GÖTEBORGS UNIVERSITET
INST FÖR HISTORISKA STUDIER

Rock Art in No Man’s Land

- A case study of the inland rock art at Högsbyn, Dalsland

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Arkeologiskt självständigt

arbete på fördjupningsnivå, 15 hp

VT 2022

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Sammanfattning

Hällristningar från den nordiska bronsåldern har en hög koncentration i det kustnära Bohuslän. Forskningen har således fokuserat på detta område. Mindre uppmärksamhet har getts till hällristningar inåt land. Denna uppsats vill bidra med att bredda forskningen och öka förståelsen om hällristningar i inlandet och samhällena som skapade dem. En fallstudie av hällristningsområdet Högsbyn i Dalsland har genomförts med hjälp av 3D dokumentering. Med utgångspunkt i den tidigare forskningen och de teoretiska perspektiven, socialsemiotik och sociokulturella system, har Högsbyn jämförts med det kustnära hällristningsområdet Brastad i Bohuslän. En av slutsatserna är att de två hällristningslokalerna ingår i samma tradition med liknande motiv och symbolism. Högsbyn kan ha varit en del av en övergång eller spridning av idéer från kusten till inlandet. Hypotetiskt kan en liknande social struktur som förknippas med de kustnära hällristningarna ha etablerats i Högsbyn.

Nyckelord: Nordisk bronsålder, kustnära hällristningar, hällristningar i inlandet, Högsbyn, Brastad, 3D dokumentering, socialsemiotik, sociokulturella system

Cover photo by author, Tisselskog 15.1 “Ronarudden” at Högsbyn, Dalsland.

Acknowledgement

I would like to express my deepest gratitude to my supervisor Christian Horn for his feedback and patience, as my thesis was completed one semester later than planned. Additionally, I am thankful that he introduced me to 3D documentation of rock art, which inspired me to choose the subject. I am also thankful to Ritwa Herjulfsdotter and Tommy Andersson, who I met during the documentation at Högsbyn, and who gave me some of Tommy's rock art reports that I was looking for. Lastly, I would like to mention my family. My father for driving me to Högsbyn and assisting me during the documentation. My mother and sisters for continuously support and encouragement.

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1 Introduction

This chapter will first introduce the background to the research topic. This is followed by a presentation of the aim and research questions. Lastly the material or case of research will be presented, as well as necessary delimitations.

1.1 Background

Communication is achieved by using symbols. It can be gestures, spoken words, marks, or emotes. The way humans communicate with symbols are commonly viewed on a different level than other animals, more precisely in form of a symbolic system that constitutes a language. The question regarding the origin of the human language is intriguing for linguists but its complex interrelationship with human culture also makes it interesting for archaeologists and anthropologists.

Figure 1: Andy Murray, professional tennis player from Scotland, tweet describing his wedding day (Foxsports 2015)

The "emoji only" tweet in figure 1 might seem cryptical, but the essential message is communicated within a contemporary cultural context. For a person living during the Nordic Bronze Age, 1700 – 500 BCE, the symbols would have been nonsense and it might not have been regarded as a communicative message. However, the petroglyphs in the rock panels would probably have made perfect sense for people living during the Bronze Age. For present day archaeologists they post an interesting challenge into the minds and culture of the Bronze Age society.

Figure 2: A parallel example to the wedding tweet above is the commonly interpreted "Bridal couple" at Tanum 1:1, Photo by Högberg, Torsten, Vitlycke museum (SHFA 2021)

Most of the Bronze Age rock art in Europe is situated in Scandinavia and with a particularly high concentration close to the coast in the Bohuslän province, western Sweden (Ling 2006; Goldhahn and Ling 2013). Considering the shoreline displacement, a majority was close to the

Bronze Age coastline (Ibid). They are also characterized by a maritime theme of ships and human figures (Ibid). The location and dominating motifs have been described as a "maritime paradigm" in Scandinavian rock art research (Nimura et al. 2020). Thus, less attention has been given to inland rock art locations (Ibid). This posts both a scientific and cultural preservation problem. Scientific as it might give a skewed understanding of Bronze Age rock art. Cultural preservation as these locations risk to be neglected. Documentation can help to monitor and increase awareness of potential threats and damages. Following this there is a potential to broaden the scientific discussion and add more complexity to the study and interpretation of rock art in Scandinavia.

1.2 Aim

The aim is to increase the understanding of inland rock art and the human societies in which it was created. This will be done through a case study of the rock art at Högsbyn, Dalsland, Sweden. The author's 3D documentation will be analysed and compared to coastal rock art from Bohuslän, Sweden. Furthermore, the purpose is to add more diversity to the study of Scandinavian rock art by contributing to the broadening of the research field.

Research questions

- What characteristics can be identified in inland rock art?
- How does inland rock art differ compared to coastal rock art?
- What can it tell us about inland Bronze Age society?

1.3 Material

This part will present the material that will be analyzed. Firstly, the case of inland rock art at Högsbyn will be shortly introduced. This is followed by a background of the coastal rock art site at Brastad that will be used in the comparison. Lastly the limitations of the study material and the delimitations made by the author will be discussed.

Inland rock art at Högsbyn, Dalsland

The rock art at Högsbyn is situated in Tisselskogs parish, Dalsland province in Sweden. It is the largest rock art area in the province with around 2000 known figures (Andersson 2000:2). In contrast to the Bohuslän rock art this region is around 65 km from the present-day coastline.

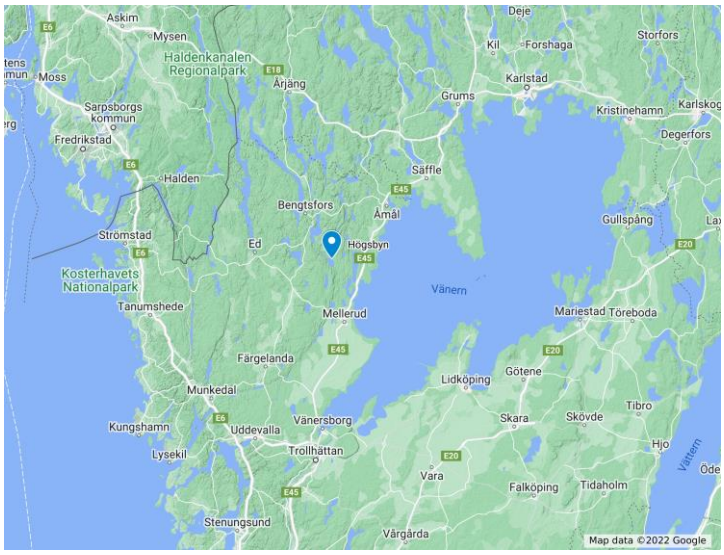

Figure 3: Högsbyn marked on a map of western Sweden

The rock art at Högsbyn is first mentioned in written text by Lars N Hesselgren in his dissertation about Dalsland in 1718. The first depiction was made by Richard Dybeck in his *"Resa i Dalsland",* 1847. Followed by Axel E Holmberg in his dissertation *"Skandinaviens hällristningar"* in 1848 and Anders Lignell *"Försök till en antiqvarisk-topografisk beskrivning öfver landskapet Dal jemte karta"* in 1850. These three depicted and described the rock art on Ronarudden [see figure 28 in appendix].

The rock art in the area can be divided into two regions with high concentration of rock art: the cultivated landscape and the forested landscape (Rex Svensson 1982:14). The cultivated landscape is in a valley on the northern side of lake Råvarp. The petroglyphs are distributed on rock panels from the water's edge, some panels are even in the water, to approximately 400 meters from the shoreline. The larger and well-known rock panels with petroglyphs are situated in this area: Tisselskog 11:1 "The procession panel" [see figure 4], Tisselskog 12.1 "The snake volution panel" [see figure 4] and Tisselskog 15.1 "Ronarudden" [see cover photo].

West and east of the valley the terrain is higher and forested. In the forested landscape the petroglyphs have been documented with both prehistoric and contemporary characteristics (Rex Svensson 1982:58). Modern additions can usually be distinguished since they are carved with modern Latin letters [ABC…] and western Arabic numerals [123…].

Figure 4: To the left Tisselskog 11:1 "The procession panel", photo by Bertilsson, Catarina (SHFA 2021). To the right Tisselskog 12.1 "The snake volution panel", photo by Bengtsson, Lasse Vitlycke museum (SHFA 2021). Cropped and merged by the author.

The rock art at Högsbyn has been chosen for this case study since it is an inland location with a high concentration of rock art, making it possible to compare several motifs. Further the location is interesting, being close to the water and not affected by the shoreline displacement. Lastly, the rock art panels have not yet been studied using 3D documentation.

Comparative coastal rock art at Brastad, Bohuslän

Brastad parish is in Lysekil municipality, Bohuslän province, on the Swedish west coast. There are 163 known rock art sites with at least 3839 figures in the parish (Toreld and Andersson 2017:20). Concentrations of rock art can be identified in four areas: Backa, Medbo, Rörvall and Heden [see figure 6] (Ibid:14). Some of the carvings in the region have been known for a long time and Peder Alfsön's documentation of Brastad 1:1 from 1627 is the oldest preserved depiction of rock art in Scandinavia [see figure 5] (Ibid:9).

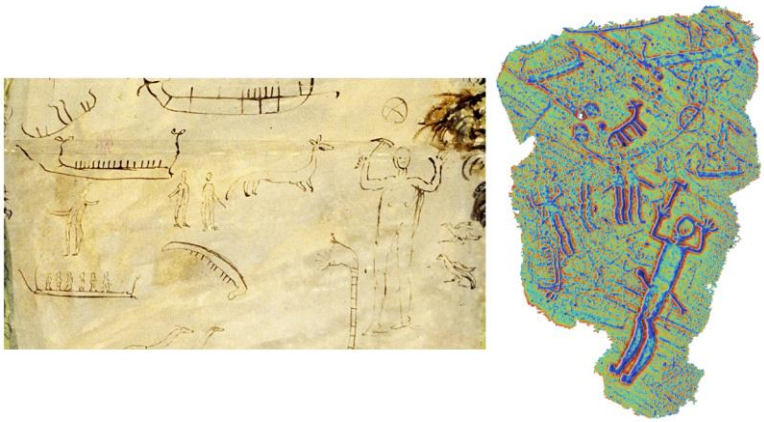

Figure 5: To the left, a photo on Peder Alfsön's documentation of Brastad 1:1, also known as "The Shoemaker", from 1627 (Vitlycke museum 2017). To the right, a modern 3D-visualization of the same rock art panel by Ellen Meijer, Christian Horn and Oscar Ivarson (SHFA 2021).

During the Bronze Age the region was part of a large island, today a peninsula, as Gullmarn and Åbyfjorden linked together in the north [see figure 6] (Ibid:14). The four areas with a high concentration of rock art could have made up separate settlements and social groups, but no archaeological excavations have been conducted (Ibid:18-19). The burial practices that are associated with the Bronze Age, cairns and stone settings, can be traced in the landscape. The placement of stone settings in the areas can be seen in association with the rock art in the landscape. In contrast the cairns are more associated to smaller islands and high grounds overlooking the sea [see figure 6] (Ibid:19).

