

Elevated rock art

Johan Ling

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Towards a maritime understanding of
Bronze Age rock art in northern Bohuslän, Sweden

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Tryck:

Dedication

To my family and kin

Abstract

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The main focus of this dissertation is the issue of how Bohuslän rock art and landscape may be perceived and understood. Since the Bronze Age, the landscape has been transformed by shore displacement but in the research tradition this has attracted very little attention. Furthermore, due to a misunderstanding of shore displacement but also to certain ideas about the character of Bronze Age society, rock art research in Tanum has drawn much of its inspiration from the present agrarian landscape. The perception of the landscape has not been a major issue. This thesis accordingly aims to shed light on the process of shore displacement and its social and cognitive implications for the interpretation of rock art in the prehistoric landscape. The findings clearly show that in the Bronze Age, the majority of rock art sites in Bohuslän had a very close spatial connection to the sea.

These conditions make it possible to apply new perspectives to Bohuslän rock art. Much rock art analysis focuses on the contemplative observer and elaborates this theme. The more direct activities related to rock art are seldom fully considered. I therefore discuss the basic conditions for the production of rock art and then move on to discuss social theory and approaches to image, communication, symbolism and social action, related to the palpable social forms of the “reading” of rock art. When considering rock art, it is the social praxis in the landscape that is of primary importance. Moreover, since Oscar Almgren there has been a tendency to picture the groups in Bohuslän as passive and immobile agriculturalists, performing rituals on the rocks. However, the sparse evidence points instead to a more complex pattern of utilisation and social praxis. The general location and content of the Bronze Age remains indicate a tendency towards the maritime realm, which seems to have included both socio-ritual and socio-economic matters of production and consumption. The thesis emphasises that Bronze Age groups in Bohuslän were highly active and mobile. The numerous configurations of ship images on the rocks could indicate a general transition or drift towards the maritime realm. Marking or manifesting such transitions in some way may have been important and it is tempting to perceive the rock art as traces of such transitions or positions in the landscape. All this points to a maritime understanding of Bronze Age rock art in northern Bohuslän.

Keywords: Rock art, Bronze Age, Scandinavia, Bohuslän, maritime praxis, terrestrial, thought style, shore displacement, seascape, social praxis, iconic order, social position, social transition

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Abbreviations

LN = Late Neolithic (2350–1700 BC)
LN I = Late Neolithic I (2350–1950 BC)
LN II = Late Neolithic II (1950–1700 BC)
BA = Bronze Age (1700–500 BC)
EBA = Early Bronze Age (1700–1100 BC)
Period I = (1700–1500 BC)
Period II = (1500–1300 BC)
Period III = (1300–1100 BC)
LBA = Late Bronze Age (1100–500 BC)
Period IV = (1100–900 BC)
Period V = (900–700 BC)
Period VI = (700–500 BC)
PRIA = Pre Roman Iron Age (500–1 BC)

ATA = Antikvariskt Topografiskt Arkiv, Stockholm
FMIS = Information from the Swedish National Heritage Boards sites and monuments register
GAM = Göteborgs Arkeologiska Museum, Göteborgs StadsMuseum
m.a.s.l = Metres above present sea level
RAÄ = Riksantikvarieämbetet, the Swedish National Heritage Boards sites and monuments register
SHFA = Svenskt HällristningsForskningsArkiv, Tanumshede
VM = The Vitlycke Museum Archive, Tanumshede

Rock art sites are identified as, for instance, Tanum 1, Herrestad 58, i.e. without the prefix RAÄ



PREFACE

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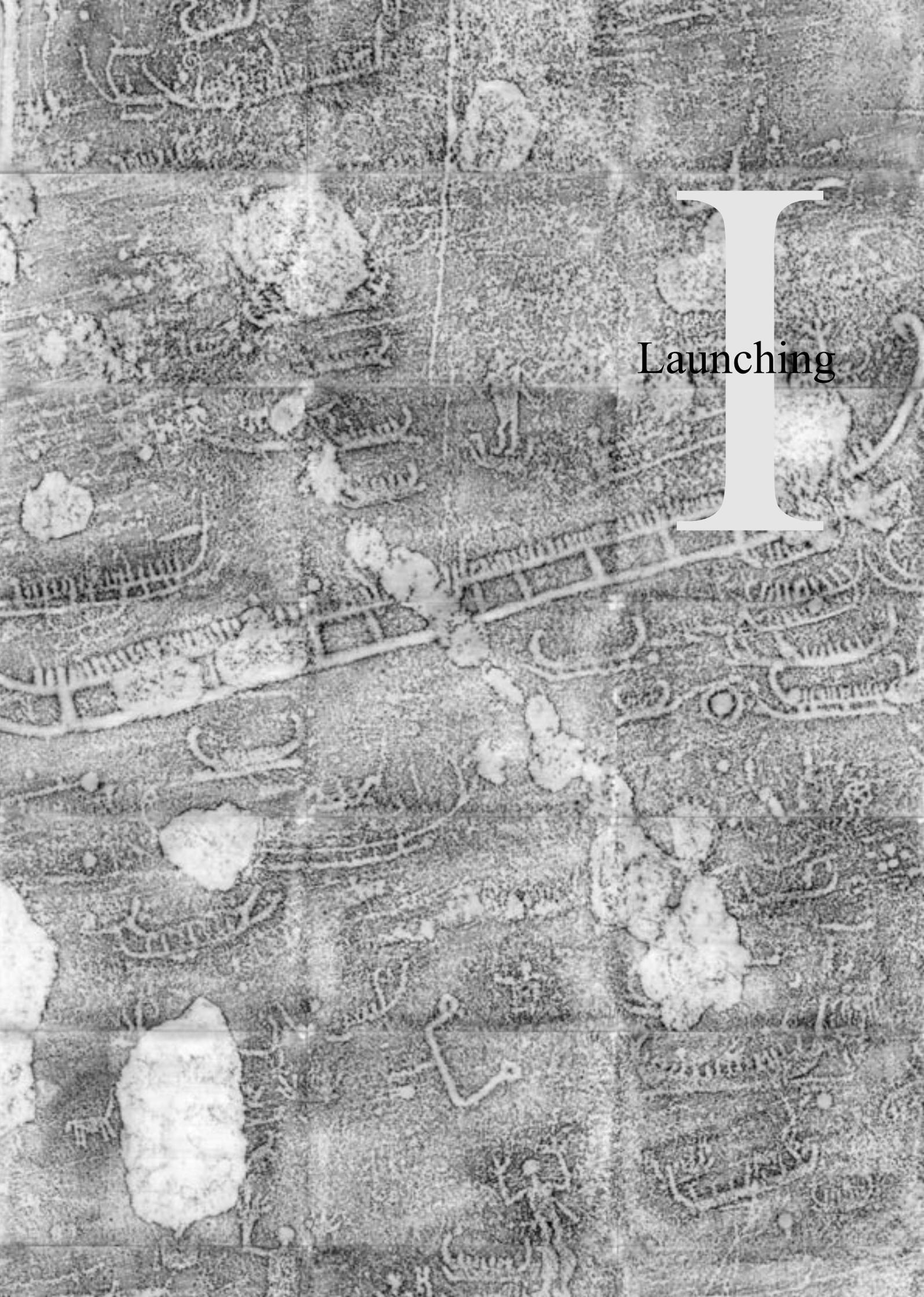
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I Launching

1

INTRODUCTION – THE ROCK ART PHENOMENON IN NORTHERN BOHUSLÄN

Introduction

The coastal region of Bohuslän, with its maritime location and its maritime history, ethnography and economy, has always been associated with the sea. Fishing and farming have a strong tradition in northern Bohuslän. For the coastal population, combining these two sources of food has been a common practice in historical times and fisher-farmers or farmer-fishers have been common terms for the most usual livelihood in Bohuslän. The fishermen and sailors of Bohuslän have a historical reputation for skill and daring; Bohuslän has also been one of Scandinavia's foremost boat-building centres (Hasslöf 1949, 1970). In the 12th century, King Sverre of Norway introduced a system that divided Bohuslän into 16 *skipreidor* (ship levies), each of which was required to provide 40 maritime warriors. After 1658, when Bohuslän became a part of Sweden, the *skipreidor* were successively renamed *härad* (hundred). In the Late Medieval era the sea provided a glut of herring, which resulted in a period of economic and social prosperity. The historical accounts of these interactions are many and varied and so are the archaeological remains (Hasslöf 1949, 1970).

Most of the prehistoric remains are also oriented towards the sea. The earliest settlement sites from the Mesolithic are strongly associated with the seashore and maritime income seems to have dominated the economy (Andersson et al. 1988). Neolithic

activity also seems to have been oriented towards the sea. Settlements and megalithic graves are often located on or in the vicinity of the contemporary shore and livelihood seems to have come from both maritime and terrestrial sources (Sjögren 2003).

Moreover, Bohuslän has Europe's largest concentration of prehistoric rock art; about 1500 sites have been recorded. The most common feature on the rock is the cup mark and most of them were probably made during the Bronze Age (BA), 1700–500 BC (Bertilsson 1987). But there are indications that cup marks were made in the landscape both earlier and later than the figurative rock art (Bengtsson 2004; Goldhahn 2006). Furthermore, no other area with South Scandinavian BA rock art presents such a rich figurative repertoire and complex compositions of images as Bohuslän. Since the BA, however, the landscape has been transformed by shore displacement, so today most of the rock art, on bedrock of granite or gneiss, is located around 10 km inland. The most common figurative image is the ship; the region is known to contain some 10,000 ship images (Hygen & Bengtsson 1999).

The figurative rock art in Bohuslän is extremely evocative and it is hardly surprising that over the years, this prehistoric feature or medium has inspired such a wide range of interpretations (cf. Baltzer 1911; Nordbladh 1995; Bertilsson 1987; Goldhahn 2006). The innovative expression and

aesthetic artistry of the rock art images are hard to put into words. The images have been hammered out in stone with the emphasis on place, motion, light, form, style and content. They are performed so concretely that they tend to both fix and distort our reading of them. Another paradox with the rock art is that although the images are fixed in stone, they are full of life, vivid and mobile. They convey motion as often as immobility and this contradiction is so stimulating that one never tires of looking at the panels. Ideals of communication, landscape and motion seem to have been mixed with “iconic” symbols (fig. 1.1, see chapter 9).

Broadly speaking, the rock art may be described as a selection of images that represent concrete social actions, social positions and abstract ritual features and matters. Some compositions may be regarded as episodic, others rhapsodic, performed in a varied and ambiguous way. Mobility and conflict seem to go hand in hand with highly ritualised scenes or compositions. The images were most probably made before, in connection with or as a manifestation of specific socio-ritual events. They may be regarded in general as reproductive features of specific social and ritual values rather than representations of mundane life.

