called classic period of hillfort building took place during the late Iron Age and the Migration Period and, as Åsa Wall writes, the structures built then are the ones usually referred to when discussing hillforts (Wall 2003: 187). However, the term hillfort encompasses a lot of other ancient structures from other periods and with arguably different functions. One way to put it is:

> "…the only shared feature of the category of sites casually referred to as 'hillfort' (Swe. *fornborg*) is that they are enclosed places. It means that in a, by humans defined, area a sort of physical remain is established, a construction that delimit the area inside from what's outside." (author's translation, from Olausson 1995: 8)

The earliest excavations of hillforts were at the beginning of the 20th century and a period during the 1920s and 1930s. These investigations were made mainly in Östergötland by Oscar Almgren and Bror Schnittger, and finished by Arthur Nordén. During the same period Ivar Schnell and Gunnar Ghil did similar investigations in Södermanland, Västmanland and Uppland. Some investigations were also made in Bohuslän, such as Gustaf Hallström's excavations at Börsås kulle (Fornvännen 1911: 289, Johansen & Petterson 1993: 23, Engström 1999: 242, Olausson 2014b: 193). Between the 1950s and 1970s Mårten Stenberger investigated the fort Eketorp, Björn Ambrosiani excavated at Darsgärde, and Peter Manneke at Havor on Gotland (Engström 1999: 242). Since then, there have been some investigations done all over the middle part of Sweden, but few extensive ones. Torsburgen on Gotland was interpreted in Johan Engströms dissertation. The hillforts of Norrland have been treated by Ove Hemmendorff. The western hillforts have been treated by Roger Nyquist

[1] As of 2016-02-09.

and the hillforts of Uppland have been investigated by Michael Olausson (Engström 1999: 242) who has been leading the current excavations at Runsa borg (Olausson 1995; 2002; 2010; 2011a+b; 2014a+b). On Öland Anders Andrén did new investigations at Ismantorp and recently Sandby Borg has been under investigations (using a "snapshot perspective") performed by Kalmar läns museum with Helena Victor as project leader (Museiarkeologi Sydost, Kalmar läns museum[2]).

Hildebrand dated the hillforts to the Iron Age since they were most commonly found in the Iron Age districts (Johansen & Petterson 1993: 23). The excavations in Östergötland mentioned above confirmed this for Östergötland based on finds that could be dated to 400-600 AD (Almgren 1906: 19-20, Nordén 1938: 337-338). The dating to the Migration period where recognised to apply to sites in Södermanland (based on one site), Öland and Bohuslän. The sites referred to as hillforts in Gotland (Herrgårdsklint and Havor) could be dated as earlier, around year 0. Until the excavations at Darsgärde during the 1960s, the hillforts in Uppland was assumed to be from the Viking Age and Early Medival Period (Ambrosiani 1964: 177-178). This dating came from the investigations of Borg at Birka and the dating of finds from Runsa borg by Oscar Almgren (Wall 2003: 28, Olausson 2011b: 35-36). The site Borg at Björkö, Birka, is Viking Age, but the similarity between the finds from Birka and the finds from Runsa, led Almgren to believe that Runsa was also Viking Age.

Since the 60's the dating on hillforts have been more varied and show that sites classified as hillforts can date from the Neolithic to the Medieval Period (Johansen & Petterson 1993: 24-29). Furthermore, the interpretations of hillforts and different classifications have increased partly in tandem with this; however, some early hillfort researchers tried to make distinctions between forts with defensive walls and forts without (see section on the term hillfort further down).

Early interpretations of hillforts were made by Hans Hildebrand during the 1800s. He thought of them as places of refuge and as part of a set defense system against enemies (Johansen & Petterson 1993: 23). This hypothesis was supported by more researchers (Johansen & Petterson 1993: 23; Nordén 1938: 267, 338-339) and was still common in the 1990s (Burenhult 1999: 246): information signs and plaques at hillfort sites often repeat these claims. Some have also raised the cult aspect of these places (Nordén 1938: 267, 339, Ambrosiani 1964: 178, Johansen & Petterson 1993: 23-24) or that some hillforts have been just settlements (Nordén 1938: 267). Ambrosiani wrote "All these interpretive attempts shows considerable want in the potential to unequivocally judge the function of the hillforts" (author's translation, Ambrosiani 1964: 176-177).

The interpretations and points of view of the Migration period hillforts are still varied. Birgitta Johansen has discussed them from a metaphorical point of view: that they are manifestations of the concept of Midgard and delimited places, and thus became the human place of order (Johansen 1997: 143-144, Carlsson 2005: 168). The concept of Midgard and Utgard, as a binary model used to understand the Iron Age society, has been problematised by Stefan Brink (2004). The association with the stone-enclosure communities by delimiting borders with stone is put forward by Kerstin Cassel as a mark of the period (Cassel 1998:

[2] Museiarkeologi Sydost, Kalmar läns museum. *Sandby Borg* [online]. Available at: http://www.sandbyborg.se/ [Accessed 2016-01-25]

150-154). Anders Carlsson argues a “border” mentality and ideology of procession/bands relating to Limes since that structure created a “mental image between centre and periphery or inside and outside” (author’s translation, Carlsson 2005: 169). Carlsson argues that this mental image became important for the people in parts of Scandinavia. Likewise, this interpretation or point of view relates the hillforts to the cosmology of the time (Carlsson 2005: 168f, 174; 2015: 141-163). Anders Andrén has also considered the cosmology of the time in his interpretations of Ismantorp and demonstrates how Roman camps and martial culture could have influenced how such a site was organised (Andrén 2006; 2014: 69-105). Damell and Lorin maintain a position that the hillforts were first and foremost established for political reasons mirroring the instability on the continent and shifting balance of power (Damell & Lorin 2010: 206) Most mainland hillforts are empty; some of them have remains of settlement visible. Michael Olausson has approached these mainly from a socio-political viewpoint reflecting that “few built remains mirrors the political and social development during the Iron Age as palpable as the hillforts and hilltop settlements of the Migration Period” (Olausson 2010: 5). Focusing on the hilltop settlements he writes that these are elite settlements with various specialised crafts, especially textile production, but also bronze casting. The different activities, which were specialised, augmented, and refined, have led to an interpretation of these sites as multifunctional (Olausson 2010: 5-8; 2016: 49).

1.2.1 The Term “Fornborg”

The umbrella-term *fornborg* (the English equivalent is “hillfort”) is used to describe a variety of ancient monuments, which is problematic for this field of study. The term *fornborg* was coined in 1881 in an article by Fredrik Nordin (Wall 2003: 21) *Fornborg* = “från forna tider stammande borg” (SAOB) which translates as “from ancient/past times originated fort” (author’s translation). *Borg* has the same etymological source as Swedish word *berg*, which refers to the geological features: *hill*, *rock* or *mountain*. The Old English word *burg/burh* shares the same etymology: proto-germanic *burgz* (“fortification”, “stronghold” or “[fortified] city”) and proto-indian-european *bʰerǵʰ-* ("to rise" or "high"/"lofty" or "hill"/"mountain"). Old Norse *borg* refers to "A city"/"town" (often fortified) or "A castle" or "Any fortified place" and also share the same etymology (Wiktionary[3], cf: SAOB, *Svensk etymologisk ordbok* by Olof Hellquist). *Borg* has also featured in women’s personal names such as *Torborg* and *Ingeborg* (Carlsson 2005). In Norway and in the western parts of Sweden they have used to word *bygdeborg* for hillforts.

In the Swedish National Encyclopedia *fornborg* is described as “…a term for a fortified facility, as a rule from the Iron Age, which might have had various functions” (author’s translation, Nationalencyklopedin[4]). In a publication by the National Heritage Board there are two definitions of hillforts: 1) “…a stone or/and earth wall, adapted to the terrain, next to

[3 a)] Wiktionary. *Berg* [online]. Available at https://en.wiktionary.org/wiki/berg [Accessed 2016-02-09]
[b)] Wiktionary. *bʰerǵʰ-* [online]. Available at https://en.wiktionary.org/wiki/Appendix:Proto-Indo-European/b%CA%B0er%C7%B5%CA%B0- [Accessed 2016-02-09]
[c)] Wiktionary. *Bergaz* [online]. Available at https://en.wiktionary.org/wiki/Appendix:Proto-Germanic/bergaz [Accessed 2016-02-09]

[4] Nationalencyklopedien. *Fornborg* [online]. http://www.ne.se/uppslagsverk/encyklopedi/l%C3%A5ng/fornborg [Accessed 2016-02-17]

natural enclosures in a crest position. They completely delimit the area" (author's translation); 2) "… a usually rounded or oval (ring wall) stone and/or earth wall, sometimes combined with moat, constructed on flat land, which completely delimit an area" (author's translation). The dating of this category of site is younger Bronze Age – Medieval Period (Johansen & Petterson 1993: 73).

When looking at the terminology that has been used; it becomes obvious that there is some overlapping with some terms. This is because the different terms have been invented as a consequence of the different aspects of the sites that have been in focus: function, morphology, topography and location, and relation to other sites or remains. Some of the terms cannot only describe a type of hillfort belonging to a certain period, but work for hillforts that has been dated to different periods. Engström has written a summary on the past classifications of different hillforts in Sweden, Norway, Denmark (Bornholm) and Finland (Engström 1984: 85-92). The perspectives have been mainly focused on the function and topography.

Previously the hillforts were just called *borgar* (Eng. "Forts") and were not supposed to be confused with the medieval forts with towers also called *borgar*. Also *bergskansar* (Eng. "mountain ramparts") and *borgberg* (Eng. "fort mountains") could be used (Almgren 1904: 15-18, Almgren 1906). *Borgberg* and *bergskansar* relate to the location of the sites. Only using *borg* however, is problematic and I find it safe to assume that a desire for distinction from medieval forts led to developing new terms.

Some general terms that include several types of hillforts are the so called *låglandsborgar* or *flatmarksborgar* (Eng. "low land forts" and "flatland forts") and *höjdborgar/klintborgar* (Eng. "height-, cliff- or hilltop forts"). These are used mainly to denote the topographic location of the hillfort. In the case of *låglandsborgar* the sites usually referred to include the ringforts of Öland and Gotland and the *trelleborgar* of southern Scandinavia (see below) (Engström 1999: 242). Björn Ambrosiani uses the term *farledsborg* (Eng. "waterway fort") to attribute some hillforts a distinction based on their location on islands and capes by waterways. Those hillforts are a bit more removed from the local settlements (Ambrosiani 1964: 180). Although the term *farledsborg* relates to the location by the waterways, Ambrosiani still notes the functional aspect of the hillfort having that location: strategic placement (Ambrosiani 1964: 176).

The majority of hillforts are denoted based on their perceived function; this is what has given the research tradition its direction during the past century. The use of terms like *fortifikationsanläggningar* (Eng. "fortification sites"), *tillflyktsborgar* (Eng. "refugee forts"), with some variations, is common in older hillfort literature (Engström 1984: 85). The *tillflyktsborgar* are located in the woodlands on a distance from the local settlements (Ambrosiani 1964: 180). These functions are the traditional interpretation of the hillforts. Previously I mentioned that Nordén put forward the idea that some hillforts could be *kultborgar* (Eng. "cult forts"), partly because he valued the enclosing structures of the sites to be without a defence function and partly because he noticed their placement in cult surroundings. Some names on hillforts also have cult/religious denotation, such as Onssten, Torsklint and Visten (Nordén 1938, Johansen & Petterson 1993: 23).

Attempts to break free of, but not to erase, the term *fornborg* have been made. The use of the word "hägnad" (Eng. "henge" or "enclosure") by Olausson in his dissertation is meant to be an umbrella term which includes any structure, which have the function of delimiting an area in common, creating a "space" (and is therefore applicable on more than just hillforts) (Olausson 1995: 41). Wall combined the word with "berg" to form the term *hägnade berg* (Eng. "henged/enclosed mountains") in order to have the term as an analytical tool, after deconstructing the term *fornborg*. The reason is to relate the sites to their spatial contexts and not limit them to their functions (Wall 2003: 46, 191).

This idea of defining a term based on the morphological aspects of a site is also shared by the *vallanläggningar*. The *vallanläggningar* (Eng. "ramparts") is defined as "a stone and/or earth bank/wall and/or palisade, in some cases combined with moat, which wholly or partially delimits an area. The enclosure (alt. rampart) cannot physically have limited/controlled the access to this area" (author's translation, Johansen & Petterson 1993: 80). These sites have dates from the Neolithic period up to the Iron Age (Johansen & Petterson 1993: 80-85). These *vallanläggningar*, form one such category of sites that has received some "liberation" from the *fornborg* category and can be registered as something else. It is a relatively new category of ancient remains, added in the late 1980s; some *vallanläggningar* might not yet have been reviewed and are still registered as *fornborg* in FMIS (Johansen & Petterson 1993: 80). There are currently 123 registered *vallanläggningar* in FMIS (as of April 2016).

The *gravhägnader* (Eng. "grave enclosures") differ from hillforts in the same way that *vallanläggningar* do; they do not have to completely delimit an area (Wall 2003: 22). They exist in the same type of Bronze Age and Early Iron Age surroundings as do most of the *vallanläggningar*. The only difference between the two categories is that the *gravhägnader* contains burials where the *vallanläggningar* do not. When burials are found within *fornborgar*, they are registered as burials and share the same RAÄ numbers as the *fornborg*, but in the case of *gravhägnader*, they are recognised as a separate category instead of being registered as graves within a *vallanläggning* (Johansen & Petterson 1993: 73, 80-81).

Some terminology has arisen that refer to the relation that the hillforts have with other sites. A first example of this is the *parborgar* or *tvillingborgar* (Eng. "coupled forts" and "twin forts"). They refer to two *fornborgar* or *vallanläggningar* that are placed next to each other on separate hilltops. The *parborgar* are located in the same contexts but one has strong walls (*fornborg)* and one has weaker walls (*vallanläggning*). Åsa Wall points out that these are two are often ascribed different functions and that they have been constructed in different points in time (Wall 2003: 24-27) but prove a good example of the difficulty that is present within the research tradition of hillforts.

1.2.2 Chronology of Hillfort Categories and Enclosures

A type of *vallanläggningar* has been noted in Scania and Denmark. These so-called s*arupanläggningar* are named after the first excavated site of its kind. They belong to various parts of the Neolithic period (Johansen & Petterson 1993: 28, 82). They are clearly something entirely different from the "regular" hillforts and also different from the Bronze Age *vallanläggningar* mentioned below. However, they are noteworthy because they show how the classification of *fornborgar* and *vallanläggningar* terms does not really represent the actual ancient remains that are present in Sweden.

From the Bronze Age and Early Iron Age there are both *vallanläggningar* and *fornborgar*, which have been described as *kultiska borgar* (Eng. "cult forts"), mainly these are *vallanläggningar*. Noteworthy examples from Uppland are Predikstolen and Odensala Prästgård. Note that this is not a homogeneous category of sites (Olausson 1995: 236-240).

Some of the ringforts of Gotland have been dated to the late Bronze Age and Early Iron Age period (Johansen & Petterson 1993: 28). Havor ringfort is an example of these. The site seems to have been used continuously into the Migration Period (Nylén et. al. 2005: 133, 138). Carlsson includes this group to be forts of "Havor type" (Carlsson 2015).

Ringborgar (Eng. "ring forts") of the Roman Iron Age and Migration Period are located at Öland and Gotland. One of the most prominent sites that are known and have been completely investigated is Eketorp which had two construction phases and use during the late Roman Iron Age and the Migration Period. It was left unattended until a third phase of construction and settlement in the medieval period (Engström 1999: 244-245, Burenhult 1999: 246-249). Others worth mentioning are Ismantorp (Andrén 2006) and Sandby Borg. It is during the late Roman Iron Age and the Migration Period that the "regular" *fornborgar* have their heyday, the ones usually referred to when mentioning hillforts in a Swedish perspective. They are built with strong walls on hilltops and are generally empty. There have been traces of minor activities and in some cases there are burials within (for example, the hillfort on Tosterön, Aspö parish, RAÄ 140:1).

For the category of sites relevant to this thesis, dated to the periods of the regular, empty hillforts, there have been some attempts to form usable terms. The term *boplatsborg* (Eng. "settlement fort") used early on is quite general and includes more than sites with remains of buildings. Hillforts with minor cultural layers and hillforts with a settlement that are located just by, but not within, the hillfort are also classified as *boplatsborg* (Olausson 2011a: 22). The term *befäst gård*[5] (Eng. "fortified farm/settlement") is used by Ambrosiani to describe Darsgärde (Ambrosiani 1964: 176). Olausson builds on to this when writing similar sites with hall-buildings: *befäst stormannagård* (Eng. "fortified chieftain farm/settlement", Olausson 1996; 2011a: 22-23). To get away from the implications of using the word *gård*, which is not inclusive of the variety of sites, Olausson uses the term *befäst höjdbosättning* (Eng. "fortified hilltop settlement") or simply *höjdbosättning* (Eng. "hilltop settlement"). The Swedish terms can be compared with the German "Höhensiedlung", "Höhensitz" and "Höhenstation", and the English "Hilltop Settlement" or "Hill-Sites" (Olausson 2011a: 20-23).

The hillfort at Birka, Borg, is contemporary with the Viking Age settlements there. The interpretation of the function of the hillforts might have been inspired from historical sources about Ansgar that the settlers of Birka fled into the hillfort (Johansen & Petterson 1993: 18). The *Trelleborgar* are Viking Age circular forts with internal constructions divided in quarters, named after the town Trelleborg, and they are located in Scania (Johansen & Petterson 1993: 75) and Denmark. They have been interpreted to relate to the king Harald Bluetooth (Burenhult 1999: 353-355). The third phase of Eketorp was constructed in the late Viking Age and has been used during the medieval period (see *Ringborgar* above). The term

[5] For a variant meaning and use of the word *gård*, which relates to the cosmology of the Iron Age, see Carlsson 2005: 169-170

höjdborg have also been used to refer to medieval forts located on hilltops (Johansen & Petterson 1993: 53, 121). These are not hillforts.

1.3 Fortified Hilltop Settlements

In this thesis I will use the term *fortified hilltop settlement*[6] to describe the sites researched, adding the term "fortified" to the established term "hilltop settlement" (Olausson 2011: 19-21). The term therefore refers to the morphological features at the sites: the fact that they have some kind of stone barrier as part of the construction. I do not infer any interpretation of the functions of these barriers. I wanted to include "fortified" because leaving it out would suggest a settlement on a hilltop with no additional structures. The effort of building barriers, or walls, around [a part of] a site should not be ignored. The term "enclosed" is not used because I do not wish to depart too much from the already established Swedish vocabulary (see below). By using the term "hilltop" instead of "hillfort" the wording also gives an indication of the topological location of the sites. By using the word "settlement" there is a distinction from contemporary, empty hillforts. The Swedish equivalent is *befäst höjdbosättning* used by Olausson (2011: 23). Current research is problematizing the view of these sites as settlements based on questions regarding permanent or temporary residence, and if the terraces are for buildings or not (Olausson 2016: 48). In case that I have made clear which fortified hilltop settlement I am writing about; I will use the term *hillfort* for short.

My definition of the *fortified hilltop settlements* is thus: hillforts originating during what is generally considered the classic hillfort period, most intensely during 400-500 AD, with internal remains of buildings, terraces and/or substantial cultural layers. They can be compared with other hilltop sites in Europe from the same period, which might have provided some cultural influence, which manifested in Bornholm, Norway and central Sweden. The fortified hilltop settlement Runsa shows a connection to the Roman cultural sphere, suggesting that the site had control over a distribution of Roman imports (Olausson 2010: 5). These types of hillfort are clearly not isolated manifestations, even though they appear during a relative short period of time. The different sites studied in this thesis are mostly from the earlier phase of fortified hillfort settlements. Boberget, Gullborg and Börsås can be dated to the 400s and Darsgärde to the end of the 400s and early 500s. Other sites of this type also have continuation into the early Vendel Period, like Runsa borg (Olausson 2016: 51). In my attempt to make a list of fortified hilltop settlements, based on the publications by Michael Olausson, I have counted there to be around 30 known sites (cf. Olausson 2010; 2011a; 2014b). Unsurprisingly, most of these types of hillforts are located in Södermanland (the most hillfort dense region in Sweden): around a third of the sites. Around a third is also found in Östergötland. Uppland and Bohuslän contain a smaller number of the fortified hilltop settlements. There are singular examples of these sites in Västmanland (Skoftesta, Köping 79:1), Närke (Tarsta Borg, Sköllersta 27:1), Värmland (Villkorsberget, Ölserud 34:1) and Jämtland (Mjälleborgen, Frösö 81:1).[7]

[6] The term used by me is not the most optimal term used for this group of sites. The hillfort discourse have a further need to develop usable terms which do not "lock" the sites to a specific set of functions. This will be achieved by gaining a deeper understanding of the sites by more research and discussion between researchers.

[7] See map of distribution of the fortified hilltop settlements in Olausson 2011a, page 20. For a comparison with the distribution of hillforts, see Fig. 42 in Johansen & Petterson 1993, page 74.

Olausson has put forward three important aspects of these sites that one has to take into consideration when understanding them (2011a: 18-25) in the Swedish perspective:

- The dominating position in which the sites are located with an overlook of the surrounding landscape, most often close to water ways.
- The variation between the placement of the fortified hilltop settlements in relation to an agrarian hinterland and a presence of burial sites (some is removed from an agrarian hinterland and some lacks burial sites).
- The architecture or morphology of the sites: their area/size, remains of buildings, extensiveness of other internal remains and the volumetric measure of the walls/fortifications.

A general observation is that the sites should be considered "individuals" (Olausson 2014b: 170), but need to be related to the other hillforts on a regional and national level (Olausson 2011a: 19). For the discourse as a whole, comparisons should also be made to hillforts on an international level since there are several present in central Europe. More closely there are hillforts (not necessarily with remains of settlements) in Norway, Åland and Bornholm. The ring forts of Gotland and Öland which dates to the Migration period are also useful to compare with. No comparisons with these sites have been done within the frames of this study.

1.4 Textile and Craft Research

Within the field of textile research, a lot of focus has been on the textiles themselves (see Franzén et. al. 2012). The tools used in textile production have been studied, mainly for the sake understanding the textiles, rather than the tools themselves or the contexts which surround the production (Andersson 2003: 13-14). Textile production is rarely seen as a craft in the same way as iron working (Andersson 2004: 195) but recent studies have not excluded textile production in the same extent. In a study of craft-tradition, Ulla Isabel Zagal-Mach Wolfe uses the textile production of sail cloth as a case study (2013). Some focus has also been on the division of labour and the assumption that textile production is a symbol of the female sphere (Andersson 1999: 10). The research on Swedish prehistoric textiles started at the end of the 19th century with the excavations at the Viking Age site Birka; since the site has brought forth both finds of textiles and the tools to make textiles (Franzén et al. 2012: 353).

1.4.1 The Textile History of Northern Europe

Based on finds of mainly textiles but also tools in Northern Europe Lise Bender Jørgensen (1992) wrote a dissertation in which the general history of textile production leading towards the Viking age is presented. The focus was on which types of weaves were produced. The oldest textiles found were made by vegetable fibres during the Neolithic period 7th Millennium BC in the Near East. During the 4th Millennium BC, evidence of woollen textile is found, at the Nahal Mishmar caves. When entering the Bronze Age there are finds of wool textiles in Scandinavia. In central Europe, flax was used in textile production at this point. The production of linen textiles was associated with the warp-weighted loom and this technology was not imported into Scandinavia until circa 200 AD. The hypothesis is that until then a tubular loom and whorl-less spindles, which do not leave many traces due to organic materials, were the preferred tools for textile production. When the warp-weighted loom was introduced in Scandinavia the quality of wool textiles improves. Wool was the main material to be used until the Vendel period (550 AD onwards) when linen can be seen in the find material (Bender Jørgensen 1992: 114-152). Bender Jørgensen (1992) described weaves in pre-historic Northern Europe in more detail; however, it is beyond the scope of this thesis to examine these details.

During the Roman Iron Age, as the building tradition was changing in Sweden: pit houses started to appear at settlements mostly interpreted as workshops with various functions. It is during this period that finds of loom weights and spindle whorls became more common. Later in the Viking Age the number of these types of finds would be much higher. At the start of the Migration Period, centralised places became more common. These places dealt with crafts. Uppåkra is an example of this. Strontium isotopic tracing analysis show that wool and other raw materials had been part of exchange networks during this period, which makes it interesting to view the textile production within the context of centralised places (Franzén et. al. 2012: 352-353), of which the fortified hilltop settlements likely is a part.

The description of textile production as women's work is prevalent in the bulk of Iron Age research. A view of gendered division of labour, with regard to one of the fortified hilltop settlements, Baldersborg, is demonstrated by Hermelin in a 1929 issue of *Fornvännen*:

> "Of the finds and remaining circumstances it seems to appear that Baldersborg constitute a refuge site for a part of the district's population for a longer period of time, however with quite substantial intervals. Those who searched for protection within the walls had access to farming equipment and livestock of many varieties. They have not performed hunting or fishing during the stay there. The inventory, which has been left behind, suggests more of a female oriented (e.g. the loom weights) rather than a male settlement. There were no warrior's equipment." (author's translation, Hermelin 1929: 97.)

The idea of a gender division exist partly due to historical sources and sagas. The connection between spinning and weaving as related to the female sphere, and magic acts, is also present within mythology and legends in various parts of Europe. Many European cultural traditions often view weaving as a sacred activity (Davidson 1998: 94, Miszk 2012: 123-124, Nosch 2014: 95-96). For Northern European contexts, there are also mentions of women spinning and weaving in different sagas. Often the activity is related to foretelling and shaping destiny (Davidson 1998: 101, 117-119, Heide 2006: 164-168, Aspeborg 2008: 112).

Elisabeth Arwill-Nordbladh suggest that there might be differences within the female gender-construction in regards to the different processes involved in the production of textiles during the Viking Age (1998: 205). One example is making the use of landscape as a part of gender dynamics, the landscape was used to procure the material used. Also, she points out the mobility of the spinning thread activity. It could be done while watching cattle since the spindle was easy to carry around. Spindles are common in graves and are seen as a female attribute representing the female gender. Arwill-Nordbladh summarises her reasoning by stating that the textile sphere could be both dividing and uniting in the constitution of female gender of the period (Arwill-Nordblad 1998: 206). As mentioned above, in textile research there has been a lot of focus on the textiles themselves and a labour division. However, the production process has gained more attention, especially through the employment of experimental archaeology to test the functions of tools such as loom weights and spindle whorls.

1.4.2 EXPERIMENTAL ARCHAEOLOGY

The experimental archaeology branch of textile research has gained ground over the last decades, with a foundation in ethnographic studies (see Hoffman 1964) since the prehistoric techniques are in some locations still in use with the same processes and the functions of the tools. Some critiques have been put forward suggesting that the ethnographic sources do not represent the ancient contexts. Within experimental archaeology there is also an element of experience-based learning in order to gain a deeper understanding of the artefacts and aspects studied. A definition of experimental archaeology is to test the function and efficiency of objects, in the case of textiles, the tools used to create textiles. Eva Andersson argues that this is what can create a link between the tools and the textiles we find (Andersson 2010: 1-2).

The Danish National Research Foundation's Centre for Textile Research (from here on abbreviated CTR) has, within the project *Textiles and Tools – Texts and Contexts Research Programme*[8], performed experiments in order to develop methods to ascertain tool function, qualities, limitations and the amount of time consumed during the production stages. This has been done together with skilled craftspeople. The results can give insights into the variation in production of yarn and fabrics at any given site (CTR[9], Andersson 2010).