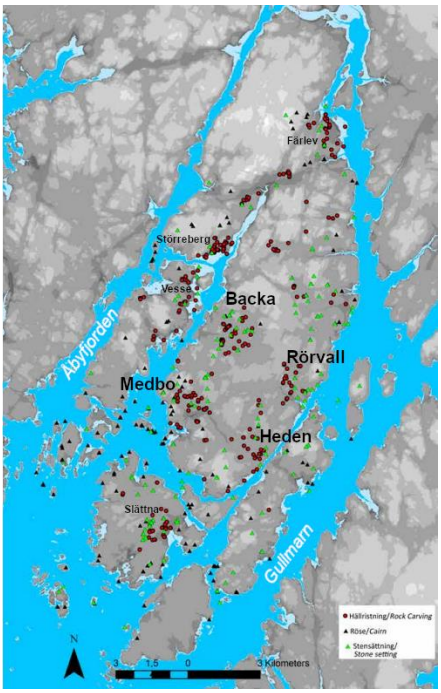

Figure 6: Map of Stångenäs at the beginning of the Bronze Age, 1700 BCE. Backa, Medbo, Rörvall and Heden are the four areas with high concentration of rock art in Brastad parish. Other areas with high concentration of rock art in adjacent parishes are marked with smaller letters. Original map produced by Johan Ling and Andreas Toreld (Toreld and Andersson 2017:17). The author has added the text of the areas and fjords.

The rock art at Brastad has been chosen as comparative material since it, together with the world heritage site at Tanum, has a high variation of motifs (Ibid:20). One of the rock art panels, Brastad 1:1, has also been described as "showing a range of 'typical' coastal rock art motifs in combination with motifs also found inland." (Bradley et al. 2020:267). The high concentration and richness of motifs makes it more likely to find something comparable.

Limitations and delimitations

Archaeological materials have its limitations and rock art is no exception. Through time the materials are no longer in their original form or context. Important data have been lost during the centuries by natural erosion or vandalism. The data left behind can not be regarded as completely representative of the past. Still, it is only by putting these pieces together that we can get a better understanding of the past. Regarding the context rock art might be more challenging than other archaeological materials, as it is usually not excavated within a context that can be dated. The dating of rock art will be discussed in more detail in next chapter.

Turning to the delimitations, one inland and one coastal rock art site have been chosen. Högsbyn with more than 2000 rock art figures and Brastad with closer to 4000 figures. This is too much data to consider within the limited scope of a bachelor's thesis. Thus, further delimitations are needed. At Högsbyn there will be a more detailed analysis on rock art panel 15.1, Ronarudden. It was chosen as it is one of the more elaborated rock art surfaces in the area and with an interesting location close to the water. The rock art at Brastad was chosen as comparative material since it has a high concentration of rock art and variation of motifs.

Both the inland and coastal rock art materials analysed in this thesis can only be regarded as small samples. This means that broader generalizations cannot be made. However, it is still possible to detect trends or patterns regarding the relationship between inland and coastal rock art. This can be followed by further research in order to verified or falsified.

2 Literature review

This section will explore the research fields that concern the topic of this paper. It will start off by giving a general picture of the Nordic Bronze Age, as the understanding of the period is deeply interconnected with the interpretations of rock art. This is followed by research on Southern Scandinavian rock art. Different paradigms, or thought styles, on the rock art context and interpretations of motifs will be presented. Lastly, previous research on the rock art at Högsbyn is discussed.

2.1 The Nordic Bronze Age

The Bronze Age is the second pre-historic period in the three-age-system concept [stone – bronze – iron], first proposed by the Danish antiquarian Christian Jürgensen Thomsen in 1837 (Eskildsen 2019). It is a relative chronology based on technological stages or evolutionary progression and thus not unproblematic. Still, it remains relevant within a European context even if closer studies of artifacts have further subdivided and regionalized the concept (Scarre 2018:29).

In Scandinavia the Bronze Age is between c. 1700 – 500 BCE and can be divided into an early and late phase with a transition around 1100 BCE. The Swedish archaeologist Oscar Montelius further subdivided the period into six phases, with 200 years each [see figure 7] (Price 2015:199). The bronze, an alloy of copper and tin, defines the period but copper objects had been present since the late Neolithic period. However, it is in the Bronze Age that it becomes more frequent together with socio-political changes (Ling et al. 2018; Ling and Uhnér 2014; Price 2015:200).

Early Bronze Age	**1700 – 1100 BCE**
- Period 1	1700 – 1500 BCE
- Period 2	1500 – 1300 BCE
- Period 3	1300 – 1100 BCE
Late Bronze Age	**1100 – 500 BCE**
- Period 4	1100 – 900 BCE
- Period 5	900 – 700 BCE
- Period 6	700 – 500 BCE

Figure 7: The Nordic Bronze Age chronology

Graves and hoards

Much of what is known about the Nordic Bronze Age comes from archaeological research on graves and hoards (Price 2015:197). Burial cairns, barrows or mounds and stone settings are some burial types that have been dated to the Early Bronze Age. The buried could be placed in stone cists or oak coffins with grave goods. During the Late Bronze Age there was a shift in burial practice, as cremation became the dominate form (Kneisel et al. 2019; Schmid 2020). The monumental burials and rich grave goods of bronze are usually associated as traces of the elite or people with high status in the society (Kneisel et al. 2019).

Hoarding is the practise of burying valuable items of bronze and gold in the landscape, usually in less accessible areas such as bogs and wetlands. This practise is commonly interpreted in a ritual and religious context, as a sacrifice, but also in some cases as storage deposits (Melheim and Horn 2014; Price 2015:213). The ore used to craft these bronze artefacts had to be imported to Scandinavia (Ling and Stos-Gale 2015; Ling and Uhnér 2014). Trade networks, specialisations in crafting and growing competition over resources led to increased conflict and even warfare (Horn and Kristiansen 2018; Ling et al. 2018) A more militarized society is also evident with the finds of weapons in burials and hoards (Horn and Kristiansen 2018).

Chiefdoms and a warrior society

One major socio-political change during the Nordic Bronze Age, that some scholars argue for, are the formation of chiefdoms (Ling et al. 2018). Chiefdoms can be defined as "a form of sociopolitical organization in which relationships are defined by inequality and the presence of a powerful leader." (Price 2015:214). The chiefdoms of the Nordic Bronze Age are generally described as decentralized units with networks of alliances or formations of confederations (Ling et al. 2018). According to this theory, the leader or chieftain relied on three elemental powers: economy, warrior might and religious ideology (Ling et al. 2018:489). Controlling the flow of resources is essential in this model. Resources in this sense is not only raw materials, for example tin, copper and agricultural products, but likewise boats and manpower. Equipping boats with warriors was not only for safeguarding the trade routes but also for raiding or the mere threat of violence. This is sanctioned by an ideological narrative that maintains the ruler authority. What is described is a maritime mode of production, controlled by a warrior elite and legitimized through religious ideology (Ling et al. 2018).

2.2 Southern Scandinavian Rock Art

Scandinavian rock art can be divided into a northern and southern tradition (Goldhahn and Ling 2013). The northern tradition is mostly dated to around 5500-4000 BCE within a Mesolithic hunter-fisher-gatherer context. This thesis will focus on the younger rock art tradition in southern Scandinavia, starting at the beginning of the Bronze age and continues into the pre-roman Iron-age, c 1700 – 200 BCE (Bradley et al. 2020).

In the 19th century the Swedish archaeologist Bror Emil Hildebrand proposed a dating method for the rock art. This was a stylistic comparison between swords and sword motifs in rock art (Goldhahn and Ling 2013:6). The premise is that the carving of the swords should be dated around the same period as its excavated counterpart. The comparative chronological method has since been developed into different directions and trends (Ibid:7). One example is Flemming

Kaul's research where the ship decorations on bronze razors have been compared to ship carvings in rock art (Bradley 2006). Since the images on metalwork were often in burials and other contexts that provide dateable material, this allows to compare the rock art to images that have an absolute-chronological date. Other methods are to compare carving techniques, superimpositions, or typology to construct relative chronologies.

Through geological analysis it is possible to date the process of shoreline displacement. This is helpful when dating rock as the carvings cannot have been made beneath the sea level. The global changes in sea level and glacio-isostatic uplift of the bedrock are the two processes behind shoreline displacement in Scandinavia (Ling 2014:47).

Open-air rock art has also been excavated indirectly by researching the area close by to the rock art. Some locations, generally the smaller and less complex once, have resulted in large numbers of prehistoric finds, while other more complex locations have shown little or no activity (Goldhahn and Ling 2013:13). This is however problematic since there can be finds from times long after or before the rock art was made.

Rock art is evocative and complex and as such have given rise to a diversity of interpretations. Lacking historical sources or anthropological information the rock art research is primarily based on two foundations, "…the images themselves, and the different kinds of context with which the rock art is associated." (Goldhahn and Ling 2013).

Context and interpretations

The perception of the context surrounding rock art, from dynamic pre-historical society aspects to static or more durable landscape aspects, shapes the interpretation. Well-established perceptions can become a pattern, or thought style, that direct the scientific field. Thomas Kuhn termed these patterns as paradigms. This concept will be used in describing two different thought styles in rock art research: the terrestrial and maritime paradigms (Ling 2014:15–34; Nimura et al. 2020).

The terrestrial paradigm

Johan Ling argues in *Elevated rock art: towards a maritime understanding of Bronze Age rock art in northern Bohuslän, Sweden* that the terrestrial paradigm has had the greatest impact on contemporary research (Ling 2014:33). As a thought style, it emphasizes rock art in the context of 1) an agricultural landscape and 2) socio-cultural aspects of a sedentary population. The first is connected to the theory of land uplift, which is only one of the two separate phenomena behind shoreline displacement, and resulted in a view on the pre-historical landscape as more similar to the contemporary arable landscape (Ibid). The second can be seen within an evolutionary and human ecology perspective on the Bronze Age population as Indo-Germanic farmers (Ibid:24).

The Swedish archaeologist Oscar Almgren, active during the first half of the 20th century, was influential for the establishment of this paradigm. He argued that the rock art reflected religious beliefs and rituals of an agrarian population, in the vicinity of their settlements (Ibid:25). The spiritual interpretation was connected to Indo-European influenced fertility rites, for example boat motifs were seen as cult ships rather than a symbol of maritime practices (Ibid:26).

The maritime paradigm

Before the terrestrial paradigm became dominant in the 20th century recognized archaeologists, for example Bror Emil Hildebrand, Oscar Montelius and Emil Eckhoff, promoted a maritime connection with the rock art (Ling 2014:22). Even if there was diversity in the interpretation of rock art there was more of a consensus regarding the pre-historic landscape. However, as the terrestrial paradigm gained support there was a growing gap between the archaeological and geological field of research.

Slowly the geological understanding of shoreline displacement, its effect on the pre-historical landscape and connection to rock art reintroduced a maritime thought style. It emphasizes rock art in the context of 1) a seascape, where rock art is close to the water's edge, and 2) social-cultural aspects of a mobile population. The first, as mentioned, is connected to interdisciplinary research on the effect of shoreline displacement (Ibid:33). The second is seen within a framework of long-distance contact and trade (Ibid:33). Instead of cult ships the dominating boat motifs are interpreted with a practical maritime function. This is however also transcended to spiritual interpretations for example boat building rituals (Ling 2014:220–30).