As to the causes or actions behind the making of this rock art, in the past two centuries the following themes have been suggested:

- Historical events (Sjöborg 1830; Holmberg 1848; Hildebrand 1869; Montelius 1874).
- Religious declarations (Worsaae 1882; Almgren 1927; Bing 1937; Ohlmarks 1963; Hultkrantz 1989; Larsson 1997; Fredell 2003; Kristiansen & Larsson 2005).
- Magi-religious incantations (Brunius 1868; Almgren 1927; Gjessing 1939; Althin 1945; Bengtsson 2004).
- Cult and cultic action (Almgren 1927; Kaul 1998, 2004; Bengtsson 2004; Kaliff 2007).
- Eschatology (Ekholm 1916; Nordén 1925; Randsborg 1993; Goldhahn 1999a, 2005).
- Socio-ritual initiations or celebrations of seasons, actions, genders (Yates 1993; Kaliff 1997; Kaul 1998, 2004; Kristiansen 2002; Goldhahn 1999a, 2005, 2007; Wahlgren 2002; Coles

2005).

- Socio-ritual and political dimensions and positions (Nordbladh 1980, 1989; Bertilsson 1987; Larsson 1994; Kristiansen 1998; Vogt 2006).
- Socio-ritual, communicative and spatial aspects of landscape (Mandt 1972; Nordbladh 1980; Sognnes 1983, 2001; Bertilsson 1987; Coles 1990, 2005; Nordenborg Myhre 2004; Vogt 2006).
- Semiotic approaches (Nordbladh 1980; Fredell 2003; Vogt 2006).
- Landscape, rituals and cosmology (Tilley 1991, 1999; Widholm 1998; Goldhahn 1999a, 2007; Helskog 1999; Bradley 2000; Sognnes 2001).

However, the perception of the landscape has not been a main topic for rock art research in Bohuslän. Moreover, the extent to which shore displacement has altered the landscape since the BA has traditionally attracted very little attention. Furthermore, due to a misunderstanding of shore displacement but also to certain ideas about the character of BA society, rock art researchers in Tanum (Bohuslän’s primary rock art centre) have tended to draw their inspiration from the present agrarian landscape.

“Finding the lost sea”

A major hazard when working with rock art in the Tanum landscape is the tug-of-war between shore displacement and the power and impact of today’s landscape. It is difficult to grasp the transformations that have occurred over more than 3000 years and to recognize that in the BA major parts of this landscape constituted a seascape, with its strikes, islands, isthmuses, bays and lagoons. Moreover, today there is an absence of perceptual and sensory features associated with a seascape, such as sounds, smells, light and specific animals and vegetation, for instance gulls, seaweeds, salty winds and odours, accompanied by the presence of typical agricultural features, such as arable land, cattle, farmers, tractors, trees and land-based birds. All this seems to contradict the fact that the BA rock art was made in a maritime environment.

In other words, there are important phenomena that cannot be either observed or recorded, which leaves you with more questions than answers con-



Figure 1.1. Rock art from the panel Skee 1539, northern Bohuslän (documentation: Broström & Ihrestam, Vitlycke Museum Archive (VM)).

cerning the prehistoric landscape's cultural and natural features. It is sometimes as though one were chasing a ghost: although the GPS clearly demonstrates that the terrain and rock art in question were once located in a seascape, the prehistoric scene is hard to envisage. A Spanish colleague and friend, Manolo Santos, was right on the mark when he asked me: "Have you found your lost sea yet?"

Furthermore, as mentioned above, it is the present agrarian landscape that has traditionally inspired rock art research in Tanum (Almgren 1927; Bertilsson 1987; Fredell 2003, cf. Baudou 1997; Nordenborg Myhre 2004). Researchers have also tended to concentrate on 'agrarian' motifs, such as plough scenes, wedding scenes, chariots, net figures, sun horses and lure blowers, which in fact are far less common than the ship depictions in this area. Why has so little emphasis traditionally been given to issues connected with the great variety of ship features, ship formations and ship scenes in relation to real and ritual maritime interactions in

the landscape? Lately, however, attempts have been made to explore spatial and social issues of the rock art in connection with the BA maritime landscape and interactions (Bradley 2000, 2006; Kvalø 2000, 2004; Kristiansen 2002, 2004; Kaul 2003, 2004; Coles 2004, 2005; Nordenborg Myhre 2004). These studies have been very inspiring and fruitful but I believe they have a propensity to be either too reserved or too general.

The purpose of the present study is to shed light on an issue that has traditionally been either ignored or treated only briefly by rock art research in Bohuslän, namely the process of shore displacement and its social and cognitive implications for the interpretation of rock art in the prehistoric landscape. However, my intention here is not to advocate a general model or law on how to interpret rock art in Bohuslän. At the same time, in some respects it would be fatal not to make use of the first extensive shore displacement study of northern Bohuslän (Påsse 2003; Berntsson 2006). The findings clearly

indicate that the majority of the rock art sites in Bohuslän had a very close spatial connection to the BA shoreline.

Aims

The primary aims of this dissertation are to present an account of results obtained from new fieldwork involving GPS measurements of rock art (Ch. 7 and 8) and to compare these results with local studies of shore displacement (Ch. 6). In the light of these observations, I will focus and discuss various chronological, spatial and social aspects of rock art.

This approach includes a history of research (Ch. 4) and geographical analogies with other rock art areas in Scandinavia (Ch. 5). On the basis of these observations, I will discuss social and maritime aspects of rock art. The material that is presented and analysed here, which I have collected during many years of fieldwork, is fitted into a theoretical framework primarily built on social theory (Ch. 9, 10, 11 and 12). These theoretical considerations have enabled me to discuss the basic conditions for the production of rock art and the social approaches to images, symbolism and social action, related to the palpable social forms of the “reading” of rock art.

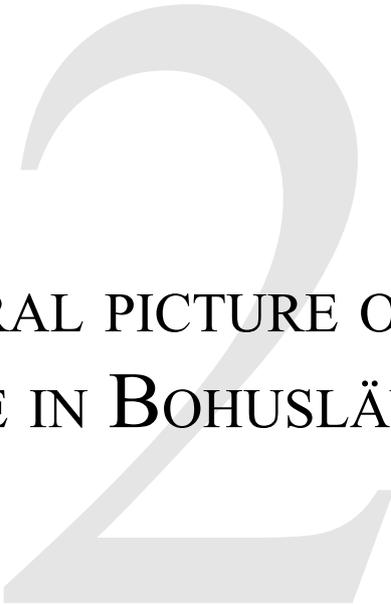
In the thesis I attempt to show that the BA social

groups in Bohuslän were highly active and mobile. I also emphasise that the general location of the BA remains could indicate a transition or drift towards the maritime realm. I further argue that the rock art may constitute traces or manifestations of such transitions or positions in the landscape. My intention is to broaden our perceptions and to advocate a maritime understanding of the BA rock art in northern Bohuslän.

Temporal and spatial limitations

This rock art study has been limited chronologically to focus broadly on the time phase 1700–300 BC. However, the discussion will also include material and features from the LN II, 1950–1700 BC. Moreover, this study focuses primarily on the Tanum and Kville area in northern Bohuslän. However, chronological, spatial and social interpretations are also made on material from southern parts of Bohuslän.

In this thesis Bohuslän is divided as follows (e.g. Bertilsson 1987): *southern Bohuslän*: The Gothenburg area up to the island of Orust; *central Bohuslän*: The island of Orust up to the isthmus of Stångenäset; *northern Bohuslän*: The isthmus of Stångenäset up to Svinesund.



A GENERAL PICTURE OF THE BRONZE AGE IN BOHUSLÄN

Bronze Age conditions in Bohuslän

Europe's largest concentration of prehistoric rock art is to be found in Bohuslän; about 1500 sites have been recorded. Today most of the rock art are located around 10 km inland. The most common figurative image is the ship; the region is known to contain some 10,000 ship images (Bertilsson 1987; Hygen & Bengtsson 1999). The rock art localities of northern Bohuslän represent one of the two general cultural landscape patterns that seem to have prevailed in most of southern Scandinavia during the Bronze Age. The first pattern, which includes northern Bohuslän, consists of rocky coastal areas with limited conditions for agriculture, characterized by a high rate of BA rock art, cairns, and flint artefacts but few bronze items from the Early Bronze Age (EBA) and rather more from the Late Bronze Age (LBA). The second pattern, which includes Västergötland, Halland, Scania, and large parts of Denmark, consists of typical agricultural areas that are characterized by numerous BA settlement structures, barrows, and bronze items from the BA but very few rock art sites and cairns (Malmer 1981; Kristiansen 1987a).

At the beginning of the 20th century, about 50 percent of the coastal area of northern Bohuslän consisted of bare rock, 20 percent of heath, 8 percent of forest and about 22 percent of arable land and pasture (Ljunger 1939; Bertilsson 1987). In the BA, however, new shore displacement studies show that

about 30 percent of today's arable land was covered by the sea and that the shoreline at the beginning of the BA was roughly 6 m higher than at the end. So during the BA less arable land was available for cultivation. Moreover, the shore displacement data indicate that a majority of the rock art sites were located close to the shore and that contemporary settlements were on higher ground, about 500–1000 m away from the sea (Ling 2006).

Pollen analyses have also contributed to our understanding of the northern Bohuslän landscape during the BA. Pollen studies from this region's coastland show a generally similar chronological pattern, which may indicate that this development applied throughout the region. For instance, Fries' pollen analyses of lake sediments and peat deposits from the 1950s in Bohuslän have been broadly verified by later attempts (Fries 1951, see Pässe 2003; Ekman 2004). The pattern also conforms to the broader picture in western Sweden (Fries 1951; Berglund 1969; Svedhage 1997; Pässe 2003; Ekman 2004).

The first phase of deforestation and expansion of heathland began around 2000 BC and lasted until about 500 BC (Fries 1951; Svedhage 1997; Pässe 2003; Ekman 2004). It is notable that this change in the landscape correlates with the archaeological record of bronze items, flint daggers and sickles from the Late Neolithic (LN) and EBA.

In northern Bohuslän, however, this early impact is not evident in all the rock art areas and the pollen records indicate that agricultural activity remained moderate here throughout the BA. Grazing and cattle breeding may have generated this deforestation. Thus different areas display different traits and phases. At Sotenäset, for instance, indications of more widespread grazing start from the beginning of the LBA (Engelmark et al. 2004: 4), while in Tanum this tendency seems to have been underway throughout the BA (Svedhage 1997: 11).