1.5 TEXTILE PRODUCTION – THEORY AND METHOD

Traditional textile production, like the one we see in Iron Age Scandinavia, is a complex process. Not only are skilled craftspeople required, but there are a lot of different resources and tools that form the basis of the outcome of the production's different stages. For the raw material, one needs areas of cultivation (something that has been studied by landscape archaeologists in Central Europe). Moreover, other spaces are required: A place for the loom, for the processing of the materials and the storage of materials and tools. Trade is also a prerequisite to some extent for the production. One example of this is that dyestuffs might need to be imported (Belanová Štolcová & Grömer 2010: 9).

Karina Grömer has made a chart of the workflow, or *chaîne opératoire*, of textile production (see Fig. 1), which gives an indication of the extensive work that comes with the production of textiles. Roughly, any textile production starts with the material that will be used for the textile and for the tools. The raw material thought to have been used in

[8] The Danish National Research Foundation's Centre for Textile Research. University of Copenhagen. *Tools and Textiles – Texts and Contexts (TTTC).* Available at http://ctr.hum.ku.dk/tools/ [Accessed 2016-05-05]

[9] Reports from the experiments available at http://ctr.hum.ku.dk/tools/exreports/ [accessed 2016-02-12].

Scandinavia during the Roman Iron Age and Migration Period is mainly wool (Bender Jørgensen 1992: 120ff) but plant fibres from flax, hemp, and nettles should not be excluded as possibly occurring (Geijer 1972: 11-20). The wool can be divided into two groups: undercoat and guard hair. The undercoat is fine, soft and quite frizzy. The guard hair is longer, straight and glossy. The different qualities of the wool fibres affect the property of the threads and textiles (Geijer 1972: 12-13). The processes of producing flax are extensive and while we can be quite sure that flax was not used on big scale in Scandinavia, there are some indications that flax could have been used during the Iron Age (Geijer 1972: 18) such as the introduction of the warp-weighted loom, a technology associated with plant fibre textiles according to Bender Jørgensen (1992). However, it might be the properties of the seeds that were of more interest (Geijer 1972: 18) than the use for textile. For spinning the threads, a spindle was used. Prehistoric spindles usually consist of a spindle whorl attached at the top of or the bottom of a rod. The whorls are the part found archaeologically since the rod usually is made from an organic material. The whorl can be made of stone, clay or anything that is heavier than the rod (Geijer 1972: 26).

The loom weights are the main finds associated with the weaving of textiles on warp-weighted looms. The weights are attached to the warp threads (vertical threads) and since everything else is made of organic material we rarely find this. This type of loom has been used in Scandinavia until the 1900s (for more on this, read M. Hoffman 1964) and are depicted elsewhere (example of image of Greek vase from ca 550 BC in: Geijer 1972: 12-13), so there is no mystery in how the looms have been constructed. The weft (horizontal threads of the weave) is beaten upwards with a sword beater in the shed (Geijer 1972: 43-44). Other types of looms have most likely been used as well since the need for textiles is constant, regardless of the scarcity of loom-weights found from this period. I will not describe the different types of weaving techniques and types of weave in more detail. There is plenty of literature to read on this. I have read Geijer 1972 and Bender Jørgensen 1992 for the general history of textiles and the archaeological finds of textiles from northern Europe. For a more complete description of the stages of textile production, weaves and techniques used; read Wild (2003), Gleba & Mannering (2012) and Andersson (2015). I will expand on the different stages, where it is relevant, for the analysis and discussion ahead.

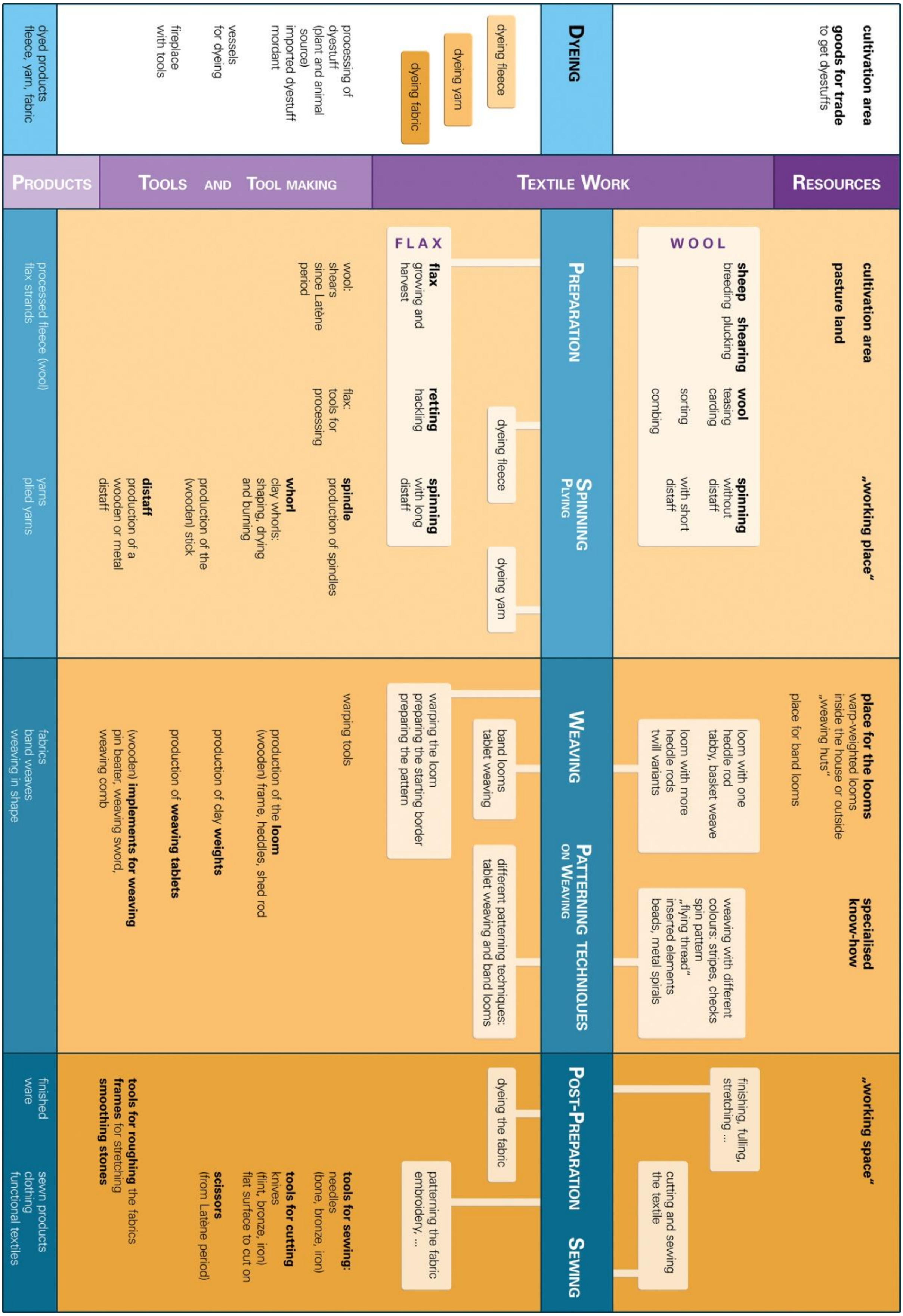


Fig. 1: Chaîne Opératoire of Textile Production. From Grömer 2016, p.38-39, Fig. 15.

For this study I have looked at the some of the materials that are left to us from the processes described above: the loom weights and spindle whorls. There are other possible tools that are involved in the textile production process such as: needles of bone or iron (for sewing), wool combs (for preparation of wool), scissors (for cutting wool and threads), tablets (for tablet weaving), smoothing stones and smoothing boards (for post-preparation), spindle rods (for the spinning), reels (to stretch threads on after spinning), sword beaters (for weaving) and parts of the loom itself. Loom weights and spindle whorls are two objects that with absolute certainty are connected with textile production, whereas for most other potential objects it is uncertain whether they have been used within the textile production or for other purposes. Things like needle-like objects, which can be used to untangle thread, have other uses as well. However, none of the other clearly textile-related objects other than loom weights or spindle whorls have been found at the sites I have studied.

1.5.1 Spindle Whorls

The spindle whorl is part of the spindle. The spindle consists of a rod with an attached whorl, placed on top or bottom. Sometimes the spindle also has a hook. It is the whorl that provides weight and tension when using the spindle. The function of the spindle is to spin fibres into thread. The rod was most often made of wood or bone, perishable materials, which is the reason why the whorls are the part most often found in archaeological contexts. The whorls are mostly made out of fired clay but there is the possibility to use bone, wood or stone as well. The parameters which affect the spinning is: the speed with which the spindle rotates (depends on the ratio of diameter and height or whorl) and the weight. For fine, thin threads, a lighter whorl has to be used and when using a heavier whorl the thread will be more coarse because it needs more fibre to hold against the weight (Gleba & Mannering 2012: 9-10).

The weight of the whorl is the most important factor in affecting the outcome of the thread. Another important factor is the material used for spinning. Experiments performed by Eva Andersson and Anne Batzner at Historical-Archaeological Experimental Centre at Lejre show that the composition of the wool fibres used affects how much material gets wasted. About twice the amount of waste was generated when using only the under coat in comparison to a mixed composition (Andersson & Batzner 1999: 24). The study also showed that a difference of 5–10 grams in the weight of the spindle affects the fineness of the thread; that spinning is time consuming; experience and knowledge is necessary; and the aforementioned aspect that that spindles of different weights have their own limits in how wide range of thread they can produce. A light spindle of 7–16 grams cannot produce a thick thread (Andersson & Batzner 1999: 24-25).

When using a lighter whorl, a short rod less than 15 cm can be used together with it. For a whorl weighing 5 grams it is necessary to use a short rod in order to achieve balance (Andersson 2003: 26). For the whorls that have holes of the same diameter and that weigh more than 5 grams they could all be used with the same rod.

Spindle-whorl/ weight	Spindle	Wool-type	m/10g + waste	Threads/cm
5g	S	1C	201,5	~ 32.5-37.5 trd/cm
5g	S	2C	179	~ 27.5-32.5 trd/cm
10g	L	1C	168,5	~ 25-30 trd/cm
10g	L	2C	101	~ 22.5-27.5 trd/cm
20g	L	1C	123	~ 17.5-22.5 trd/cm
20g	L	2C	59,5	~ 17.5-22.5 trd/cm
30g	L	1C	71	~ 10-15 trd/cm
30g	L	2C	39	~ 7.5-12.5 trd/cm
5g	S	1M	140	~ 30-35 trd/cm
5g	S	2M	117	~ 25-30 trd/cm
10g	L	1M	123	~ 22.5-27.5 trd/cm
10g	L	2M	92	~ 20-25 trd/cm
20g	L	1M	108	~ 15-20 trd/cm
20g	L	2M	52	~ 15-20 trd/cm
30g	L	1M	60,5	~7.5-12.5 trd/cm
30g	L	2M	39	~ 5-10 trd/cm
10g	L	1U	53	~ 10-15 trd/cm
10g	L	2U	52	~ 12.5-17 trd/cm
20g	L	1U	41,5	~ 5-10 trd/cm
20g	L	2U	39	~ 10-15 trd/cm
30g	L	1U	30	~ 5-10 trd/cm
30g	L	2U	26	~ 2.5- 7.5 trd/cm
S= short spindle (~13 cm, 2,5 g); L = long spindle (~25cm, 5-6g); Wool type 1 = wool of fibre quality 1; Wool type 2 = wool of fibre quality 2; C = combed wool; M = mixed wool; U = under coat				

Tab. 1: The results of the spinning experiments in terms of suitability for 12/12 threads per cm in a 2/2 twill. After Andersson and Betzner 1999, p.24, Tab.4.

1.5.2 Loom Weights

In short, the function of a loom weight is to weigh down the warp threads on a loom. When found in situ, the loom weights are lying down together in a row. However, the weights are often found in other contexts and their function of only being used for weaving can be questioned (Gleba & Mannering 2012: 15). Also, the identification of a loom weight can be difficult in these cases. There are occasions where it is questionable if a loom weight should instead be interpreted as blast nozzles or weights for fishing nets (Almgren 1907: 35, Nordén 1929: 74-79, Gustafsson 2009: 257). The majority of loom weights are made of clay, unfired and fired (the fired ones are more easily preserved) but stones can also be used (Shaffrey 2012: 252-255). The actual attachment of the warp threads to the weights is debated, whether they were tied to the weights themselves or not. One set of loom weights should be around 6–30 pieces. Weight and thickness are the parameters that influence the outcome of the weave the most (Gleba & Mannering 2012: 15-16).

When a warp weighted loom is set-up, there are some parameters that affect each other and the produced fabric: the threads used and the weight and thickness of the loom weights. A thin thread requires less warp tension than a thicker thread (Andersson 2015: 53). The weight of the loom weight determines how many threads that can be attached to it. The thickness (or shape) of the loom weight impacts how densely woven a fabric might be. All of these parameters work together.

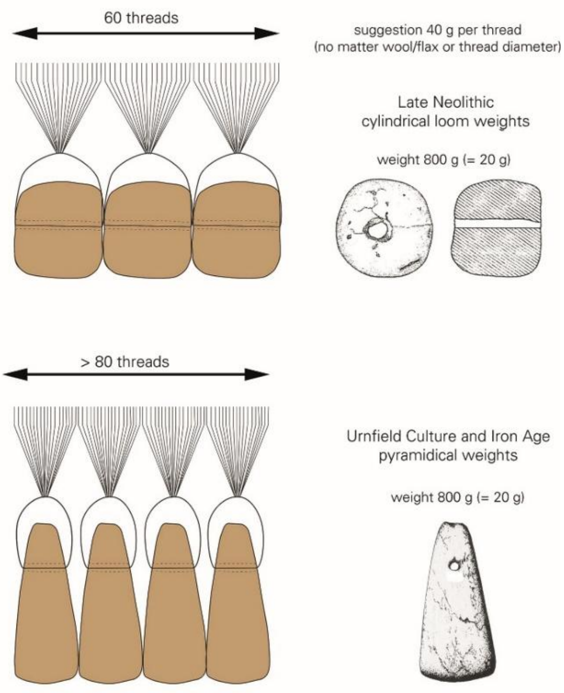


Fig. 2: Comparison between the thread spacing of a fabric produced with loom weights of two different types. From Grömer 2016, p.113, Fig. 61.

As mentioned earlier, the optimal number of threads per weight is 5–30 (Andersson et. al. 2009: 392). A theoretical example to illustrate how weight ties in to this; if a thread that requires a 40g warp tension per thread is used for a weave, using a 100g loom weight, only 2-3 threads could be attached to the weight, which is not optimal. Instead, if using 800g loom weights, 20 threads could be attached to each weight, which would make the set-up better. If taking the thickness of the weights into consideration as well, this will create different thread counts per centimetre in the weaves (see Fig. 2).

In two set-ups using loom weights (of the same weight) of different thickness, with the same number of threads that requires the same tension, the resulting weaves will look completely different. If the threads are distributed at the top of the loom so that they hang completely vertically straight (matching the width of the set of weights), the set-up with thicker weights will produce a wider fabric than the weave produced using thinner weights, but the warp thread count per centimetre will be lower. If the thread set-up on the top of the loom does not match the width of the loom weights, this will result in a uneven weave where the warp threads are directed outwards if using thicker weights and inward if using thin weights (Andersson Strand et. al. 2009, Andersson Strand et. al. 2015: 91).

Two of the main weaving techniques are tabby and twill; a third one is satin (Geijer 1972: 57-58), which is not relevant within this study. A regular tabby is most efficiently weaved by setting up the warp weighted loom with two rows of loom weights (Andersson Strand et.al 2009: 377). A tabby is easily recognised by its criss-cross pattern. Each thread is traced under one thread and then above one thread and so on. Twill has more variations than the tabby. A 2/1 twill (the weft goes over two warp threads and then under one) is made by using three rows of loom weights. A 2/2 twill (the weft goes over two warp threads and then under two) is made by using four rows of loom weights. The twill is recognised by the diagonal patterns (Geijer 1972: 57). The important thing to have in mind for this study is that the number of rows of loom weights used also affects the thread count. If using the same type of thread and loom weights, a set-up with four rows of loom weights will result in twice as many threads per centimetre than a set-up with two rows of loom weights.

1.6 Social Dimensions of Technology

There is a risk with having an *a priori* strictly functionalistic perspective for the study of tools and their function. Especially for such a distinguished type of sites such as hillforts where it is not absolutely certain which function and meaning the craft has had on the sites. To just look at form, function and meaning is limiting for a study where the place itself is also in focus. Therefore, the context is of relevance when interpreting the tools and the craft. Research in archaeology since the 1980s has brought forward theoretical perspectives on material culture that are able to bring a social perspective based on contextualisation. Helle Vandkilde (2000) presents how the concepts of form, function and context can be used to gain a deeper insight into the past society through material culture:

> "Material culture relates to, interacts with and is conditioned by the society in which it is embedded. This implies that archaeological material culture through contextualization can be utilized as an entry to past society […]" through which we can gain insight into issues such as "[…] gender relations, social distinction, ethnicity, ritual performance, domestic life and substinence, technology and craft specialization, religion and identity, and warfare […]". (Vandkilde 2000: 4)

Material culture is defined by Vandkilde as "any physical feature that results from or is influenced by human activity", the form is the "physical appearance of material culture", which includes the morphology, decoration, and the expression and instrumentality of an object. Style is the "presence of visual unity or coherence in material form over geographical space" (Vandkilde 2000: 13). The concept of function can be divided into three aspects: practical function, social function and symbolic meaning. Together they form the identity of an object (Vandkilde 2000: 21).

1.6.1 Practical Function, Social Function and Symbolic Meaning

The practical function and social function of a type of object often overlap and are present simultaneously (Zagal-Mach Wolfe 2013: 54). For loom weights, the practical function would be to weigh down warp threads. For a whole loom it would be to weave cloth. This goes along with the definition of practical function being the "manifold utilitarian purposes material culture can have or obtain, typically – but not exclusively – in subsistence production and domestic life" (Vandkilde 2000: 22).

The social function is more difficult to define. Zagal-Mach Wolfe writes, "The social function of an *object-group* is when it takes part, in some shape or form, in the human organization and understanding of the social and/or cosmos, and the communication within this structure" (2013: 54) which ties into the how social function "pertains to the various social uses material objects can have or obtain, notably in constituting and confirming cultural identities and social categories relating for instance to ethnicity, rank, status, age, gender and profession" (Vandkilde 2000: 22). I agree with both definitions and would argue that some aspects that it also covers include politics and rituals. All of these are integrated.

A hypothetic example of how practical function is integrated with various social functions with regards to textile production, in this case weaving, would be:

The loom is placed in a house, right in front of the door because of the practicality of having the best light conditions. It also leads to the weave being visible (Cassel 1998: 111-113); to any person entering the house it will be the first thing they see. It thus become a representation of the people living there and is part of showcasing their identity. The identity of the craftsperson, the weaver, can be represented likewise. The cloth being woven might be for regular clothing, but it might also be a weave depicting events, building history, having similar effects as the weave found in the Oseberg burial being of an identity building nature, possibly connected to the goddess Freyja and cult practice (Ingstad 1992: 224-256). Arwill-Nordblad presents tapestries and weaves with images as creator of prestige and social marker; it creates a new context by changing an ordinary room to become a hall of feast by its presence (Arwill-Nordblad 1998: 209). The objects themselves, by choice of form, can be a representation of identity for political and/or ritual reasons. The choice of using pyramidal loom weights or torus loom weights is related to this. Their physical function is the same, but their form has an impact on how the object and owner/user is perceived. A contemporary comparison would be that some mobile phones give the owner a "higher status", while it still does the same things as another brand.

While symbolic meaning is not completely independent from practical and social function, it "relates more directly to the cultural principles of society, its ideology and history" (Vandkilde 2000: 24). It is more difficult to get to the symbolic meaning, because it requires knowledge of the totality of dimensions of variation such as similarities, associations and contrasts within society (Vandkilde 2000: 11). The capability of objects to gain new meaning and social function through change of context (Vandkilde 2000: 11) is important to take into consideration. The context is a key determent to evaluate the function of an object or the activities in which it was used (Vandkilde 2000: 13).

1.6.2 CENTRAL PLACES AS CONTEXT

When studying craft in fortified hilltop settlements from a contextual point of view, one is faced with one of the concepts that has dominated Iron Age research over the last decade: the Central Place. In the standard textbook *Archaeology: Theories, Methods and Practice* by Renfrew & Bahn, there is a check-list of what a chiefdom society consists of, with relation to social organisation, economic organisation, settlement patterns, religious organisation, architecture and some archaeological examples such as early metalworking. Within this list there are mentioning of craft specialisation, hereditary leaders, high ranking warriors, and fortified- and ritual centres (2008: 180). Scandinavia, during the late Roman Iron age and the Migration period, is often considered to be a typical chiefdom society, or "Tribal confederation" according to Ulf Näsman's model, that during the Vendel period, changed into more of a Kingdom society (Näsman 1998: 22-23). In order to understand the chiefdom society, research often deals with so-called "central places". A term used often within the archaeological discipline, but not always with a definition. It is more of a concept used to denote places that could be politically or ritually more important than the settlements of "ordinary" people (Helgesson 1998: 39). Bertil Helgesson combines models of Watt (1991) and Fabeck and Ringtved (1995) based on finds that relates to different archaeological phenomena (1998: 43). The different phenomena that could be associated with a central place includes: local regime, regional regime, over-regional regime, craft/production, trade/distribution, cult/religion, defence/military organisation, justice system, and communications (Helgesson 1998: 40). Helgesson argues that this categorisation of phenomena is necessary to categorise and interpret the archaeological material, since using only the find categorisation is limited to the understanding of the structures of Iron Age society as a whole. The central phenomena can be spread to a large area, not just the local area of resources (1998: 41, 44).

Common settlement finds (Watt 1991) Pottery, various tools (knives etc.), polishing stone, grind stone, spindle whorls, loom weights, sewing needles, "vantnål", bone combs, tweezers, local types of fibula, decorative needles, glass- and amber pearls, gaming pieces, animal bones. **Finds related to crafts (Watt 1991)** Iron slag, iron bars, preparatory work (knives), crucibles and moulds for casting, casting waste, metal scraps (bronze), metal stamp, sheet metal, gold plate, raw garnet, raw amber, glass scraps. **Special finds related to commerce and cult (Watt 1991)** Solidi, denarii, gold to break, weights, glass, cloisonné, raw garnet, gold foils figures, bracteates, spears, parts of statues .	**Common settlement (Fabech & Ringtved 1995)** Pottery, tools, polishing stone, fire stone, grind stone, spindle whorls, loom weights, fibulae, decorative needles, glass pearls, amber pearls, gaming pieces, animal bones. **Central place with regional importance (Fabech and Ringtved 1995)** Solidi, denari, bracteates, gold foil figures, glass, gold to break, weapons, parts of statues, raw garnet, metal scrap, crucibles and moulds for casting, iron barns, iron slag, preparatory works. **Central place with over-regional importance (Fabech & Ringtved 1995)** Prestige helmets, continental gold items, unusual find combinations, items of a high artistic quality.	**Other central place indicators (Fabech & Ringtved 1995)** Archaeological remains: Hall buildings, larger contemporary settlements, larger burial place, metal tempering place. Landscape position: communicative place, beneficial location in regards to resources, the settlement with its functions spread over a large area. Place names: sacral, organisation-based Structural continuity: rune stones, silver hoards, early roman church, chapel.

Tab. 2: Categories of finds that separates central places from common settlements. After Helgesson 1998, p. 43, Tab. I.

The concept of centrality in itself is complex since the phenomenon mentioned above is expressed to various degrees. The difficulty in researching places that are more than common settlements is to identify where on the "elite settlement spectrum" they are located, how the place is connected to its area and region, and the other places located there (Näsman 1998: 1-5). John Ljungqvist discusses the problems with using the term "elite" when speaking about people with higher rank in Iron Age Scandinavia due to its negative connotations. It is the most inclusive term however if used with the definition as "designated body of people" which can relate to the situation of power and status being hereditary during the Iron Age (Ljungqvist 2006: 11-12). I will use the term "elite" within this study to describe the body of people that has a culturally distinctive social role in terms of the organisation of phenomena mentioned in the discussion about central places.

The aspect of production organisation mostly studied is the matter of *specialisation*, often connected to central places. It is distinguished from a non-specialised production such as a generalised or domestic production, but there are some that treat production organisation as multifaceted (e.g. Costin 1991 and Zagal-Mach Wolfe 2013: 57-58). The term "specialisation" is problematic in itself: it suggests that there can only be specialised and non-specialised production. Zagal-Mach Wolfe argues for a multidimensional perspective on production that encompasses all production organisation from four different parameters: context, concentration, scale, and intensity (Zagal-Mach Wolfe 2013: 58-63). Specialisation is best described as a “way to organize production” (Costin 1991: 3). There are various views exactly how this organisation should be defined, but it is commonly accepted that specialised craft can be performed on various levels (Costin 1991: 3-11).

The “elite spectrum” is often illustrated by hierarchy models with a “band-tribe-chiefdom-state” ranking. A complementary notion of heterarchy has been introduced to archaeology, in order to understand the complexity of societies (Crumley 1995: 3). It is not unlikely that the difficulty of placing central places, or elite environments, on the spectrum might be that the society is not as easy to understand as nodes outranking each other. The concept of heterarchy does not equal a lack of importance or elite identity for extraordinary settlements, but rather manifests itself in various ways. It is important to note that heterarchy and hierarchy do not automatically contradict each other. Social relationships between units can be heterarchical in some situations and hierarchical in other situations (Crumley 1995: 4). For studies of craft based on context, function and meaning, it is worth considering that there was possibly a horizontal organisation of production as well as a vertical.

1.7 Application of Theories and Methods in the Present Study

Guided by the research questions of the thesis and the theoretical-methodological discussion above, I have performed a quantitative analysis of material from Gullborg, Boberget, Darsgärde and Börsås kulle in order to answer the first research question: *What type(s) of textiles could be produced with the material found at fortified hilltop settlements?* The material I analysed consists of loom weights and spindle whorls.

To answer the second question: *Which spaces within the fortified hilltop settlements can we locate the presence of items related to textile production – why there?* I looked at the documentation available from the sites and see in which contexts where the objects found. For example, some possible spaces or context are: 1) inside a building; 2) outside the buildings; 3) within a construction (in a posthole or wall). In cases where this information has not been recorded, a general idea of the location within the hillfort have been noted: for example, if it is close to the entrance to the hillfort. This could be answered if the items have been documented as found in excavation units. The “why there?” part of the question is linked to the third question, which relates to the contextual perspective used to say something about the form, function, and meaning, which is the theoretical framework for this study.

The third question is the most difficult one to answer: *What role did textile production play for the function of the fortified hilltop settlements?* I approached this question based on both the results from the analysis and the reviewing of the contexts. I discuss the practical function, social function, and symbolic meaning of the textile craft in relationship to the hillforts as central places.

1.7.1 Quantitative Analysis

Eva Andersson Strand has studied Swedish material from the late Iron Age and Viking Age in Scania (Andersson 1996) and Birka (Andersson 2003). The methodology used is applicable to textile production tools internationally, since the practical function of spindles and loom weights remain the same. The experimental studies performed show that for the process of spinning thread, it is the weight of the spindle [whorl], the fibre material and the preparation of the material that affects the outcome. The very light spindle whorl can be used, but only for very thin threads, and a heavier whorl weighing more than 40g could only spin a thicker thread. For whorls between 15–30g, it is easier to vary the thickness of the thread spun (Andersson Strand 2015: 47-48). Based on the results of the experiments performed by Andersson Strand and Betzner (see Tab. 1) I can estimate the range of thread possible to create with the whorls found at the sites.