Coastal and inland traditions

The maritime paradigm has been established in recent work on coastal rock art (Nimura et al. 2020). But what research has been done on inland rock art and how has it been affected by this paradigm shift? As mentioned in the introduction less attention has been given to inland rock art. Courtney Nimura, Richard Bradley, and Peter Skoglund have however discussed this issue in two separate publications (Bradley et al. 2020; Nimura et al. 2020).

The papers are the result from two projects where more than 40 inland rock art sites around the major lakes Vänern and Vättern have been investigated. The authors looked on the relationship between inland and coastal rock art within the maritime framework. Since the focus has been on coastal rock art the discussion regarding long-distance exchange have stopped there. Using Johan Lings suggestion on aggregation sites together with Christer Westerdahls concepts of transport zones, means of production, and transit points, they propose a theory that integrate the hinterland into the coastal exchange or trade system (Nimura et al. 2020). This consist of two separate networks an "Atlantic sphere" reaching lake Vänern and an "Baltic sphere" reaching lake Vättern and Mälaren.

Further, the papers argue for two traditions of rock art, a coastal and an inland tradition. The inland tradition is not only identified by its geography, being further away from the sea, but also for having a more restricted range of motifs, with regional variation (Bradley et al. 2020:264). Fundamental motifs are cupmarks, grooves, footprints, and circular motifs and most are found in agricultural and pastoral landscape, but may still be close to water like lakes, rivers, or streams (Ibid). The authors notes, however, that his is not entirely straightforward and mentions Högsbyn as one important exception, with elements from both traditions (Ibid:264; 272). These locations, with both traditions, could be aggregation sites where different communities met and exchange and rituals took place (Ibid:275-276). At the end the authors urge for more local studies on inland rock art and comparative studies to its coastal counterpart, for a more versatile understanding of the Bronze Age long-distance exchange system (Bradley et al. 2020:275–76; Nimura et al. 2020:200).

2.3 Previous research at Högsbyn

The first detailed description and mapping was done in 1931 by Claes Claesson as part of the Swedish National Heritage Boards [SNHB] inventory in Tisselskogs parish. A second inventory was conducted in 1964 when most of the rock art panels were given their registration number. The most recent inventory by the SNHB was done in 1988 (Fornsök 2021).

In 1981 a documentation of all then known rock art in Dalsland and Göta Älvdalen was conducted by Karin Rex Svensson at the request of the county museum in Vänersborg. The documentation was limited to only figurative petroglyphs, thus excluding cup marks, but in Högsbyn they were included as part of a coherent rock art area (Rex Svensson 1982:9). The aim of the documentation was not to discuss different interpretations of the rock art but only to present the so far know figurative rock art in the area (Ibid:12). It also raises the concern about how rock art can be preserved for the future (Ibid).

Tommy U Andersson conducted further documentation during the 1990s and early 2000s that also resulted in new discoveries of rock art surfaces and figures (Andersson 1997, 2000, 2005). Andersson's interpretive framework is within the terrestrial paradigm, emphasizing on agricultural fertility cult (Andersson 2001). The boat motifs are argued as cult ships in a spring procession, or in other words carnival parade, to celebrate the rebirth of the new year and the circularity of life and death. Andersson also compares the voltigeur scene and horn helmets depictions with the Minoan bull cult and the latter with Celtic bull cult. He argues that the bull cult is an important part of agricultural fertility cult and that the rock art at Högsbyn most likely has been a part of this (Ibid:20).

Christopher Tilley made a comprehensive interpretation of the rock art at Högsbyn in *Metaphor and material culture* (Tilley 1999). With a phenomenological perspective on the landscape, he argues for a structural order that links the rock panels together while moving from the shore, south, to the higher ground, north. He interprets this general pattern of movement as part of a narrative of becoming human "…to do with life, death and the regeneration of life, time, movement, the rising and setting of the sun and moon, the passage of the seasons, and relationships between land and water, their connotations and associations" (Ibid:171). It is a rather wide interpretation where individual motifs, or designs, can have multiple meanings. Similar to Andersson, Tilley's interpretation follows the terrestrial paradigm that emphasis seasonal fertility rituals or ceremonies in a context of agricultural practices.

Johan Ling uses the rock art at Högsbyn for demonstrative purposes, as one of three analogies together with rock art in western Norway and Simris area in Scania, regarding the original setting of rock art in Northern Bohuslän (Ling 2014:35–46). As these sites are not as affected by the shoreline displacement, and still close to the water's edge, they offer a seascape environment that could resemble the Bronze Age settings in Norther Bohuslän. Although the shoreline of lake Råvarp at Högsbyn has not been altered significantly since the Bronze Age there was, however, more variation in the water levels before the lake was regulated, rising up to 5 meters (Tilley 1999:153). Following this Ling argues, within a maritime framework, that more attention should be given to the seascape and seasonal movement of the lake in the interpretation of the rock art, for example he mentions how the wavy lines motifs could reflect the motion of the lake (Ling 2014:41). Lastly, as mentioned above, Nimura, Bradley, and

Skoglund also discuss the rock art at Högsbyn within a maritime framework, as an aggregation site where different communities came together (Bradley et al. 2020).

3 Theory

In this chapter the theoretical perspectives that are fundamental for the thesis will be presented. The thesis uses two interconnected theories: social semiotics and sociocultural systems. Together they will be used in the analysis and discussion to answer the research questions.

3.1 Social semiotics

This thesis will have a social semiotic perspective on rock art. It is "…a theoretical framework that helps understand the communicative role of signs and symbols in the society." (Vogt 2014:25). Rock art motifs can be seen as semiotic resources that emphasis certain characteristics in specific sociocultural situations. A semiotic resource can tell something about ideas and ideals that were important in the particular context it was made in (Rédei et al. 2019; Skoglund et al. 2020; Wessman 2021). The assumption is that rock art, and its motifs, exist in relation to the surrounding sociocultural context.

An example of this was presented in the introduction. The emojis in Andy Murray tweet [figure 1] are semiotic resources that trigger associations, which can only be understood when it is put in context. The ambiguousness of symbols can also be seen, for example the ring emoji represent both a physical thing and abstract values at the same time. Consequently, the theoretical perspective on the context is essential for the interpretation.

3.2 Sociocultural systems

This thesis also uses a contextual perspective borrowed from macrosociology and can be referred to as sociocultural systems. It is influenced by the work of the American anthropologist Marvin Harris and rooted in the classical social theories of Karl Marx, Émile Durkheim, Max Weber and Herbert Spencer (Elwell 2013:7). Sociocultural systems consist of three interconnected phenomena: material, structural and ideational.

The material has an observable presence and can be divided into two dimensions: ecosystem and infrastructure. Ecosystem can be defined as "a geographic area where plants, animals, and other organisms, as well as weather and landscapes, work together to form a bubble of life." (NG 2021). The infrastructure is the interface between the ecosystem and human society. Human population, or demography, and production are part of this exploitation of the ecosystem. The structural phenomena refer to all human social groups and organizations, for example family structures, craft guilds or political organization. Lastly the ideational, or superstructure, comprise of the ideologies, religious beliefs, values, norms, and other symbolic meanings present in societies.

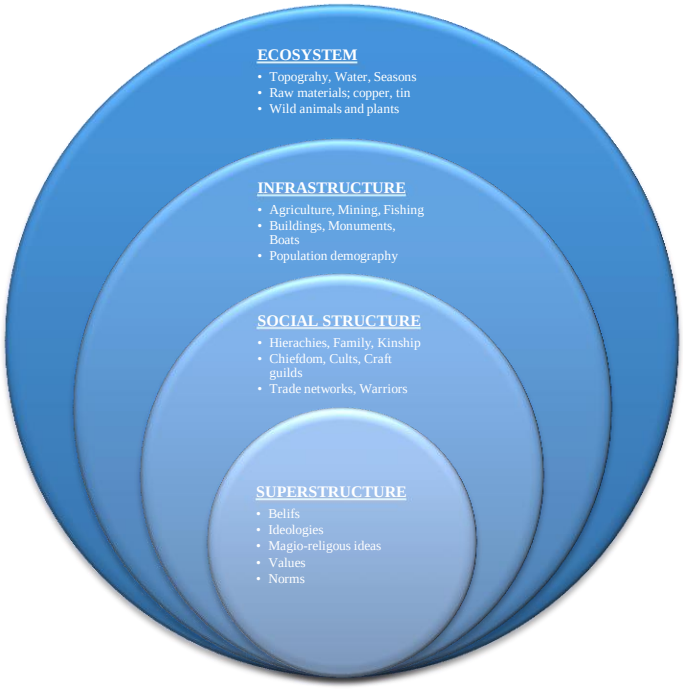

Figure 8: Exemplifying Model of a Bronze Age sociocultural system

Rock art carries information regarding the local Bronze Age sociocultural system. Further, rock art is part of a variety of Bronze Age sociocultural systems. By analyzing motifs characteristics, comparing to other locations, and putting them in context it is possible to get a better understanding of the local Bronze Age society.

4 Method

In this section the choose of study design will be presented. Further the method used to investigate and analyse the material will be described. A workflow will be presented as well how previous documentation will be used.

4.1 Case study design

The intention is to investigate a case, the inland rock art at Högsbyn, in relation to established theories on coastal rock art. Thus, the documentation of the case is the study object, and the most obvious design is thereby a case study. Focusing on one case gives a more deeply investigation. However, the case is not representative for inland rock art and the goal is not to generalize on this phenomenon. Rather an in-depth study may be able to question established theories or give new insights.

A comparative study between coastal and inland rock art would be possible but have not been chosen due to two reasons. Firstly, the selection of case is based on the lack of knowledge

concerning inland rock art. Secondly, a comparative study would be more time consuming in regard of documentation and processing of 3D models for an additional site. There are however comparative elements with the previous research that generally has focused on coastal rock art.

4.2 3D documentation

3D documentation has become a new standard in rock art documentation that present an extra dimension that facilitate analysis (Horn et al. 2018). In contrast to traditional documentation of rock art, for example tracing, rubbing or frottage, 3D documentation enables a non-destructive and more objective documentation that is accessible beyond the academic world (Meijer 2015:66). This gives new insight and interpretations that may challenge traditional interpretations and potentially contributes to new knowledge of prehistoric human culture.

There are various 3D documentation methods. This thesis will use structure from motion [SfM]. In comparison with other 3D documentation methods, for example laser scanning, it is possible to produce good models relatively cheap, using mobile phone camera and free open-source software (Ducke 2018:2). Even if the 3D model quality varies depending on camera type and processing software it can be done on a low budget and thereby suitable for a bachelor's thesis.