It should be noted, however, that some of the species which are regarded as indicative of land being grazed by cattle, such as *Poaceae* or *Plantago*, are also generated “naturally” by regressive shore displacement and may thus simply signify newly exposed shores (Påsse 2003: 63). So such traits do not necessarily point to increased cattle breeding. Pollen records from all areas in northern Bohuslän demonstrate that agricultural activity seems to have made its first general impact from about 0 BC onwards (Fries 1951; Svedhage 1997; Påsse 2003; Engelmark et al. 2004; Ekman 2004). It is notable that the making of figurative rock art in this area seems to have ceased at about this time.

It therefore seems to be the case that in the rock art rich areas of northern Bohuslän, agriculture was not particularly prevalent in the BA. In connection with the Tanum project, for instance, when intense environmental studies were made of 35 rock art panels in Askum parish at Sotenäset, no pollen-based evidence or other indications of prehistoric agricultural activity were found adjacent to the rock art panels (Engelmark et al. 2004: 4).

Investigations at rock art sites

A number of excavations at rock art sites in northern Bohuslän in connection with the Tanum project have provided some interesting observations. The general outcome is that comparatively small rock art sites located on higher ground have yielded a large number of prehistoric finds and features that correspond to the typological dating of the rock art images (Bengtsson 2004; Bengtsson et al. 2005). For example, investigations at three rock art sites at Torp in Tossene parish on Sotenäset have uncovered numerous artefacts and features of a ritual

character. Moreover, C14 analyses of the finds have demonstrated a clear chronological connection between the prehistoric activity and images on the rocks, with C14 datings that mainly range from about 1500 to 300 BC (Bengtsson et al. 2005). In contrast, excavations at larger, monumental rock art sites with more communicative locations in the landscape have yielded very sparse finds and no concrete prehistoric features.

Household and metallurgic activity

Compared to other regions in southern Scandinavia, rather few BA house structures in northern Bohuslän have been investigated and those that have been are indicative of single households rather than larger hamlets (Streiffert 2004: 142). There is a case from the Uddevalla area that may indicate the latter form (Lindman & Ortman 1997) but it is not as clear-cut as the excavated hamlets in Scania, Mälardalen, or Östergötland (Artursson 2005). The general spatial distribution of house structures and settlement finds indicates that individual households were scattered across the landscape and mainly located in the coastal zone (Bertilsson 1987; Lindman & Ortman 1997; Claesson & Munkenberg 2004a; Streiffert 2004). Moreover, rock art and burial sites seem to have been situated away from the settlement areas, generally at a distance of 500–1000 m (Ling 2004a, 2005, 2006; Goldhahn 2006, 2007).

The settlement structures that have been investigated comprise three-aisled house structures dated 1400–500 BC (Streiffert 2004: 144). They range in size from 13 to 24 m long and 3 to 7 m wide. There are also traces of smaller functional buildings adjacent to the house structures. Settlement activity seems to have been extensive in relation to the house structures, with settlement-related features such as heaps of fire-cracked stones, cooking pits, metallurgic activity, hearths, and cultural layers often found in a radius of 300 m from the central house structures (Lindman & Ortman 1997; Streiffert 2004: 147; Andersson & Ragnesten 2005: 115pp; Munkenberg & Gerdin 2005: 101). The house structures are mainly erected on well-drained sandy soil, in some cases with parts placed directly on the bedrock. This practice seems to be specific to prehistoric house structures in Bohuslän and this building tradition is also

characteristic of house structures built in the area in historical times (Streiffert 2004: 147).

High quantities of cereals have been found in some of Bohuslän's BA settlement sites, which is an indication of agriculture's importance (Gerdin 1999; Sandin 2001; Bengtsson et al. 2005; Munkenberg & Gerdin 2005: 47). Archaeobotanical remains reveal that the cereals included barley, corn, naked corn and emmer (Sandin 2001; Aulin & Gustafsson 2002; Streiffert 2004, 2005; Bengtsson et al. 2005; Munkenberg & Gerdin 2005).

Up to now it is a pastoral or agrarian economy that has been highlighted with regard to the BA in Bohuslän but the overall osteological record suggests a more complex pattern. In this region, osteological remains after fish are, in fact, more common than finds from domestic animals (Jonsson pers. comm. 2006). For instance, at Huseby Klev on the island of Orust, a culture layer from the BA contained a vast number of fish bones from species such as pollock, cod, herring and mackerel that outnumbered the traces of terrestrial domestic mammals such as cattle, sheep and pigs (Jonsson 2005: 103). The layer was carbon dated to period V/VI, 830–600 BC (Nordqvist 2005: 48–53). The archaeological evidence of fishing may contribute to a more balanced view of household economies during the BA.

There is also evidence of bronze casting and metallurgic activity in Bohuslän (Niklasson 1948; Andersson & Ragnesten 2005: 199pp; Munkenberg & Gerdin 2005; Goldhahn 2007). The well-known settlement site at Röra in the Gothenburg area has several features and finds that could be related to bronze casting (Andersson & Ragnesten 2005: 199pp). Another site with traces of bronze casting is the one at Bokenäset (Nicklason 1948: 45pp; Goldhahn 2007). Moreover, several mounds containing fire-cracked stones and traces of melting have been excavated in both the Gothenburg and the Tanum area (Andersson & Ragnesten 2005: 124pp; Munkenberg & Gerdin 2005: 132pp).

Graves

It is noteworthy that excavations of BA graves in Bohuslän have uncovered just a few cases of graves equipped with bronze items, gold or elaborate stone cists. For instance, in the Tanum area 14 cairns and

6 stone settings have been excavated and only two of them contained bronze items (Hallström 1917; Munkenberg & Gerdin 2005: 99pp). The pattern is even clearer in the Gothenburg area, where about 20 cairns and 20 stone settings have been investigated and dated to the BA. Only about 10 percent of these burials had prestige goods such as bronze items, gold or elaborate stone cists (Andersson & Ragnesten 2005: 133–138). The largest excavated cairn in the region, Kuballa Vette on the island of Tjörn, is also the cairn with most bronze items: a razor, a fibula, a sword and a double stud, all items dated to period III (Herner 1999: 39; Skoglund 2005: 194).

Bronze Age burial mounds are not as common in Bohuslän as in the rest of southern Scandinavia (Andersson & Ragnesten 2005; Selling 2007). However, the 6 or so that have been investigated, all of them in the southern part of Bohuslän, do display some interesting features as regards their location and content. They are, for instance, located inland, away from the sea, in areas with favorable conditions for prehistoric agriculture and about a quarter of them contained bronze items (Andersson & Ragnesten 2005: 139pp; Selling 2007).

The agricultural area of Kareby, in southern Bohuslän, has the region's highest number of bronze items from the LBA as well as the largest BA barrow, the Faxe mound (Kindgren 1999; Selling 2007). This mound is in fact the best-equipped BA burial with 6–7 bronze items: a belt-plate, a dagger, 2 arm-rings, a double stud and a tutulus, as well as several other bronze fragments and parts (Herner 1999: 52; Selling 2007: 66). Susanne Selling has recently discussed this burial and argues that: "Similar burials found in Denmark, indicate that the buried person in the Faxe mound was most probably a woman" (Selling 2007: 275).

Taking the BA grave material as a whole, it seems that both men and women, as well as children, are represented (Claesson & Munkenberg 2004b; Andersson & Ragnesten 2005; Munkenberg & Gerdin 2005; Selling 2007: 27). However, some burials display more prestige goods as well as constructions that are considerably larger and more elaborate than the average. This may indicate that burial praxis was marked by social inequality or social stratification.

Bronze items and flint daggers

The bronze items in Bohuslän include 51 from the EBA and 163 from the LBA. Elsewhere in Sweden, this number of LBA items is exceeded only in the Simris and Ystad area in Scania (Larsson 1986: 23). Thus, from a low consumption of bronze during the EBA, Bohuslän advances to become one of the major regions of bronze consumption during the LBA (Larsson 1986: 53). In this context it is interesting to note that the rock art in Bohuslän is mainly from the LBA. A similar development is evident in Østfold (Vogt 2006). Thus, rock art and bronze increase simultaneously in the region during the LBA. It is also noteworthy that most of the LBA bronze items have been found in southern Bohuslän, where the agricultural area of Kareby, in the Kungälv community, is outstanding with a third of Bohuslän's total number of LBA bronze items. It is, however, the Tanum parish that has most of the EBA bronze items (10) as well as only slightly fewer of the LBA items than the Gothenburg area. It should also be born in mind that the Tanum area has been less investigated and less exposed to recent centuries' agrarian reforms and urban expansion (Nyqvist 2001).

Ulf Bertilsson has pointed out that even if the bronze finds are not located just by the rock art sites in northern Bohuslän, there is a clear correspondence between them (Bertilsson 1987). Skoglund, on the other hand, argues that the discrepancy between bronze razors in southern Bohuslän and those

in rock art rich areas in northern Bohuslän reflects differences in ritual praxis and culture (Skoglund 2005). However, if one considers all the bronze items in Bohuslän, instead of focusing on just the bronze razors as Skoglund does, the distribution of bronze items is more uniform and less geographically limited (Bertilsson 1987; Kindgren 1999; Vogt 2006).

Bohuslän also has a considerable number of flint daggers and sickles from the LN and EBA period I–II. There are approximately 450 daggers, all probably imported from Jutland in Denmark (Apel 2001), and they are particularly frequent in the Tanum area, which has a quarter of all the daggers in the region.

Conclusion

The BA archaeological material, such as graves, bronze items and rock art, indicates that Bohuslän communities were hierarchic or socially stratified. What is known about BA household economies in northern Bohuslän reveals a sparse but nonetheless complex economic and social pattern. Judging from the materials recovered from sites that have been excavated in the area, the main pattern during the BA seems to have been a mixed economy based on fishing and farming.

However, future systematic surveys, excavations, and analyses are needed in order to clarify the picture of these sites and their uses during the BA.



SOCIAL LANDSCAPES

Introduction

The perception of the landscape and its social interaction has been intensely debated in anthropology and archaeology since the 1960s, resulting in many new perspectives. For instance, the criticism of evolutionary and nature deterministic assumptions, stressed by scholars like Clarke, Price and Binford, became one of the cornerstones of the so-called postprocessual approaches within the archaeological discourse (Shanks & Tilley 1987, see Jensen & Karlsson 1998; Cornell & Fahlander 2002).