Andersson Strand, Mårtensson and Nosch have also performed experiments with loom weights to see how the weight and thickness affect the produced outcome/textile (Andersson Strand et. al. 2009). These properties have to work together with the thread. Different threads need different tensions and this is what limits how many threads can be attached to a weight. If using threads that need the same tension, a heavier weight can carry more threads than a lighter one. There is also a practical limit on how many threads you can attach to a loom weight (Andersson Strand et. al. 2009: 378). The optimal loom set-up is 5–30 threads/loom weight, a possible set-up is 4 or 30–40 threads/loom weight, and an unlikely set-up is less than 4 or more than 40 threads/loom weight (Andersson Strand et. al. 2009: 392). Based on this it is possible to estimate the possible range of fabric that could be produced.

The combination of fineness or thickness of threads made with the spindle whorls and determine the thread count of the fabric that could be achieved with the loom weights. I will only analyse what could be made with wool fibre, since according to Bender Jørgensen this was the main material used during this period (see above). In order to get the data I need, I will register the material and take the measurements needed of the object (see below).

1.7.2 Registration of Finds

I worked hands on with the material, which consists of loom weights and spindle whorls, at SHMM in Stockholm. Since I do not have the software Access by Microsoft I could not use the database created by CTR to register the finds. But with the help of the CTR manual *From Tools to Textiles* (Andersson Strand et. al. 2011, unpublished), I was able to decide which parameters I wanted to record. All the data was registered into Excel sheets. I based my registration of the objects on the manual: how the measurements should be taken and how to identify the different category types (Andersson Strand et. al. 2011, unpublished, 27-29). I have chosen to only register the loom weights and spindle whorls. Finds that can be relevant to the textile production, have been considered and presented as part of the discussion.

When I registered the material from the different sites I used different sheets. One was for all the finds of spindle whorls or loom weights from all four sites with general information that will provide an overview of all the material relevant from the sites (see Tab. 3). I used sheets for each of the find category (see Tab. 4 and Tab. 5), with only the finds that could be used for analysis (i.e. the objects that are well enough preserved and possible to ascertain the complete artefact weight and measurements. Heavily fragmented finds are therefore not included there). When the preservation status is “1” (heavily fragmented) I counted the fragments and included them in the general sheet. They were grouped if found in the same site, shared the same context and consisted of similar materials. The analysis cannot be performed on fragments and therefore they are only accounted for in the general sheet in order to provide an overview on where these categories of finds have been found and which materials they are made from. If a parameter could not be filled I left a blank square or wrote NA (not available).

Data fields for all the finds, the "general sheet"	
Find ID	Three letter site code (GUL = Gullborg, DAR = Darsgärde, BOB = Boberget, BOR = Börsås kulle) followed by the excavation number of the object in question. If there is not an excavation number available, I used SHMM's own Find ID serial (Boberget & Gullborg) or started a new serial starting with 001 (Börsås). If separate items share a find number/SHMM Find ID they will be separated in the registration by letters a, b, c, d, and so on… Example: BOB-1234a.
Context ID	The context ID assigned during excavations.
Photo ID	File name for photos taken of object during registration. Example: DSC_0001.
Site	Boberget, Gullborg, Börsås or Darsgärde. Which refer to the hillfort site only, except in the case of Börsås where there is an object from a burial (mound) included.
Context type	Examples: Post-hole, pit, floor etc. If available.
Context description	Context ID and a short description of the context if available.
Find category	Loom weight or Spindle whorl.
Type	Artefact type (see Fig. 7 & Fig. 5**Fel! Hittar inte referenskälla.**)
Preservation status	1, Heavily fragmented, shape not recognisable. 2, Fragmented, shape and size could be somewhat recognised. Pieces can be put together. 3, Piece(s) missing. 4, Intact.
Material	Clay, stone, bone, etc.
Object description	General description of the object. Include aspects like production quality, material properties and size.
Number of pieces	The number of pieces that makes up the object or a concentration of fragments. Fragments from one digging unit will be counted together but stay separated from the objects possible to analyse.
Remarks/Other	Any information or notes that cannot be accounted for in the previous fields are noted here if relevant. I also note if any aspect of registration might have impacted the data in this field.
SHMM Inventory	The inventory ID that the material is filed under at SHMM.

Tab. 3: List of parameters included in the "general sheet".

Data fields for loom weights	
Find ID	The Find ID used in the general sheet.
Type	Artefact type (see Fig. 7)
Material	Clay, stone, bone etc.
Weight (g)	The weight of the object in grams.
Weight if not complete (g)	The weight of the object if it is not complete (if several fragments, their collected weight) in grams.
Calculated weight (g)	The estimated weight of object, which is not complete, if it can be done with relative confidence, in grams.
Maximum height/diameter (mm)	The maximum height or diameter of object in millimetre.
Maximum thickness (mm)	The maximum thickness of object in millimetre. This is the measurement between the surfaces where the hole(s) is.
Maximum width (mm)	The maximum width of the object in millimetre. Not applicable for round weights.
Number of holes	Number of holes.
Position of hole(s)	Central, cornered, top, etc.

Maximum hole(s) diameter range (mm)	The maximum diameter range of the hole in the object in millimetre.
Surface treatment	If the object has been smoothed, has any decorations, is there are groove, etc.
Use wear	Trace of use wear.
Use wear description	A description of the use wear.
Remarks/Other	Any information or notes that cannot be accounted for in the previous fields are noted here if relevant. I also note if any aspect of registration might have impacted the data in this field.

Tab. 4: List of parameters included in "category sheet" (loom weights).

Data fields for spindle whorls	
Find ID	The Find ID used in the general sheet.
Type	Artefact type (see Fig. 5)
Material	Clay, stone, bone, etc.
Weight (g)	The weight of the object in grams.
Weight if not complete (g)	The weight of the object if it is not complete (if several fragments, their collected weight) in grams.
Calculated weight (g)	The estimated weight of object, which is not complete, if it can be done with relative confidence, in grams.
Maximum diameter (mm)	The maximum diameter of object in millimetre.
Maximum height (mm)	The maximum height of object in millimetre.
Maximum hole diameter (mm)	The maximum diameter of the hole in the object in millimetre.
Hole shape	S = straight, C = cone, DC = double cone.
Surface treatment	If the object has been smoothed, has any decorations, is there are groove, etc.
Remarks/Other	Any information or notes that cannot be accounted for in the previous fields are noted here if relevant. I also note if any aspect of registration might have impacted the data in this field.

Tab. 5: List of parameters included in "category sheet" (spindle whorls).

1.7.3 Source Criticism

The main reason for selecting the four sites for this study is that the finds from these sites are stored and available at SHMM, making them accessible at the same place. Also, the sites represent three different hillfort areas: the east coast of Uppland, Vikbolandet in Östergötland, and the west coast of Bohuslän. The sites are somewhat different from each other and because of this; they represent the diversity among fortified hilltop settlements. These sites have also been used, especially the two sites from Östergötland, to emphasise the textile craft at hillforts within the discourse over the past century without any closer studies.

The main source criticism to have in mind when researching these sites and materials concerns the representativeness of the finds used in the analysis. There are several layers of this to consider. The most important aspect of representativity in this case is that for none of the places, the whole area has been excavated. Darsgärde is the one with the highest percentage of its internal area excavated, which makes the finds from that site relatively more representative of that site, in comparison with the others which have a lesser percentage of their internal area excavated. The issue of the finds being *in situ* should be addressed. Due to the nature of the documentation I cannot be sure of this. I have seen no written account or picture of the weights lying in a line which indicate them being left exactly where they hanged on the loom. However, if their use was something else, they might be *in situ* but without this being recognised.

The analysis could only be performed on some of the finds. When material is too heavily fragmented, some parameters cannot be recorded. In the case of this study, the weight parameters have been estimated, with relative confidence for some of the incomplete weights. However, the exact weight is impossible to establish with a damaged object, since items from this category of finds are not always of a consistent shape. Since all the finds are not able to be analysed, due to heavy fragmentation where both the important parameters cannot be recorded, it is important to keep in mind that the result of the analysis is a "least possible" result. However, the information of the fragmented material's spatial location from the excavation could be used to analyse the excavated areas and show the density of pieces within the excavation units.

Another problem is that we do not have the complete sets of tools (see above in chapter 1.6) used for the production on these sites. Organic material, like wood, has perished and other items might have been discarded at other locations. For these objects we also do not know to what extent these objects have been used. Some might have been completely discarded and never used. Possibly, they might have had a secondary use that does not leave a trace. The high level of fragmentation suggest that the loom weights have not been left "hanging on a thread" but rather disposed of when being out of use – an assumption that arises from not knowing about other possible uses of loom weights discarded as of being of no use for their practical function.

During the collection of material for this thesis the impact on how well the research, and through that the results, can be made have shown to be related to the level of documentation done at the sites. The documentation is fairly similar at the sites, but in the case of contextualising the finds, there is a lot missing. In the case of Boberget, Gullborg and Darsgärde it is possible to compare the finds lists at ATA (the Antiquarian Topographical Archive) with the actual material registered and accessible at SHMM. It is possible to say if there are any discrepancies between the reports and regarding the issue if all the finds are collected. Some items might have been overlooked in the field, but with regards to the heavily fragmented material stored at SHMM, I would say that it is likely that there was no material consciously not collected. In the chapter presenting the material, there is an account about the discrepancies between field report and the present storage (as of March 2016).

Some variance is to be expected with any craft due to various levels of crafts people's individual skill, the quality and properties of the raw material, and production conditions. The results of experiments made with current crafts people's knowledge, on which I base my quantitative analysis, are general and reflects a standard of what the craftspeople should be able to produce in the past.

Regardless of all this, it is possible to perform the quantitative analysis on some of the items. The results will shed light on possibilities of manufacture that actually could have been performed on the sites with the items that were left. The exact specifications that were possible to manufacture is impossible to ascertain because the material left is only a part of what was used and not the exact collection of items present in the past. Although the material is not completely representative, an analysis will provide a minimum range of possibilities. This is what I call a “least possible perspective”. Whether or not these possibilities were actually realised in the past cannot be confirmed without actual finds of textiles from the relevant period and region.

2 ANALYSIS

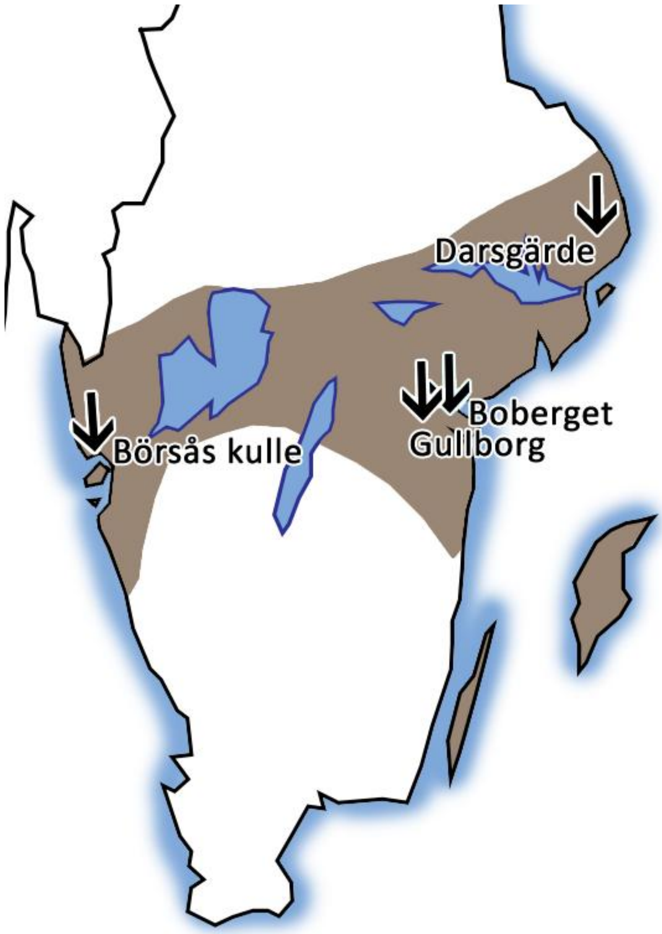


Fig. 3: Map over central and southern Sweden. With a generalised spread of hillforts where they are the most common, in brown and the fortified hilltop settlements used for this study marked with arrows.

2.1 BOBERGET, ÖSTERGÖTLAND, ÖSTRA STENBY PARISH. RAÄ 204:1, AND KONUNGSUND PARISH. RAÄ 27:1

Boberget is located on the border between two parishes and estates. Therefore, it is registered under two RAÄ numbers. In FMIS the data is given at the Östra Stenby number. But in the ATA-archive, the documentation is available through the Konungsund material and the separate Bror Schnittger and Hannah Rydh archive. Four plans are filmed. The name “Boberget” mean “the mountain where people have dwelt” (author’s translation from Nordén 1939: 292). Around the site there are many place names including the word “sten”, such as Stenby, which is known to relate to hillforts (Almgren 1906: 22-23, Nordén 1938: 292, Carlsson 2005, Widegren Lundin 2011).

This fortified hilltop settlement is located in Vikbolandet, a peninsula that reaches out into the Baltic Sea. The hillfort is confined by perpendicular cliffs except to the south where a ridge adjoins – there the only fortifications have been built. East of the site there is still a small creek flowing; in the early Iron Age when the shoreline was some 10 metres higher in the landscape this might have served as a passage to Bråviken into the Baltic Sea. If not, it is a walking distance to Bråviken from Boberget. There seems to have been a grave field north east of the hillfort, but it has probably been spoilt by farming. Some stone settings have been noted (FMIS[10]).

Boberget was excavated in 1906-1907 under the management of Oscar Almgren (Almgren 1906, 1907) and in 1908-1909 under the management of Bror Schnittger (Schnittger 1908, 1909). A final dig was completed in 1913, possibly by Schnittger (Nordén 1938: 293-298).

The documentation from the excavations are very clear about in which excavations units the finds where made and the size of the areas that have been excavated. However, I have found no written account on any features that have been located in relation to the excavation units. The drawn plan is located at ATA in the register with filmed plan drawings.

The main investigation was performed just inside of the wall. There is a plan drawing of these excavations units with numbered dots showing where the finds where made. This plan includes the digging units A, A1, A2, A3, B, B1, B2, B3, C, C1, C2, C3, D1, D2, D3, D4, and E2. Together they cover an area of 178 square metres. Along the edge of the cultural layers 32 trial trenches were made (Schnittger 1908: 33), numbered with roman figures (I-XXXII). Some excavations units were opened in the central part of the hillfort, on the highest plateau: they have the numbers IIA, IIB, IIC, IID, IIE and cover an area of 51 square metres. For the trial trenches and the latter, I have found no drawn plan in the archive material at ATA. The results of the excavations are published in *Meddelanden från Östergötlands Fornminnesförening* 1906, 1907, 1908, 1909, and in *Östergötlands Järnålder* by Arthur Nordén.

The hillfort itself is 250 metres in length and 70–90 metres wide and only have walls to the south east, where the only possible way up to the fort is located. The main wall is 35 metres long, 10–13 metres wide and and 1–3.5 metres high. There is a 25 metres long outer wall that connects with an approach ramp to the fort. This outer wall is 1-2 metres wide and less than a metre high (FMIS[11]). Nordén writes that the wall probably also had wood as part of its construction (Nordén 1938: 292).

Within the wall there are remains of a building that is 4–4.5 wide and 12 metres long (Almgren 1906: 21-22, Nordén 1938: 292). A 30 metre terrace edge is located in the middle of the fort (FMIS[12]). The cultural layers on the site are extensive and rich, 10–100 centimetres deep, giving rise to the assumption that people have dwelt there for a long time (Schnittger 1908: 33, Nordén 1938: 292).

[10] FMIS. RAÄ-nummer Östra Stenby 281:1 [online]. Available at http://kulturarvsdata.se/raa/fmi/html/10055602810001 [Accessed 2016-05-05]
[11] FMIS. RAÄ-nummer Östra Stenby 204:1 [online]. Available at http://kulturarvsdata.se/raa/fmi/html/10055602040001 [Accessed 2016-05-05]
[12] Ibid.

A variety of finds were made at Boberget, I will not mention all of them here – see publications for the entire lists. Iron objects include nails, piece of a possible spear[13] and a silver rod. Sharpening stones, hammer stones, calcium carbonate disc concretions and a stone axe are some of the stone objects that were found. The distinctive category of pottery with holes (giving it the character of a sieve) was well represented at the site. Other materials of finds include: hair needle of bone, gaming pieces, pearl of amber, bread from barley flour, and more (Almgren 1906, 1907, Schnittger 1908, 1909, Nordén 1938). The loom weights and spindle whorls will be presented further down.

2.2 GULLBORG, ÖSTERGÖTLAND, TINGSTAD PARISH. RAÄ 54:1

Together with Boberget, Gullborg has been representative of the hillforts of the Migration period in Östergötland, noted especially for the finds of pyramidal loom weights. At ATA, some of the documentation, just like for Boberget, is available in the Bror Schnittger and Hannah Rydh archive. Gullborg is located within a farmed area a few kilometres south east of Norrköping, in Vikbolandet. There are no immediate water-ways present close to the hillfort. Like Boberget, Gullborg is located on a highly visible hilltop; which is relatively inaccessible. Two stone strings are located south east and north east of the hillfort. A handful of burials are located within half a kilometre of the site. Two stone settings are located just in the vicinity on the slopes east of the hillfort (FMIS[14]).

The site was excavated in 1909 by Bror Schnittger. Eight excavation units were dug and some trial trenches (Nordén 1938: 282). Excavation field A comprised 70 m^2, field B 50–60 m^2, field C 50 m^2 and field F 16 m^2. The smaller trenches D, E and G comprised 4 m^2 each. The trial trenches are called a-g (FMIS[15], Schnittger 1909: 16). Together they form an area of around 200 square metres. The cultural layers in the western part are mighty, but quite confined. No constructions have been noticed where it has been investigated (FMIS[16]). In 2008 Martin Rundqvist led an archaeological prospecting campaign around the hilltop, up to 200 metres distance from the site (Rundqvist 2008).

The hillfort is 180 by 100–130 metres, limited by steep cliffs to the north and east. In the south west part of the hillfort, is a wall of 125 metres located. The wall is three to ten metres wide and 0.3–1.5 metre high. Several parts of the wall have tumbled down. A round stone setting-like remain is located within the fort; it is 7 metres in diameter and do not belong to the active period of the hillfort. It is likely rests of an optical telegraph (FMIS[17]).

The categories of items recovered from Gullborg includes rod of gold, three bronze brooches, a fragment of sheath iron work, pieces of glass of green colour, iron spearheads, knives, scythe, studs, hairpins of bone, and fragments of slag, sharpening stones, bones, and coal. Also a tool of red slate (Stone Age) and a hammer stone were found. The finds of loom weights will be presented further down.

[13] MIS. Föremål 1153135. SHM 12822:A2 [online]. http://kulturarvsdata.se/shm/object/1153135 [Accessed 2016-05-17]
[14] FMIS. *RAÄ-nummer Tingstad 54:1* [online]. Available at http://kulturarvsdata.se/raa/fmi/html/10050800540001 [Accessed 2016-05-05]
[15] Ibid.
[16] Ibid.
[17] FMIS. *RAÄ-nummer Tingstad 54:2* [online]. Available at http://kulturarvsdata.se/raa/fmi/html/10050800540002 [Accessed 2016-05-05]

2.3 DARSGÄRDE, UPPLAND, SKEDERID PARISH. RAÄ 16:1

In 1999 Darsgärde was restored by Stockholms Läns Museum and the National Road Administration after having been used as a sand stock by the National Road Administration (Andersson 2000). It was this use that prompted the excavations starting in 1956. Of all the sites I selected, this was the easiest to research due to the well-recorded documentation and reports of the site. Darsgärde is also the site that has most of its internal area excavated, making the finds more representative of the site than on the other sites. This makes Darsgärde a good site for comparing against other hillforts. Darsgärde might relate to the male name "Dag" and *–gård* relates to Old Norse "gardhe" meaning "enclosed".

This fortified hilltop settlement is located in Roslagen, the coastal area north of Stockholm. The hillfort is placed on a cliff protruding from a ridge that sits close to an ancient waterway which connected the place to the Baltic Sea (Ambrosiani 1958: 166, Olausson 2014b: 184). Darsgärde was excavated under the management of Björn Ambrosiani in 1957-1960. In the vicinity of the hillfort there are three grave fields also located on the ridge: the northern grave field (RAÄ 17:1, RAÄ 17:2) closest to the hillfort; the southern grave field (RAÄ 34:1, RAÄ 34:2); and a smaller damaged one (RAÄ 35:1, RAÄ 35:2).
The main part of the southern grave field (east of a road) was excavated and removed in 1956–59. More than half of the 0.5 hectares of the hillfort has been excavated (Olausson 2014b: 184), in addition to the investigations at the grave fields. The excavations of Darsgärde show that there was a settlement there during the latter part of the Bronze Age, but without any fortifications (Ambrosiani 1964).

Extensive reports of the excavations are archived at ATA together with lots of plans and drawings. The finds have been listed and attributed to distinguishable contexts. The main publications of the Darsgärde excavations are *Darsgärdekomplexet: En preliminär rapport* (Ambrosiani 1958), *Keramikboplatsen på Hamnbrinken vid Darsgärde* (Ambrosiani 1959), *Fornlämningar och bebyggelse: Studier i Attundalands och Södertörns förhistoria* (Ambrosiani 1964).

Darsgärde is approximately 100 by 95 metres and is surrounded by a wall on all sides except towards the south-east. The wall is 2–6 metres wide and 0.4–1 metres high. Most of the wall is levelled but the north east part is visibly a dry wall. An outer wall is located along the western side, 3–10 metres outside of the main wall. The outer wall is 1.5–3 metres wide and 0.8 metres high. The entrance through both the walls is located in the northwest part of the hillfort (FMIS[18]).

There are close to 20 house foundations found at the site. Before the excavation only two were known. A22, the largest of the houses, is designated the function of a possible house of representation or a hall (Olausson 2014b: 184-189). This period of settlement with several houses is the youngest on the site and has at a moment been burnt seeing as there are traces of vitrified material present. The site has not been used for settlement afterwards (Ambrosiani 1964: 12-14). The burning of Darsgärde is claimed to be caused by accident or enemy action (Kresten 1992: 5)

[18] FMIS. *RAÄ-nummer Skederid 16:1* [online]. Available at http://kulturarvsdata.se/raa/fmi/html/10008200160001 [Accessed 2016-05-05]

Two waterholes or wells have been found at Darsgärde. See Fig. 20, A5 which is just next to one of the entrances (closed in the later period of use) and just east of A16 (Olausson 2014a: 33-34). Apart from loom weights at Darsgärde there are finds of pottery, hammer stones, fire steel, iron key, iron buckle, tools such as a Bronze Age axe (Swe. "holkyxa"), knives and ard plough. Additionally, there are finds of crucibles.

2.4 Börsås kulle, Bohuslän, Skredsvik parish. RAÄ 181:1

The most problematic of these sites to research is Börsås kulle. There is very little documentation available; there is no report; and the only publication of the excavations of the site is a short article in Göteborg Handelstidning 28/10-1911. This was reprinted by Bohuslän local history society (Bohusläns hembygdsförening) in 1963 (see Hallström & Nyström 1963). The documentation kept at ATA consists of shorter descriptions of the site, a reference to the article, and a letter from Gustaf Bolinder in 1916 where he writes that he wishes to finish the investigations, started by Gustaf Hallström in 1912 at Börsås kulle, at which he had been participating. There are also a couple of photographs from the excavations. The drawings from the investigations are stored at Umeå University.

This fortified hilltop settlement is located on the Swedish west coast by Gullmarsfjorden with a view all the way to current city Lysekil. The site is located on a hill around 45 metres above the surrounding land. The hillfort consists of a rugged high plateau with terraces (FMIS[19]). Three mounds are located south west of the hillfort, the biggest called "Kungshögen" (RAÄ 182:1, 182:3, 182:3). There are also noted stone lines parallel to the hill and remains of buildings. Two of the mounds were excavated (Hallström & Nyström 1963: 5). Börsås kulle measures 270 by 160 metres and at the time of the investigation of the site, a visible remain of a road could be seen, leading up to the hillfort. Hallström was convinced that the road was there at the point of usage of the surrounding remains (Hallström & Nyström 1963: 5). The road passes two stonewalls. The one closest to the top is 15 metres and tumbled stones. Below this wall there is a longer one, 35 metres, also with its stones tumbled.

The buildings of this hillfort were located on terraces. Three building lots (Swe. "tomtningar") were investigated during the excavations. It was here the finds were made. At least one of these buildings was completely excavated. The structures are built of stone and no postholes; a given possibility is that they were built in a post-and-plank method (Swe. "skiftesverk") (Hallström & Nyström 1963: 5-6, Olausson 2014b: 193-194), which often require the carpentry to stand on stone-sills.

Apart from loom weights, the finds from Börsås kulle include: fragments of iron, lots of grain, pottery shards and grinding stones. The article mentions that two whole and fragmentary rotary querns (Swe. "handkvarnar") were found as well. The rotary querns were actually a part of the building structures. Other finds were also made in the burial mounds. The pottery found was characteristic of the 400–500 AD Migration Period (Hallström & Nyström 1963: 5).

[19] FMIS. RAÄ-nummer Skredsvik 181:1 [online]. Available at http://kulturarvsdata.se/raa/fmi/html/10159601810001 [Accessed 2016-05-05]

2.5 TEXTILE IMPLEMENTS AT THE SITES

All the material used for this thesis is located in the storage of SHMM. The inventory numbers are as follow: Börsås - 14560, Gullborg – 13824, Darsgärde – 25878, Boberget – 12822, 13247, 13529, and 13823. The find lists are available at ATA, except for Börsås, where there is no report of the excavation. This has made it possible to compare the finds reported to have been found and the registered material at SHMM.

2.5.1 SPINDLE WHORLS

There are no spindle whorls found at Gullborg or Darsgärde. In total, I registered 13 whorls for all the sites. A total of 11 whorls can be used for analysis.

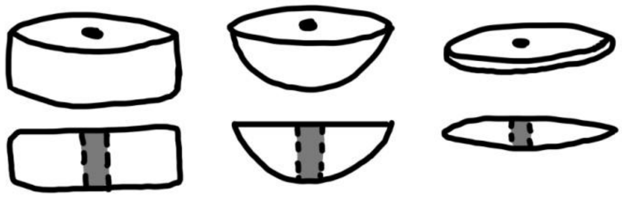


Fig. 5: Spindle Whorl types from left to right: Cylindrical, Convex and Discoid. Illustration by author after Andersson Strand & Nosch 2015.

All but one of the spindle whorls from these sites are from the site Boberget. The single one is from Börsås kulle. The ones available at the museum come in three types: cylindrical, convex and discoid (see Fig. 5). The materials are diverse: bone, rock type, clay, ceramics and ceramics. In the documentation at ATA from the excavation it is reported to have some pieces of charred wood of a different shape and with decoration (cf. Nordén 1938: 296) However, I have not been able to find them among the material from Boberget. The fact that two of the locations lack finds of spindle whorls does not mean that there were none used at the sites. They might just not have been found yet or the items have been brought from the places.

Fig. 4: Spindle Whorl from Börsås: BOR-020. Photo by author, 2016.

Only one spindle whorl has been found at Börsås. It is a half cylindrical whorl made from ceramic. It was found in “tomt 3”, digging unit D3:1. The fragment weighs 15g and the estimated complete weight is 30–35g. The maximum diameter is 37 mm, maximum height/thickness is 20 mm, and the maximum hole diameter is 8 mm.