SfM refers to the 3D perception we receive from moving through space around an object, for example a statue. The three dimensions are width, depth and height and are commonly referred to as x, y and z in 3D software. By taking multiple overlapping photos, ideally 60-80% overlap, around the study object it is possible to create a 3D model (Horn et al. 2018; Meijer 2015). This is done by using a computer software that processes the photos with the SfM algorithms. The first step is the alignment of the photos, using the internal camera parameters, and calculating camera positions for each photo by matching them after common points. This results in a sparse point cloud with marked camera positions. The sparse point cloud is used in the second step, together with the photos, to calculate depth maps or the distance between camera and object. This results in a dense point cloud that is used for the last step to calculate a meshed 3D model. The model can then be analyzed using different filters and lightning angles to enhance the rock surface.

4.3 Workflow

Two technical devices are needed for this workflow: a camera for documentation and computer for processing the 3D model. The camera is a mirrorless system camera Sony A5000 model with a 20,1-megapixels APS-C-sensor and 16-50 mm-lens. The computer has the following hardware: Central processing unit [CPU] Core i7 (9700K) 3.6 GHz (4.9 GHz with turbo), Graphics processing unit [GPU] Nvidia GeForce RTX 2070, 8 GB and a Random-access memory [RAM] of 16 GB.

Fieldwork

The documentation at Högsbyn was conducted on the 4th of September 2021 between 09:00 – 12:00. Weather was clear given an even lightning during the documentation. Unfortunately, most of the rock art panels slopes towards east and thus documentation in front of the panel cast

a shadow. It was overcome by taking photos from different angels and masking the shadow in the processing software. Taking photos in the afternoon or on a completely overcast day would have been faster. In the end this was simply bad preparation from the author that resulted in longer documentation and processing time. The following camera settings were used: 1/80 - 1/160 sec shutter speed, aperture 11, ISO 100 and focal length of 16 mm.

Computer software and analysing tools

The photos were run in the photogrammetry software 3DF Zephyr Lite trial version by 3Dflow [see figure 32 and 33 in appendix]. It has previously been used in cultural heritage and archaeological research (3Dflow 2021; Pancani et al. 2020). Three 3D models were computed: surface 1, 2 and 3. Surface 1 using 80 photos, surface 2 using 72 photos and surface 3 using 86 photos. For the sparse point cloud, camera orientation, reconstruction the software default presets for surface scan was used. For the dense point cloud creation, the high detail preset for surface scan was applied. Lastly, for the mesh generation the high detail preset for surface scan was used. The 3D models have the following components. Surface 1: 2,000,004 vertices, 3,999,889 faces and a file size of 452 MB. Surface 2: 1,564,106 vertices, 3,128,091 faces and a file size of 357 MB. Surface 3: 1,964,020 vertices, 3,927,874 faces and a file size of 490 MB.

MeshLab, a 3D mesh processing and editing software, was used in the analyzing and enhancing of the models (Cignoni et al. 2008; Horn et al. 2019; Vergne et al. 2010). Further enhancement of the 3D models has been provided with the tool “ratopoviz” = rock art topographic visualization (Horn et al. 2021).

Use of previous documentation and comparative data

With the help of the tools above the rock art motifs will be identified and classified. Their characteristics, relationship to other motifs and context will be further analyses through comparison with coastal rock art. The documentation of coastal rock art was supplied by Swedish Rock Art Research Archives [SHFA]. The previous literature and the theoretical framework serve as a lens in the discussion on interpretations. Previous documentation of the rock art at Högsbyn will supplement the 3D documentation [see figure 29-31 in appendix]. This is important in areas that show traces of erosion or other damages.

5 Analysis

In this chapter the rock art panel Ronarudden, Tisselskog 15.1, at Högsbyn will be analyzed. The rock art panel at Ronarudden is divided in three segments, which have been named 1, 2 and 3 (see cover photo). Surface 1 is the southernmost at the point of the peninsula, 2 is the middle surface and 3 the northernmost. The surfaces will first be analyzed separately, where motifs will be described and interpreted. This is followed by a contextual analysis of the whole site. Lastly there will be a comparison between the inland rock art site of Högsbyn and the coastal rock art site of Brastad.

5.1 Surface 1

Six recurring types of motifs can be distinguished on surface 1: boats, feet, hands, circles, cupmarks and infilled or net motifs. Further there are unclear, or dubious, carvings that could be one of the mentioned or other types of motifs. For instance human motifs, usually in connection to boats, and at least one animal motif will be argued for.

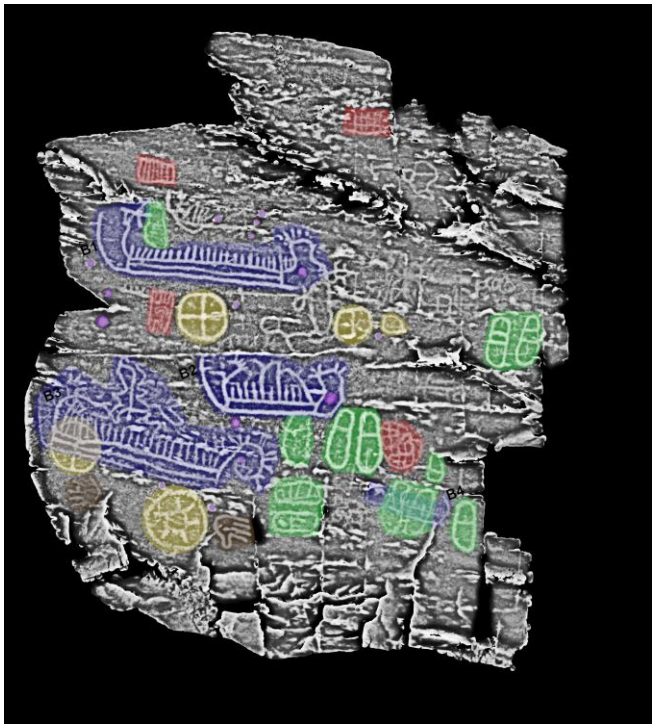

Figure 9: Surface 1 with marked motifs. Blue = Boats, Green = Feet, Brown = Hands, Yellow = Circles, Purple = Cupmarks and Red = Infilled or net motifs

Starting with the boats there are three clearly visible and arguably the most salient motif on surface 1. These three, referred to as B1, B2 and B3, are in a north-south direction, have crew strokes and elaborated but ambiguous stern parts [see figure 10-12]. B1 and B3 are the longest in length and with 25 and 23 crew strokes each. B2 has 8 crew strokes with similar length and three longer lines that connects to each other and should probably not be regarded as crew strokes. The fourth boat, B4, follows the same direction but the crew strokes are harder to count since it is superimposed by a pair of feet motif.

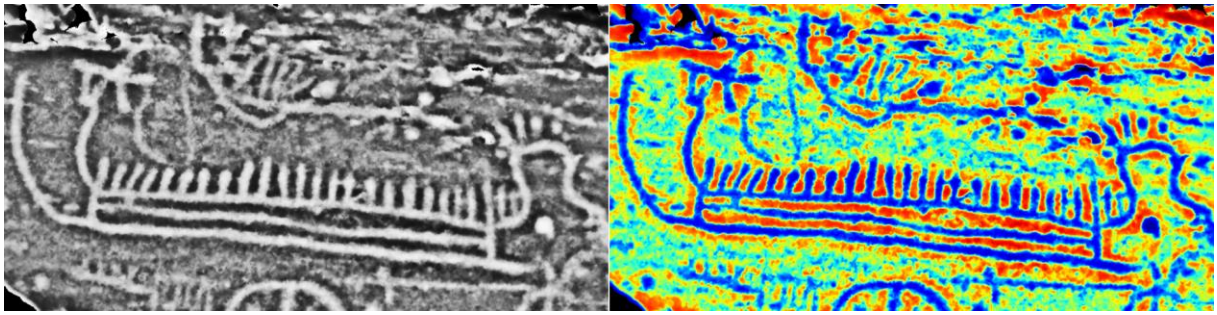

Figure 10: B1 with 25 crew stokes

The fore parts, to the south, are similar between B1, B2 and B3 with a long keel extension. However, there are some minor differences. On B2 the extension goes up directly from the stem while B1 has a short straight line before bending upwards. The extension on B3 is not as distinguished and has a steeper angle. Behind the keel extension on B3, the prow is sharply bending inwards towards the center of the boat, crossing over a human motif. The human appears to be standing and is turned looking forward, to the south. B1 and B2 have S-shaped prows even if it is more distinguished on B2. This can be due to latter alterations where an animal head has been added to an inward going prow, arguably even on two occasions. On B4 it is unfortunately hard to distinguish the fore part.

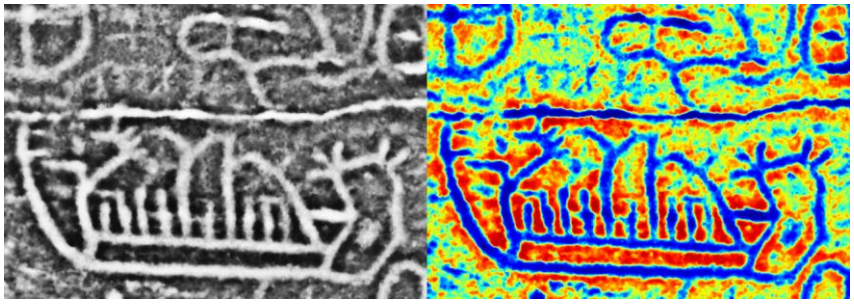

Figure 11: B2 and potential animal motif with mounted human above

The stern parts, to the north, are more similar between B1 and B2 with a cupmark in the center of an obscure form with five lines at the top. B3 also has a cupmark but at the end of an open-ended circle with outward going lines. B4 has a more modest stern with a stabilizer and inward angled prow. Further, interesting observations can be made above the boats. B1 has a faint trace of what can be a foot motif and deeper carvings of a possible unfinished boat motif, but this is unclear. Above B2 there is a diagonal crack in the bedrock and on this line there is a potential animal motif with a mounted human. The wavy lines above B3 forms an obscure figure and a controversial argument would be for a sail, however the lack of a line marking a pole debunk that argument.