However, it is not my intention to recount all these matters because they have been thoroughly discussed by many others (e.g. Shanks & Tilley 1987; Olsen 1997; Jensen & Karlsson 1998; Cornell & Fahlander 2002; Gröhn 2004: 139pp; Goldhahn 2006: 98pp). Moreover, some of these perspectives are considered in chapter 4 which deals with how rock art and landscape have been perceived from the 19th century and onwards. I will therefore focus here on perspectives that have influenced my work. I have been inspired both by early scholars' way of describing landscape and places and also by more recent attempts.

A vital point is how changes in the landscape are perceived and understood. This matter has a clear social and philosophical dimension. From my point of view, it is not the subjective or the pure ideographic "being" perspective that is of interest (e.g.

Karlsson 1998), but rather more socially oriented theory that considers different social and cognitive aspects of the landscape, related to social and ritual praxis (see Goldhahn 1999a, 2007; Helskog 1999, 2004; Sognnes 2001; Cornell & Fahlander 2002; Ingold 2002: 199pp; Nordenborg Myhre 2004; Coles 2005; Skoglund 2005). Or as Marx once put it:

It is not the consciousness of men that determines their being, but, on the contrary, their social being that determines their consciousness (Marx 1973a: 29).

Thus, more concrete social theories about praxis and changes in the landscape that could be related to archaeological, geological or botanic facts have doubtless exerted most influence on my work, rather than economic or mythological models or generalisations. In the following I shall account for research that has inspired my thesis.

First there are Emil Eckhoff's descriptions of prehistoric remains in the Bohuslän landscape and his emphasis on features, forms, shapes and certain details of the landscape and the prehistoric remains, which convey such a strong sense of these matters (Eckhoff 1881). However, the first attempt that focused on the landscape as an interpretive feature in Scandinavian rock art research was launched by Gro Mandt in her influential master thesis about rock art

in Hordaland (Mandt 1972). Jarl Nordbladh (1980) presented some interesting social, spatial and communicative aspects of the rock art in the Bohuslän landscape, stressing various approaches to do with location, visibility and accessibility. Moreover Ulf Bertilsson's (1987) contextual and thorough descriptions of the rock art in Bohuslän have been of great importance for me. In fact, his descriptions and statistical accounts and maps have been an endless source of information.

Another source of inspiration has been ideas from so-called landscape archaeology, such as the works of Christopher Tilley (1994), Richard Bradley (1997, 2000) and Tim Ingold (2002). Scholars in this field have stressed interesting concepts and aspects in the context of landscape and seascape, such as perception, movement, time, history, space and place. I have, however, had a hard time with some of the social and subjective "being and dwelling" perspectives, as well as with some of the mythological and cosmological models or perceptions of the landscape that some of these scholars have advocated (cf. Tilley 1994, 1999). These generalisations also tend to be as abstract as the environmental interpretations of the landscape put forward by so-called processual archaeologists (e.g. Cornell & Fahlander 2002: 117).

Many Scandinavian archaeologists have been inspired by the "new landscape archaeology", besides developing their own conceptions and interpretations of the landscape (Gansum et al. 1997; Sognnes 2001; Lekberg 2002; Wahlgren 2002, Heimann 2004; Nordenborg Myhre 2004; Skoglund 2005). For instance, Richard Bradley's work has stimulated many later attempts in Scandinavia (Sognnes 2001; Wrigglesworth 2002; Nordenborg Myhre 2004).

Gansum et al. (1997) put forward a pragmatic and operative perspective that has been applied by many scholars (Gjerde 2002; Wrigglesworth 2002; Heimann 2004; Nordenborg Myhre 2004); they integrated Lynch's definitions of the significant features of perception and visibility in a city landscape and adapted them to features in the landscape. Some of these concepts are highly relevant here and may help to distinguish some general patterns of the prehistoric remains in the landscape.

At the same time, too much emphasis on these

concepts may mean that the particulars of reality are overlooked. Moreover, the visibility aspects of prehistoric remains are often overemphasised in reconstructions based on GIS assumptions (cf. Cornell & Fahlander 2002). Nevertheless, scholars such as Curry Heiman (2004: 141) and Lise Nordenborg Myhre (2004) manage to balance these concepts and put forward some interesting interpretations of the prehistoric remains in the landscape/seascape. Some of these aspects will be further discussed in the thesis.

The concept *seascape* was introduced in Scandinavia by John Coles (1990, 2000), who has discussed many aspects of south Scandinavian rock art and stressed the conscious choice of making rock art by the shore. He has also pointed out that shore displacement may have had an historical impact on the making of rock art panels (Coles 2005). Coles has unquestionably been one of my greatest sources of inspiration.

Moreover, the ideas and works of Joakim Goldhahn (1999a, 2002, 2005, 2007), Knut Helskog (1999, 2004), Kalle Sognnes (2001, 2003), Katty Wahlgren (2002), and Lasse Bengtsson (2004) on rock art and social and ritual action in the landscape have contributed on many levels and some of these aspects will also be discussed further on in the thesis.

Finally, scholars such as Merleau-Ponty (1962) and Ingold (2002) have stressed the importance of physical movement, perception, praxis, knowledge and memory for understanding the landscape. A similar perspective, though more articulated towards social praxis, has inspired my work, starting from the slightly more "poststructural" perspective of Cornell and Fahlander (2002).

Thus some scholars claim that humans perceive best as they move. This procedure is what Merleau-Ponty and Ingold define as the real observation process, which is more of a process of movement "in varying the point of view while keeping the object fixed" than a scanning from a fixed position (Merleau-Ponty 1962: 91, cf. Ingold 2002: 226). An analogy can be drawn with approaching a rock art site you have never visited before. You have a picture of it in your head from descriptions but these are short and abstract and you cannot be sure how

or whether they fit your own perception. Then from a distance you spot an outcrop that seems to be “the one”. This initiates an inquisitive train of thoughts as you approach the panel. Could this be it? Can I spot a ship or some other figure from this distance? Is it severely damaged by weathering? When I finally reach the rock art panel, the next phase of questions has to do with finding specific images. The panel is scanned from different positions and perhaps the images are spotted, or rather they pop up as I move from one position to another.

Conclusion

Many interesting theoretical perspectives of the landscape have been launched by archaeologists and anthropologists. However, my work has been influenced more by social theories about praxis and changes in the landscape that can be related to archaeological, geological or botanic facts, rather than economic or mythological models or generalisations. Much of the work has been devoted to problems concerning shore displacement, altitude, depo-

sitions, chronology, coordinates and tides – matters that archaeologists tend to adopt, apply and justify rather uncritically from natural science (cf. Jones 2002). This can be hazardous because it is liable to downplay the discipline itself and may lead to biased interpretations. Archaeologists therefore need to be critically engaged in this process, the context of observation, not just the context of justification (Gustafsson 2001). Today, archaeologists are grappling with so many other textual and philosophical problems that there seems to be little room for considerations like this. That is a pity because I believe they have much to contribute to such matters.

Finally, the GIS models and reconstructions I present in this study are to be seen as models, not as reconstructions of a real world.

I have already described some of the general archaeological conditions in the study areas (Ling 2004a, 2005, 2006). I will now consider some other facts that may throw further light on the social praxis in the landscape/seascape of northern Bohuslän.

It is now time to embark...



III

Embarking

4

THE TERRESTRIAL PARADIGM: HISTORY OF RESEARCH

Introduction

The main focus of this dissertation is the issue of how Bohuslän rock art and landscape may be perceived and understood. Shore displacement has altered the landscape to a large extent since the Bronze Age but this has traditionally attracted very little attention. It may therefore be well to give a history of the pertinent research. Other approaches to the history of Bohuslän rock art have tended to concentrate on historical interpretations, epistemological trends and the BA society, its rituals, economy and religion (Nordbladh 1995; Vogt 2001; Wahlgren 2002; Kaul 2004; Nordenborg Myhre 2004; Goldhahn 2005). For instance, the conception of religion in the rock art and BA discourse is excellently presented by Flemming Kaul (2004). These issues will therefore not be recounted here. But as the perception of the landscape has not been a main target of analysis to date, it may be as well to start with a history of research that accounts for the perception of the landscape in which rock art in Bohuslän is set.

This aspect has been treated by Lise Nordenborg Myhre (2004) with reference to rock art in Rogaland in Southwest Norway. She emphasizes the close relationship between the BA remains and the sea. However, BA remains with a maritime location have not traditionally been interpreted on the basis of these premises (Fett & Fett 1941; Mandt 1972). Instead, they have been placed in the context of a

South Scandinavian BA culture based on agriculture (Nordenborg Myhre 2004: 20, 58). Nordenborg Myhre employs and focuses on two central concepts that may imply this interpretative tradition, “peripherism” and “agriculturalism”:

Spatial studies of Scandinavian Bronze Age have usually been based on settlement archaeology with an agrarian perspective. Such an approach is predominant also in works about Southwest Norway, where monuments, rock art and hoard sites mainly have been understood in relation to a permanent population of farmers (Nordenborg Myhre 2004: 58).

Although Nordenborg Myhre does succeed in breaking the prevailing agrarian “thought style” in western Norway, she fails to notice some of the major forces behind this idea. The land uplift theory is of crucial importance in this respect, especially for the rock art areas of Bohuslän and Østfold which have served as a matrix for agricultural interpretations of rock art in Southwest Norway (e.g. Almgren 1927; Gjessing 1939; Marstrander 1963). Moreover, a deeper understanding of this thought style may be related to the influence of Gustaf Kossinna’s “Siedlungsarchäologie” (settlement archaeology) on Scandinavian archaeology during the late 19th century and early 20th century, as well as to the connec-

tions Kossinna (1911) makes between the BA and the agricultural heritage of the Germanic people.

I therefore intend to examine how rock art research in Bohuslän has considered the surrounding landscape, land uplift and shore displacement. One of the main issues is why rock art research in Bohuslän traditionally either neglected or only briefly discussed the correlation between the placing of rock art and the BA shoreline.

I argue that this thought style (e.g. Fleck 1997) was established in connection with the introduction of so-called “bebyggelsearkeologin” (settlement archaeology) in Uppsala, Sweden, in the early 20th century. At the same time, influenced by Oscar Almgren, rock art research progressed in the same direction. However, both within and outside the discipline of archaeology, rock art research is still considered to be a separate research field (Wahlgren 2002; Goldhahn 2005, 2006). Settlement-oriented archaeology was the outcome in turn of a reciprocal interaction of knowledge, scientific concepts and methods between the newly articulated discourses of archaeology, geology and botany (Nordlund 2001). One of the major ideas that these disciplines agreed on was the concept of land uplift, which accordingly influenced and inspired rock art research. This analysis will therefore start at the origin of that issue, namely the notion of land uplift among natural scientists and antiquarians during the 19th century. I will then try to connect the notion with the major research concept of rock art and landscape.