For Boberget 13 spindle whorls were accounted for in the excavation reports at ATA. Ten whorls were registered in the SHMM inventory, one of these was not accounted for in the documentation. When comparing the finds at SHMM there were five whorls missing and not registered. Three of these were supposed to be made by charred wood (two from D3:2 and one from D3:1). Two were supposed to be made out of bone (F42 from D2 and a whorl from D3:2). In addition to this I found two possible spindle whorls among weight loom fragments. They have not been included in this analysis. The types include convex, cylindrical, discoid, and one irregularly shaped (see Fig. 6). One of the possible spindle whorls could be a spherical type. The materials are bone, concretion, rock type, ceramic, and possibly clay.

Fig. 6: Spindle Whorls from Boberget. Top left: BOB-77. Top right: BOB-54, BOB-1153298. Bottom: from top left to right: BOB-19, BOB-874447, BOB-874449. Bottom: from bottom left to right: BOB-70, BOB-874446, BOB-1153398. Five made of bone, two rock types, and two made of concretion. Photo by author, 2016.

2.5.2 Loom Weights

Two types of loom weights have been identified for the fortified hilltop settlements in this thesis: Torus (Swe. "trissformad") and Pyramidal (Swe. "pyramidisk", see Fig. 7). The torus type is the most common type of loom weight from the hillforts. The pyramidal loom weights have their origin in the Graeco-Roman cultures, in Sweden they're dated to c. 200–550 AD (Bratt 1998: 136). The loom weights are mainly made out of clay. Of the sites discussed in this thesis, the pyramidal has only appeared from the sites in Östergötland. There are known finds of this type at hillfort Braberg in Östergötland as well (Nordén 1938: 308) as in Baldersborg in

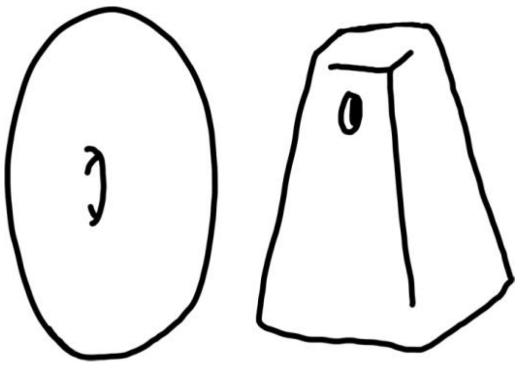


Fig. 7: Loom Weight types: Torus type and Pyramidal type. Illustration by author after Andersson Strand & Nosch 2015.

Södermanland (Hermelin 1929: 95). No other types have been accounted for. Two irregular pieces registered as loom weights might be interpreted as a cube loom weight, but since it is fragmented and no other pieces of this type have been found on these sites, it is difficult to determine. Most likely it is a clay object of some other find category, such as daub, since the “holes” looks like imprints from wattle. Some of the loom weights are currently exhibited in the “Forntider” exhibition at the National Historical Museum in Stockholm.

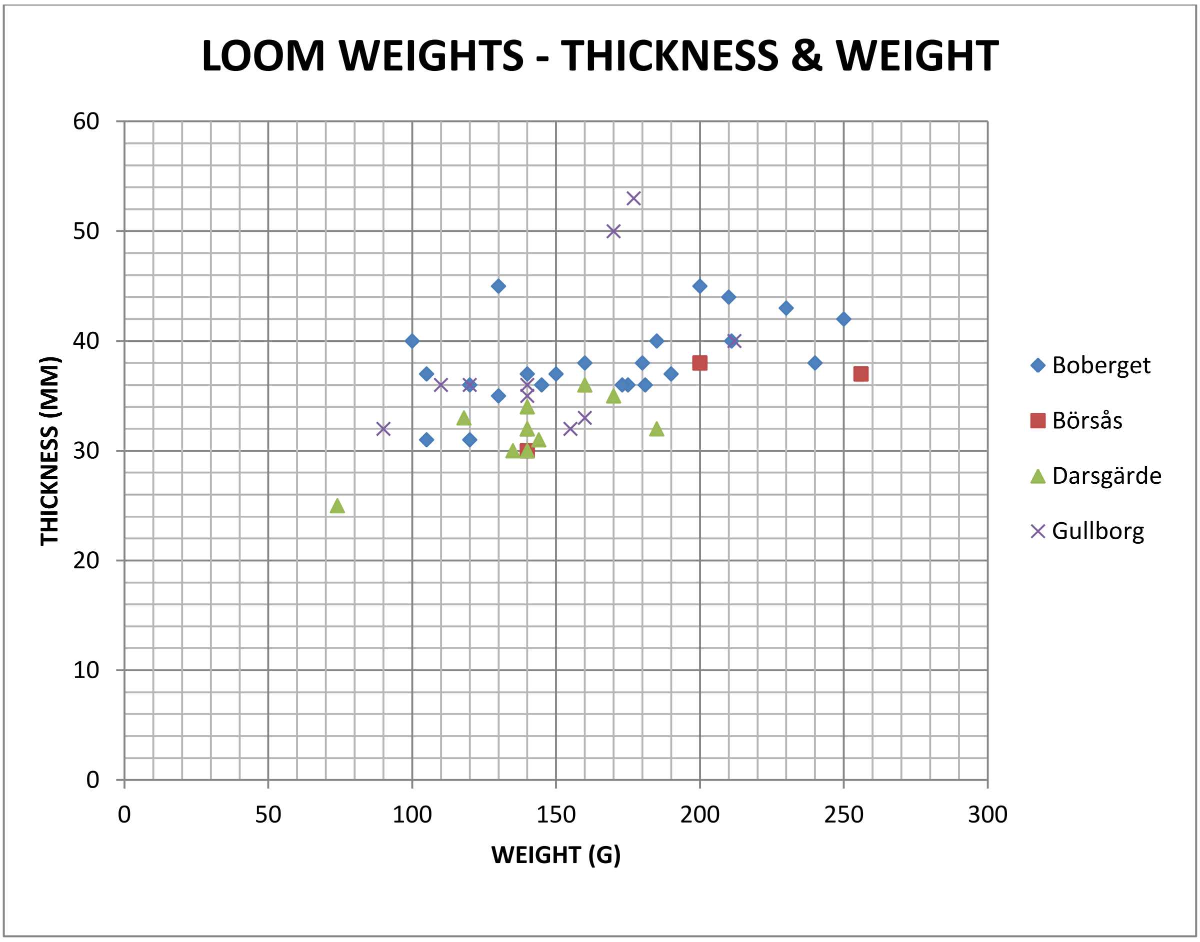


Fig. 8: The relation between thickness and weight of the analysable loom-weights from Boberget, Gullborg, Darsgärde and Börsås. By author.

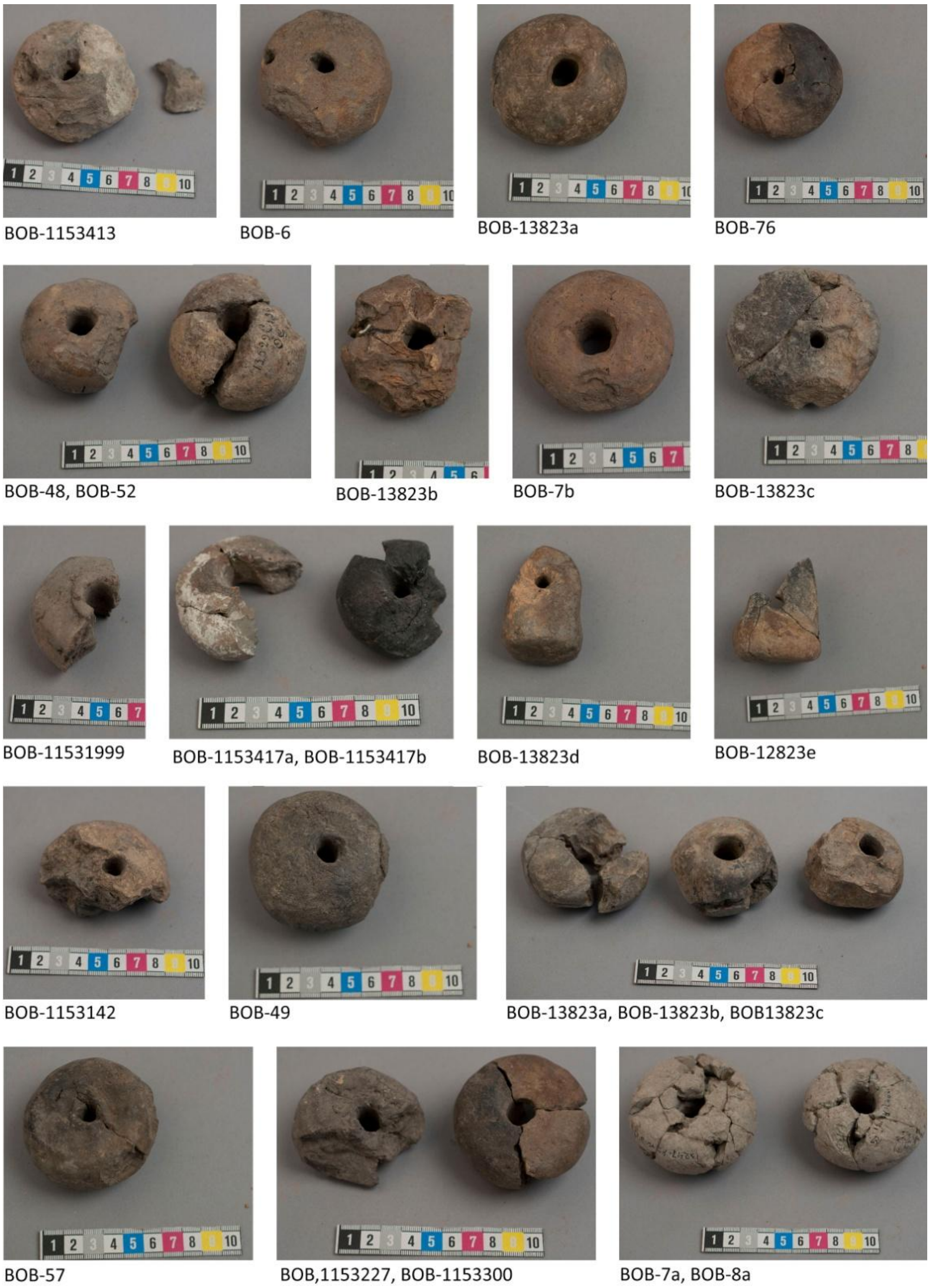


Fig. 9: Loom weights from Boberget. Pyramidal types in the middle row, to the right. BOB-1153413 and BOB-13823c not used in weight/thickness analysis. Photos by author, 2016.

For Boberget I have registered 69 Find ID's (see Tab. 3) of which 25 are individual loom weights. Of the individual loom weights, it has been possible to include 23 in the weight/thickness analysis. Of the individual weights they are only made out of clay. For the fragmented weights there are a handful of fragments that could be made out of ceramic. The 44 posts with loom weight fragments vary in numbers of pieces and have a maximum of 58 pieces for one post. Of the individual loom weights, 23 are of torus type and two are of pyramidal type. Among the fragments the majority indicate a torus type and there are some fragments that indicate pyramidal type as well. The individual torus thickness, range between

31–45 mm where the pyramidal thickness range between 40–45 mm. The torus diameter, range between 57–81 mm. The torus weight range is between 120–250 g and the pyramidal weight range is between 100–130 g. The general impression is that that there is a variation in quality; the shape, smoothness and position of the hole are not as uniform as the weights of Darsgärde (see below). In the SHMM database seven loom weights (of which one was whole) that were written about in the report at ATA were not registered, and could therefore not be found in the storage. Also, what was described as 60 pieces clay lumps or possible loom weight fragments in the report at ATA, was not registered or found at SHMM and could not be inspected. The loom weights missing were mainly from the excavation's trial trenches. The Find ID in my registration for Boberget is based on: 1) Find number from excavation in the case where it is provided (example: BOB-57); 2) SHMM's registered ID (example: BOB-1153413); 3) in the case none of the previous data were available, the SHMM inventory numbers with a following letter was used (example: BOB-13823c).

Fig. 10: Loom weights from Gullborg. Bottom row is pyramidal loom weights. Photos by author, 2016.

For Gullborg I have registered 58 Find ID's of which 16 are individual loom weights; ten of these could be used for the weight/thickness analysis. The 42 posts which represent fragments consist of varying numbers of pieces with the maximum of 340 pieces for one post. Of the individual loom weights two could be identified as pyramidal type and the other 14 are of the torus type. Of the fragments all posts contains likely torus type weights and the majority of the posts with fragments contains some pyramidal type fragments. The material used for the weights is mainly clay with a small number of ceramic fragments. The thickness range between 32–50 mm, the diameter range between 57–80 mm and the weight range between

90–212 g for the torus type. The pyramidal type thickness range 50–53 mm, height range 81–85 mm and weight 170–177 g. Out of all the loom weights I have looked at from all the sites, only one is partially vitrified: GUL-1155145 (see Fig. 10). There is a discrepancy between the find lists at ATA, the registered objects and my count. Mainly there are smaller numbers of fragments that make a small difference in most of the contexts accounted for. The total difference of numbers of fragments is only 13 pieces. This might be due to losing fragments when moving them and that a few have ended up in another box. In the cases where there are more pieces in the boxes than according to earlier accounts it is also possible that recent fragmentation has taken place. Finds from nine excavation units are not registered at SHMM and three registered excavations units are registered at SHMM but not accounted for in the finds lists at ATA. For individual loom weights there is only one from A13 that I have not been able to find registered/stored by SHMM. The Find ID in my registration for Gullborg is based on: 1) SHMM's registered ID (example: GUL-1155153); 2) when the previous data were not available, the SHMM inventory numbers with a following letter was used (example: GUL-13824a).

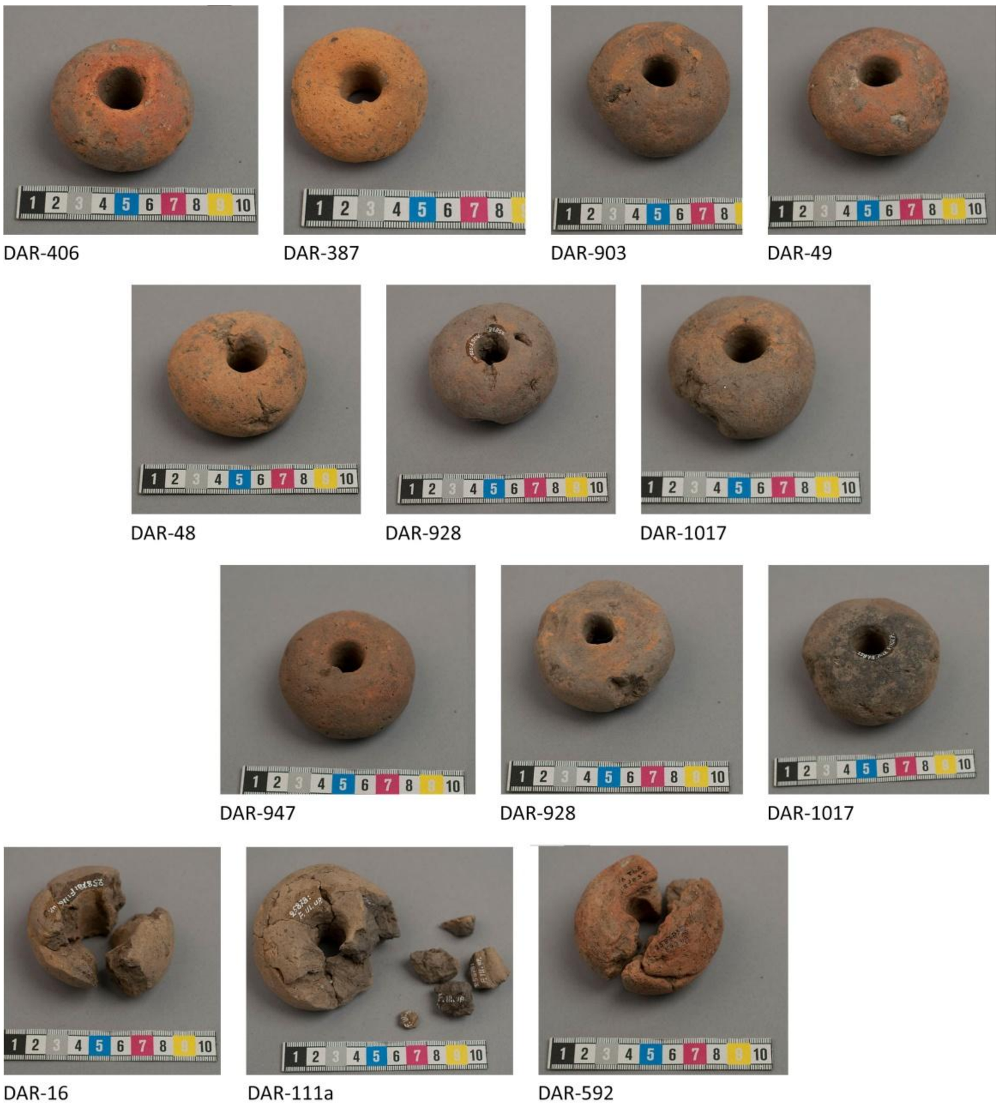


Fig. 11: Loom weights from Darsgärde. Photos by author, 2016.

For Darsgärde I have registered 24 Find ID's of which twelve are individual loom weights; three of these are fragments that have been glued together. The other half represents fragments, up to four pieces per loom weight. The twelve individual loom weights are analysable since both the weight parameter could be documented or estimated and the thickness could be measured. All the analysable loom weights could be identified as being of a torus-shape and none of the fragments indicate being of another type. The weights mainly consist of ceramic material. The thickness range between 25–36 mm, the diameter range between 56–75 mm and the weight range between 74–185 g. In the SHMM storage I could not find a loom weight with the find number F232 from A9 which was accounted for in the excavation report stored at ATA. That weight was not registered in the SHMM database. The Find ID in my registration for Darsgärde is based on the find numbers from the excavation (example: DAR-947).

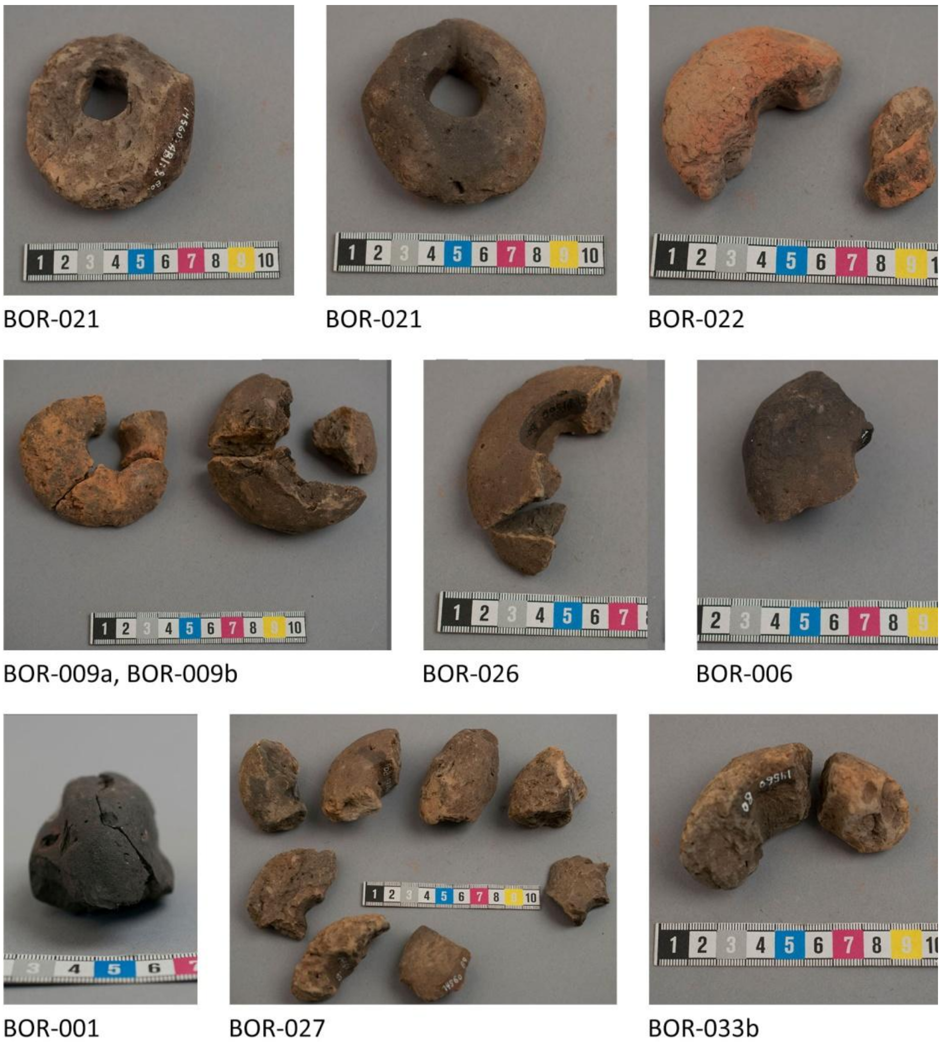


Fig. 12: Loom Weights from Börsås kulle. BOR-006, BOR-009a and BOR-033b used for weight/thickness analysis. Photos by author, 2016.

For Börsås kulle I have registered 54 Find ID's of which six are individual loom weights. Of these six only three could provide both thickness and an estimated weight to be analysed. The other 48 posts are collections of fragments of various numbers with a maximum of 104 pieces in one post. One of the individual loom weights (BOR-021), which was not usable for thickness/weight analysis, was found in one of the mound burials beside the hillfort. It is the only weight from Börsås that have the complete hole visible. It is worth noting that it has traces of use-wear in the form of a depression by the hole suggesting that it has been hanging. Five of the individual weights could be determined as torus-shaped, the sixth (BOR-006) is highly likely also torus; it has been analysed based on that interpretation. Only one of the fragments indicate being of a different shape; BOR-001 suggests a slightly odd "flying saucer"-shape (see Fig. 12). Based on both fragments and individual weights, the main material used for the weights is clay, but a handful is also made with ceramic material. The individual loom weights have a thickness range between 30–38 mm, a diameter range between 74–86 mm and a weight range of 140–256 g. A couple of pieces of fragments show a thickness up to 41 mm. The general impression from viewing the loom weight fragments is that they are quite unevenly shaped in comparison with the weights from Darsgärde. Since a report is missing from this excavation it is not possible to discern if there is a discrepancy between the items stored at SHMM and the items found at the excavation. The Find ID used for Börsås kulle starts at BOR-001 and ends at BOR-051.

2.5.3 Fibres and Other Tools

Bones from sheep or goats have been found at Boberget and Gullborg (Nordén 1938: 295, Olausson 2014b: 192). I have not seen any comments on types of bones from Darsgärde or Börsås. The presence of bones from sheep or goat is an indication that they had access to wool as material for the making of textiles. The analysis and calculations have been done based on the premise that wool was used. Different qualities of wool were used in the experiments which is the foundation for the analysis (see Tab. 1).

At Boberget, the only find that could be related to textile work other than the spindle whorls and loom weights, is an object of bone according to the publications (Nordén 1938: 333-334). There are two bone items with needle like appearance; they don't have holes for thread in the head. They are registered as "awl" (Swe. "pryl", MIS[20]) although Almgren considers them to be hair needles (Almgren 1907: 35). At Gullborg, there were no obvious objects (like needles, scissors, and combs) that could be directly related to the production of textiles. It is possible that someone with a high expertise in textile craft could identify implements usable for textile production among the objects registered only as "items". At Darsgärde I have not observed any other implements that are obviously related to the textile production. There are knives, and other items of iron that are registered as simply "iron". The SHMM online database, MIS, does not seem to show the entire list of finds for Darsgärde (when browsing the inventory numbers, I have not been able to see any data for the pottery or loom weights online). There are finds of sheephook needles[21] of which the function is unknown to me, but there are pieces resembling it from Finland and Balkan areas from the Roman Iron Age and the Migration Period (Ambrosiani 1958: 165). At Börsås, there are a few other finds that could be related to the production of textiles: a comb of either bone or

[20] MIS. *Föremål 874492. SHM 13823:II C:18* [online]. http://kulturarvsdata.se/shm/object/874492 [Accessed 2016-05-05]
[21] See image of object at: MIS. *Föremål 454378. SHM 25878 (F532)* [online]. http://kulturarvsdata.se/shm/object/454378 [Accessed 2016-05-06]

horn, in several fragments, and the point of an iron needle registered as a craft implement (MIS[22]). The comb was found in one of the burial mounds (Hallström & Nyström 1963: 6).
In comparison, Runsa borg in Uppland, has some other items related to the textile production. There are loom weights and spindle whorls. Also finds of smoothening stones, bone needles, and bone combs (Olausson 2011c: 232; 2014a: 22, 24, and 28). One deviant object out of bone has been suggested as a possible tool used within textile production but was interpreted as a likely part of a lock mechanism (Olausson 2011c: 234-235).

2.6 Production Possibilities

In order to understand the various types of textiles that can be produced, it is necessary to have some basic knowledge of how textiles are made. The aspects that I mainly focus on for this analysis is: the weight of the spindle whorls to get an idea of the range of thread quality (and their warp tension requirements), and the weight and thickness of the loom weights in relation to weaving techniques to get an idea of which types of textiles they could make based on comparison of thread count. For a loom weight the maximum amount of threads and the lowest amount of threads per loom weight, when set up in a loom, decide together with the weight and thickness of the loom weight what the range can be. In my following example the loom weight weighs 300 grams and is four centimetres thick. The recommended maximum number of threads is 30, so we can calculate that the lowest warp tension per thread can only be 10g. If the minimum recommended number of threads is 10, then we can calculate the highest warp tension per thread to be 30 grams. 10–30g warp tension per thread - this is the range of threads with certain warp tension that are appropriate for the loom weight. When we know this, it is possible to calculate the thread count, how many threads fit within one centimetre.

a) $$\frac{A}{10} = B \qquad \frac{A}{30} = C$$

b) $$\frac{(D \, x \, E)}{F} = G$$

A = Weight of loom weight
B = Maximum warp tension for threads (when using the minumum of 10 threads per weight)
C = Minimum warp tension for threads (when using the maximum of 30 threads per weight)
D = Number of threads per loom weight
E = Number of rows (2 for tabby, 3 for 2/1 twill, 4 for 2/2 twill)
F = Thickness of loom weight in centimeter
G = Thread count: Number of threads/cm.

Fig. 13: How to calculate: a) Warp tension range based on minimum and maximum number of threads recommended using per loom weight and b) Thread count per centimetre. By author.

If the loom is set up with a 30g warp tension thread it will be 10 threads per loom weight. If making a tabby, two rows of loom weights are used. The calculation then is the number of threads for the loom weight multiplied by number of rows (10 x 2, since it is a tabby with two rows) divided by the thickness of the loom weights (4) in centimetre. The result is the minimum thread count: 5 threads per centimetre. If, on the other hand, you calculate with the 10g warp tension = 30 threads per loom weight, the thread count will be 15 threads per centimetre. This is the maximum thread count for this loom weight. The 5–15 threads per centimetre is this loom weights thread count range when used in a tabby. If making a 2/1 twill

[22] MIS. *Föremål 363054. SHM 14560* [online]. http://kulturarvsdata.se/shm/object/363054 [Accessed 2016-05-06]

the calculation is done based on using three rows, if making a 2/2 twill the calculation is done based on using four rows, both which result in a higher thread count. The table below demonstrates the optimal thread count for a tabby.