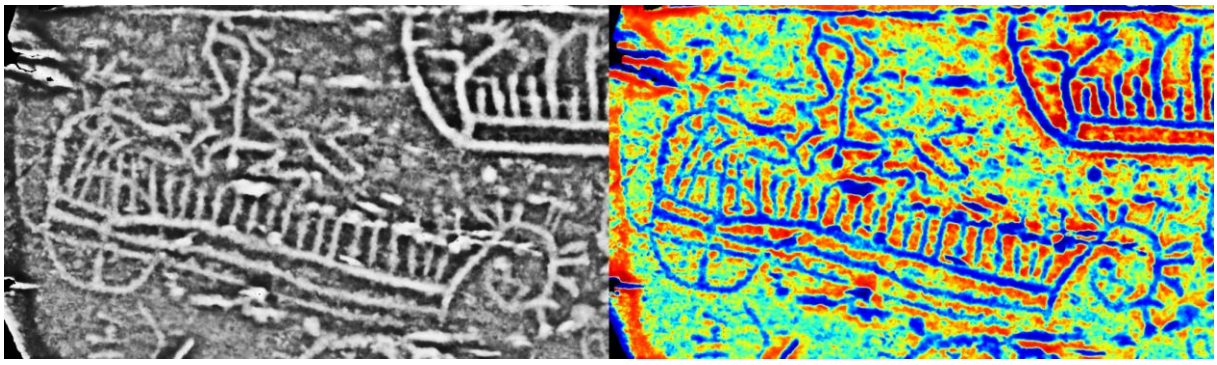

Figure 12: B3 with circular prow to the right and superimposed circle to the left. Human motif standing on the left side of the boat

It is important to note that the traveling direction of the boats, and what should be considered the front and rear, can have been altered over time. The fore keel extension on B1 can have been added to a stern stabilizer, thus turning the traveling direction. Also, the fore extension on B3 stands out as a possible latter addition since the carving is not as clear as the rest of the boat. The steep angle could be a result of the carver running out of space on the rock. Further new details can have been added, superimposing previous design. This is clear regarding the circle

motif on B3 and feet motif on B4. More unclear are the third line on B1 and B3 between the lower keel line and the upper gunwale line. This could be a design chose or an indicator that the design has been altered over time. Another possible indicator of alteration is the obscure stern part of B2. The two lines are turned inwards, towards the boat, forming a “curved rectangle”. This form could be the result of two individual prows with animal heads made at different times.

In contrast to the boats the feet motifs, with one exception, have a west-east direction going down the slope of the bedrock. They are distinguished by a foot-like form as well as one or two diagonal lines, marking the heel. Four of these carvings are in pairs while four appears to be single foot motifs. As mentioned above one pair of feet are superimposed on B4. Another pair of feet appears to have at least one small boat crossing diagonal, but the carvings are faint [see figure 13, left image]. The divergent north-south directed feet motif also stands out with possible superimpositions. The topmost foot likely has a boat motif within or human figures standing in T-posture in a line [see figure 13, right image].

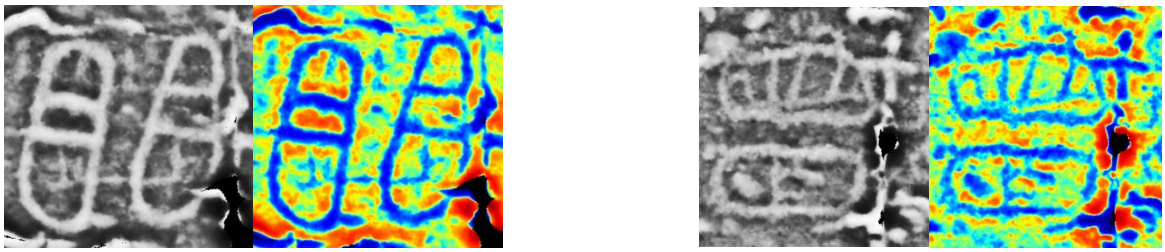

Figure 13: Left, a pair of feet motif with a crossing boat motif at the lower part. Right, north-south directed pair of feet motif with a likely boat motif in the uppermost foot

The two hand motifs that can be identified are both beneath B3 at the lower end of the surface. The rightmost is carved more distinctly with fingers in different length and a thumb. If pressed on the surface it represents a left hand and if turned upwards, towards the sky, a right hand. The other hand motif is not as clearly carved but follows the same pattern, thus it is not representing a pair of hands but two individual hands.

There are at least five circle motifs on the surface. The one below B1 has a cross inside and is similar to the circle that is superimposed on B3. Another circle below B3 is interesting as it has an inner circle with what could be five spokes. However, they are asymmetric and do not appear to connect to the outer circle. To the right of B1 it is difficult to interpret any clear motifs, but it appears to be at least two circle motifs and possibly some small human figures.

It is difficult to establish if the cupmarks on the surface are deliberately part of any other design or individually placed on the surface. The cupmarks at the stern parts of the boats, as discussed above, are the only pattern that can be noted. The infilled or net motifs are also difficult to interpret.

5.2 Surface 2

Five of the six distinct motifs on surface 1 have a present on surface 2, with the exception being the hand motif. Instead of boats, the most salient motif on surface 2 are the circle carvings. Especially two larger circles stand out on the upper part of the sloping bedrock.

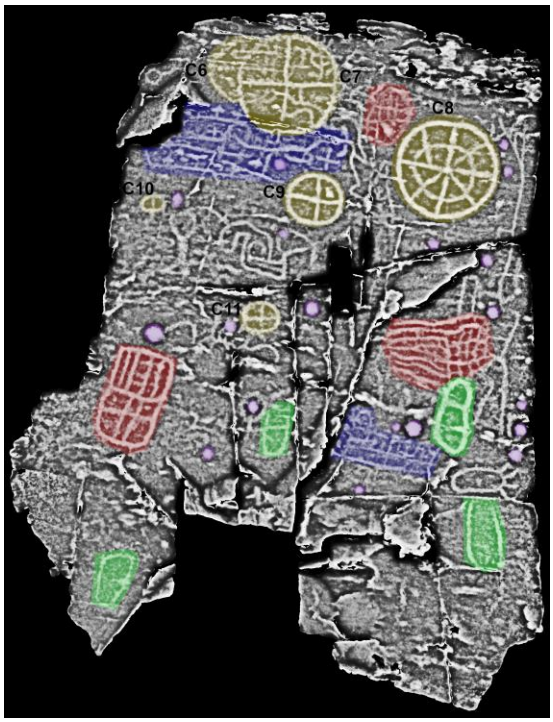

Figure 14: Surface 2 with marked motifs. Blue = Boats, Green = Feet, Yellow = Circles, Purple = Cupmarks and Red = Infilled or net motifs

Two smaller circles, C9 and C11, have the typical cross inside the circle, known as sun crosses. One of the largest, C8 [see figure 15], has an inner circle and 8 spokes, where one spoke is asymmetric to the rest. C7, similar in size, has the more frequent cross inside the circle and is superimposed with what could be another circle motif, C6. This area is interesting as there is elaborate carvings inside the four areas separated by the cross. Unfortunately, these carvings are difficult to interpret, and it is no clear whether they are the result of an intentional design or if the sun cross has been superimposed over other motifs.

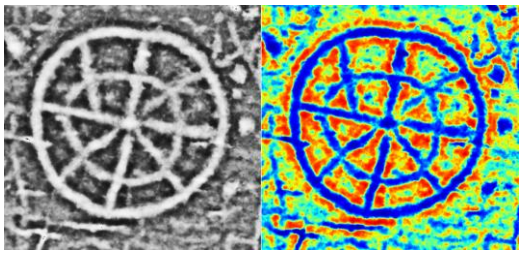

Figure 15: C8 with inner circle and asymmetric spoke

At first only one boat motif, B5, was identified on the surface with the same north-south direction as on surface 1. The southern end of the boat is hard to distinguish due to the damaged bedrock. There could be a superimposed feet motif, like B4, but the lines are faint. Rather late in the analyzing process, while looking at the amount of small cross markings, there was a realization that more boats can be distinguished on the surface. Arguably the cross markings can be interpreted as humans in a poise with open arms. Further there is a clear line beneath that connects them. Thus, it is likely that some are sitting in boats [see figure 16]. In the area under C7 at least five boats can be identified. In contrast to the boats on surface 1 they are smaller in size, and the hull of the boat is represented with only one line.

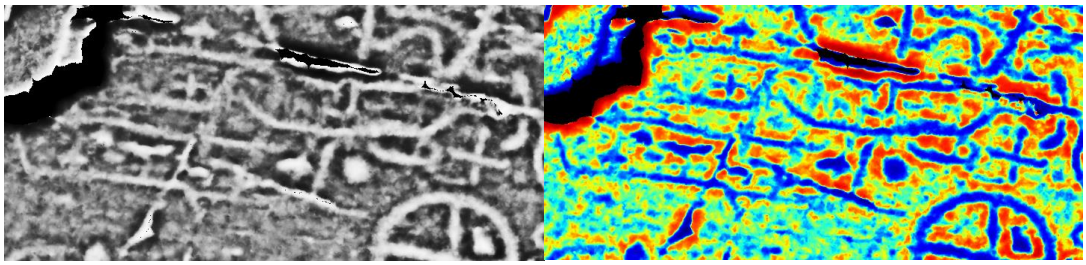

Figure 16: Area with several human motifs sitting in boats

Additional human motifs can be argued for further down on the surface. C10 and C12 can be identified as circles with cupmarks but arguably there are more to it. Another interpretation would be human motifs in a poise with their arms above the head in a circular form [see figure 17]. To the right of C10 there is a larger carving that clearly is more than a circle but the potential head, or cupmark, is not represented.

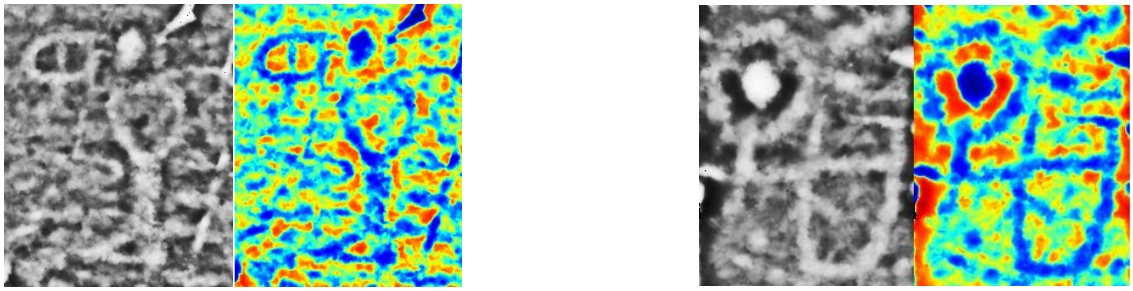

Figure 17: Left and right are example of possible human motifs in a poise with their arms forming a circle

In contrast to surface 1 there are no pair of feet but only individual foot motifs. They follow the same west-east direction as on surface 1, going down the slope of the bedrock. Two of the foot figures have diagonal lines that marks the heel. The rightmost foot is interesting as it could arguably be barefoot, with lines marking the toes. On closer inspection it is also possible that it constitutes the lower part of some abstract motif [see figure 18]. The upper part has an oval shape with four lines spreading out on one of the sides. This could also be interpreted as an animal paw with a human foot motif underneath.

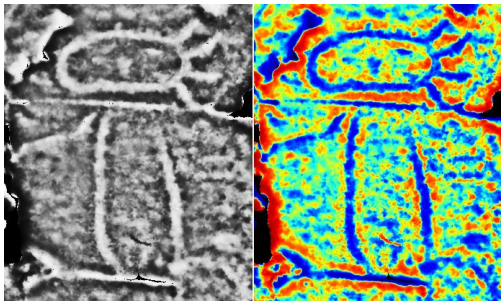

Figure 18: An ambiguous motif that can be interpreted as a foot and an animal paw

Compared to surface 1 there is a higher frequent of cupmarks. Especially on the right side, northernmost, there is a higher concentration, but as before it is difficult to identify any clear pattern regarding these. The same must be said about the infilled or net motifs even if they are more salient on this surface, than compared to surface 1.