Theory

In the following section I aim to clarify some of the theoretical terms and concepts that are used to elucidate and distinguish some of the most significant traits in rock art research in Scandinavia. However, it is not my ambition to dissect, define or explain research into rock art and landscape in terms of any specific conception or epistemological criterion from the history of science, such as scientific phases, facts, changes, revolutions, etc. Such theoretical concepts may sometimes shed light on certain trajectories and tendencies, perspectives and situations (e.g. Olsen 1997; Baudou 2004), but they by no means have the power or the precision to frame the specific societal, political and social aspects that

have historically influenced individual and institutional perceptions of, for example, rock art and landscape.

The first acknowledgement of the rock art in Bohuslän, from historical times, came in 1627 from the Danish lector Peder Alfson. He claimed that it was stone workers who had made the images. The next phase of acknowledgement did not occur until the mid and late 18th century (Baltzer 1911: 14pp). Moreover, the comparatively few people who studied rock art in Sweden in the 19th century came from very different disciplines, departments and offices, such as antiquarians, historians, priests, natural scientists and natural philosophers. It is therefore problematic to identify common sources of the conceptions and interpretations in this early discussion. Nevertheless, there are some broad social and epistemological conditions that may contribute to a more general discussion about why some perspectives were more dominant than others.

Paradigm and thought style

Following his definition of the phases or paradigms, the epistemological, social processes and changes that seem to govern science, Thomas Kuhn's model and concepts have frequently featured in various projects in the natural and cultural sciences. Some are in favour, others are more critical (von Essen 1996; Olsen 1997; Lakatos & Feyerabend 1999; Nordlund 2001; Jensen 2002). Many scholars have claimed that Thomas Kuhn has copied concepts and models from the earlier work by Ludwik Fleck from 1935. But the main criticism against Kuhn concerns his functionalistic rule of perceiving and conducting knowledge while neglecting those historical and societal factors that may have contributed, directly and indirectly, to scientific changes. Some scholars therefore claim that Kuhn's concepts and models are designed primarily for the natural sciences (von Essen 1996; Nordlund 2001; Jensen 2002). I do not agree.

Thus, what scholars such as Kuhn, Fleck and Michel Foucault have in common is that they tone down the individual's influence on scientific changes. Foucault is most radical about this, almost totally denying the effect and influence of the individual (Foucault 1972). Of these authors, Fleck pays the in-

dividual most attention because he emphasises that the process is an interaction between individual and collective wills and demands (Jensen 2002: 24).

In a broad sense, Fleck, Kuhn and Foucault all start from general sociological models. It seems, however, that Fleck and Foucault have a more social perspective on issues such as science, power, society and history (Lakatos & Feyerabend 1999). Kuhn seems to end up with the rather liberal notion that science and the scientific process are alienated from historical and societal biases and changes. For Foucault, the main topics are the social constraints between the producers and consumers of power, knowledge and science (Foucault 1972). The discourse of power and its effect on the initiation, consensus and development of knowledge is, according to Foucault, the very foundation of science. Power and power discourses are also a recurring theme in Fleck's work. However, Fleck does not distinguish or define power and its effect on society and science as convincingly or precisely as Foucault (Foucault 1972; see further Hall et al. 1996: 10; Cornell & Fahlander 2002).

Regarding the interpretation of the concept "paradigm", in this context I do not wish to relate primarily to Kuhn's definition. Instead, I have chosen to apply it in a broader sense. First of all, I share the general criticism both of Kuhn's application of the concept and of his esoteric notions of power and knowledge. Secondly, as mentioned above, the heterogeneity of rock art researchers in the 19th century, with ties to very different disciplines and departments, means that sources of conceptions and interpretations in this early discourse are almost impossible to uncover or analyse.

Although I find Fleck's ideas about knowledge, science and society, and his definitions of "thought style" and "thought collective" preferable to Kuhn's concepts of "paradigm" and "scientific community", I see a pedagogic and rhetorical potential in using them both to assist the reader in distinguishing between 19th and 20th century rock art research. This has to do with the different epistemological and institutional conditions in these two centuries. For most of the 19th century archaeology was not a discipline of its own. It became one, articulated and initiated via various processes of knowledge

and institutions, only towards the end of that period (Baudou 1997, 2004).

In the following discussion, the concepts thought style and paradigm are used to distinguish between rock art research in the 19th and the 20th century, respectively. They each signify a situation where a limited group of researchers opts for a common mode and takes it for granted that this mode represents reality. However, this does not mean that I regard thought style and paradigm as synonymous. The general significance of both concepts can be related to Fleck's conception of science and the development of science within society. Fleck's perspectives and concepts are briefly summarised below.

Fleck assumed that science is governed by norms of thoughts that arise sequentially in a historical reciprocal process between society and science, where specific conversational situations had been determined. Central concepts for Fleck were therefore thought style and thought collective, which denote interconnected pluralistic, epistemological, sociological and psychological activities that determine and preinterpret knowledge into scientific facts (Fleck 1997: 32; see Nordlund 2001: 29; Jensen 2002: 23). The thought style may be interpreted as rules of conduct which are defined, performed and conducted by oral or textual discussions, exchanges of ideas between different social networks and institutions. The thought style may be a single normative theory or an entire normative theoretical concept or model. The thought collective comprises the esoteric (authorities) and the exoteric (non authorities) engagement in this discourse, which may therefore affect the thought style in different manners, the former more, the latter less.

Thus, a thought style, together with the process of initiation (learning by books and authorities) and the process of perception (the "Gestalt sehen"; the learning of a perception as a world view by a specific observational method), form a specific esoteric thought collective. According to Fleck, science is therefore a collective passive creation defined by the world view and perception of the system that teaches the knowledge (Fleck 1997: 89).

One of Fleck's most interesting definitions is that the normal state of science is "the harmony of illusions". Fleck emphasises that the normal state

of science is governed by an uncritical conservative direction, where researchers and the scientific community follow the same rules of conduct. There are, according to Fleck, no methodological or epistemological tricks or illusions that scientists may use to ignore earlier discussions and thought styles' pre-interpretation of phenomena. This is because in the context of observations and interpretations, everything has already been pre-interpreted by the prevailing thought styles and though collectives of history (Fleck 1997: 38, 89).

Finally, the concepts thought style and paradigm which are employed in the following account and discussions are used with reference to a more general epistemological praxis in the history of science and the discourse of archaeology (e.g. Prescott 1994; Baudou 1997, 2004; Olsen 1997; Jensen & Karlsson 1998; Jensen 2002).

Conditions and questions

On the basis of literature that treats aspects of research into ancient monuments, rock art and geology in the 19th century, the following conditions can be established as a matrix for the further discussion of rock art research in Scandinavia (based on Sarauw & Alin 1923; Trigger 1989; Baudou 1997, 2004; Christensson 2001; Nordlund 2001; Jensen 2002; Goldhahn 2005):

- A scientific cosmology replaces the biblical cosmology.
- The interpretation of the Icelandic sagas and their impact on rock art research.
- The theory of land uplift and the emergence of geology as a discipline.
- Bror Emil Hildebrand's introduction of the Three-Age system in Sweden.
- Sven Nilsson's implementation of evolutionary comparative ethnology.
- The articulation of the archaeological discipline.

The questions addressed in this chapter are briefly as follows:

- How was the landscape pictured and used for the interpretation of Scandinavian BA rock art?

- What social, societal and religious actions and conceptions were associated with the rock art images?
- How was the social construction of rock art and landscape represented in relation to geology and the question of land uplift?

A history of landscape and rock art research

In order better to understand why rock art research in Bohuslän traditionally either neglected or only briefly discussed the correlation between the placing of the rock art and the BA strip, coast or shore, we need to look at the source of the issue, namely the notion of land uplift among natural scientists and antiquarians.

In his dissertation "Det Upphöjda landet" (The elevated land) Christer Nordlund accounts for how different natural and cultural disciplines utilised the phenomenon of land uplift as an empirical, theoretical and symbolical, nationalistic matrix in the reconstruction and charting of Sweden's past. Nordlund emphasizes the geological discourse and the discussion whereby the concept of land uplift was established in the period 1860–1930. He also describes how a consensus was being reached in the natural and cultural sciences concerning the image of Sweden's past (Nordlund 2001: 15).

The scientific history of shoreline displacement in Sweden was initiated during the 18th century, when national and international natural scientists and natural philosophers observed that sea levels in Europe were tending to fall. This issue was a general topic for discussion in Europe at the time but in Sweden the debate was particularly lively within the discourse of natural science (Nordlund 2001: 15). Part of the background was the dominant biblical interpretation with its connection to the Deluge (Nordlund 2001: 14). Natural scientists in Sweden, such as Urban Hiärne, Anders Celsius, Emanuel Swedenborg and Carl von Linné, challenged the biblical explanation with various empirical observations and conclusions of their own.

For instance, Carl Olof Tamm, one of Linné's apostle, gave several accounts of how the peasantry in Bohuslän discussed aspects of sinking sea levels in the landscape during the end of the 18th century (von Linné 1972). While all these scholars had dif-

ferent opinions about the causes of land uplift, there was a solid consensus that sea levels in Scandinavia were falling. On the basis of Celsius' work from 1743, the writer and historian Olof von Dahlin formulated the problem in his "Vattuminskningläran" (the doctrine of water subsidence).

Dahlin's theory was considered very controversial because it questioned the biblical tradition and chronology as well as the prevailing nationalistic view of Sweden's ancient legacy and historical function. The result was an epistemological struggle between natural science and enlightenment philosophy on the one hand and Christian and historical values and morals on the other. Dahlin's thesis was vigorously opposed by the powerful clergy, who claimed that he was unorthodox and accused him of abandoning the biblical traditions. He was also severely criticized by national historians and politicians (Sarauw & Alin 1923: 16; Nordlund 2001: 14).

Despite the criticism from religious and political discourses, Dahlin's secular reduction of Sweden's geographical history subsequently became more widely accepted (Sarauw & Alin 1923: 17; Nordlund 2001: 16). At the turn of the century, his theory was modified and further articulated as "the elevation of land".