Optimal thread count	5–30 threads/cm for very thin warp threads of 10–20 g warp tension; 5–20 threads/cm for thin warp threads of 20–30 g warp tension; 5–10 threads/cm for thick warp threads of more than 30 g warp tension.
Possible thread count	30–40 threads/cm for very thin warp threads of 10–20 g warp tension; 3 threads/cm for very thick warp threads of 40 g warp tension.
Unlikely thread count	>40 threads/cm or <4 warp threads/cm for thin threads of 10–20 warp tension; >20 threads/cm or <3 warp threads/cm for thick threads of more than 30 g warp tension.

Tab. 6: Guideline for the thread count per centimetre for tabby cloth, taking into consideration the combination of 1) the number of threads per loom weight, 2) thread diameter and 3) thickness of loom weight. After Anderson Strand et. al. 2009, p.392.

2.6.1 Thread Range

The spindle whorls from Boberget weigh 6–25g and the spindle whorl from Börsås kulle should weigh 30–35g if it had been intact. Based on the analysis of the loom weights, the threads best put to use range between a having a 5–25g warp tension. In comparison with results from spinning experiments (see Tab. 7) the spindle whorls from Boberget encompass at least the 10/15–25g warp tension. The weight from Börsås could definitely be used to produce a coarser yarn with more than 30g warp tension.

Boberget would need to have at least a spindle whorl weight range between 4–18 grams, Gullborg would need to have at least a spindle whorl weight range between 4–8 grams, Darsgärde would need to have at least a spindle whorl weight range between 4–8 grams, and Börsås would need to have at least a spindle whorl weight range 4–18 grams, in order to match the warp tension requirements which are appropriate to the weight and thickness of the loom weights.

Spinning with a **4 g spindle whorl** yields a **very thin thread of ≤0.3 mm.** This thread requires **c.10 g warp tension** per thread.

Spinning with an **8 g spindle whorl** yields a **thin thread of 0.3–0.4 mm.** This thread requires **c.15–20 g warp tension** per thread.

Spinning with an **18 g spindle whorl** yields a **thread of 0.4–0.6 mm.** This thread requires **c.25–30 g warp tension** per thread.

Spinning with a **44 g spindle whorl** yields a **thick thread of 0.8–1.0 mm**. This thread requires **c.40 g warp tension** per thread.

Tab. 7: Thread thickness produced from whorls of different weights and the thread tension required per thread. After Andersson Strand et.al. 2009: 378.

Although, there is room for a larger variety, since the experiments show a generalisation of possible results. The quality of raw material used for spinning thread impacts the strength of the thread. A thin thread can be spun hard and therefore require a more heavy warp tension than another thread of similar width, which was not spun as hard. This is due to there being more fibres in the hard spun thread (Andersson Strand et. al. 2009: 378, Grömer 2016: 112). A certain amount of skill is needed to control the spinning of the thread (Geijer 1972: 29). In general, a variety of whorls suggest a wider range of threads to be produced, and whorls of similar weights suggest production of similar threads (Andersson Strand, Nosch & Olofsson et.al. 2015: 86). The spindle whorls' individual measurements and types are accounted for in the database (see appendix).

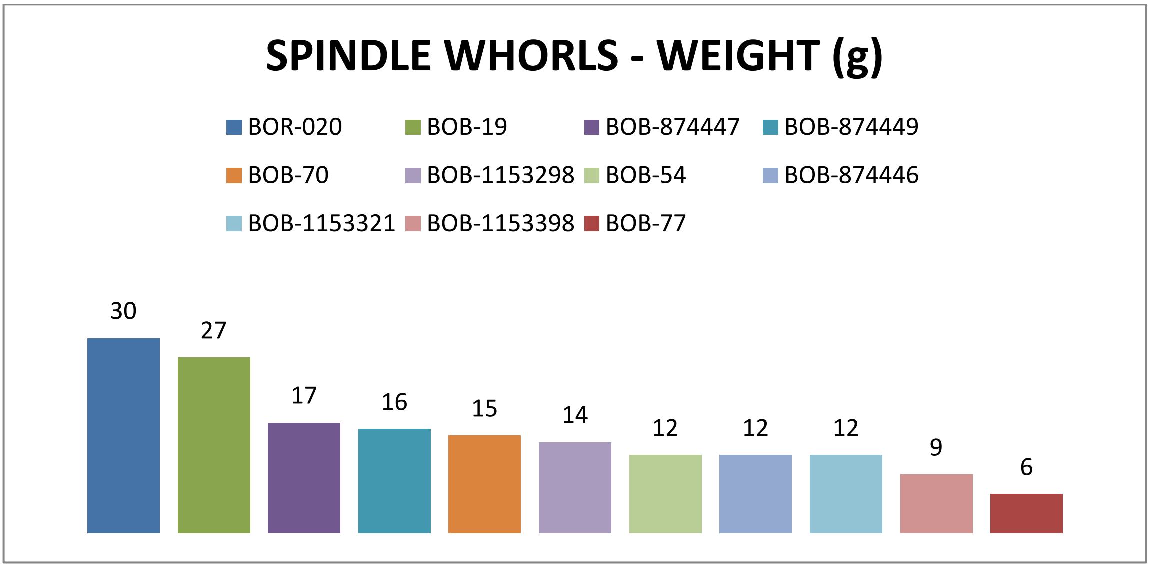


Fig. 14: Weight in grams of the analysable spindle whorls from Börsås and Boberget. By author.

2.6.2 Possible Use of Loom Weights

The total number of loom weights used for analysis is 48 for all four sites combined (list of loom weights used below). The analysis is based on the possible use of loom weights in a 1 metre wide and 2 metres long textile in a tabby (using two rows of loom weights), a 2/1 twill (using three rows of loom weights), and a 2/2 twill (using four rows of loom weights). The calculations are based on that 10–25 threads can be used per loom weight (after recommendation from Eva Andersson Strand who assisted me with how to perform the calculations using a digital calculation sheet). The lowest limit for number of wool threads per centimetre is 3, which means that results with fewer threads per centimetre were shown as unlikely. Bender Jørgensen describes Scandinavia as an independent area in the Migration Period and that the area had a very narrow range of cloth-types. The dominant type is the Haraldskjær twill and related fabrics. During the Roman Period there had been more foreign cloth types in Scandinavia (Bender Jørgensen 1992: 136). The Haraldskjær twill is used for wool and is of 2/2 twill z/z (z indicates the spin of the thread, not relevant for this analysis) and is typically woven on a warp-weighted loom (Bender Jørgensen 1992: 121). The tables below shows the textiles that can be made based on the analysis of loom weights. The most likely type would be the 2/2 twill, based on Bender Jørgensen's studies. The thread count is how many threads will fit into one centimetre of fabric. The thread count varies depending on which warp tension is required for the threads. A thin thread (fewer fibres) requires less warp tension than a thick thread. Therefore, the thinner threads can have a higher thread count. Generally it seems that the higher the thread count and the thinner the thread, the more the fabric can be said to be of fine quality. I discuss further down what the results mean.

Range of possible use for loom weights from Boberget, 21 loom weights analysed

Tabby (2 rows)	2/1 Twill (3 rows)	2/2 Twill (4 rows)
- 11–15 threads/cm when the required warp tension is 5g/thread - 6–13 threads/cm when the required warp tension is 10g/thread - 5–8 threads/cm when the required warp tension is 15g/thread - 4–6 threads/cm when the required warp tension is 20g/thread - 5 threads/cm when the required warp tension is 25g/thread	- 17–23 threads/cm when the required warp tension is 5g/thread - 9–19 threads/cm when the required warp tension is 10g/thread - 8–13 threads/cm when the required warp tension is 15g/thread - 7–9 threads/cm when the required warp tension is 20g/thread - 7–8 threads/cm when the required warp tension is 25g/thread	- 23–31 threads/cm when the required warp tension is 5g/thread - 12–24 threads/cm when the required warp tension is 10g/thread - 11–17 threads/cm when the required warp tension is 15g/thread - 9–13 threads/cm when the required warp tension is 20g/thread - 10–11 threads/cm when the required warp tension is 25g/thread

Pyramidal loom weights from Boberget, two loom weights analysed

Tabby (2 rows)	2/1 Twill (3 rows)	2/2 Twill (4 rows)
- 10 threads/cm when the required warp tension is 5g/thread - 5–6 threads/cm when the required warp tension is 10g/thread	- 15 threads/cm when the required warp tension is 5g/thread - 8–9 threads/cm when the required warp tension is 10g/thread	- 20 threads/cm when the required warp tension is 5g/thread - 10–12 threads/cm when the required warp tension is 10g/thread

Tab. 8: The possible range of textile that can be made with the analysable weights from Boberget.

Range of possible use for loom weights from Gullborg, eight loom weights analysed

Tabby (2 rows)	2/1 Twill (3 rows)	2/2 Twill (4 rows)
- 11–13 threads/cm when the required warp tension is 5g/thread - 6–11 threads/cm when the required warp tension is 10g/thread - 6–7 threads/cm when the required warp tension is 15g/thread - 6 threads/cm when the required warp tension is 20g/thread	- 17–20 threads/cm when the required warp tension is 5g/thread - 9–16 threads/cm when the required warp tension is 10g/thread - 9–11 threads/cm when the required warp tension is 15g/thread - 8 threads/cm when the required warp tension is 20g/thread	- 23–27 threads/cm when the required warp tension is 5g/thread - 12–21 threads/cm when the required warp tension is 10g/thread - 13–14 threads/cm when the required warp tension is 15g/thread - 11 threads/cm when the required warp tension is 20g/thread

Pyramidal loom weights from Gullborg, two loom weights analysed

Tabby (2 rows)	2/1 Twill (3 rows)	2/2 Twill (4 rows)
- 7 threads/cm when the required warp tension is 10g/thread - 4–5 threads/cm when the required warp tension is 15g/thread	- 10 threads/cm when the required warp tension is 10g/thread - 7 threads/cm when the required warp tension is 15g/thread	- 14 threads/cm when the required warp tension is 10g/thread - 9 threads/cm when the required warp tension is 10g/thread

Tab. 9: The possible range of textile that can be made with the analysable weights from Gullborg.

Range of possible use for loom weights from Darsgärde, 12 loom weights analysed

Tabby (2 rows)	2/1 Twill (3 rows)	2/2 Twill (4 rows)
- 12–17 threads/cm when the required warp tension is 5g/thread	- 18–25 threads/cm when the required warp tension is 5g/thread	- 24–33 threads/cm when the required warp tension is 5g/thread
- 7–12 threads/cm when the required warp tension is 10g/thread	- 11–18 threads/cm when the required warp tension is 10g/thread	- 15–24 threads/cm when the required warp tension is 10g/thread
- 6–8 threads/cm when the required warp tension is 15g/thread	- 9–11 threads/cm when the required warp tension is 15g/thread	- 12–15 threads/cm when the required warp tension is 15g/thread

Tab. 10: The possible range of textile that can be made with the analysable weights from Darsgärde.

Range of possible use for loom weights from Börsås kulle, three loom weights analysed

Tabby (2 rows)	2/1 Twill (3 rows)	2/2 Twill (4 rows)
- 9–11 threads/cm when the required warp tension is 10g/thread	- 14–16 threads/cm when the required warp tension is 10g/thread	- 19–21 threads/cm when the required warp tension is 10g/thread
- 7–9 threads/cm when the required warp tension is 15g/thread	- 10–14 threads/cm when the required warp tension is 15g/thread	- 14–18 threads/cm when the required warp tension is 15g/thread
- 5–7 threads/cm when the required warp tension is 20g/thread	- 8–11 threads/cm when the required warp tension is 20g/thread	- 11–14 threads/cm when the required warp tension is 20g/thread
- 5 threads/cm when the required warp tension is 25g/thread	- 8 threads/cm when the required warp tension is 25g/thread	- 11 threads/cm when the required warp tension is 25g/thread

Tab. 11: The possible range of textile that can be made with the analysable weights from Börsås kulle.

The loom weights used for analysis for each place are the following:

Boberget:
BOB-1153142,BOB-11531999, BOB-1153227, BOB-1153300, BOB-1153417a, BOB-1153417b, BOB-12823e, BOB-13823aa, BOB-13823ab, BOB-13823b, BOB-13823c, BOB-13823d, BOB-48, BOB-49, BOB-50, BOB-52, BOB-57, BOB-63,BOB-6, BOB-7a, BOB-7b, BOB-76, BOB-8

Gullborg:
GUL-1155160a, GUL-1155162, GUL-1155206b, GUL-1155206c, GUL-1155287, GUL-1155312, GUL-1155315b, GUL-13824a, GUL-13824b, GUL-13824c

Darsgärde:
DAR-1017, DAR-107, DAR-111a, DAR-116, DAR-387, DAR-406, DAR-48, DAR-49, DAR-592, DAR-903, DAR-928, DAR-947

Börsås kulle:
BOR-006, BOR-009a, BOR-033a

The loom weights' individual measurements and types are accounted for in the database, where it is also possible to see which of the weights have a weight (if complete) or a calculated weight (if not complete). See appendix for the list.

2.6.3 Possible Textiles & Comparison to Finds of Textiles

The analyses presented above show that:

- The collection of spindle whorls from Boberget suggest a possibility of spinning a variety of thickness of thread, noticeably a relatively thin thread.
- The spindle whorl from Börsås suggest the possibility of spinning a coarser thread than at Boberget.
- The loom weights show that the threads optimal to use for...

  ...Boberget requires 5–25g warp tension, which demands spindle whorls of a range weighing c. 4–18g.

  ...Gullborg requires 5–20g warp tension, which demands spindle whorls of a range weighing c. 4–8g.

  ...Darsgärde requires 5–15g warp tension, which demands spindle whorls of a range weighing c. 4–8g.

  ...Börsås requires 10–25g warp tension, which demands spindle whorls of a range weighing c. 4–18g.

In the case of Boberget, there actually is a trace of textile (2.5 by 2.5 centimetres) on a fragment of iron. It is a balanced 2/2 twill with 6/6 threads in one centimetre (Bender Jørgensen 1986: 235). This does not match the range calculated from the analysable weights from Boberget. However, if this textile was produced at this place, it means that the possible range is even wider than the analysis shows, making the “least possible”-perspective justified as there might have been loom weights appropriate to use for that weave. It is also worth noting that during the Iron Age, the craftspeople did not use these types of calculations to know how to use their tools; they relied on their learnt skill – tacit knowledge, so it is unsurprising that there can be some deviations when comparing with existing prehistoric textiles.

There are not many finds of textiles dating to the late Roman Iron Age and Migration Period from the areas relevant in this study (Bohuslän, Uppland, and Östergötland). However, in Sweden during this period, the 2/2 twill is the predominant weaving technique among the finds that have been made, with thread counts ranging between 6–16 threads/cm for this technique (Bender Jørgensen 1986: 234-235, Geijer 1972: 272). Tablet weaving was also predominant during this period (Geijer 1972: 272), but no traces of this have been found on either of the fortified hilltop settlements, maybe because the tablets often were made from organic materials. We have no way to prove or disprove the existence of this type of textile craft in the context of hillforts.

For the Migration Period, there are many more finds of textiles from Norway and Denmark, where similarly the 2/2 twill is the dominant weaving technique. For Norway the thread count is generally between 8–16 threads per centimetre where having 12 threads per centimetre is most common. The minimum and maximum thread count is 5 and 36 (Bender Jørgensen 1986: 67). This corresponds well with the Danish material which has commonly 10–20 threads per centimetre, with a minimum and maximum count of 5 and 33 threads per centimetre (Bender Jørgensen 1986: 60).

In analysis of textiles from Birka four groups were distinguished, with various qualities (Andersson 2003: 35-38):

Group I	Group II	Group III	Group IV
Coarser woolen fabrics Tabby 5–7/3–5 theards/cm	Fine fibre wool Patterned twills of high quality 24/15-c.55 threads/cm Dyed 3- or 4-end diamond twill	Ribbed fabrics Tabby of fine quality Thinly spun 15–25 threads/ cm 18–22 threads/ cm	Simple 2/2 twills Post treatment: shrunk. Pressed, fulled 11/8–20/22 threads/ cm Both hair and wool used, durable fabrics

Tab. 12: Textile quality groups from Birka. After description in Andersson 2003, p. 35-38.

Even if the material from Birka is Viking Age, it gives an indication of what might be considered quality textiles in earlier periods as well. All the hillforts of this study can make the coarser tabby; Boberget and Börsås are more likely since they can use the coarser threads that require 25 g warp tension. For the fine quality textile of Group II Boberget and Darsgärde can reach the thread count to match using threads that require 5-10 g warp tension. Gullborg could only use threads with 5 g warp tension. For the very fine quality tabby, Boberget and Börsås can just about make fabric that fits that group, using threads that require 5 g warp tension. All the sites could easily make the fabrics of Group IV, using threads with 10 g warp tension or over. Boberget clearly has the possibility of making a wide range of different textiles with their tools, both high quality, coarse, and simple textiles. The Darsgärde tools show that they are capable of making twills of both a simpler and more fine quality. Interestingly, from just three analysable loom weights from Börsås, it is possible to see that they could produce both coarse and fine tabbies. This result also confirms the difficulty, based on archaeological finds, to distinguish with certainty between household production and specialised production (Andersson 2003: 150). The material from Birka in comparison with Bender Jørgensen suggest that a thread count from c. 20 threads/cm can be considered fine (Bender Jørgensen 1992: 73) and the higher the thread count, the finer the quality. Whether the fabric is balanced or not (imbalance = when there is a strong difference in thread count between warp and weft) does not seem to impact the fineness of the fabric (Bender Jørgensen 1992: 75).

2.7 CONTEXTS

In order to contextualise the finds, I used the available plan drawings from ATA and the relevant publications (Nordén 1938, Ambrosiani 1964), and created maps that show the spread of loom weights and spindle whorls. Note that none of the modified maps are precise and should not be used for measurements. They have been created as a visual aid and reference for approaching the written documentation. For example, see Fig. 17, which is a collage of three different field drawings (stored as filmed plans at ATA) with a digital frame of the excavation units made by me, based on another field drawing. The drawing and frame does not match perfectly, but it gives a good indication for which structures were found in which excavation unit since this information was not given anywhere else, except for the mention of a building structure. The maps also work as a visual aid for the reader, in order to get a visual understanding about the extent which the hillforts have been excavated. For Darsgärde, the contextual information was more detailed than for the others. Most finds were connected to a layer or feature within the site. Restriction of time has limited the contextualisation that I could work with. I have had little opportunity to compare thoroughly which other types of objects are present in the same contexts as the textile implements, due to lack of documentation and time restraints for the present study, so the focus has been on the spatial context. Where I have found indications for other types of objects in the same context, it has been mentioned.

2.7.1 BOBERGET

At Boberget, around 250 m^2 has been excavated. Fig. 15 shows the size of the trenches in comparison with the size of the hillfort. There are still surfaces to be excavated. We know that parts of a building have been excavated (see 2.1) and that it is closely located to the wall in the southern parts of the hillfort. This is where the majority of the finds of loom weights are located. A large number of the spindle whorls are located to the excavation units D3:2 and C3, which are bordering each other. From these units there are also finds of iron fragments, hammer stones, coal, bronze pieces, pottery shards and gaming pieces. A large number of loom weights are located within the units D2 and C2, which are bordering to the south of the D3 and C3 units. From D2 and C3 there are other finds such as a piece of bronze, bronze button, hammer stones, pottery shards, amber pearls, gaming piece, grind stone, and a stone axe. The majority of finds which were given find numbers during excavation and were marked on the excavation plan were in trenches C2, C3, D2, and D3. One spindle whorl was located in the E2 unit. These all seem to be within what likely is the possible building (see Fig. 17). Of the analysable loom weights, most of them are located in the same area. The exception is a concentration of analysable loom weights in the northeast corner of A2. Unfortunately, the field drawings do not give much opportunity to contextualise them.

A large amount of fragmented loom weights are located in the A3 unit. Also one possible spindle whorl was found there. The only description of the feature there is that it is a stone setting. Other finds from this area includes pottery shards, a knife, iron fragments and a hammer stone (field drawings, ATA). A few loom weight fragments were found in the wall of the hillfort and there are fragments found between the wall and the stone setting.

Two spindle whorls were found in IIC and one in IIA. There are finds of analysable loom weights in IIB, IIC and IID. Fragmented loom weights are accounted for in most excavated units and in seven out of 31 trial trenches. The trenches IIA-IIE are located just by the central high plateau in the hillfort. Unfortunately, that entire area has not been excavated and I have not found any field drawings from that area at all. The items suggest there have been weaving activity performed there, since there are a fair number of more or less complete loom weights found there. The highest plateau is also a likely place for the site to showcase anything they find meaningful, since it is likely the most visible space.

The contexts that I find to be important to take into consideration then, apart from a general spread of items are thus: within a building, in the proximity of a stone setting, just inside the wall and close to the high plateau.

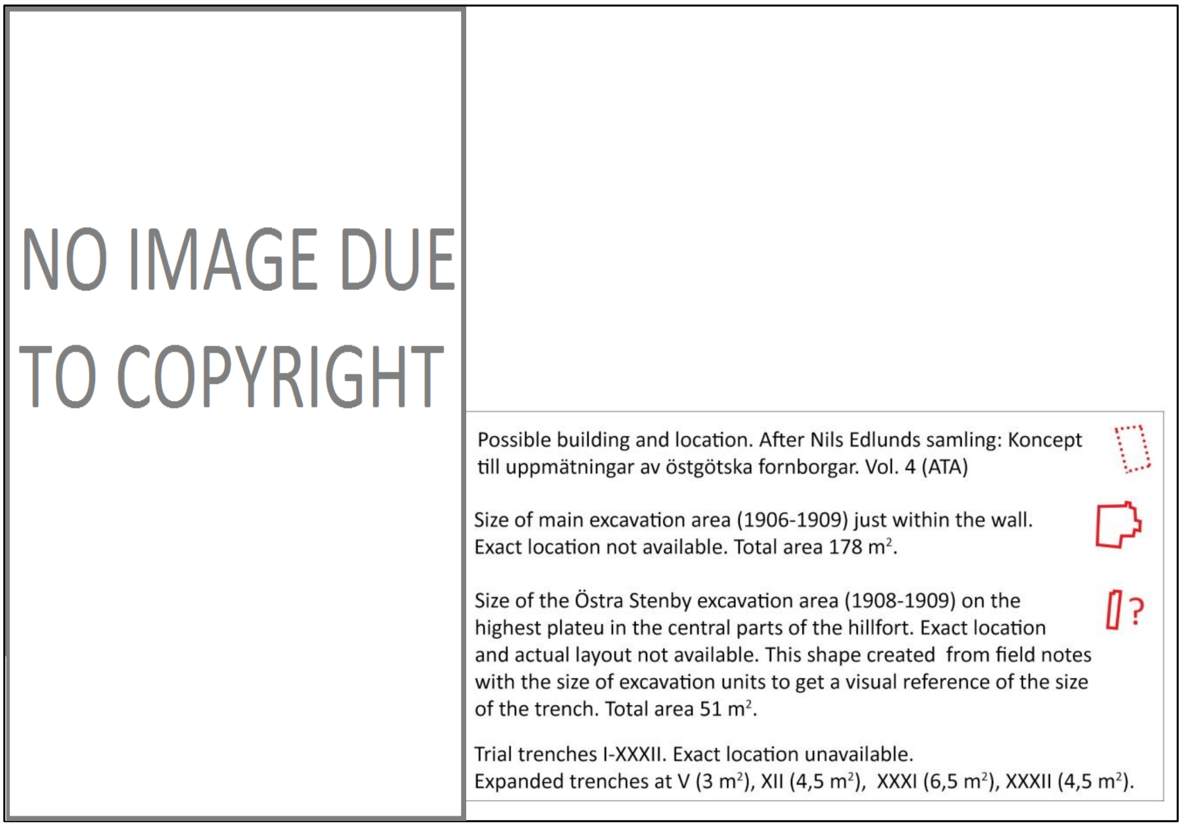


Fig. 15: Map of Boberget. Question mark, text and red symbols are added by author. Map by Nordén 1936, from Nordén 1938, p. N/A.

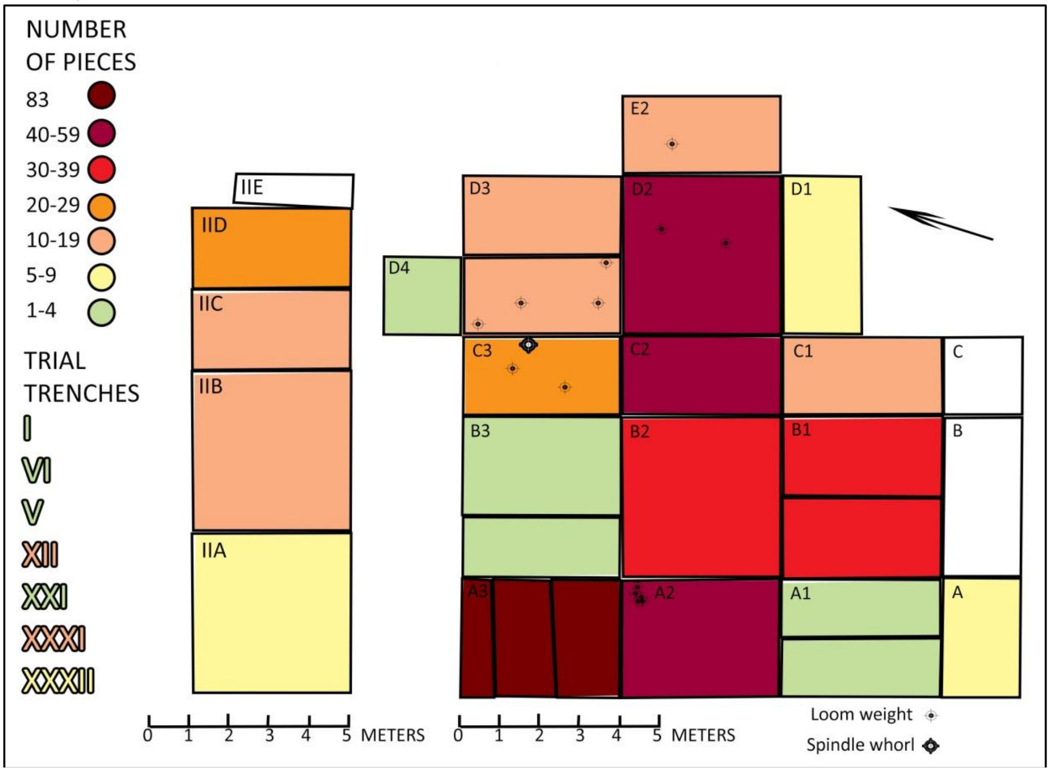


Fig. 16: Density of pieces of Loom Weights and the location of some of the analysable weights and one whorl. All levels of fragmentation included. Regarding the excavations units IIA-IIE, and the trial trenches, see the legend of the map above.