5.3 Surface 3

The last surface is the most ambiguous and hardest to define motifs on. The motifs that could be identified are feet, circles, cupmarks and infilled or net motifs. Arguably there are boat motifs on surface 3 as well.

Figure 19: Surface 3 with marked motifs. Blue = Boats, Green = Feet, Yellow = Circles, Purple = Cupmarks and Red = Infilled or net motifs

The most salient motif on surface 3 is the pair of feet that is almost encircled with cupmarks. It follows the same direction as on the previous surfaces, west-east, going downslope. Interesting to the right there are traces that can be interpreted as one end of a boat with a human figure aboard [see figure 20]. This can be compared to B4 on surface 1, which is superimposed with a pair of feet motif, and the boat and feet combination shown in figure 13.

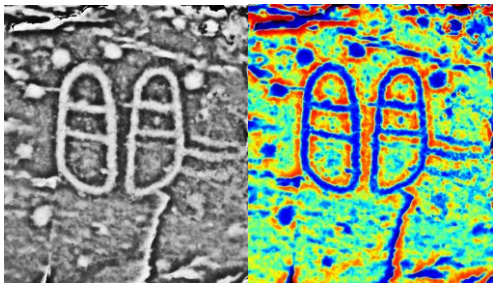

Figure 20: The pair of feet encircled with cupmarks and traces of a boat motif with a human figure on

At least two small circles can be identified, one with a cupmark at the center. The infilled or net motifs are once again represented. One is carved above a boat motif and a similar argument regarding sails could be made here as on surface 1. A large area of the surface is carved with curving lines that are hard to interpret. One of the foot motifs stands out as it follows a more north-south direction, typical for boats on the other surfaces. Further the line that marks the

heel is not in a straight line. It can be argued that this motif represents a boat with human figures on board [see figure 21]. Thus, it is marked in both blue and green in figure 19.

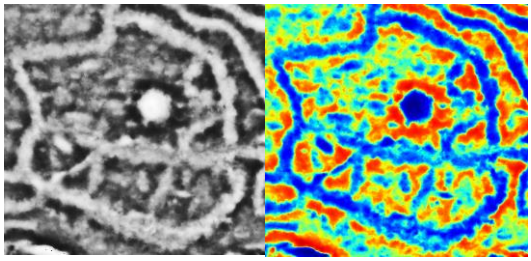

Figure 21: A north-south directed foot motif that arguably can be a boat motif

In total the three surfaces are covered with carvings but also damaged with cracks from erosion. In several areas motifs or carved lines are superimposed on each other. Together, the damage and superimposition, makes the surfaces difficult to interpret but the latter is an important part of the function and/or practice of rock art. There are for example recurring superimpositions between boat and feet motifs that can have an underlying meaning. Further there is a clear pattern of motifs with similar design, abstract cupmarks and circle carvings, and figurative boat and feet motifs.

Lastly, the 3D documentation has shown new motifs that was unclear or not visible at all in the previous documentation. For example, there are arguably more boat motifs than previous documentation and literature have taken account for. This is important for the interpretation of the site. Thus, it has shown that 3D documentation can give new insights and why it is important to use new documentation methods to complement the previous data.

5.4 Contextual analysis

Högsbyn is situated along Upperudsälven, a 135 km long stretch of water, which includes many of the lakes in the geographical province of Dalsland. The water system is an important natural resource for fresh water and fishing. The long distance it reaches and the oblong form of many of the lakes makes it practical for transportation and communication. This was for example utilized in the 19th century with the construction of Dalsland Canal. 2000 years earlier, during the Bronze Age, this water system would have been useful as well and Högsbyn has a strategical position close to the outflow into lake Vänern.

The setting at Högsbyn is in an open agricultural valley surrounded by lake Råvarp to the south and forested highlands on the other sides. There is a headland going out into the water and on both sides, there are streams running from the highlands into the lake. The amount of deforestation during the Bronze Age is difficult to assess but the area is clearly suitable for agricultural activities. The rich wildlife in the forested areas would also have been an important natural resource.

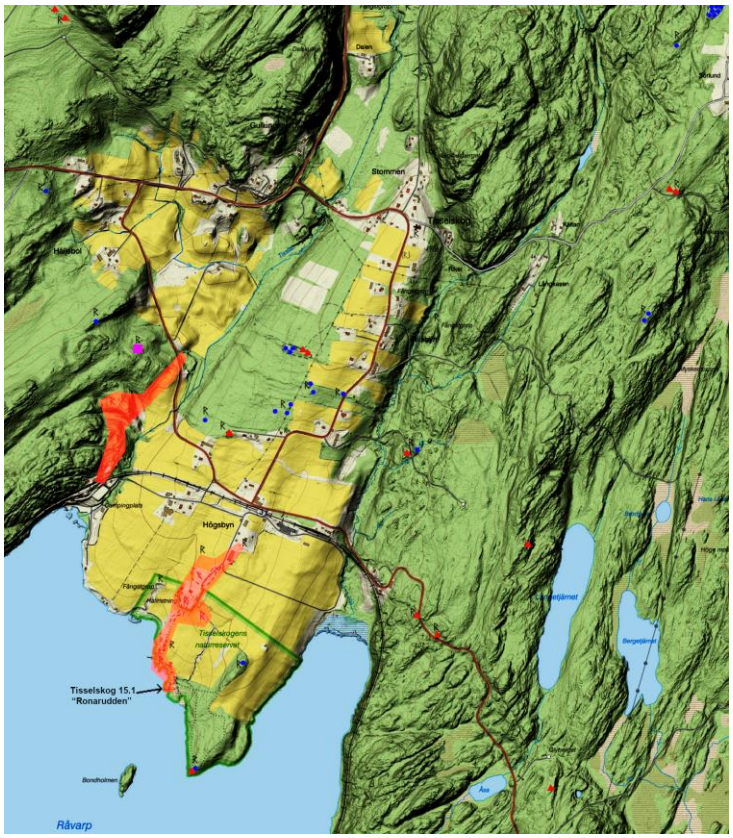

Figure 22: Map of Högsbyn. Areas with high concentration of rock art are marked in red. Red triangle = cairns. Blue circle = stone settings. Purple square = mound. Produced by the author using different maps, topographic, terrain shading and terrain slope, from Fornsök (Fornsök 2021).

In addition to the rock art there are ancient graves documented in the area: at least 13 cairns, 25 stone settings and 1 mound [see figure 21] (Fornsök 2021). On the tip of the headland there is a cairn and stone setting. There is a concentration of ancient graves in the middle of the valley, but some are also spread out on higher ground in the landscape. These grave monuments can be contemporary to the rock art, but no archaeological excavation has been conducted. Interesting there is no direct link to the rock art, but rather they occupy different areas in the landscape.

Analyzing ancient population and demography in the past is always difficult. At Högsbyn there is little, to none, archaeological findings on settlements or human remains. South of Tisselskog church a potential settlement was registered in 1996. Twelve test pits resulted in finds of coal fragments, brittle burnt stone and fragments of burnt clay, but there is no dating of the site, Tisselskog 108:1 (Fornsök 2021). Lacking clear evidence of any settlements, the graves and rock art combined still show evidence of human activity during the Bronze Age. Further, considering the scale of these remains the activities at Högsbyn likely stood out in the region.

The lack of a settlement could be an argument for seasonal activities at Högsbyn. Religious activities connected to agriculture, cultivation and harvest, have been proposed in previous literature. Other applicable seasonal activities could be hunting or markets. However, as described in the literature, the social structure was decentralized and organized in single farmsteads. With this perspective it is not likely to find any larger structures of settlements. Different groups of people living along the water system likely used it for communication and

exchange of goods. Högsbyn can have developed into the central location for these activities, the need of social exchange.

As mentioned in previous chapter, rock art can be found in two areas with different settings: the cultivated landscape and the forested landscape. The rock art in the cultivated landscape is part of the headland that goes out into the lake. This creates a setting where the water is visible as a backdrop for some of the rock art panels closest to the lake. The rock art in the forest landscape is further away from the lake but about 200 meters from the Tisslan stream, which flows into the lake. It is on higher terrain overlooking the valley. There can be different interpretations on this divided concentration of rock art. If contemporary the different settings can imply two distinctive practices or meanings of the rock art. It can also be the result of a movement of activity from one of the locations to the other. The lack of dating makes this question difficult to answer with any certainty.

Considering the general orientation of the bedrocks with rock art they slope eastwards towards the rising sun. This is true with several of the more elaborated surfaces in the Högsbyn complex, for example “the procession panel” and “the snake volution panel” [see figure 4]. A preference of eastward sloping bedrocks can thus be seen, however, rock art at Högsbyn can be found on westward facing rock panels and flat bedrocks as well.

5.5 Comparison with coastal rock art

Starting with a contextual comparison some general similarities and differences can be drawn. A clear difference is the ecological system at the sites, with a coastal marine biome at Brastad and an inland forested and lake biome at Högsbyn. The sea provides a different type of natural resources and greater potential for communication than the freshwater system in Dalsland. Another difference is the scale. Brastad has a greater amount of rock art, both in numbers and amount of different motifs. There are also more ancient graves in the coastal landscape of Brastad. Cairns and stone settings are present at both sites. At Brastad the stone settings are more connected to the rock art while the cairns are located on higher ground overlooking the sea. Comparing to Högsbyn there is no clear pattern. Stone settings are more concentrated in the open valley but there is no clear connection to the rock art.

Some similarities can be drawn on the rock art location in the landscape. Both sites can be described to have a high concentration of rock art in valleys and open plains. The rock art on higher ground tends to be on downslopes facing out over the open landscape. Water, in the form of the sea, lakes or streams, is in proximity to the rock art. In proximity does not mean that open water must be visible from every rock art location. At both sites the location, in relationship to water, varies from the edge of the lake or sea to approximately 1000 meters away. The use of bedrocks, and hillslopes, facing the east towards the rising sun is another pattern that can be distinguished at both sites. Further, researchers have argued for procession ways or sacred roads at both sites that follow the rock art locations. Whether or not this linear pattern of rock art is intentional or a consequence of a preference for eastward sloping surfaces is difficult to determine. Still, the choice of location was arguably thoughtfully done and not randomly carved in the landscape.

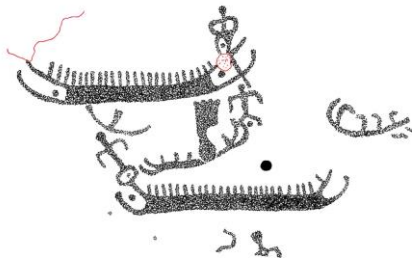

Figure 23: Brastad 123.1 Boats with cupmarks, human motifs and a foot motif (SHFA 2021)

Turning to the rock art itself, motifs and designs, there are some interesting observations. The most common motif on both sites are cupmarks. Likewise, the most frequent figurative motif are boats. Brastad stands out with a high occurrence of animal motifs, birds are numerous in this category, while Högsbyn has more salient pairs of feet or foot motifs. These two categories of motifs are however present at both sites. Circle motifs are also present at both sites but the "sun stand" motifs, typical for the Backa location at Brastad, have not been identified at Högsbyn.