The perception of geology and landscape among 19th century antiquarians

In the early 19th century, a Danish scholar of antiquity, Christian Jürgensen Thomsen, introduced the so called Three-Age system, a chronological and interpretative method that assigned archaeological material to either the Stone, the Bronze or the Iron Age (Trigger 1989). Shortly afterwards, Bror Emil Hildebrand incorporated the Three-Age system in the Swedish antiquarian discourse. One of those who promoted, conducted and further developed this system in the Swedish discourse was the Professor of Zoology at Lund University, Sven Nilsson (see Gräslund 1987; Trigger 1989: 79; Nordlund 2001: 219; Baudou 2004: 119; Christensson 2005: 77; Goldhahn 2005: 69). Bruce G. Trigger describes Nilsson's ambition to integrate the Three-Age system in accordance with his evolutionary concept:

Nilsson strongly believed in cultural evolution, but unlike Thomsen, he was mainly interested in the development of subsistence economies rather than technologies (Trigger 1989: 80).

It was also Nilsson who succeeded in persuading many antiquarians in Sweden to integrate man's history with the history of nature. In this way, thanks to Nilsson's interest and status, the geological theory of land uplift was introduced to and integrated in the antiquarian discourse. The elevation theory was subsequently used as a central argument for an earlier date for the Stone Age in Scandinavia (Nilsson 1866). Inspired both by Thomsen's geological notion of analysing closed archaeological finds and by geological stratigraphic comparative analysis, Nilsson established a new interpretative tool for the analysis of prehistory which he named "the comparative ethnological method". He argued that it might be possible to identify evolutionary stages simply by analysing each archaeological item or find and its specific geological context (Nordlund 2001: 217–219).

While Nilsson described most of the prehistoric monuments, graves and artefacts in Scandinavia, he paid very little attention to Bohuslän rock art (Nilsson 1838–43, 1866, see Christensson 2001: 30). However, other written sources and correspondence indicate that this rock art clearly interested him. He seems to have discussed and shared this interest with his student, the curate Axel Emanuel Holmberg, who later presented the first thesaurus of Scandinavian rock art in 1848 (Christensson 2001: 26; Goldhahn 2005: 70). Nilsson and Holmberg made many joint excursions to the prehistoric remains in the landscape and discussed phenomena such as land uplift in relation to the remains. Their relationship seems to have been very intense in the years before and just after the publication of Holmberg's thesis and some scholars argue that Nilsson had a great impact on Holmberg's work at that time (Christensson 2001: 30; Goldhahn 2005: 70).

The land uplift theory underwent further development in the middle of the 19th century and became interconnected with the causes of the Ice Age. It became apparent that during the Ice Age the inland ice had depressed the land and that when the ice re-

treated a counter-reaction set in that resulted in the process of land uplift. The Scandinavian Peninsula was being successively restored to its earlier shape (Nordlund 2001: 17). Thus, the Ice Age theory led to the perception that Sweden had been a geographical *tabula rasa*. The very notion of this geological process became a way of legitimating and symbolising a historical and evolutionary perception of the expansion of the Swedish nation, horizontally as well as vertically (Nordlund 2001: 23, 87).

Summing up

Four major concepts, prerequisites or conditions seem to have affected and biased early 19th century rock art research in Bohuslän: the geological theory of land uplift, Thomsen's introduction of the Three-Age system, Sven Nilsson's evolutionally inspired comparative ethnology and the romantic influence on literature and history. All these concepts subsequently gave rise to different interpretations and made the 19th century discourse considerably more dynamic than the subsequent discourse in the 20th century (Goldhahn 2005, 2006: 13–14).

The landscape via the rock art image

In general, it may be said that early research on rock art in Bohuslän was coloured by a romantic historical perspective. The early 19th century interpretations of rock art in Bohuslän were primarily influenced by a classical historic perception, where the rock art was interpreted in the context of the Icelandic sagas (Mandt 1991; Christensson 2001). One of the initiators of this theory was Sven Lagerbring, who saw rock art as ancient depictions of historical accounts that had been produced in ancient oral society. Although Lagerbring never accepted Dahlin's notion of the water's subsidence, he seems, somewhat inconsistently, to have favoured the idea that the rock art had originally been placed by the shore (Lagerbring 1797: 73).

Thus a thought style was articulated which stated that the rock art primarily reflected the history of the Vikings' maritime action in the landscape (Lagerbring 1797; Sjöborg 1830; Åberg 1839: 388; Holmberg 1848; see also Montelius 1874; Mandt 1991: 114).

This early perception is evident in a statement from 1830 by Professor Nils Henric Sjöborg which stresses that the rock art reflects the mobile and dynamic Vikings' action in the landscape:

Since a large proportion of the country's settlers such as travellers and Viking voyagers were the most knowledgeable, the liveliest and those who had seen and experienced most, and moreover had been moving around every summer, it is not a cause for wonder that the greater part of our figures in stone are carved by them. But these carvings do not contain other hieroglyphs or mysteries, they simply represent ships, on which have been carried people and animals that they either brought with them or took as booty, in combat or through other deeds that could be performed on land, so that such carvings are to be found to the greater extent on cliffs and on the so-called flat rocks by the shores (Sjöborg 1830: 149, translated here).

Sjöborg perceived the ancient landscape by the ship images on the rocks and assumed that these places represented ancient maritime ports and maritime landmarks. Interestingly enough, Sjöborg implicitly used land uplift as an argument for the rock art's ancient location and function in the landscape.

The first substantial thesaurus of Bohuslän rock art was presented, as mentioned above, by Axel Emanuel Holmberg in the mid 19th century (Holmberg 1848). Holmberg stressed a late Iron Age date for the rock art, basing this primarily on an analysis of the depicted artefacts and actions in relation to the Icelandic sagas. While Holmberg in general had the same thought style concerning the rock art's chronology and meaning, he was clearly against the idea of an original maritime setting in the landscape.

Unlike his contemporaries, Holmberg used the elevation theory both to falsify the notion of an original maritime setting for rock art and to show how inadequate and useless this geological method was for their dating. In the following quotation, Holmberg refers to a "fredjad fornforskare" (happy antiquarian) who had previously argued for the rock art's ancient and original connection with the shore. Holmberg does not mention the person by name but

it was almost certainly Carl George Brunius, professor and antiquarian (see Goldhahn 2005: 70pp):

To turn to certain natural conditions, such as erosion and land uplift and the like, for the foundation for these determinations of dates would be thoughtless. We would not have mentioned this were it not that this has actually been the case. We have heard a happy antiquarian declare: "that the rock carvings' great age can be deduced from the fact that, as they invariably are to be found by such rocks where in ancient times there have been, to judge from the location, good harbours but never lower than some fathoms above the surface of the sea, a fairly long time must have elapsed before they attained their present height above the same". [...] Who has actually said that these relics of antiquity should have been carved just at the water's edge? And if there had been harbours everywhere that rock carvings exist, such as for example Sundby in Hogdal parish near Svinesund (Tab. 1), where they lie at their 300 feet above the present level of the water, one can at least be certain that seafarers in those days had a dearth of anchorages to the south and east. Now that we know that, to judge from the observations during the past three centuries, the Bohuslän coast, disregarding its fluctuating elevation, rises above the surface of the water by not quite 2 feet each century, for the afore-mentioned rock carvings one would obtain the age of 14 to 15,000 years, which naturally does not add up. With the same foundation for calculations, one would arrive at differences of many millennia in the age of the various carvings, all depending on whether they lie high or low above the surface of the sea, which is just as improbable. When determining their age we must therefore adhere exclusively to historical documents (Holmberg 1848: 17, translated here).

During the 19th century it was only Holmberg who calculated land uplift in relation to the rock art in Bohuslän and at that time his conclusions were perfectly correct. However, it never occurred to Holmberg, that the rate of uplift had changed very markedly since prehistoric times (Nordlund 2001: 17).

The thesis promoted by Brunius (1868), at the age of 76, was quite the opposite of Holmberg's. His thesaurus is still regarded as one of the most innovative ever made in Sweden, with ethnographic and linguistic analogies (Christensson 2001; Goldhahn 2005). Brunius questioned the prevailing Viking interpretations of rock art and argued strongly against Holmberg's chronological and functional conclusion. He repudiated almost every date that Holmberg had suggested for his chronological device. Drawing on his empirical and architectonic experience of stonework, Brunius claimed that the rock art may have been made with tools of stone rather than iron. He also argued that the depicted images – warriors, obscene scenes and actions – reflected a raw, primitive society that most probably could be related mainly to the Stone Age, some to the BA.

Despite their chronological differences, Holmberg and Brunius used a similar methodology based on the land uplift theory, the Three-Age system and Nilsson's comparative ethnology, albeit with different outcomes (Goldhahn 2005: 69–72). They shared the same thought style.

The most interesting aspect of Brunius' attempt is that he was one of the first to observe that many rock art panels were situated at much the same altitude and that many were severely affected by erosion (Brunius 1839: 79, 1868: 151):

That the occasional rock carving is to be found high above the surface of the sea can in no way nullify the importance of the circumstance that not a single one is to be discerned on shoreline rocks. It is therefore clear that the rock carvings, which with few exceptions were executed on coastal rocks, like fairly many monograms, owner's marks and dates that have been cut into the Bohuslän archipelago in more recent times, must have attained their present elevation above the sea level after a long succession of centuries. Here one may likewise adduce erosion, whereby extensive carvings have been destroyed to such a degree that not infrequently just the bottom of broad lines is apparent, which demonstrates that they formerly had a considerable depth (Brunius 1868: 151, translated here).

On the basis of these observations and through analogies with rock art situated by lakes and rivers in Scandinavia and North America, Brunius concluded that many images may originally have been made on panels at the water's edge.

The shore-connected rock art

Regardless of the different opinions concerning the chronological, social or ritual significance of rock art, the 19th century discourse seems to have generally accepted that the rock art was made near to what was then the shore. The maritime thought style became predominant, supported by the frequency of ship depictions. The elevation theory was often used as a rhetorical device in this context (Sjöborg 1830; Brunius 1839, 1868; Åberg 1839; Holmberg 1848). Moreover, this maritime perspective was promoted by recognized antiquarians, e.g. Bror Emil Hildebrand, Oscar Montelius and Emil Eckhoff, in accordance with the diffusionistic theories based on and manifested by the import of bronze items (Hildebrand 1869; Montelius 1874: 151, 159; Eckhoff 1881). By this time, the antiquarian discourse had reached a consensus that the rock art was primarily produced during the BA. A major reason for this consensus was the articulation of the typological method, which was still being developed by Montelius and Hans Hildebrand, and acquired its final formulation by Montelius in 1884 (Gräslund 1987; Trigger 1989; Baudou 2004: 158–190).