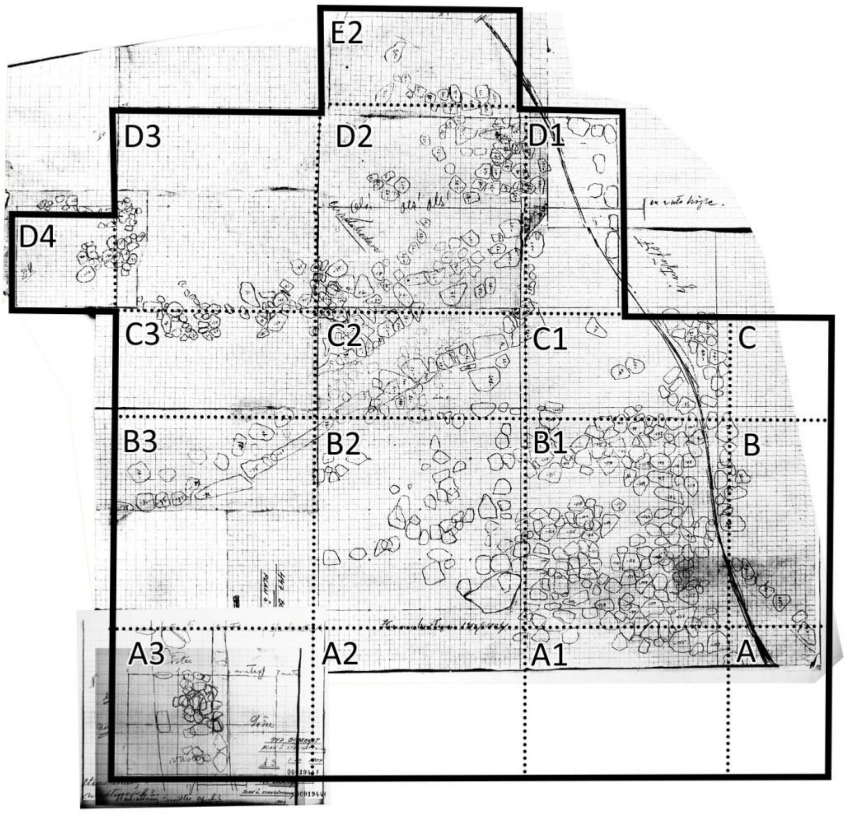


Fig. 17: Collage of three plan drawings of the main excavation area at Boberget. The line in the excavations to the right represents the wall. Compare with the plan below. Plan drawings filmed at ATA.

2.7.2 GULLBORG

At Gullborg around 200 m^2 has been excavated. I have only found one field drawing that sketches out the stones that where visible. This only covers trench B and is available at ATA (see description of Fig. 19). I have found no written account of any interpretation with regards to these except that at FMIS it is stated that no constructions could be identified in the trenches located in the western part of Gullborg. I have not been able to find any references within the original documentation about locations of possible houses within Gullborg, though Olausson writes that the fortified hilltop settlements in Östergötland, Uppland and Södermanland have mainly been filled with buildings (Olausson 2011a: 23).

This is making the contextualisation of the loom weights very difficult as I only have the field drawings, plans and Bror Schnittger's map (Fig. 18) to rely on.

Trench B, where the majority of the loom weights have been found, is located in what seems to be a hollow between two heights in the south part of the hillfort. The densest presence of loom weight pieces was located in the narrowest part of this hollow, towards the centre of the hillfort. The trench is also located just where the entrance, from the south, into the hillfort is situated in the break of the wall. Other finds from the same area include a crucible, rings, arrowheads, a bottleneck of glass, knives, gaming piece, a clasp, fire stones, iron rods, sheet metal, and whetstones. The excavation unit within trench C is facing that same hollow. A smaller number of finds were found in this trench: iron fragments, a ring, iron rods, knife, whetstone and rings. This context then suggests that textile craft existed close to other crafts, weapons, and leisure activities such as games. It is quite possible that if the area between those trenches were excavated, we would find even more loom weights. Interestingly, the corner of trench A with quite a dense presence of loom weights is faced toward the centre of the hillfort as well. Similar finds as in the other trenches has been made here. For all the other trenches, there seems to be presence of loom weights at various places at this site. From what I can tell from the maps, the highest densities are located towards the centre of the hillfort, the area that it is most convenient to walk through. Upon entering the hillfort are two heights on each side of the entrance, so you'd be most comfortable walking straight ahead, through the hollow and therefore ending up in the centre in the hillfort before relocating to the other areas in the site.

The contexts that I have been able to discuss are spatial, with some reference to the finds, and relate to the layout of Gullborg: the central space of the hillfort and the hollow just inside the entrance in the south. I've not found any publication discussing the site from a spatial perspective.

NO IMAGE DUE TO COPYRIGHT

Fig. 18: Map over Gullborg with excavation trenches marked. Legends and red symbols by author. Map by Schnittger, from Nordén 1938, p. 281, Fig. 237.

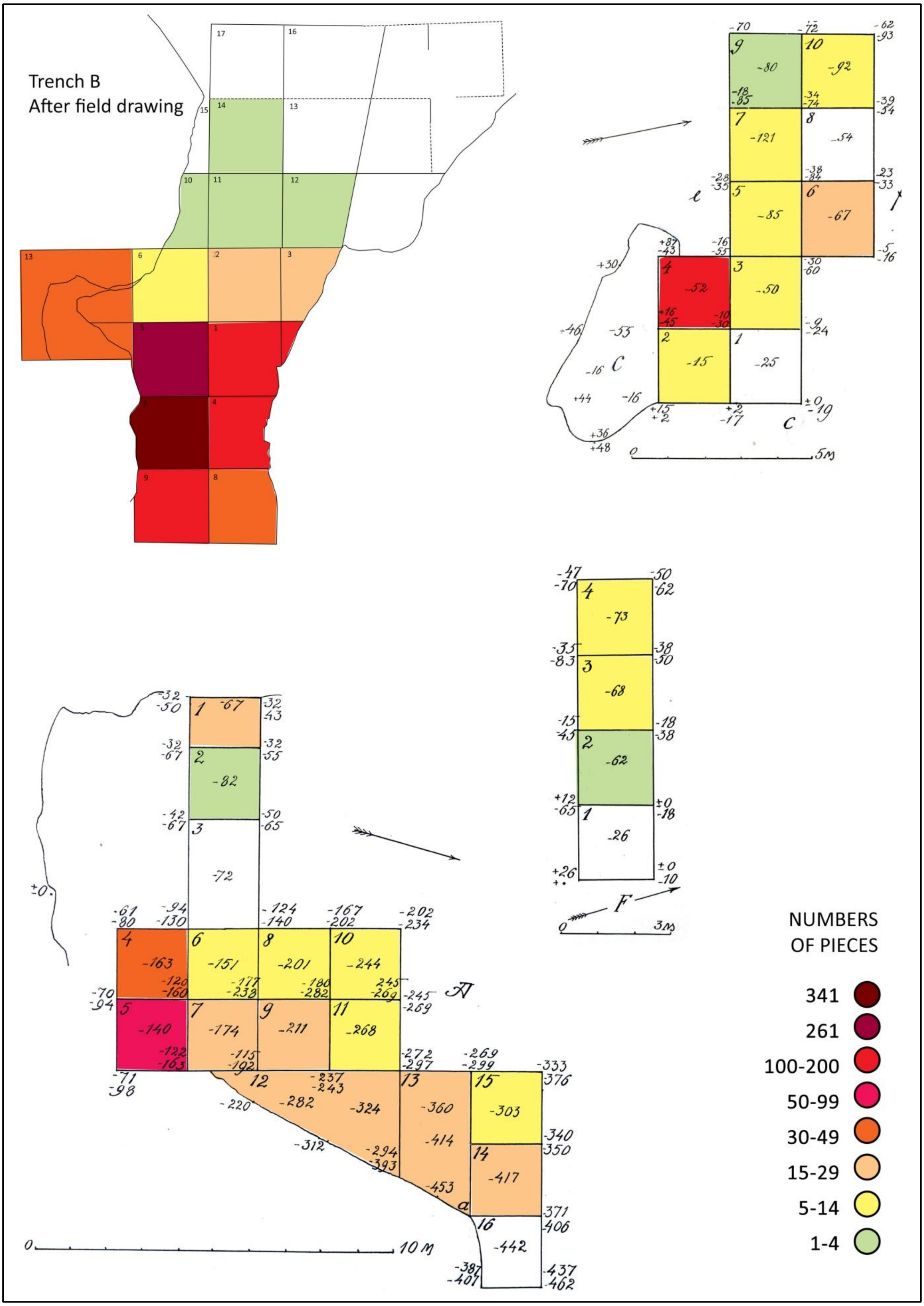


Fig. 19: Density of Loom weights at Gullborg in excavation trenches A, B, C and F. Number of pieces in D=5, E=10, G=2 (see previous map). Trench B after Schnittger's field drawings (ATA). Legend and colours added by author. Maps made by Schnittger (ATA, Bror Schnittger & Hannah Rydhs arkiv).

NO IMAGE DUE TO COPYRIGHT

Fig. 20: Map of Darsgärde with density of Loom Weights. A6-A34 is Terraces and Building Foundations. Legend, colours, and image title have been added by the author. Map by Ambrosiani, from Ambrosiani 1964, p.14, Fig.4.

2.7.3 DARSGÄRDE

Darsgärde is a good case to study in terms of contextualisation. The finds are all related to a context, the report is extensive and precise. More than 50% of the site's total area has been excavated, so the finds are considerably more representative for the site than in my other case studies. With more time, it is possible to relate the finds of textile implements to other finds, though this was not possible within the timeframe of this study. However, Ambrosiani writes that the majority of finds from the smaller houses are regular settlement material such as pottery, hammer stones, knives and some tools (Ambrosiani 1958: 167). For the A22, the longhouse there are also pottery, some iron objects and a fragment of a crucible (Olausson 2014b: 186). The exception is the crucibles for bronze casting. A few fragments of loom weights are found in or by A9-12, A10, A11, A16, A29, A28, and A35 and in the northern area of the settlement. These contexts represent between buildings, outside a building, within a building, stone concentration in a layer below the mountain. Most of the material was found within A13, A15 and A22. A13 and A15 are both buildings, located just next to each other. A22 represent a longhouse, possibly a hall building (Olausson 2014b: 184-185). The A13 and A15 are located very close to the longhouse. This gives an impression of quite a concentrated area of activity related to weaving. The lower amount of finds related to weaving, and spinning, at Darsgärde having in mind how much of the area that has been excavated, suggest that the textile production might not have been as extensive as Boberget and Gullborg. The location of tools related to weaving in the longhouse does imply that the craft is something that is embedded with meaning at Darsgärde regardless. With regard to finds made at Darsgärde, it is quite ordinary and corresponds with other farms of the period in the area.

Olausson writes that the finds to not indicate the presence of an elite and that the smaller houses have the character of workshops and storehouses mainly (Olausson 2014b: 186). The contexts that will be taken into consideration for Darsgärde are: Longhouse/hall building, two buildings located next to the longhouse.

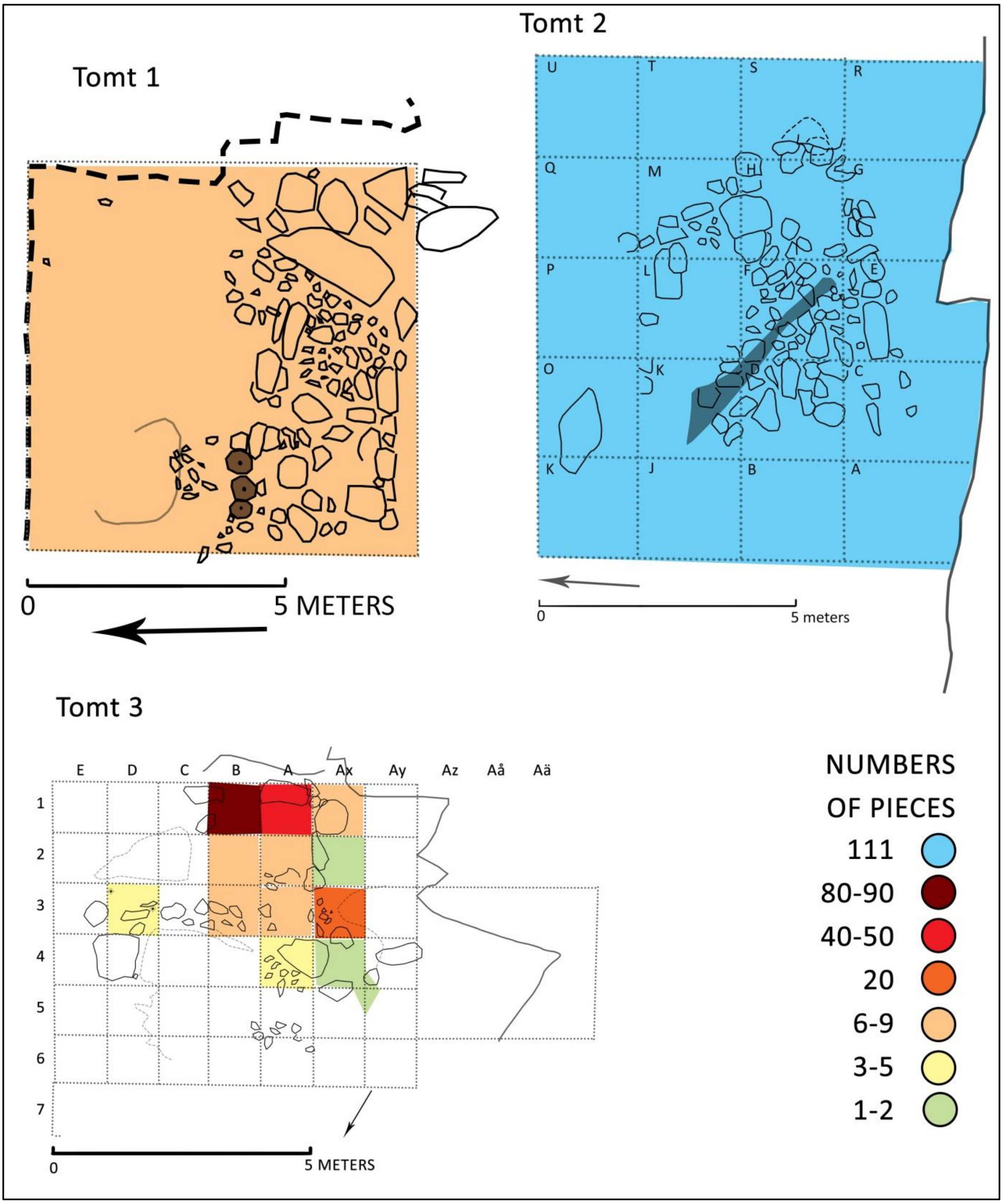


Fig. 21: Density of Loom weights in the excavation fields of Börsås. I am not certain of the exact extension of the trenches for all the trenches combined, the field drawings suggest that it is around some 100 m^2. All levels of fragmentation included. Tomt = Building lot. By author, after field-drawings (Umeå University).

2.7.4 BÖRSÅS KULLE

The extension of the trenches from Börsås kulle is somewhat uncertain, the field drawings gives some indication that it is around some 100 m^2. However, whether all of the excavation's units where completely excavated is unknown to me. From the field drawing I cannot tell which of the trenches had been placed where. The site is currently so overgrown that I was not able to orientate myself according to the surroundings in relation to the drawn plan. When I found one of the excavated areas I was not sure where I was on the mountain side in relation to the other trenches or the path leading up to the hillfort. The findings from Börsås kulle are not consequently recorded, only for Tomt 3 (building lot 3) have the finds been recorded after excavation unit, making the interpretation for the context difficult in the case of Tomt 1 and 2. It is safe to say that not many of the loom weights were found in Tomt 1, which has rotary querns as part of the building's construction. This suggests that not all houses at Börsås were dedicated towards the process of weaving. For Tomt 2 I can only say that the finds are connected to a building, but the lack of precision in the documentation don't give any indications of where in the house the finds are made. However, there are quite a lot of loom weight fragments in that building. None of the analysable weights were found there. For Tomt 3 we can actually see that the densest occurrence of loom weights is situated towards the southeast corner of the building, close to the natural rock wall. The spindle whorl and a loom weight were found in D3. The loom weight is described to have been found "in ash" and the whorl under the turf on the find box in SHMM. Notably, one loom weight (BOR-021) was actually found in one of the burial mounds and that particular one is also the weight that has the clearest trace of use-wear (see Fig. 12). Other finds from Börsås that are dominating the image of the site are related to harvest, such as grain, pieces of bread and several rotary querns in both the building lots and the burial mounds (Olausson 2014b: 194). The contexts that I will take into consideration then are: the division between presence in buildings, a concentration towards the south-eastern corner of the building in Tomt 3 and within a burial mound.

2.7.5 CONTEXT SUMMARY

A summary of the analysis of the contexts where spindle whorls and loom weights have been found at these various hillforts is that the spindle whorls from Boberget are located within a house, a concentration outside of the house quite close to the entrance, and toward the high plateau. For Börsås kulle, the spindle whorls are located within a building structure, separate from the densest findings of loom weights. The loom weights are in the cases of Boberget, Börsås and Darsgärde focused towards the buildings, although, for both Boberget and Darsgärde there are pieces found outside of buildings. Notably, for Darsgärde, there was a relatively high presence of loom weights in the longhouse and two buildings situated close to it. For Börsås, there surprisingly was a loom weight in a burial mound, which is unusual. Generally, spindle whorls are more common than loom weights in the context of burials. For Boberget we have a concentration of loom weights related to a stone setting, close to the entrance. For Gullborg, the majority of loom weights are found in the central parts of the site, with a high presence especially in the narrowest part of a hollow accessible just inside the entrance. The variance of the loom weights context is notable.

3 DISCUSSION

3.1 PRODUCING TEXTILES

What this study can show for certain is that there is a clear connection between the sites and the activity associated with weaving. The textile implements at the site are dominated by the loom weights. To some extent spinning can also be associated with the sites, especially Boberget. These are only two chains of the workflow (see Fig. 1) clearly represented at the sites and they may, based on comparisons with other sources, have been associated with the female gender. For example as seen in Northern European sagas mentioned earlier.

In the context of grave material, sewing and textile implements are only found in women's graves during the Scandinavian Iron Age (Hjørungdal 1991: 96, Cassel 1998: 49, Aspeborg 2008: 77). There are however exceptions to this rule as exemplified by an Iron Age burial in Pottenbrunn, Austria, where a 55–60 year old man has been buried with a spindle whorl. In this area it is also the norm that only women are buried with textile tools (Grömer 2016: 270-273).

The existing depictions show only certain parts of the textile production workflow, the spinning and weaving, which in these cases are also attributed to women. For all the other steps of the workflow, such as shearing sheep, treating flax, dyeing, and cutting and sewing the fabric, it is uncertain if there is a gender division or not (Grömer 2016: 273). I have not come across any texts that discuss any social function or symbolic meaning attributed to these steps:

- Preparing the raw material: breeding sheep, shearing, teasing/combing, etc.
- Production of the tools: weights, looms, shears, etc.
- Post-prep: processing dyestuff and dyeing, fulling, stretching, etc.
- Sewing: cutting, sewing, etc.

Regarding the steps not represented at the sites – could those be connected to the fortified hilltop settlements? For breeding sheep, pastures are needed as well as people to watch the sheep. There are finds of sheep bones from the hillforts. The sites definitely had access to sheep. But was it the people of the fortified hilltop settlements that herded their own sheep? It could be other settlement units in the area that provided the material for the hillforts. If that is the case, it would mean that the hillforts had a certain amount of influence among the surrounding settlements. For the other parts of the production, there is nothing obvious to prove or disprove that this was done at the sites.

With Arwill-Nordbladh's discussion in mind, where she suggests a differentiation within the female gender-construction in regards to the different processes of textile production (1998: 205), perhaps it is not unlikely that there are differentiations between more than just people of the female gender for the different processes. As mentioned above, there are male burials with spindle whorls which definitely suggest complex social dynamics.

Within some contexts it might be socially accepted for males to engage in activities otherwise perceived as belonging to the female sphere. The textile production activities which are less pronounced might not have as strong a social function as weaving or spinning. These "hidden" activities are still very open to interpretation and might hold social function we cannot currently perceive without further study. The whole workflow of textile production seems to have a differentiating symbolic meaning and pronounced social function, based on the material culture we find and the historical sources, they should however not be overlooked. The hidden steps of the workflow must have been performed somewhere by someone. If not at the fortified hilltop settlements, they are obviously performed somewhere else. We cannot presently know if the people dwelling at the hillforts are stationary there or if they have other settlements for their use as well. Regardless, if the activities were not performed at the hillforts, there was certainly a connection between the hillforts and other sites. For this study, the absence of material proof of these activities provides emphasis on the activities that are visible at the fortified hilltop settlements.

3.1.1 TYPES OF TEXTILES

The analysis was performed on spindle whorls and loom weights, using methods based on previous work and experiments performed by archaeologists and craftspeople associated with CTR. Although the analysis shows a wide possibility to create various levels of textiles, these are the least possible ranges of the craft at the sites. What they actually made at the sites is another matter. As previously mentioned in connection with Andersson's study of Birka, the difficulty lies in distinguishing between household and specialised production based on only the archaeological finds (Andersson 2003: 150). The warp-weighted loom, with a few sets of loom weights, is evidently a remarkably versatile instrument. It is theoretically possible to create low-quality, coarse fabrics as well as fine, high quality fabrics using the same tools. In order to discuss whether or not it was specialised the craft has to be contextualised.

The collection of spindle whorls from Boberget suggests a possibility of spinning a variety of thickness of thread, noticeably relatively fine threads. The spindle whorl from Börsås suggests the possibility of spinning a coarser thread than at Boberget. In comparison with textile groups from Birka (see Tab. 12), all the hillforts of this study can produce a course tabby and all could easily produce simple 2/2 twills. Boberget, Gullborg and Darsgärde can all produce high quality twills using fine threads. Although the material at Börsås does not match this, they can make fine tabbies. Boberget can also make the fine tabbies. Boberget is therefore the only of the sites that can produce textiles belonging to all four groups of textiles. I want to remind the reader that these results are not absolute. It is the result of an analysis that show the least possible level of production, based on just the loom weights that are analysable and are therefore not 100% representative for the sites. The sites could theoretically have a wider range of possible types of textiles.

3.2 VISIBLE CRAFTS

Cassel put forward how the loom weights and weaving usually belongs to the home or house, and spindle whorls belong to the individual (Cassel 1998: 111-113). The spread of finds on the fortified hilltop sites show that loom weights are present in both public/visible and private/closed spaces. The contexts that seem to be of a slightly more private nature include presence within the buildings and within a burial mound. In the case of burial mounds especially it is discussable whether it is private as in personal representation, or rather a representation of the person buried based on the perspectives of the people burying them. It can also be discussed whether the person rather than being represented themselves represents a population or ideas within the society. For the presence of loom weights within the buildings, such as the building at Boberget, the possible workshops at Darsgärde, and the building lots at Börsås, they are arguably more private than the other contexts. They are within an enclosed and restricted area, assumedly accessed mainly by the people who reside there.

For the more public aspect, there are a lot of loom weights found close to the entrance to Boberget: In relation to the so-called stone-setting close to the wall, the building is also located close to the wall, being one of the first things people would have seen when entering the hillfort (and can in this regard be viewed as public). There are in general finds of loom weights between the stone-setting, the wall and the building making the whole entrance area relatable to the craft. Since the loom is constructed to lean towards a wall, it is most likely that the actual weaving took place within the house. There are also finds of loom weights toward the high-plateau in the central parts of the hillforts, suggesting that the craft could have been performed there as well. As the high-plateau could arguably be the place at the site which is most dominating, the textile craft there, and just by the entrance, could easily have had a representative character. It is something meant to be seen. This is applicable to the craft at Gullborg as well. The find distribution is heavy towards the centre of the hillfort, toward the hollow which seems to be the most easily accessed area in the hillfort. To my knowledge, nothing indicates a building here, but the amount of loom-weights in this particular area suggests that the tools were likely to have been used here and therefore seen upon entering the hillfort.

The textile production of Darsgärde is more ambiguous in the respect of public and private. On the one hand, the loom weights are located in buildings, most of them in what is thought to be workshops. On the other hand, some are located in a longhouse, a possible hall which is a house of representation. It is a place where guests are invited. To access the longhouse, the guest has to pass the whole interior of the hillfort, since it is furthest from the entrances. The “textile workshops” are located very close to the longhouse and would probably have been seen. But the craft itself would have been closed from sight unless you entered the building. In the circumstances of Börsås, the tools are restricted to the buildings and one burial (keep in mind, however, that these are the only excavated areas), which gives the impression of a less public craft in comparison to the other sites. With a perspective of the burials as public representations though, with the aim of showcasing the people of the site who engage in the activities, Börsås could also be considered as a site which wanted the craft to be representative. The idea of craft as representative is common within studies of central places and since fortified hilltop settlements are suggested to be sites that are of higher rank than ordinary settlements or farms, craft within the context of a central place is worth discussing.

These various levels of visibility of the textile production suggest that the craft might have had slightly different functions at the site and that the sites had clear ideas and control over the extent of craft that should be viewed or not. The practical function is similar for all the sites: the spinning of thread on some of the sites, and for all the sites: the weaving of textiles of likely fine quality. The symbolic meaning of weaving is not something that I will discuss in depth, since it is so difficult to assess. But the associations to weaving and spinning in the Norse sagas mentioned earlier in this text suggest that the material culture and activity surrounding spinning and weaving are embedded with symbolic meaning which penetrates the whole of Iron Age society, relating to the themes of foretelling and creating fate. The social function of the craft, especially concerning weaving, seems to be connected to the organisation of production (see below). As social function is connected to how the material objects are part of constituting and confirming the identities of the people performing the activities it is essential to have an idea of the group of people associated to the hillforts. For a better understanding of the social function of the textiles, finds of the produced textiles would be very helpful. If the case is that tapestries were being woven, it would have made a huge statement. As previously described, tapestries can depict history and build identity and it is such a specific craft that it would require a great deal of specialised knowledge. There is nothing that proves or disproves the production of tapestries at these sites.

3.2.1 Fortified Hilltop Settlements as Central Places

Martin Rundqvist describes Gullborg to be an elite settlement while other fortified hilltop settlements in Östergötland such as Boberget and Odenfors are "fortified farmsteads with varying social pretensions" (Rundqvist 2011: 32, 124) which highlights the internal individuality among this group of hillforts. John Ljungqvist presents four functions that can be attributed to central places: judicatory, cult (presence of a "harg" or hall), communicative location and craft production (2006: 82-83). Specialised craft such as bronze casting, horn crafts, and comb production, are indications of elite environments. Presence of specialised craft shows the aim of an elite group to control these productions. Ljungqvist does not consider textile craft as a whole to be a specialised craft because it has been performed at most of the settlements during the Iron Age, though he does not discuss it in relation to different qualities of textiles and extent of production (2006: 90-94). Another indication for the social elite group is burial mounds, especially great mounds. At Runsa borg, there is a great mound that is over 40 metres in diameter. At the sites I studied there are only burial mounds at Börsås, one aptly named "the King's Mound". Though, they are not of size with the great mounds, they could still be connected to an elite if, as Peter Bratt argues for circumstances in lake Mälaren area, the elite made the mound burials relevant again by using them to claim right to the land (2008: 186-187).

The hillforts which I have studied are individual and relate to the concept of central places in various ways. Boberget and Gullborg show the most extensive textile production due to their large amount of textile implement finds and Boberget's wide range of possible production. Also, the possibility to create very fine textiles suggests a specialisation. At Gullborg there are also finds of Roman imports. At Börsås there are the burial mounds and a communicative location which indicates an elite setting. Darsgärde might have far fewer finds of loom weights, but the site has a longhouse/hall, presence of bronze casting and a very communicative location. In comparison to the sites I have studied, there is Runsa borg which has bronze casting, comb and horn/bone crafts, a hall, a cult activity area, a great mound, a communicative location, and rich finds. The site is in these regards clearly a central place – with textile production.