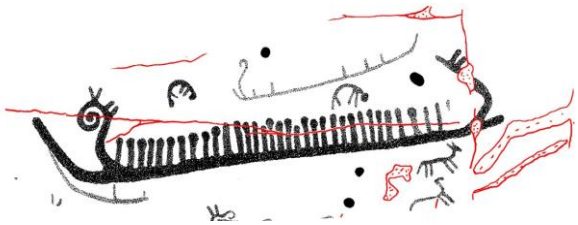

Figure 24: Brastad 26.1 Boat with a spiral prow at the front, stabilizer and an inward going prow at the back. This one has four "ear" strokes but two are more common (SHFA 2021)

Onwards the next comparison is the motif design. Starting with the boat motifs there are some clear similarities. At Brastad the hull is depicted in at least four different variations: a single line [see figure 23], two lines [keel line and gunwale: see figure 25] with two connector lines, two lines with more than two connector lines [see figure 24] and as infilled [see figure 22]. These four hull designs are also present at Högsbyn [see for example the three analyzed surfaces at Högsbyn 15:1, but also Högsbyn 11:12 and Högsbyn 11:4 for infilled boat design]. However, the infilled hull design is more frequent at Brastad. The hull design with three horizontal lines at Högsbyn [see surface 1, B1 and B3] stands out in the comparison but somewhat similar hull designs are present at Brastad 14:1, but these have no elaborated prows.

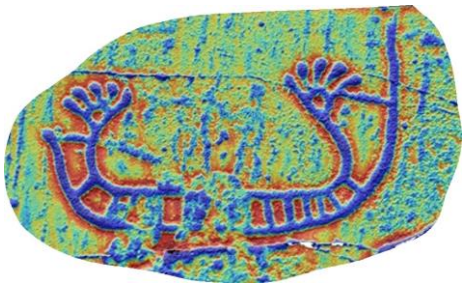

Figure 25: Brastad 1.1 Boat with comb prows (SHFA 2021)

Looking at the design of the prows there are many different variations on both sites. The arguably basic shapes of inwards going prows and S-shaped prows are present at both sites. This can also be said about the strokes or comb that is usually interpreted as ears on animal

heads. At Högsbyn the bigger boats rarely only have two strokes, which might question the interpretations as ears. There are however examples at Brastad as well with more than two strokes and comb like features [see figure 23 and 24]. Brastad is also known for boats with spiral prows and animal ears [see figure 23]. This is an interesting comparison with the circular prow on B3, surface 1. Both have circular shapes but the one at Högsbyn stands out with at least 10 strokes, making it difficult to be interpret as ears. It can be further noticed that boats on Tisselskog 6.1, at Högsbyn, have S-shaped prows that can be identified as spirals, but these have no strokes for ears. Another interesting observation is the placement of a cupmark in the space between the prow and the keel extension at Brastad [see figure 22] and the similar cupmark placement on B1 and B2 on surface 1 at Högsbyn. Thus, this relationship between boats and cupmarks can be seen at both sites but it is only a few examples.

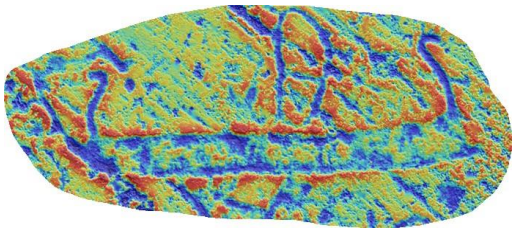

Figure 26: Brastad 1.1 Boat with S-shaped prows and a foot motif above (SHFA 2021)

Further, both sites have boats with crew strokes and larger more figurative human designs aboard. On both places there is a variation in the crew numbers, but the largest crews can be identified at Brastad. Another observation is the relationship between boat and feet motifs, which can be identified at Brastad as well [see figure 22 and 25]. The pair of feet or foot motifs at Brastad have the same design that can be identified at Högsbyn, a shoe-sole with a diagonal line that marks the heel. The bare-foot design is more common at Brastad. The feet motifs are not as salient at Brastad as at Högsbyn. Instead, the human figures are more numerous and stands out together with animal motifs. On the human figures the hands have a clear focus and commonly in a pose of adoration [see figure 5]. These have not been observed at Högsbyn where human figures are not as dominated. There are however some individual hand motifs that arguably resemble the hands of the human figures in adoration at Brastad.

Figure 27: Brastad 29:1 Circle motif with asymmetric spokes (SHFA 2021)

Turning to the circular motifs the sun cross design is common at both sites. The more elaborated wheel design, with more spokes than four, are also frequent. There is an interesting similar asymmetrical design between C8 on surface 2 at Högsbyn and a circle motif at Brastad 29:1, both with 8 spokes, [see figure 26]. A small degree of asymmetry is likely due to the carver, but these examples are arguably intentional. These motifs are usually interpreted as the sun or wheels and at Brastad there are more elaborated motifs with two circles, resembling a pair of

glasses, which forms a wagon connected to two animals. There is no clear evidence of wagons at Högsbyn. Lastly the ambiguous lines on surface 3 at Högsbyn have similar abstract carvings on for example Brastad 29:1 [see figure 27]. These lines and forms are not similar per se but rather as a phenomenon.

Figure 28: Brastad 29:1 Example of abstract lines and forms (SHFA 2021)

6 Discussion

In this chapter the result of the analysis will be discussed, and arguments will be made in relation to previous literature and the theoretical perspective. Answers to the research questions will be motivated. Lastly there is a discussion considering future research topics and method in the subject.

6.1 An inland tradition?

The inland rock art site at Högsbyn has three significant geographical characteristics: the water system, the open valley, and the surrounding hilly and forested landscape. The water system opens for a mobile Bronze Age population. Longer routes of communication and trade that would not be possible by foot in the rugged terrain. There is clear evidence of human activities but no archaeological evidence regarding settlement or means of subsistence. It is also questionable if the activities were seasonal or permanent. If the valley was deforested during the Bronze Age, it is suitable for agriculture that could be complemented with wild hunt and fishing. Overall, some parallels can be drawn between these characteristics and those of the coastal rock art site. Firstly, the present of a waterway that facilitates exchange of goods and ideas. Secondly, the protective valley is suitable for farming that could sustain a population. Importantly there is an evident difference in the reach of the waterways and scale of productive land.

The rock art at Högsbyn is characterized by figurative boats and abstract cupmarks. It follows the general pattern of coastal rock art with some local variation. But this local diversity is also evident between different coastal rock art sites. Thus, Högsbyn show similar symbolism as the coastal rock art sites. The ideological meaning or practical implementations can differ over time and space, but it is likely that these different communities understood each other and was part of the same political, economic, and cultural sphere.

As mentioned in the literature review, Nimura, Bradley, and Skoglund argue for an inland tradition of rock art characterized by its inland location, a more restricted range of motifs and

with certain salient motifs like cupmarks and footprints. They also noted that Högsbyn stood out as an inland site. Therefore, it is not surprising that Högsbyn shares characteristics with the maritime tradition. It can, however, be argued that the feet motifs at Högsbyn are more salient and recurring than at Brastad. Hypothetical Högsbyn can be seen as a meeting place and contact zone between different communities from the coast and the hinterland.

6.2 Rock art in No Man's Land – Högsbyn's role during the Bronze Age

While traveling to Högsbyn , by car from Gothenburg in the south, you first pass by Dalboslätten. A vast plain of arable land in southeastern Dalsland. After passing this plain and the town of Mellerud the terrain shift and becomes hilly and forested. Following along crooked roads for about 30 minutes you arrive at Högsbyn. Rock art in no man's land was a thought that struck me. Dalsland is one of the smallest traditional provinces in Sweden and with a low population density. At the border to Norway and with no larger urban areas it can be regarded as isolated. During historic times the province has been in the border area between Sweden and Denmark/Norway, which was an exposed location due to invasions and raids. But can this context be applied to the Bronze Age society at Högsbyn? Was the rock art at Högsbyn carved in a "no man's land" or can they tell us something more?

To begin there were obviously no national borders during the Bronze Age. Here another parallel can be drawn from historic times. During the personal union between Sweden and Norway, 1814 – 1905, Dalsland were not a border area. It is also in this period that Dalsland Canal was built, which utilized the lake system for transportation. National borders were not a hindrance during the Bronze Age and both Dalsland and Bohuslän were more integrated with the Viken province in Norway, than with for example eastern Sweden.

As argued for in the previous chapter, the rock art at Högsbyn is part of the maritime tradition and likely interconnected to the coastal political and cultural sphere. The shared symbolism in rock art can be seen as an indicator of a similar superstructure: beliefs, values, and ideologies. Further, this would involve the structure of the society. Arguably the rock art phenomenon spread from the coastal areas, through rivers and lakes, into the hinterland. If this is true it can be debated whether there was a movement of people, ideas, or a combination. An expansion theory can typically be described as a growing population that requires new natural resources, arable land or hunting grounds. The social structure presented in the literature review, with a hierarchical mobile warrior society, would likely have affected the hinterland communities in one way or another. An opportunistic theory can be described as local inhabitants taking advantage of foreign ideas and connections to gain power and influence. Rock art is commonly associated with religious beliefs or cult practice and in many societies, this is closely connected to political power. It can be used to legitimize control over spiritual matters but also social relationships and material resources.

Thereby, this thesis argues that Högsbyn can have been part of a decentralized chiefdom in the lake system of Dalsland. The amount of rock art and its organization indicate that Högsbyn was the center of power in this social structure. Likely the family on top of this hierarchy would have had their farmstead at this location. The chieftain at Högsbyn can have used the location to control the trade route between the upper part of the lake system and lake Vänern. A

potentially important trade resource can have been pelts. Meetings at Högsbyn can have been seasonal and on certain events and multifunctional, for religious, trade and political reasons.

Arguments against this hypothesis would come from scholars that support the terrestrial paradigm. Thus, it is important to look at Högsbyn through that lens as well. Arguably the theory that connects rock art with agriculture and more precisely religious beliefs regarding the means of survival can not be completely falsified. In fact, it goes in line with the notion of this thesis, that rock art reflects an essential part of Bronze Age society. As part of the infrastructure agriculture is one such essential part. No matter how mobile the Bronze Age societies were there must be a stable surplus of food to sustain a more specialized social structure. The introduction of bronze by trade does not only imply mobility but also new and more efficient tools that can result in surplus and population growth. Thereby the importance of agriculture in the society and its impact on the superstructure should not be underestimated. Still, at Högsbyn the rock art in connection with the lake system is arguably of greater importance. As mentioned, there are other locations, Dalboslätten, in Dalsland that are more suitable for agricultural activities. Interestingly there is a rock art site in this landscape, Evenstorp [Sundals-Ryr 17:1], with figurative motifs. A comparison between Evenstorp and Högsbyn can be an interesting topic for future research.

6.3 Future research

This thesis has showed that rock art can be documented in an easy and cheap way without damaging the surface. The 3D documentation has also given new insight on motifs on the analyzed surfaces. However, research methods can always be improved and yield better results. The 3D documentation in this thesis used a basic camera and freeware software. Better professional cameras with higher resolution and more advanced software as analyzing tools can improve the quality and result. A second visit to the site to improve the data and a better understanding of traditional rock art documentation methods had also been helpful. There is much to gain by using complementary documentations method in the analysis.