Inspired by the development of the typological method, Bror Emil Hildebrand made a major contribution that most probably determined the subsequent conception of the chronology of South Scandinavian rock art (Hildebrand 1869, see also Montelius 1874: 159; Nordén 1925: 11; Almgren 1927; Baudou 2004; Goldhahn 2005). In a paper on the issue of the era to which and the people to whom the Swedish rock art should be attributed, Hildebrand (1869) resolutely insisted that the rock art had been produced primarily during the BA. His main point was a stylistic comparison between real BA swords and the swords depicted on rock art in the Norrköping area in Östergötland. Hildebrand argued that this chronology would also hold for the rock art in Bohuslän. Moreover, he stressed the close resemblance between the ship depictions on

bronze razors and those on the rocks. This resemblance had been noted earlier by Åberg but he had not immediately connected the rock art to the BA (Åberg 1839: 388).

Hildebrand adhered to the maritime thought style of rock art. He emphasised that land uplift had transformed the landscape and that the rock art had been produced close to the shore. He perceived the ships, other items and actions performed on the rock as very realistic and a witness that real maritime action, such as sea voyagers and sea battles, had taken place (Hildebrand 1869: 422–423). At that time, Hildebrand's perception of the rock art was obviously very pragmatic.

Hildebrand criticised Brunius' and Holmberg's dating attempts, as well as their use of Nilsson's ethnological comparative method, which led to erroneous mythological interpretations of rock art. In the following quotation, Hildebrand refutes Holmberg's argument concerning the similarity of rock art ships and ship features in the Icelandic sagas. He does this in two steps. The first amounts to an implicit but very detailed argument concerning land uplift. The second dismisses Holmberg's Viking Age hypothesis and argues instead that the ships depicted on rock are closer to those on bronze items:

Most of the reproduced rock carvings witness to seafaring and combat. Ships of different dimensions, with or without crew, are a general occurrence. These carvings are usually encountered on rocky slopes by lakes, bogs and valleys, which in a far-distant past formed sea bays and sounds or river-beds. Simply the circumstance that these lakes and bogs are now above the sea and that the valleys for centuries or millennia have yielded grass and farmers' crops is evidence that a very long time has passed since here could occur such matters as have been depicted on the former coastal rocks and thus that these rock-pictures' representations do not have anything in common with the Viking eras that are mentioned in the Islandic sagas' and other of our written documents. [...] It would not be difficult to point to a good deal in the Islandic sagas descriptions of the sea-heroes boats that has no equivalent in the rock carvings. On the other hand, among

the rock carvings one cannot avoid finding ships with shapes that are reminiscent of the absolutely similar ship images that not infrequently occur on relics from the Bronze Age (Hildebrand 1869: 422–423, translated here).

Hildebrand's observation gained acceptance and recognition by leading scholars such as Montelius and Sven Nilsson. Montelius saw the ship images in the light of bronze imports, which may be one of the most persistent conceptions (Montelius 1874, also Nilsson 1866; Nordén 1925; Burenhult 1980; Kristiansen & Larsson 2005). Nilsson had previously supported Holmberg but Hildebrand's conclusions served to underpin his own new wild theory about rock art as traces of Phoenician maritime action in southern Scandinavia (Christensson 2005). In any event, Hildebrand synchronised and reduced the different chronological and societal interpretations to a matter of a single people and a single period, namely the people of southern Scandinavia in the BA. His great authority enabled him to change and unify the discourse regarding the BA and rock art, with the result that the Vikings, the Celts, the Stone Age savages and the Phoenicians were dismissed.

A notable development was that in the forthcoming archaeological discourse, the geological theories concerning land uplift went hand in hand with an increasingly religiously oriented perception (Montelius 1874; Nordén 1925; Almgren 1927, see also Vogt 2001; Goldhahn 2005). The social and interdisciplinary interconnection with geology is discussed in the next section. A final quote from Hildebrand gives a further indication of the antiquarian's expectations of and confidence in the geological discipline:

No closer dating with respect to the age of the rock carvings is yet possible to provide. Perhaps one day geology will throw the light on this issue that archaeology is seeking in vain (Hildebrand 1869: 432, translated here).

Land uplift and the landscape

In the late 19th century there was an intensive exchange of knowledge between geology and archaeology. The land uplift theory and comparative geol-

ogy were promoted by archaeologists and became important cornerstones when Nordic comparative archaeology was established as a separate scholarly discipline in the late 19th century. At the same time, geologists began to show an interest in methods from archaeology. In the 1880s, for instance, the very time-specific division of BA chronology that Montelius (1884) presented via the typological method was much admired in the geological discourse. Another indication is the fact that Montelius was able to apply this very scientific method and thereby further explain the major cultural diffusions in European prehistory (Trigger 1989: 189pp; Nordlund 2001: 228; Baudou 2004).

As a result, several leading geologists emphasized that the discipline should strive for a similar specific chronology. During the late 19th century, geologists such as Henrik Munthe and Gerard de Geer contributed observations that altogether advanced the Stone Age chronology several thousand years. Moreover, in dialogue with vegetation historians such as Rutger Sernander and with archaeologists such as Montelius and Almgren, de Geer introduced both a relative and an absolute method for dating Stone Age artefacts (Nordlund 2001:229). The interactions between these disciplines were consolidated in Stockholm and Uppsala in the early 20th century:

When the preservation of antiques was centralized and professionalized with the foundation of the Museum of National Antiquities and the establishment of Nordic comparative archaeology as a scholarly discipline, leading archaeologists flocked to Stockholm and Uppsala (Nordlund 2001: 286).

In bourgeois circles in Stockholm, archaeologists and geologists socialized and arrived at a mutual epistemological understanding with the natural sciences that legitimised how Sweden's past should be charted, described and depicted. This interaction promoted collaboration, mergers and agreements on aims, methods and fieldwork, besides generating and influencing societies, institutions and publications. The Swedish Geological Survey started to chart archaeological remains in the landscape and

the Swedish Anthropological and Geological Society was founded by leading archaeologists such as Montelius and by geologists such as de Geer (Baudou 1997; Nordlund 2001: 221, 287). Shoreline displacement, soil stratigraphy, and vegetation history analysis became central methods for verifying the chronology of ancient action in the landscape.

All these dating methods had their roots in the same thought style – land uplift theory. It is noteworthy that while shoreline displacement curves were used to locate Stone Age settlements, they were not considered to be equally helpful when it came to the BA (Ekholm 1915, 1921; Almgren 1912). The geoscience evolved new methods such as “archaeological geography”, which became a crucial instrument for understanding Sweden’s first inhabitants (fig. 4.1, 4.2). For instance, in the early 20th century Arthur Hollander presented a thesis about the distribution of Stone Age finds in relation to land uplift.



Figure 4.1. Arthur Hollander’s map from 1901, demonstrating the distribution of finds from the Stone Age in relation to shores of the Litorina Sea (after Nordlund 2001).

Two decades earlier, in the 1880s, the geologist Eckhoff had conducted an archaeological-topographical inventory and description of the Bohuslän landscape. Prominent scholars such as Almgren and Gabriel Gustafsson participated in these early surveys, and latter on also Otto Frödin and Gustaf Hallström. These inventories are important because some general conclusions regarding rock art’s situation and function in the landscape were then being articulated (Baudou 2004). One particular observation was that the rock art was situated at considerably lower altitudes than the Iron Age remains; the conclusion, however, was that they illustrated two different forms of behaviour and settlement (Eckhoff 1881). Thus, these interpretations and geographical and statistical methods were used and consolidated mainly within the newly formed “bebyggelsearkeologiska” (settlement archaeological) seminar at Uppsala University.

This seminar was initiated in the early 20th century by Knut Stjerna, who succeeded Almgren at the university when the latter became director of the National Museum of Antiquities in Stockholm. It was basically inspired by Montelius’ chronological and diffusionistic/evolutionistic notions and the general geological thought style but it provided more scope for new ideas and influences (Baudou 1997; Nordlund 2001). Earlier, Montelius (1884) had paved the way for these notions in an essay on the immigration of the Swedish ancestors to Scandinavia. Moreover, some scholars claim that the project was partly inspired by Gustaf Kossinna and his “Siedlungs-Archäologie”, though to what extent is not clear (Baudou 1997).

In particular, Almgren may have been influenced by Kossinna’s notion of “Heimat” (the earth as home) and its metaphorical connection with the economic and ideological agrarian dependence of the ancient Germanic peoples (Cornell et al. 2008). Thus, the idea of the strong sedentary Germanic farmer became an important cornerstone of the terrestrial thought style. In the following quotation, Baudou stresses that Almgren mentioned Kossinna’s research as early as in 1902:

To judge from Gustaf Hallström’s notes from Almgren’s lectures of Europe’s prehistory, Koss-



Figure 4.2. According to Nordlund, this illustration, used by Geologist A. Högbom from 1899, could be seen as a metaphor for how the Swedish culture and people successively managed to tame nature, from the wild, mobile Stone Age savages living by the shore to the more evolved, sedentary and organised Vikings (after Nordlund 2001).

inna and his research were at least known and spoken about in Uppsala as early as 1902. In his assessment of Stjerna's doctoral dissertation, moreover, Almgren mentions Kossinna as a forerunner to Stjerna in the studies of human history (Baudou 1997: 128, translated here).

To sum up, the foundation for 20th century rock art research in Bohuslän included 5 major premises:

1. The methodological synchronisation of geological and archaeological disciplines.
2. Hildebrand's chronological concentration of rock art to the BA.
3. Montelius' consolidation of the typological method, his chronological division of the BA and his major contribution to the development of Europe's prehistory by cultural diffusion.
4. An increasingly idealistic, religious diffusionistic perception in the archaeological discourse, connected to evolutionistic notions about Germanic agriculturalism in the BA.
5. The aims and perceptions of settlement ar-

chaeology and its provincial survey in relation to a growing cultural historical and idealistic ideal in national and international archaeology.

The image via the landscape

Oscar Almgren sanctioned and participated directly and indirectly in the provincial survey, which was epoch-making for Stone and Bronze Age research in Sweden as well as for the excavation of settlements and the general practice of mapping the prehistoric remains in the landscape. Inspired by the project's means and forms, in the early 20th century Almgren launched an extensive inventory and documentation of rock art in the Tanum area in Bohuslän (Almgren 1912, 1927, see Baudou 1997: 124–129).