3.2.2 Specialised Craft

As previously mentioned, it is difficult to see a distinction between household and specialised production. Sites with specialised textile production often have evidence for other crafts such as bronze casting, comb or bead-making. High-quality cloth is identified in assemblage of light spindle whorls. Other exclusive textiles are: tablet woven bands, details in metal thread, tapestries (Andersson 1999: 40). We have no proof for the other exclusive textiles being made at the hillfort, but it is still possible that for example tapestries could be made with the tools present. For Darsgärde, there are archaeological remains of bronze casting and at Runsa borg, there are finds of both bronze casting and comb-making. It is not so farfetched to assume the textile production there being specialised.

In grave material it is visible that the elite associated with textile craft production. Kerstin Cassel shows in her study, that within the context of graves on Gotland from the Roman Iron Age, that graves that hold spindle whorls are of a quite special nature: they never include weapons but have more items than the average grave. They often hold more Roman items as well (1998: 49). Tove Hjørungdal can show that from the same period in Norway, graves with tools are often rich graves, sometimes with import goods, within the context of a great mound area (Hjørungdal 1991: 100). Whether the buried individuals with tools are certainly craftspeople is difficult to prove, but these studies show that the idea of elite identity and craft production is linked together. Hjørungdal raises the question of whether the individuals with tools are representing people or families that administer the production and commerce in the local area (1991: 100) and Cassel agrees that this might be the case but relates the choice of the spindle whorl in particular to the mythological meaning embedded within the object (1998: 49), the female spinning thread.

It is a high chance of specialisation of textile production if there are other features that indicated specialised craft or evidence of elite manifestation. If comparing the sites to each other, Boberget really stands out as the most productive. This is partly a result based on there being more analysable weights found there. However, the wide ranges and number of different weights there (see Fig. 8) in comparison to the other sites gives the impression that the textile craft is more pronounced at that site. The situation for Gullborg is similar and they both share finds of pyramidal loom weights. It is possible that for the fortified hilltop settlements of Östergötland, that the textile production has a stronger manifestation there because they lack some of the other elite-indicating features of the other sites. Börsås kulle has their burial mounds and Darsgärde has bronze casting and a likely house of representation (hall). Runsa borg has the whole package with all these features. With this in mind, I’d argue that it would be possible that a high level of textile production, in itself, could be an indicator for prestige. When other types of craft or prestige manifestations are in place, the textile production might not need to be as specialised and visible.

The social function of textile production, in regards to specialisation in the context of a central place, chiefly seems to be representation and constitution of elite identity by controlling the production of fine textiles.

3.3 Conclusion: The Roles of Textile Production at Fortified Hilltop Settlements

The practical function of the textile implements found at Boberget, Gullborg, Darsgärde and Börsås kulle is to spin thread and weave textiles. With the tools present, it was possible to make both fairly coarse and fine weaves. At the moment it cannot be proved exactly which textiles were actually made since there are few finds of textiles from the time period in Sweden, especially from these areas.

The context of a central place does however suggest a likelihood of a specialised textile production at these sites. The level of specialisation is assumedly varied between the sites. Boberget has the possibility to create the widest range of different textiles. The spread of finds and their context suggest a fairly visible production: of a representative nature. In Börsås a loom weight is found in a burial mound, demonstrating a personal or collective connection to the craft. At Darsgärde there are finds of loom weights in workshops close to the longhouse and in the longhouse, likely a house of representation at that site. Some steps of the workflow were probably not made on the site, such as breeding and shearing the sheep. As central places, they were likely connected to other settlement units which could have shared some steps of the workflow. In that circumstance it is likely that the hillfort was in control of the textile production.

All in all, the textile production at these sites is meaningful to the people dwelling there, especially the spinning and weaving. It worked as a specialised and also a representative activity. Socially it might have functioned as a sustenant for the elite as a mark of their identity. With the ideas of the period in mind, these activities were likely to have been performed by people of the female gender, though there might be differentiation between the craftspeople of the various aspects of the production.

For a better study and analysis, there would need to be a higher degree of well-preserved loom weights and especially spindle whorls. This is almost always the case with archaeology; the material does not always perfectly represent the circumstances of the past. However, the analysis would have been more efficient if there had been a more standardised and similar documentation methods used at the sites. For Börsås, there was very little written documentation to use at all and the find material barely related to a context. Darsgärde was the best documented site and was easiest to work with. For Boberget, I had very little to go on in regards to all the trenches that was not adjacent to the wall. Contextualising on many different levels is easier and doable with a well performed documentation. A comparison between the sites and the representativity of the material would also be stronger if the sites are excavated to the same extent. For a possibility for comparative studies of how the textile production during the late Roman Iron Age and the Migration Period manifests in various contexts, more studies of this kind would be helpful.

This study shows how, within a specific context, a craft that often is viewed as a simple household activity, can embody specific social functions relevant to that site. The practical function and morphological traits of the material culture and the organisation of production, in combination, is essential for understanding the connection between craft and social function.

4 REFERENCES

4.1 LITERATURE

Almgren, O. 1904. *Sveriges fasta fornlämningar från hednatiden.* Stockholm.

- 1906. Undersökningar på Vikbolandet 1906. *Meddelanden från Östergötlands Fornminnesförening 1906.* Linköping.
- 1907. Undersökningar på Boberget 1907. *Meddelanden från Östergötlands Fornminnesförening 1907.* Linköping.

Ambrosiani, B. 1958. Darsgärdekomplexet: en preliminär rapport. *Fornvännen 53.* Stockholm.

- 1959. Keramikboplatsen på Hamnbrinken vid Darsgärde. *Tor: tidskrift för nordisk fornkunskap.* Societas archaeologica Upsaliensis 108-128. Uppsala.
- 1964. *Fornlämningar och bebyggelse: studier i Attundalands och Södertörns förhistoria*. Uppsala.

Andersson, E. 1996. *Textilproduktion I arkeologisk context. En metodstudie av yngre järnåldersboplatser I Skåne.* University of Lund, Institute of Archaeology Report Series No. 58. Lund.

- 1999. *The Common Thread. Textile Production during the Late Iron Age – Viking Age.* University of Lund, Institute of Archaeology Report Series No. 67. Lund.
- 2003. *Tools for Textile Production from Birka and Hedeby.* Birka Studies 8. Stockholm.
- 2004. The reconstruction of archaeological textiles, a source critical approach. *Priceless invention of humanity: textiles.* Acta archaeologica Lodziensia, Nr 50/1. Łódź.
- 2010. Experimental Textile Archaeology. *North European Symposium for Archaeological Textiles X*. Ancient textiles series 5. Oxford.
- 2015. The basics of textile tools and textile technology – from fibre to fabric. *Tools, textiles and contexts. Investigating Textile Production in the Aegan and Eastern Mediterranean Bronze Age.* Ancient textiles series 21. Oxford.

Andersson, E. & Batzner, A. 1999. Spinning wool: now and then. *The Common Thread. Textile Production during the Late Iron Age – Viking Age.* University of Lund, Institute of Archaeology Report Series No. 67. Lund.

Andersson, L. 2000. *Återställande av Darsgärde Fornborg. Antikvarisk kontroll i samband med återställande av Darsgärde fornborg, Skederids socken, Norrtälje kommun. RAÄ 16.* Rapport 2000:4. Stockholms Läns Museum. Stockholm.

Andersson Strand, E., Gebauer Thomsen, L. & Cutler, J. 2011. *From Tools to Textiles.* CTR. Unpublished.

Andersson Strand, E., Mårtensson, L. & Nosch, M-L. 2009. Shape of things. Understanding a Loom Weight. *Oxford Journal of Archaeology Vol. 28, No. 4.* Oxford.

Andersson Strand, E. & Nosch, M-L. 2015. Introduction to the CTR-database. *Tools, Textiles and Contexts. Investigating Textile Production in the Aegan and Eastern Mediterranean Bronze Age.* Ancient Textile Series 21. Oxford.

Andersson Strand, E., Nosch, M-L. & Olofsson, L. 2015. Experimental testing of Bronze Age textile tools. *Tools, Textiles and Contexts. Investigating Textile Production in the Aegan and Eastern Mediterranean Bronze Age.* Ancient Textiles Series 21. Oxford.

Andrén, A. 2006. A world of stone. Warrior Culture, Hybridity and Old Norse Cosmology. *Old Norse Religion in Long-term perspectives. Origins, changes, and interactions: an international conference in Lund, Sweden, June 3-7, 2004.* Vägar till Midgård 8. Lund.

- 2014. *Tracing Old Norse Cosmology. The world tree, middle earth, and the sun in archaeological perspectives.* Lund.

Arwill-Nordbladh, E. 1998. *Genuskonstruktioner i nordisk vikingatid. Förr och nu.* GOTARC. Series B No 9. Göteborg.

Aspeborg, H. 2008. *Bönder och barbarer. Helsingborgsområdets järnålder.* Skrifter; Stadshistoriska avdelningen, Dunkers kulturhus, 11. Helsingborg.

Belanová Štolcová, T. & Grömer, K. 2010. Loom-weights, Spindles and Textiles – Textile Production in Central Europe from the Bronze Age to the Iron Age. *North European Symposium for Archaeological Textiles X*. Ancient textiles series 5. Oxford.

Bender Jørgensen, L. 1986. *Forhistoriske textilier I Skandinavien.* Nordiske fortidsminder. Serie B - in quarto, 9. Copenhagen.

- 1992. *North European Textiles until AD 1000*. Aarhus.

Bratt, P. 1998. En gård i Roslagen. *Forntid i ny dager. Arkeologi i Stockholmstrakten.* Stockholm.

- 2008. *Makt uttryckt i jord och sten. Stora högar och maktstrukturer i Mälardalen under järnåldern.* Stockholm Studies in Archaeology 46. Stockholm.

Brink, S. 2004. Mytologiska rum och eskatologiska föreställningar i det vikingatida Norden. *Ordning mot Kaos – studier av nordisk förkristen kosmologi.* Vägar till Midgård 4. Lund.

Burenhult, G. 1999. *Arkeologi i Norden 2.* Stockholm.

Carlsson, A. 2005. Tankar kring Torsten och Torborg. *Arkeologi och naturvetenskap*: *Gyllenstiernska krapperupstiftelsens symposium nr 6 år 2003*. Nyhamnsläge.

- 2015. *Tolkande arkeologi och svensk forntidshistoria.* Stockholm Studies in Archaeology 64. Stockholm.

Cassel, K. 1998. *Från grav till gård: romersk järnålder på Gotland.* Stockholm Studies in Archaeology 16. Stockholm.

Costin, C.L. 1991. Craft Specialization: Issues in Defining, Documenting, and Explaining the Organization of Production. *Archaeological Method and Theory.* Tucson.

Crumley, C. 1995. Heterarchy and the Analysis of Complex Societies. *Heterarchy and the Analysis of Complex Societies.* Archaeological Papers of the American Anthropological Association no. 6. Washington.

Damell, D. & Lorin. O. 2010. Fornborgsundersökningar i norra Södermanland: en slutrapport. *Situne Dei 2010.* Sigtuna.

Davidson, H. E. 1998. *Roles of the Northern Goddess.* London.

Engström, J. 1984. *Torsburgen. Tolkning av en gotländsk fornborg.* Aun 6. Uppsala.

- 1999. Förhistorisk fortifikation. *Arkeologi i Norden 2.* Stockholm.

Fabech, C. & Ringtved, J. 1995. Magtens geografi i Sydskandinavien: Om kulturlandskab, produktion og bebyggelsesmønster. *Produksjon og samfunn: om erverv, spesialisering og bosetning i Norden i 1. årtusen e.Kr.: beretning fra 2. nordiske jernaldersymposium på Granavolden Gjæstgiveri 7-10 mai 1992.* Universitetets Oldsaksamling 30. Oslo.

Fornvännen 1911 (author anonymous). 1911. Tillväxten under år 1911. *Fornvännen 2011*. Stockholm.

Franzén, M-L., Lundwall, E., Sundström, A. & Andersson Strand, E. 2012. Sweden. *Textiles and Textile Production in Europe: From Prehistory to AD 400.* Ancient Textiles Series vol. 11. Oxford.

Geijer, A. 1972. *Ur textilkonstens historia.* Lund.

Gleba, M. & Mannering, U. 2012. Introduction: Textile Preservation, Analysis and Technology. *Textiles and Textile Production in Europe from Prehistory to AD 400.* Ancient Textiles Series vol. 11. Oxford.

Grömer, K. 2016. *The Art of Prehistoric Textile Making. The development of craft traditions and clothing in Central Europe.* Veröffentlichungen der Prähistorischen Abteilung 5, Verlag des Naturhistorischen Museums Wien, Vienna 2016. Vienna.

Gustafsson, N. B. 2009. Vikingatida blästerskydd av sten och lera från Mälardalen. *Fornvännen 2009:4.* Stockholm.

Hallström, G. & Nyström. P. 1963. *1911-års undersökning av fornborgen Börsås kulle i Skredsvik*. Bohusläns hembygdsförening. Uddevalla.

Heide, E. 2006. Spinning seiðr. *Old Norse Religion in Long-term perspectives. Origins, changes, and interactions: an international conference in Lund, Sweden, June 3-7, 2004.* Vägar till Midgård 8. Lund.

Helgesson, B. 1998. Vad är centralt? – fenomen och funktion: lokalisering och person. *Centrala Platser, Centrala Frågor. Samhällsstrukturen under Järnåldern.* Acta Archaeologica Lundensia, series in 8^0, No. 28. Lund.

Hermelin, E.M. 1929. Om södermanlands fornborgar. *Fornvännen 24.* Stockholm.

Hoffman, M. 1964. *The Warp-weighted loom: studies in the history and technology of an ancient implement*. Studia Norvegica 14. Oslo.

Ingstad, A.S. 1992. Oseberg-dronningen – hvem var hun? *Osebergdronningens grav: Vår arkeologiske nasjonalskatt i nytt lys.* Oslo.

Johansen, B. 1997. *Ormalur: aspekter av tillvaro och landskap*. Stockholm Studies in Archaeology 14. Stockholm.

Johansen, B. & Petterson, I-M. 1993. *Från borg till bunker: Befästa anläggningar från förhistorisk och historisk tid.* Fornlämningar i Sverige 2. Riksantikvarieämbetet. Stockholm.

Kresten, P. 1992. Swedish vitrified forts - a reconnaissance study. *Fornvännen 87*. Stockholm.

Ljungqvist, J. 2006. *En hiar atti rikR: Om elit, struktur och ekonomi kring Uppsala och Mälaren under yngre järnålder.* Aun, 34. Uppsala.

Miszk, L. 2012. The Interpretation of Loomweights in various archaeological contexts. *Studies in Ancient Art and Civilization, vol. 16.* Krakow.

Nordén, A. 1929. *Östergötlands Järnålder. Monografier. Vol.1, Häfte 1.* Stockholm.
- 1938. *Östergötlands Järnålder. Monografier. Vol.1, Häfte 2.* Stockholm.

Nosch, M-L. 2014. Voicing the Loom: Women, Weaving and Plotting. *KE-RA-ME-JA: Studies presented to Cynthia W. Shelmerdine.* Philadelphia.

Nylén, E., Lund Hansen, U. & Manneke, P. 2005. *The Havor Hoard. The Gold – The Bronzes – The Fort.* Kungl. Vitterhets-, historie- och antikvitetsakademiens handlingar. Antikvariska serien, 46. Stockholm.

Näsman, U. 1998. Sydskandinavisk samhällsstruktur i ljuset av merovingisk och anglosaxisk analogi eller i vad är det som centralplatserna är centrala? *Centrala Platser, Centrala Frågor. Samhällsstrukturen under Järnåldern.* Acta Archaeologica Lundensia, series in 8^0, No. 28. Lund.

Olausson, M. 1995. *Det inneslutna rummet – om kultiska hägnader, fornborgar och befästa gårdar i Uppland från 1300 f Kr till Kristi födelse.* Studier från UV Stockholm. Riksantikvarieämbetet, Arkeologiska undersökningar 9. Stockholm.
- 1996. *Runsa fornborg: en befäst stormannagård från folkvandringstid*. Skrifter om Väsby 5. Upplands-Väsby.
- 2002. *Två uppländska fornborgar*. Rapporter från Arkeologiska forskningslaboratoriet 6. Stockholm.
- 2010. När Mälardalens elit flyttade upp på höjderna: om folkvandringstidens höjdbosättningar. *Makt, kult och plats: högstatusmiljöer under äldre järnåldern: kultplatser: två seminarier arrangerade av Stockholms läns museum under 2009 och 2010*. Arkeologi i Stockholms län 5. Stockholm.
- 2011a. Förord + Inledning. *Runnhusa: bosättningen på berget med de många husen*. Skrifter från projektet Runsa borg, Eds socken, Uppland; 1. Stockholm.
- 2011b. ”… ett slags bostadslämning med härd”. *Runnhusa: bosättningen på berget med de många husen*. Skrifter från projektet Runsa borg, Eds socken, Uppland; 1. Stockholm.
- 2011c. Undersökningen av Runsa borg 2010. *Runnhusa: bosättningen på berget med de många husen*. Skrifter från projektet Runsa borg, Eds socken, Uppland; 1. Stockholm.
- 2014a. The investigations of the Runsa Hilltop Site 2011-2013. *Runsa Borg: Representative Life on a Migration Period Hilltop Site – a Scandinavian Perspective.* Papers from the Project Runsa borg, Uppland; 2. Östersund.
- 2014b. The Great House at Runsa – a house of representation. *Runsa borg: Representative Life on a Migration Period Hilltop Site – a Scandinavian Perspective.* Papers from the Project Runsa borg, Uppland, 2. Östersund.
- 2016. Varför bygga på höjder? Om den yngre folkvandringstidens och äldre vendeltidens höjdbosättningar. *Fornborgar, höjdbosättningar*

– aktuell forskning. Rapport från ett seminarium hösten 2015. Stockholms läns hembygdsförbund

Renfrew, C. & Bahn, P. 2008. *Archaeology: Theories, Methods and Practice.* Fifth edition. London.

Rundqvist, M. 2008. *Prospektering kring fornborgen Gullborg i Tingstad sn, 10 april 2008.* Report. Archived at ATA.

- 2011. *Mead-halls of the Eastern Geats. Elite Settlements and Political Geography ad 375–1000 in Östergötland, Sweden.* Kungl. Vitterhets-, historie- och antikvitetsakademiens handlingar. Antikvariska serien, 49. Stockholm.

Schnittger, B. 1908. Undersökningar på Boberget 1908. *Meddelanden från Östergötlands Fornminnesförening 1908.* Linköping.

- 1909. Östergötlands fornborgar. Grävningsnotiser. *Meddelanden från Östergötlands Fornminnesförening 1909.* Linköping.

Shaffrey, R. 2012. Worked stone. *A Road Through the Past: Archaeological discoveries on the A2 Pepperhill to Cobham road-scheme in Kent.* Oxford Archaeology Monograph No 16. Oxford.

Vandkilde, H. 2000. Material Culture and Scandinavian Archaeology. A review of the concepts of form, function and context. *Form, Function & Context. Material culture studies in Scandinavian Archaeology. Acta archaeologica Lundensia. Series in 8°, No. 31.* Lund.

Wall, Å. 2003. *De hägnade bergens landskap: om den äldre järnåldern på Södertörn*. Stockholm Studies in Archaeology 27. Stockholm.

Watt, M. 1991. Sorte Muld. Høvdingesæde og kultcentrum fra Bornholms yngre jernalder. *Fra stamme til stat i Danmark 2. Høvdingesamfund og kongemagt.* Jysk Arkæologisk Selskabs skrifter: 22 (2). Højbjerg.

Widegren Lundin, L. 2011. *Efter fornborgarna… En granskning av Stenbygårdarnas koppling till fornborgarna och periodskiftet 550 e.Kr.* Bachelor thesis. Stockholm.

Wild, J-P. 2003. Introduction: General Introduction. *The Cambridge History of Western Textiles I.* Cambridge.

Zagal-Mach Wolfe, U. I. 2013. *Grasping Technology, Assessing Craft. Developing a Research Method for the Study of Craft-Tradition.* Acta archaeologica Lundensia. Series in 8°, No. 63. Lund.

4.2 Web Pages

CTR/The Danish National Research Foundation's Centre for Textile Research. *The Danish National Research Foundation's Centre for Textile Research* [online]. http://ctr.hum.ku.dk/ [Accessed 2016-02-12, 2016-05-05]

Hellquist, E. 1922. *Svensk Etymologisk Ordbok* [online]. Digitalised by Projekt Runeberg. Available at http://runeberg.org/svetym/ [Accessed 2016-02-09]

Historiska Museet. 2011. *Sök i samlingarna* [online]. Available at http://mis.historiska.se/mis/sok/start.asp [Accessed on multiple occasions between 2016-02-01 and 2016-05-05]

- **MIS.** *Föremål 874492. SHM 13823:II C:18* [online]. http://kulturarvsdata.se/shm/object/874492 [Accessed 2016-05-05]
- **MIS.** *Föremål 454378. SHM 25878 (F532)* [online]. http://kulturarvsdata.se/shm/object/454378 [Accessed 2016-05-06]

Museiarkeologi Sydost, Kalmar läns museum. *Sandby borg* [online]. Available at: http://www.sandbyborg.se/ [Accessed 2016-01-25].

Nationalencyklopedien. *Fornborg* [online]. http://www.ne.se/uppslagsverk/encyklopedi/l%C3%A5ng/fornborg [Accessed 2016-02-17]

Riksantikvarieämbtet. *Fornsök* [online]. http://www.fmis.raa.se/cocoon/fornsok/search.html

- **FMIS.** *RAÄ-nummer Östra Stenby 281:1* [online]. http://kulturarvsdata.se/raa/fmi/html/10055602810001 [Accessed 2016-05-05]
- **FMIS.** *RAÄ-nummer Östra Stenby 204:1* [online]. http://kulturarvsdata.se/raa/fmi/html/10055602040001 [Accessed 2016-05-05]
- **FMIS.** *RAÄ-nummer Tingstad 54:1* [online]. http://kulturarvsdata.se/raa/fmi/html/10050800540001 [Accessed 2016-05-05]
- **FMIS.** *RAÄ-nummer Tingstad 54:2* [online]. http://kulturarvsdata.se/raa/fmi/html/10050800540002 [Accessed 2016-05-05]
- **FMIS.** *RAÄ-nummer Skederid 16:1* [online]. http://kulturarvsdata.se/raa/fmi/html/10008200160001 [Accessed 2016-05-05]

Svenska Akademien. *Svenska Akademins Ordbok (SAOB)* [online]. Available at *http://g3.spraakdata.gu.se/saob/* [Accessed 2016-02-09]

Wiktionary. *Berg* [online]. Available at https://en.wiktionary.org/wiki/berg [Accessed 2016-02-09]

- *b^herǵ^h-* [online]. Available at https://en.wiktionary.org/wiki/Appendix:Proto-Indo-European/b%CA%B0er%C7%B5%CA%B0- [Accessed 2016-02-09]
- *Bergaz* [online]. Available at https://en.wiktionary.org/wiki/Appendix:Proto-Germanic/bergaz [Accessed 2016-02-09]

4.3 OTHER RESOURCES

Riksantikvarieämbetet (RAÄ)
The National Heritage Board

Antikvarisk-Topografiska Arkivet (ATA)
Antiquarian Topographical Archives, Stockholm.

- **Topographic dossiers:** Konungsund (Boberget), Skederid (Darsgärde),
- **Hanna Rydhs & Bror Schnittgers arkiv**: F3, vol. 13: Schnittger – dokumentationsmaterial rörande fornborgar. Volymen innehåller även att antal brev rörande detta ämne.
- **Nils David Edlunds samling:** F2, vol. 4: Koncept till uppmätningar av östgötska fornborgar.

Statens Historiska Museer (SHMM)
National Historical Museums.

Historiska Museet
The Swedish History Museum, Stockholm.

- **Boberget:** Inv. 12822, 13247, 13529, 13823
- **Gullborg:** Inv. 13824
- **Börsås:** Inv. 14560
- **Darsgärde:** Inv. 25878

APPENDIX - DATABASE

4.4 THE GENERAL SHEET

The list of all registered items. Does not include: photo-ID, context description, object description and remarks/other. Registration performed during March 2016 at SHMM.