Only one of the larger rock art surfaces at Högsbyn was 3D documented and analyzed in this thesis. Thus, more research is needed at Högsbyn to better understand the site. Future research at Högsbyn could compare the two rock art concentrations in the forested and cultivated landscape. Is it possible to get a better understanding of this division of location? A more detailed comparison of motifs is possible and a method to date the two areas would be helpful. For example, chronological dating based on boat design could be regarded.

Research with an interdisciplinary approach between archaeology and geology can focus to better understand the waterways into the hinterland and how ancient communities used them to communicate. The study of shoreline displacement on the coast and its relationship to rock art is an example of an interdisciplinary approach that opens for new knowledge and interpretations. Hopefully this thesis has been helpfully as an example of 3D documentation and as inspirations for future research on inland rock art.

7 Conclusions

This thesis has discussed the characteristics of inland rock art through a case study of Högsbyn. It has been compared to the general more studied coastal rock art using material from the site of Brastad. Lastly there was a discussion about what these insights on rock art can tell us about inland Bronze Age society. These are the conclusions on the research questions.

The rock art at Högsbyn is characterized of recurring motifs like boats, circles, feet and cupmarks. There are also some figurative human and animal motifs as well as other abstract motifs that are difficult to categorize. Compared to coastal rock art there are some local variations, but the general repertoire of motifs and symbolism are resembling. Despite different biomes there are similar patterns in location of the sites and orientation of rock art.

Consequently, this thesis argues that the rock art at Högsbyn is part of the same maritime tradition as at Brastad. It does not argue against the theory of a maritime and an inland tradition. Rather Högsbyn can be part of a transition or spread of ideas from the coast to the inland. The similar superstructure evident in the rock art likely reflects an influence on the organization of society. Thereby the social structure of chiefdoms and trade networks, which has been argued for along the coast, can be used as a hypothesis to understand Högsbyn. There is a potential infrastructure for fishing and agriculture, but arguable pelt trade was an economical inducement in this region.

8 Summary

Most of the Bronze Age rock art in Europe is situated in Scandinavia and with a particularly high concentration close to the coast in the Bohuslän province, western Sweden. A lot of attention has been given to this region in the academic research on Scandinavian rock art. Less attention has been given to inland rock art locations. From a scientific perspective this pose a problem when other regions are not as representative in the research. Further, the cultural preservation at inland locations risk to be neglected.

Following this there is a potential to broaden the scientific discussion and add more complexity to the study and interpretation of rock art in Scandinavia. The aim is to increase the understanding of inland rock art and the human societies in which it was created. Furthermore, the purpose is to add more diversity to the study of Scandinavian rock art by contributing to the broadening of the research field. The following research questions will be discussed.

- What characteristics can be identified in inland rock art?
- How does inland rock art differ compared to coastal rock art?
- What can it tell us about inland Bronze Age society?

To answer these questions a case study was conducted at the rock art site of Högsbyn in Dalsland, Sweden. It is an inland location with a high concentration of rock art, making it possible to compare several motifs. 3D documentation, structure from motion [SfM], was used as method to document and analyze the rock art surfaces. The coastal rock art at Brastad in

Bohuslän, Sweden, was used as comparative material and the documentation was provided from Swedish Rock Art Research Archives [SHFA].

The thesis uses two interconnected theories: social semiotics and sociocultural systems. Rock art motifs can be seen as semiotic resources that can tell something about ideas and ideals, which were important in the context it was made in. The assumption is that rock art exists in relation to the surrounding socio-cultural context. The theory of sociocultural systems is used to understand the context. It consist of three interconnected phenomena: material, structural and superstructural.

Rock art is evocative and complex and as such given rise to a diversity of interpretations in the academic field. This thesis focused on the previous research regarding the different kinds of context with which the rock art is associated. Two different paradigms were presented: the terrestrial and the maritime. The first, emphasizes rock art in the context of 1) an agricultural landscape and 2) socio-cultural aspects of a sedentary population. The second, emphasizes rock art in the context of 1) a seascape, where rock art is close to the water's edge, and 2) socio-cultural aspects of a mobile population. In previous literature there has also been a discussion on two different rock art traditions: a coastal and an inland. Beyond the geographical difference, it is argued for regional variation and a more restricted range of motifs in the inland tradition.

Turning to the result of the thesis. The rock art at Högsbyn is characterized of recurring motifs like boats, circles, feet and cupmarks. There are also some figurative human and animal motifs as well as other abstract motifs that are difficult to categorize. Compared to coastal rock art there are some local variations, but the general repertoire of motifs and symbolism are resembling. Despite different biomes there are similar patterns in location of the sites and orientation of rock art.

Consequently, this thesis argues that the rock art at Högsbyn is part of the same maritime tradition as at Brastad. It does not argue against the theory of a maritime and an inland tradition. Rather Högsbyn can be part of a transition or spread of ideas from the coast to the inland. The similar superstructure evident in the rock art likely reflects an influence on the organization of society. Thereby the social structure of chiefdoms and trade networks, which has been argued for along the coast, can be used as a hypothesis to understand Högsbyn. There is a potential infrastructure for fishing and agriculture, but arguable pelt trade was an economical inducement in this region.

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Appendix

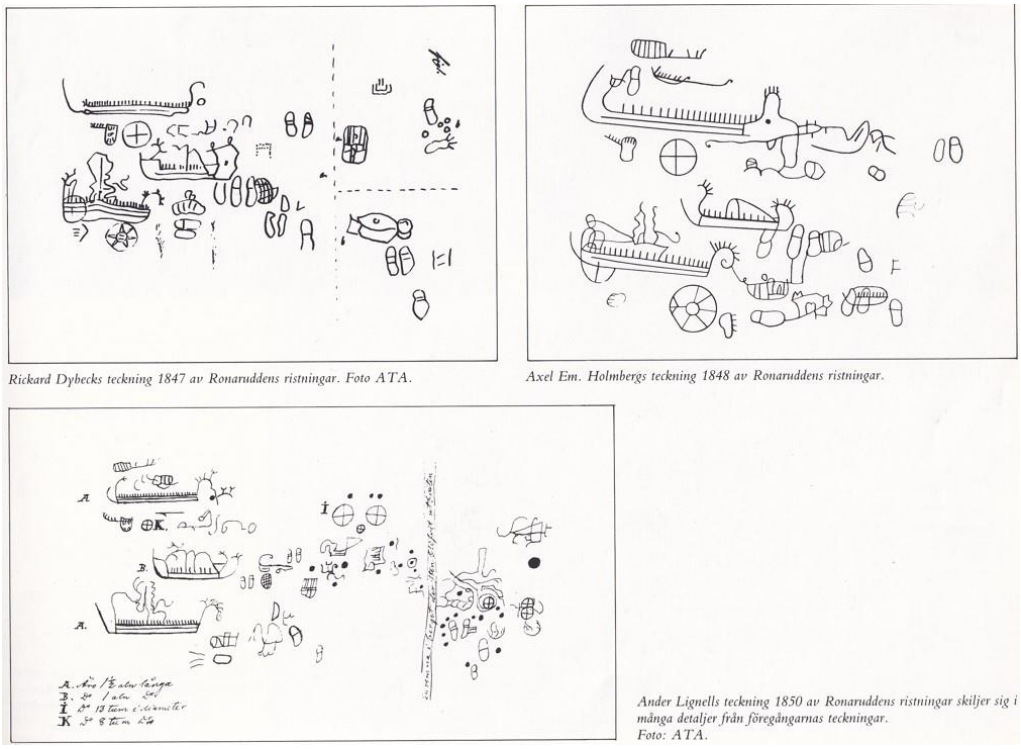

Figure 29: Three first depictions of Ronarudden, Tisselskog 15.1, from “Hällristningar i Älvsborgs län” (Rex Svensson 1982:53)

Figure 30: Rex Svensson’s documentation of Tisselskog 15.1 [surface 1 in this thesis], from “Hällristningar i Älvsborgs län”. Unfortunately the book binding made the scan blurry. (Rex Svensson 1982:50–51)

Figure 31: Rex Svensson's documentation of Tisselskog 15.1 [surface 2 in this thesis], from "Hällristningar i Älvsborgs län" (Rex Svensson 1982:50–51)

Figure 32: Rex Svensson's documentation of Tisselskog 15.1 [surface 3 in this thesis], from "Hällristningar i Älvsborgs län" (Rex Svensson 1982:50–51)

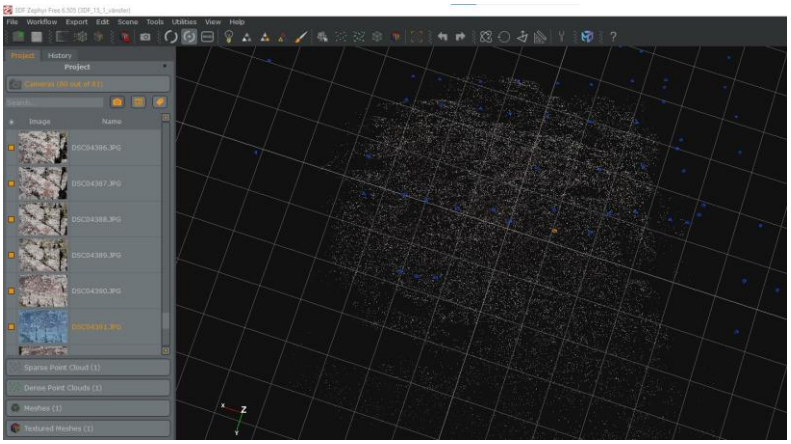

Figure 33: Images, seen to the left, are represented by blue camera markers and creates a sparse point cloud. Authors screenshot from 3DF Zephyr Free

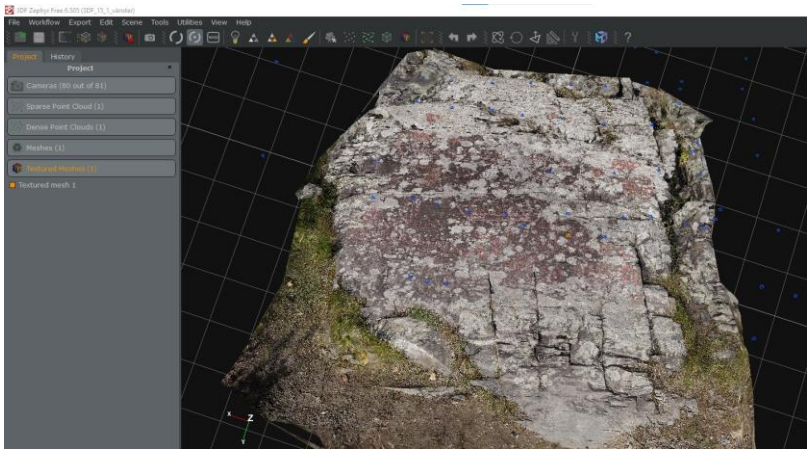

Figure 34: When the software has processed all the images it creates a textured mesh, a 3D model. Authors screenshot from 3DF Zephyr Free