Find ID	Context ID	Site	Context type	Find category	Type	Preservation status	Material	Number of pieces	SHMM Inventory
BOB-11	A2	Boberget	NA	Loom Weight	NA	1	Clay	9	13247
BOB-1153142	A2	Boberget	NA	Loom Weight	Torus	3	Clay	1	12822
BOB-1153143		Boberget	NA	Loom Weight	NA	1	Clay	6	12822
BOB-1153145	A2	Boberget	NA	Loom Weight	NA	2	Clay	8	12822
BOB-1153146	B2:2	Boberget	NA	Loom Weight	NA	2	Clay	10	12822
BOB-1153147	B2:1	Boberget	NA	Loom Weight	NA	2	Clay	27	12822
BOB-1153148		Boberget	NA	Loom Weight?	Cube?	2	Clay	2	12822
BOB-1153188	A	Boberget	Wall	Loom Weight	NA	1	Clay	6	13247
BOB-1153192	A3:I	Boberget	NA	Loom Weight	NA	2	Clay	20	13247
BOB-1153193	A3:II	Boberget	NA	Loom Weight	NA	1	Clay	14	13247
BOB-1153194	A3:IV	Boberget	NA	Loom Weight	NA	1	Clay	3	13247
BOB-1153195	B1	Boberget	NA	Loom Weight	NA	1	Clay	37	13247
BOB-1153196	A3:V	Boberget	NA	Loom Weight	NA	2	Clay, Ceramic	5	13247
BOB-1153197	A3N	Boberget	NA	Loom Weight	NA	1	Clay	39	13247
BOB-11531999	C2	Boberget	NA	Loom Weight	NA	2	Clay	58	13247
BOB-1153204	A2	Boberget	NA	Loom Weight	NA	2	Clay	9	13247
BOB-1153205	B1	Boberget	NA	Loom Weight	NA	2	Clay	2	13247
BOB-1153227	A2	Boberget	NA	Loom Weight	Torus	3	Clay	1	13247
BOB-1153230	B3	Boberget	NA	Loom Weight	NA	1	Clay	3	13247
BOB-1153231	A1	Boberget	NA	Loom Weight	NA	1	Clay	2	13247
BOB-1153233	I	Boberget	NA	Loom Weight	NA	1	Clay	1	13529
BOB-1153234	VI	Boberget	NA	Loom Weight	NA	2	Clay	1	13529
BOB-1153298	C3	Boberget	NA	Spindle Whorl	Convex	2	Bone	3	13529
BOB-1153300	IIB	Boberget	NA	Loom Weight	Torus	2	Clay	3	13529
BOB-1153307	C3	Boberget	NA	Loom Weight	NA	1	Clay	1	13529
BOB-115331	IIB	Boberget	NA	Loom Weight	Torus? Pyramidal?	1	Clay	7	13529
BOB-1153311	D2	Boberget	NA	Loom Weight	NA	2	Clay	2	13529

Find ID	Context ID	Site	Context type	Find category	Type	Preservation status	Material	Number of pieces	SHMM Inventory
BOB-1153312	C3	Boberget	NA	Loom Weight	NA	2	Clay	24	13529
BOB-1153313	D2	Boberget	NA	Loom Weight	NA	2	Clay	40	13829
BOB-1153315	IIA	Boberget	NA	Loom Weight	NA	1	Clay	2	13529
BOB-1153317	D4	Boberget	NA	Loom Weight	NA	2	Clay	2	13829
BOB-1153318	IIC	Boberget	NA	Loom Weight	NA	2	Clay	2	13529
BOB-1153319 a	A3	Boberget	NA	Loom Weight	NA	1	Clay	2	13529
BOB-1153319 b	A3	Boberget	NA	Spindle Whorl?	Spherical?	1	Rock type?	1	13529
BOB-1153321	IIA	Boberget	NA	Spindle Whorl	Cylindrical	3	Ceramic	1	13529
BOB-1153352	D3:2	Boberget	NA	Loom Weight	NA	2	Clay, Ceramic	4	13829
BOB-1153354	XXI	Boberget	NA	Loom Weight	NA	1	Clay	2	13529
BOB-1153358	D1	Boberget	NA	Loom Weight	NA	1	Clay	5	13529
BOB-1153398	IIC	Boberget	NA	Spindle Whorl	Convex	3	Bone	1	13823
BOB-1153413	IID	Boberget	NA	Loom Weight	Torus	3	Clay	2	13823
BOB-1153415	D3	Boberget	NA	Loom Weight	NA	2	Clay, Ceramic	5	13823
BOB-1153416	XII	Boberget	NA	Loom Weight	NA	2	Clay	14	13823
BOB-1153417 a	IID	Boberget	NA	Loom Weight	Torus	2	Clay	3	13823
BOB-1153417 b	IID	Boberget	NA	Loom Weight	Torus	2	Clay	3	13823
BOB-1153417 c	IID	Boberget	NA	Loom Weight	NA	2	Clay	12	13823
BOB-1153473	XXXII	Boberget	NA	Loom Weight	NA	1	Clay	6	13823
BOB-1153477 a	XXXI	Boberget	NA	Loom Weight	NA	2	Clay, Ceramic	9	13823
BOB-1153477 b	XXXI	Boberget	NA	Spindle Whorl?	NA	1	Clay	1	13823
BOB-1153486	V	Boberget	NA	Loom Weight	NA	2	Clay	3	13823
BOB-1153491	XXXI	Boberget	NA	Loom Weight	NA	1	Clay	1	13823
BOB-115398	C1	Boberget	NA	Loom Weight	Torus? Pyramidal?	2	Clay	18	13247
BOB-12	A2	Boberget	NA	Loom Weight	NA	1	Clay	12	13247
BOB-12823e	IIC	Boberget	NA	Loom Weight	Pyramidal	2	Clay	3	13823
BOB-13823aa	E2	Boberget	NA	Loom Weight	Torus	2	Clay	4	13823
BOB-13823ab	IIC	Boberget	NA	Loom Weight	Torus	4	Clay	1	13823
BOB-13823b	E2	Boberget	NA	Loom Weight	Torus	2	Clay	6	13823

Find ID	Context ID	Site	Context type	Find category	Type	Preservation status	Material	Number of pieces	SHMM Inventory
BOB-13823b	IIC	Boberget	NA	Loom Weight	Torus	2	Clay	3	13823
BOB-13823c	E2	Boberget	NA	Loom Weight	Torus	3	Clay	1	13823
BOB-13823c	IIC	Boberget	NA	Loom Weight	Torus	2	Clay	6	13823
BOB-13823d	IID	Boberget	NA	Loom Weight	Pyramidal	3	Clay	1	13823
BOB-13823d	E2	Boberget	NA	Loom Weight	NA	2	Clay	8	13823
BOB-19	IIC	Boberget	NA	Spindle Whorl	Convex	4	Bone	1	13823
BOB-48	C7	Boberget	NA	Loom Weight	Torus	3	Clay	1	13529
BOB-49	D2	Boberget	NA	Loom Weight	Torus	3	Clay	1	13529
BOB-50	D2	Boberget	NA	Loom Weight	Torus	4	Clay	1	13529
BOB-52	C3	Boberget	NA	Loom Weight	Torus	2	Ceramic?	3	13529
BOB-54	C3	Boberget	NA	Spindle Whorl	Convex	3	Bone	1	13829
BOB-548590	IIC	Boberget	NA	Loom Weight	NA	NA	NA	1	13823
BOB-57	D3	Boberget	NA	Loom Weight	Torus	3	Clay	1	13529
BOB-6	IIB	Boberget	NA	Loom Weight	Torus	3	Clay	1	13529
BOB-63	D3	Boberget	NA	Loom Weight	Torus	4	Clay	1	13529
BOB-70	D3:2	Boberget	NA	Spindle Whorl	Discoid	4	Concretion	1	13829
BOB-76	D3	Boberget	NA	Loom Weight	Torus	4	Clay	1	13823
BOB-77	E2	Boberget	NA	Spindle Whorl	Cylindrical	4	Rock type	1	13823
BOB-7a	A2	Boberget	NA	Loom Weight	Torus	2	Clay	1	13247
BOB-7b	IIB	Boberget	NA	Loom Weight	Torus	4	Clay	1	13529
BOB-8	A2	Boberget	NA	Loom Weight	Torus	2	Clay	1	13247
BOB-874446	D3:2	Boberget	NA	Spindle Whorl	Discoid	3	Concretion	1	13829
BOB-874447	D3:2	Boberget	NA	Spindle Whorl	IREG	4	Bone	1	13829
BOB-874449	D3:2	Boberget	NA	Spindle Whorl	Cylindrical	1	Rock type	1	13829
BOB-9	A2	Boberget	NA	Loom Weight	NA	2	Clay	9	13247
BOR-001	Tomt 1	Börsås	NA	Loom Weight	NA	1	Clay	2	14560
BOR-002	Tomt 1 / Tomt 2	Börsås	NA	Loom Weight	NA	1	Clay	1	14560
BOR-002	Tomt 3 Ax2:1	Börsås	Ashpit	Loom Weight?	NA	1	Ceramic	2	14560
BOR-003	Tomt 3 B3	Börsås	NA	Loom Weight?	NA	1	Clay	2	14560
BOR-004	Tomt 3 A1 ÖA	Börsås	NA	Loom Weight	NA	1	Clay, Ceramic	20	14560
BOR-005	Tomt 3D.H.	Börsås	NA	Loom Weight?	NA	1	Clay	1	14560
BOR-006	Tomt 1: II gr. E2:2	Börsås	NA	Loom Weight	NA	2	Clay	1	14560
BOR-007	Tomt 3	Börsås	NA	Loom	NA	2	Ceramic	1	14560

	B1:1			Weight					
Find ID	**Context ID**	**Site**	**Context type**	**Find category**	**Type**	**Preservation status**	**Material**	**Number of pieces**	**SHMM Inventory**
BOR-008	Tomt 3 B1:1	Börsås	NA	Loom Weight	NA	1	Clay	3	14560
BOR-009a	Tomt 3 Ax3:1	Börsås	NA	Loom Weight	Torus	2	Ceramic	3	14560
BOR-009b	Tomt 3 Ax3:1	Börsås	NA	Loom Weight	Torus	2	Clay	3	14560
BOR-010	Tomt 3 A4	Börsås	NA	Loom Weight	NA	1	Clay	3	14560
BOR-011	Tomt 3 B1:1	Börsås	NA	Loom Weight	NA	2	Clay	3	14560
BOR-012	Tomt 3 Ax1:1	Börsås	NA	Loom Weight	NA	1	Clay	3	14560
BOR-013	Tomt 3 G3	Börsås	NA	NA	NA	1	Clay, Ceramic	2	14560
BOR-014	Tomt 3 Ax:4	Börsås	NA	Loom Weight	NA	2	Clay	1	14560
BOR-015	Tomt 3 B2:1	Börsås	NA	Loom Weight	NA	1	Ceramic, Clay, Rock?	8	14560
BOR-016a	Tomt 2	Börsås	NA	Loom Weight	NA	2	Clay	5	14560
BOR-016b	Tomt 2	Börsås	NA	Loom Weight	NA	2	Clay	2	14560
BOR-017	Tomt 2	Börsås	NA	Loom Weight	NA	2	Clay	104	14560
BOR-018	Tomt 3 B1	Börsås	NA	Loom Weight	NA	2	Clay	4	14560
BOR-019	Tomt 3	Börsås	NA	Loom Weight?	NA	2	Clay	1	14560
BOR-020	Tomt 3 D3:1	Börsås	NA	Spindle Whorl	Cylindrical	3	Ceramic	1	14560
BOR-021	Grav II m5	Börsås	Burial Mound	Loom Weight	Torus	3	Clay	1	14560
BOR-022	Tomt 3 A1	Börsås	NA	Loom Weight	Torus	2	Clay	2	14560
BOR-023	Tomt 1	Börsås	NA	Loom Weight	NA	2	Clay	4	14560
BOR-024	Tomt 3 A3:5	Börsås	NA	Loom Weight	NA	2	Clay	1	14560
BOR-025	Tomt 3 A2	Börsås	NA	Loom Weight	NA	2	Clay	8	14560
BOR-026	Tomt 3 D3:2	Börsås	Ash	Loom Weight	NA	2	Clay	2	14560
BOR-027	Tomt 3 AB1:2	Börsås	NA	Loom Weight	NA	2	Clay, Ceramic	12	14560
BOR-028	Tomt 3 A1, nedre hälft	Börsås	NA	Loom Weight	NA	2	Clay	10	14560
BOR-029	Tomt 3	Börsås	Ashpit	Loom Weight	NA	2	Clay	2	14560
BOR-030	Tomt 3 B1	Börsås	NA	Loom Weight	NA	1	Clay	3	14560
BOR-031	Tomt 3 B3:1	Börsås	NA	Loom Weight	NA	1	Clay	2	14560
BOR-032	Tomt 3 Ax3	Börsås	NA	Loom Weight	NA	1	Clay	1	14560
BOR-034	Tomt 3 A1	Börsås	Layer?	Loom Weight	NA	2	Clay	9	14560
BOR-035	Tomt 3 B1	Börsås	NA	Loom Weight	NA	1	Clay, Ceramic	15	14560
BOR-036	Tomt 3 B1:1	Börsås	NA	Loom Weight	NA	1	Clay, Ceramic	14	14560
BOR-037	Tomt 3	Börsås	NA	Loom	NA	1	Clay,	8	14560

	B1:1			Weight			Ceramic		
Find ID	**Context ID**	**Site**	**Context type**	**Find category**	**Type**	**Preservation status**	**Material**	**Number of pieces**	**SHMM Inventory**
BOR-038	Tomt 3 B1:1	Börsås	NA	Loom Weight	NA	1	Clay, Ceramic	12	14560
BOR-039	Tomt 3 B1:1	Börsås	NA	Loom Weight	NA	1	Clay, Ceramic	13	14560
BOR-033a	Tomt 3 A1:2	Börsås	NA	Loom Weight	Torus	2	Clay	2	14560
BOR-033b	Tomt 3 A1:2	Börsås	NA	Loom Weight	NA	2	Clay	5	14560
BOR-040	Tomt 3 B1:1	Börsås	NA	Loom Weight	NA	1	Clay, Ceramic	8	14560
BOR-041	Tomt 3	Börsås	NA	Loom Weight?	NA	1	Clay	1	14560
BOR-042	NA	Börsås	NA	Loom Weight	NA	1	Clay	2	14560
BOR-043	NA	Börsås	NA	Loom Weight	NA	1	Clay	1	14560
BOR-044	Tomt 3	Börsås	NA	Loom Weight	NA	1	Ceramics	6	14560
BOR-045	Tomt 3 Ax3:1	Börsås	NA	Loom Weight	NA	1	Clay	8	14560
BOR-046	Tomt 3 Ax3	Börsås	NA	Loom Weight	NA	1	Clay	3	14560
BOR-047	Tomt 3 B3:3	Börsås	NA	Loom Weight	NA	1	Clay	2	14560
BOR-048	Tomt 3 Ax3:1	Börsås	NA	Loom Weight	NA	1	Clay	2	14560
BOR-049	Tomt 3 A3:5	Börsås	NA	Loom Weight	NA	1	Clay	7	14560
BOR-050	Provgrop II	Börsås	NA	Loom Weight	NA	1	Clay	2	14560
BOR-051	Tomt 3 A:Ax:1	Börsås	Layer?	Loom Weight	NA	1	Clay	3	14560
DAR-1000	A22	Darsgärde	Long-house	Loom Weight	NA	1	Clay	1	25878
DAR-1017	A22	Darsgärde	Long-house	Loom Weight	Torus	3	Clay	1	25878
DAR-107	A13, A15	Darsgärde	Between buildings	Loom Weight	Torus	2	Clay	1	25878
DAR-111a	A13, A15	Darsgärde	Between buildings	Loom Weight	Torus	2	Clay	6	25878
DAR-111b	A13, A15	Darsgärde	Between buildings	Loom Weight	NA	2	Clay	3	25878
DAR-116	A13, A15	Darsgärde	Between buildings	Loom Weight	Torus	2	Ceramic	4	25878
DAR-126	A9-12	Darsgärde	NA	Loom Weight	NA	2	Ceramic	1	25878
DAR-158	ANB	Darsgärde	NA	Loom Weight	NA	2	Ceramic	1	25878
DAR-387	A16	Darsgärde	Hearth	Loom Weight	Torus	4	Ceramic	1	25878
DAR-406	A16	Darsgärde	Hearth	Loom Weight	Torus	4	Ceramic	1	25878
DAR-48	A11	Darsgärde	Entrance	Loom Weight	Torus	4	Ceramic	1	25878
DAR-49	A13	Darsgärde	Building, floor	Loom Weight	Torus	3	Ceramic	1	25878
DAR-524	A29	Darsgärde	Building	Loom Weight	NA	1	Ceramic	2	25878
DAR-592	A28	Darsgärde	Group of stones	Loom Weight	Torus	2	Ceramic	3	25878
DAR-608	A10	Darsgärde	NA	Loom Weight	Torus	2	Ceramic	2	25878
DAR-615	A13, A15	Darsgärde	NA	Loom Weight	NA	1	Clay	1	25878

Find ID	Context ID	Site	Context type	Find category	Type	Preservation status	Material	Number of pieces	SHMM Inventory
DAR-617	A13, A15	Darsgärde	Outside buildings	Loom Weight	Torus	2	Ceramic	4	25878
DAR-618	A13, A15	Darsgärde	Outside buildings	Loom Weight	NA	2	Clay	2	25878
DAR-676	A15	Darsgärde	Layer	Loom Weight	NA	1	Ceramic	1	25878
DAR-903	A22	Darsgärde	Long-house	Loom Weight	Torus	4	Clay	1	25878
DAR-905	A22	Darsgärde	Long-house	Loom Weight	NA	2	Ceramic	4	25878
DAR-916	A22	Darsgärde	Long-house	Loom Weight	NA	1	Ceramic	4	25878
DAR-928	A35	Darsgärde	NA	Loom Weight	Torus	3	Ceramic	1	25878
DAR-947	A22	Darsgärde	Long-house	Loom Weight	Torus	4	Ceramic	1	25878
GUL.1155305	C6	Gullborg	NA	Loom Weight	NA	1	Clay	18	13824
GUL-1088466	F2	Gullborg	NA	Loom Weight	NA	1	Clay	2	13824
GUL-1155140	A2	Gullborg	NA	Loom Weight	NA	2	Clay	1	13824
GUL-1155141	A1	Gullborg	NA	Loom Weight	NA	2	Clay	15	13824
GUL-1155143	A4	Gullborg	NA	Loom Weight	NA	2	Clay	47	13824
GUL-1155145	A13	Gullborg	NA	Loom Weight	NA	3	Clay	2	13824
GUL-1155146	A5	Gullborg	NA	Loom Weight	NA	1	Clay	67	13824
GUL-1155153	A5	Gullborg	NA	Loom Weight	Torus	2	Clay	2	13824
GUL-1155159	A7	Gullborg	NA	Loom Weight	NA	1	Clay	19	13824
GUL-1155160a	A6	Gullborg	NA	Loom Weight	Torus	2	Clay	4	13824
GUL-1155160b	A6	Gullborg	NA	Loom Weight	NA	2	Clay	8	13824
GUL-1155162	A12	Gullborg	NA	Loom Weight	NA	3	Clay	3	13824
GUL-1155164	A11	Gullborg	NA	Loom Weight	NA	2	Clay	13	13824
GUL-1155170	A8	Gullborg	NA	Loom Weight	NA	1	Clay	11	13824
GUL-1155172	A10	Gullborg	NA	Loom Weight	NA	1	Clay	11	13824
GUL-1155173	A15	Gullborg	NA	Loom Weight	NA	1	Clay	5	13824
GUL-1155174	B	Gullborg	NA	Loom Weight	NA	2	Clay	6	13824
GUL-1155176	A12	Gullborg	NA	Loom Weight	NA	1	Clay	13	13824
GUL-1155183	A9	Gullborg	NA	Loom Weight	NA	1	Clay	27	13824
GUL-1155197	B1:2	Gullborg	NA	Loom Weight	NA	2	Clay	8	13824
GUL-1155198	A13	Gullborg	NA	Loom Weight	NA	2	Clay	17	13824
GUL-1155199	B2:1	Gullborg	NA	Loom Weight	NA	1	Clay	16	13824
GUL-1155204	B1:1	Gullborg	NA	Loom Weight	NA	1	Clay, Ceramic	136	13824
GUL-	A14	Gullborg	NA	Loom	NA	1	Clay	12	13824

Find ID	Context ID	Site	Context type	Find category	Type	Preservation status	Material	Number of pieces	SHMM Inventory
1155206 a				Weight					
GUL-1155206 b	A14	Gullborg	NA	Loom Weight	Torus	2	Clay	2	13824
GUL-1155206 c	A14	Gullborg	NA	Loom Weight	Torus	3	Clay	1	13824
GUL-1155206 d	A14	Gullborg	NA	Loom Weight	Torus	3	Clay	1	13824
GUL-1155220	B7	Gullborg	NA	Loom Weight	Torus	3	Clay	1	13824
GUL-1155222	B6:1	Gullborg	NA	Loom Weight	NA	1	Clay	8	13824
GUL-1155224	B2:2	Gullborg	NA	Loom Weight	NA	1	Clay	2	13824
GUL-1155226	B3:1	Gullborg	NA	Loom Weight	NA	1	Clay	20	13824
GUL-1155231	B5	Gullborg	NA	Loom Weight	NA	1	Clay, Ceramic	261	13824
GUL-1155233	B4	Gullborg	NA	Loom Weight	NA	2	Clay	139	13824
GUL-1155240	B10	Gullborg	NA	Loom Weight	NA	2	Clay	3	13824
GUL-1155242	B11	Gullborg	NA	Loom Weight	NA	1	Clay	3	13824
GUL-1155254	B8	Gullborg	NA	Loom Weight	NA	1	Clay	33	13824
GUL-1155256	B7	Gullborg	NA	Loom Weight	NA	2	Clay	340	13824
GUL-1155258	B9	Gullborg	NA	Loom Weight	NA	1	Clay	160	13824
GUL-1155264	B13	Gullborg	NA	Loom Weight	NA	1	Clay	48	13824
GUL-1155268	B12	Gullborg	NA	Loom Weight	NA	2	Clay	4	13824
GUL-1155270	B14	Gullborg	NA	Loom Weight	NA	1	Clay	4	13824
GUL-1155282	C2	Gullborg	NA	Loom Weight	NA	2	Clay	5	13824
GUL-1155287	C3	Gullborg	NA	Loom Weight	NA	2	Clay	6	13824
GUL-1155293	C4	Gullborg	NA	Loom Weight	NA	2	Clay	103	13824
GUL-1155309	D	Gullborg	NA	Loom Weight	NA	1	Clay	5	13824
GUL-1155310	E	Gullborg	NA	Loom Weight	NA	2	Clay	10	13824
GUL-1155312	C5	Gullborg	NA	Loom Weight	NA	2	Clay	15	13824
GUL-1155315 a	F4	Gullborg	NA	Loom Weight	NA	2	Clay	7	13824
GUL-1155315 b	F4	Gullborg	NA	Loom Weight	Pyramidal	2	Clay	5	13824
GUL-1155320	F3	Gullborg	NA	Loom Weight	NA	1	Clay	6	13824
GUL-1155329	C10	Gullborg	NA	Loom Weight	NA	1	Clay	8	13824
GUL-1155342	B6:2	Gullborg	NA	Loom Weight	NA	1	Clay	6	13824
GUL-1155347	C7	Gullborg	NA	Loom Weight	NA	1	Clay	5	13824

Find ID	Context ID	Site	Context type	Find category	Type	Preservation status	Material	Number of pieces	SHMM Inventory
GUL-1155355	C9	Gullborg	NA	Loom Weight	NA	1	Clay	3	13824
GUL-13824a	G	Gullborg	NA	Loom Weight	Torus	4	Clay	1	13824
GUL-13824b	G	Gullborg	NA	Loom Weight	Torus	3	Clay	1	13824
GUL-13824c	B9	Gullborg	NA	Loom Weight	Pyramidal	4	Clay	1	13824
GUL-13824d	F2?	Gullborg	NA	Loom Weight	Pyramidal	3	Clay	1	13824

4.5 Category: Spindle Whorls

The category sheet of analysable spindle whorls. Does not include surface treatment or remarks/other.

Find ID	Type	Material	Weight (g)	Weight if not complete (g)	Calculated weight (g)	Maximum diameter (mm)	Maximum height (mm)	Maximum hole diameter (mm)	Hole shape
BOR-020	Cylindrical	Ceramic		15	30-35	37	20	8	NA
BOB-77	Cylindrical	Rock type	6			23	8	4	DC
BOB-19	Convex	Bone	27			48	27	10	S
BOB-874447	NA	Bone	17			38	30	13	C
BOB-874449	Cylindrical	Rock type	16			27	19	NA	NA
BOB-70	Discoid	Concretion	15			36	9	6	S
BOB-874446	Discoid	Concretion	12			32	11	9	S
BOB-1153398	Convex	Bone	9			38	13	12	S
BOB-54	Convex	Bone		12	13	41	23	10	S
BOB-1153298	Convex	Bone		14	17	44	22	11	S
BOB-1153321	Cylindrical	Ceramic		12	25	33	22	9	S

4.6 Category: Loom Weights

The category sheet with analysable loom weights. Does not include surface treatment, use wear, use wear description, and remarks/other.

Find ID	Type	Material	Weight (g)	Weight if not complete (g)	Calculated weight (g)	Maximum height/diameter (mm)	Maximum thickness (mm)	Maximum width (mm)	Number of holes	Positions of hole(s)	Maximum hole(s) diameter range (mm)
BOB-1153142	Torus	Clay		112	150	68	37	NA	1	centred	10
BOB-11531999	Torus	Clay		103	210	66	44	NA	1	centred	14
BOB-1153227	Torus	Clay		102	130	66	35	NA	1	centred	11
BOB-1153300	Torus	Clay		145	175	71	36	NA	1	centred	14
BOB-1153413	Torus	Clay		133	NA	67	37	NA	1	centred	14
BOB-1153417a	Torus	Clay		79	105	69	31	NA	1	off-centre	15

Find ID	Type	Material	Weight (g)	Weight if not complete (g)	Calculated weight (g)	Maximum height/diameter (mm)	Maximum thickness (mm)	Maximum width (mm)	Number of holes	Positions of hole(s)	Maximum hole(s) diameter range (mm)
BOB-1153417 b	Torus	Clay		83	105	57	37	NA	1	centred	8
BOB-12823e	Pyramidal	Clay		101	130	NA	45	50	1	centred	7
BOB-13823aa	Torus	Clay		106	120	67	31	NA	1	centred	15
BOB-13823ab	Torus	Clay	211			72	40	NA	1	centred	19
BOB-13823b	Torus	Clay		127	140	64	37	NA	1	centred	17
BOB-13823c	Torus	Clay		97	NA	NA	NA	NA	1	off-centre	15
BOB-13823c	Torus	Clay		211	240	80	38	NA	1	centred	8
BOB-13823d	Pyramidal	Clay	95	95	100	65	40	43	1	top half	8
BOB-48	Torus	Clay		149	190	69	37	NA	1	centred	15
BOB-49	Torus	Clay		176	200	71	45	NA	1	centred	12
BOB-50	Torus	Clay	115	115	120	60	36	NA	1	centred	15
BOB-52	Torus	Clay		223	250	81	42	NA	1	centred	17
BOB-57	Torus	Clay		168	180	69	38	NA	1	centred	9
BOB-63	Torus	Clay	173			71	36	NA	1	centred	11
BOB-6	Torus	Clay		148	160	72	38	NA	1	centred	11
BOB-7a	Torus	Clay		180	185	75	40	NA	1	centred	20
BOB-7b	Torus	Clay	181			73	36	NA	1	centred	17
BOB-76	Torus	Clay	145			68	36	NA	1	centred	8
BOB-8	Torus	Clay		225	230	81	43	NA	1	centred	17
BOR-006	NA	Clay		64	256	NA	37	NA	1		NA
BOR-009a	Torus	Ceramic		147	200	86	38	NA	1	Centred	NA
BOR-009b	Torus	Clay		82	NA	NA	NA	NA	1	Centred	18
BOR-021	Torus	Clay		118	160	76	NA	NA	1	Centred	24
BOR-022	Torus	Clay		83	NA	74	>26	NA	1		NA
BOR-033a	Torus	Clay		70	140	79	30	NA	1		20
DAR-1017	Torus	Clay		175	185	69	32	NA	1	Centred	20
DAR-107	Torus	Clay		77	140	70	32	NA	1	Centred	16
DAR-111a	Torus	Clay		150	170	75	35	NA	1	Centred	18
DAR-116	Torus	Ceramic		111	140	62	30	NA	1	Centred	16
DAR-387	Torus	Ceramic	74			56	25	NA	1	Centred	15
DAR-406	Torus	Ceramic	118			62	33	NA	1	Centred	18
DAR-48	Torus	Ceramic	135			68	30	NA	1	Centred	17
DAR-49	Torus	Ceramic		156	160	67	36	NA	1	Centred	17
DAR-592	Torus	Ceramic		127	140	66	34	NA	1	Centred	14
DAR-903	Torus	Clay	144			65	31	NA	1	Centred	14

Find ID	Type	Material	Weight (g)	Weight if not complete (g)	Calculated weight (g)	Maximum height/diameter (mm)	Maximum thickness (mm)	Maximum width (mm)	Number of holes	Positions of hole(s)	Maximum hole(s) diameter range (mm)
DAR-928	Torus	Ceramic		137	140	65	32	NA	1	Centred	15
DAR-947	Torus	Ceramic	123			65	30	NA	1	Centred	15
GUL-1155145	Torus	Clay		170	NA	80	53	NA	1	Centred	9
GUL-1155146	Torus	Clay		132	NA	70	40	NA	1	Centred	11
GUL-1155153	Torus	Clay		106	120	72	NA	NA	1	Centred	15
GUL-1155160a	Torus	Clay	120			64	36	NA	1	Centred	10
GUL-1155162	Torus	Clay		134	155	69	32	NA	1	Centred	19
GUL-1155206b	Torus	Clay	212			76	40	NA	1	Centred	18
GUL-1155206c	Torus	Clay		129	160	63	33	NA	1	Centred	10
GUL-1155206d	Torus	Clay		141	NA	74	45	NA	1	Centred	11
GUL-1155220	Torus	Clay		87	160	68	NA	NA	1	Centred	11
GUL-1155258	Torus	Clay		101	NA	69	37	NA	1	Centred	12
GUL-1155287	Torus	Clay		71	140	58	36	NA	1	Centred	10
GUL-1155312	Torus	Clay		67	140	63	35	NA	1	Centred	14
GUL-1155315b	Pyramidal	Clay		146	170	81	50	52	1	top half	14
GUL-13824a	Torus	Clay	90			57	32	NA	1	Centred	14
GUL-13824b	Torus	Clay		105	110	60	36	NA	1	Centred	15
GUL-13824c	Pyramidal	Clay	177			85	53	56	1	top half	12

LUND UNIVERSITY