However, it was probably the power of the contemporary landscape that made the strongest impression on Almgren. The location of the rock art in the landscape – on the outermost edges of cliffs that surrounded clayey lowlands – prompted Almgren's major conclusion that the rock art reflected an agricultural population's religious beliefs and rituals in the landscape (fig. 4.3). The rock art images had been

made on rock adjacent to arable land, away from the sea, in the vicinity of settlements (fig. 4.4):

Neither has one grounds for assuming that at the time they were created, the groups of rock carvings were generally situated by bays of the sea. Their location is usually far too high for that. According to Professor Brøgger's well-founded calculations, during the transition from the Stone Age to the Bronze Age, the mouth of the Kristiania Fjord was at most 9–11 metres higher than today, but land uplift there has been greater than in Tanum. It is therefore not even likely that what is presumably the lowest-lying of all Tanum's rock carvings, at Orrekläpp's station (no. 178), was cut at the shore of a sea-bay because here the foot of the narrow valley is 8 metres above the sea (the carving 12 metres). Here, as in other parts of Bohuslän, the characteristic feature of the location of the rock carvings must be that they occur within or at the edges of the areas which in the Bronze Age just as today were best suited for cultivation and settlement. It is in the vicinity of their dwellings that the Bronze Age people wished to see these rock pictures, not by the shores of the sea-bays they travelled in their boats, however much their thoughts were occupied with just that side of life (Almgren 1912: 562, translated here).

Consequently, Almgren did not share the earlier maritime interpretations of rock art in the Bohuslän landscape. In 1912 he cited and adopted “Professor Brøgger’s sound calculation of the shoreline” from 1908 (Almgren 1912: 562) and it is notable that he never revised or upgraded this calculation in relation to later geological observations concerning land uplift. He was still referring to this study as late as 1927, by which time, as I will illustrate later, the elevation theory had been totally abandoned.

In contrast to the maritime thought style that dominated 19th century research, Almgren interpreted rock art images in the context of the contemporary agrarian landscape (fig. 4.4, 4.5). Thus, he reduced and transformed the concrete maritime ship image into an abstract “terrestrial cult ship” and connected it to Indo-European influenced fertility rites

(Almgren 1912, 1927: 120, 263, 1933: 58–59).

Almgren’s theories concerning ritual behaviour, settlement and landscape during the BA were further developed in Stjerna’s archaeological settlement seminars (e.g. Ekholm 1921). Gunnar Ekholm also participated in these seminars and undertook a study of the Stone and Bronze Ages in the province of Uppland. In a book on Uppland’s BA, Ekholm discussed the BA shoreline in relation to measured rock art localities, graves and stray finds of bronze. A comparison of the assumed BA shoreline with the distribution of primitive and less primitive ships images led him to favour a close connection between the rock art localities and the shore (Ekholm 1921).

However, this tentative conclusion is followed by a passage in which Ekholm refers to Almgren’s theories about the location of rock art in the prehistoric landscape of Bohuslän:

For a certainty it may not be established as any generally applicable rule that the rock carvings were located by the contemporary shore. As regards those in Bohuslän, Almgren has declared that “they occur within or at the edges of the areas which in the Bronze Age just as today were best suited for cultivation and settlement” (Ekholm 1921: 112, translated here).



Figure 4.3. The well-known plough scene from the panel Tanum 193 was taken literally as evidence of an agrarian oriented religion and action in the landscape during the Bronze Age (after Högberg 1995).



Figure 4.4. The open agrarian landscape by the well-known rock art sites at Bro Utmark in Tanum, Tanum 192, from the beginning of the 20th century; the famous panel Tanum 192:1 is on the left (photo: Gustaf Hallström, now in Umeå University Research Library).

In the subsequent discussion Ekholm mobilised every possible argument for lowering the shoreline in order to adapt to Almgren's terrestrial theory. He finally concluded that it was the exception rather than the rule for a rock art locality to be located at the level of the BA shoreline.

Here it is apt to apply Fleck's notion of the harmony of illusions to Ekholm's action in relation to Almgren (Fleck 1997: 28). At that time Almgren had a clear power position in archaeology (Baudou 1997) and Ekholm seems to have adjusted his observations to Almgren's findings. In this context, Almgren can be seen as the esoteric authority of the terrestrial thought style, with Ekholm in a position that obliged him to adjust his observations accordingly. However, although Ekholm altered his conception of rock art and the landscape, he never changed his general theory, which favoured eschatological aspects and functions of rock art and graves in the

landscape (Ekholm 1916). He shared this view with Arthur Nordén, who was careful not to challenge Almgren's thought style, preferring to juxtapose his own ideas (Nordén 1925: 220, e.g. Goldhahn 2005, 2006).

These early models of rock art and landscape formed the cornerstones of the terrestrial paradigm and these assumptions were generally supported by later studies during the 20th century (Selinge 1966; Nordbladh 1980; Bertilsson 1987; Winter 2002; Fredell 2003; Vogt 2006, cf. Helskog 1993).

Furthermore, other Scandinavian scholars accepted and developed the terrestrial model of rock art and landscape. In the 1930s, for instance, Gurtorm Gjessing introduced what became a familiar concept, "Jordbruksristningar" (agrarian rock art). According to him, this style of rock art was to be found in Scandinavia's best agrarian areas, while "Jaktristningar" (hunting rock art) occurred in north-

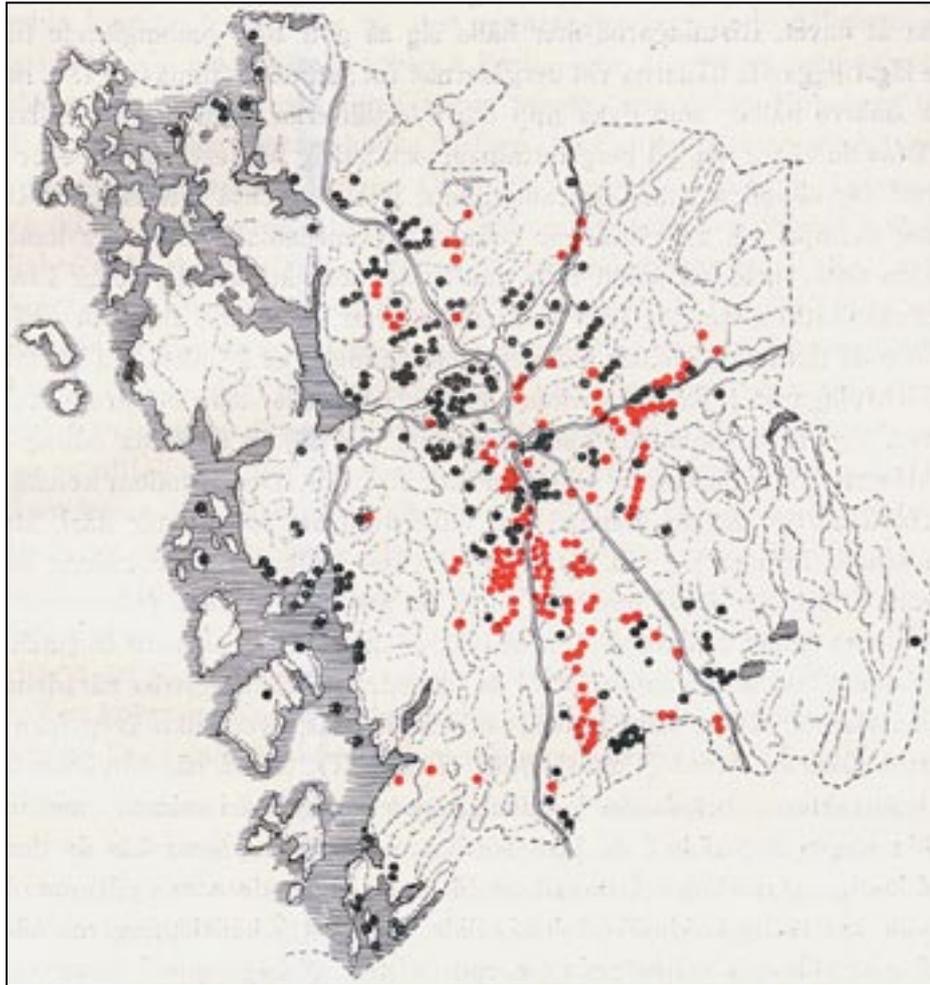


Figure 4.5. Oscar Almgren's map of the Tanum area in Bohuslän, showing the "terrestrial" distribution of rock art (grey dots) and cairns (black dots) (after Almgren 1927).

ern areas (Gjessing 1936, 1939: 1). Not only did the two rock art traditions reflect different chronological and geographical spheres of action; they also displayed clear economic and ideological differences as well as an implicit connection to Kossinna's conceptions of culture, race and geography. It is noteworthy that Almgren's and Gjessing's agrarian notions of rock art were still current in the 1960s, in Sverre Marstrand's influential work on rock art in Østfold. Marstrand did focus on various chronological, technological and functional aspects of the ship images but he still regarded the action, the images and the landscape as parts of an agrarian, not a maritime, culture (Marstrand 1963).

However, geological research was producing results that challenged archaeology's conception of the landscape and thereby rock art research. It

was becoming apparent that the ongoing land oscillation had been neither a uniform nor a geographical or altitudinal process. These observations shook the foundations of the elevation theory. To explain the anomalies, a general theory of land subsidence was integrated with the elevation theory and together they formed the main explanation of shoreline displacement in Scandinavia (Nordlund 2001: 111–117).

These developments prompted leading geologists such as Arvid Högbom to recommend a more cautious attitude to verification by geological findings. Divergent observations were also coming from the "sub-disciplines" botany and archaeology (Nordlund 2001: 257). The elevation paradigm was badly shaken by new archaeological results. One example is the observations of transgressed Stone Age

dwelling sites that were presented by the Gothenburg-based archaeologists George Sarauw and Johan Alin (Sarauw & Alin 1923). Notwithstanding the anomalies, geological scholars tried to maintain the reigning geological thought style about land uplift for as long as possible (Nordlund 2001: 288).

Most embarrassingly, it was Finnish and Norwegian geological research that ultimately, in the early 1930s, succeeded in dethroning the Swedish “elevation paradigm”. Based on a substantial material, the Finnish geologists Wilhelm Ramsay and Väniö Tanner, and the Norwegian polar researcher Fritjof Nansen demonstrated the prevailing geological thought style’s major anomalies and contradictions. A central item in this criticism concerned the ignorance of eustatic movements of the sea surface. In this way, the postglacial history of the Swedish landscape became more complex (Nordlund 2001: 288).

Since then, shore displacement has generally been regarded as a dialectical process between vertical transformations of the bedrock (isostasy) and global changes in sea levels (eustasy) (Påsse 2001: 7, 2003: 31; Nordlund 2001: 288). How was this scientific revolution received in archaeology and, more specifically, in the rock art discourse? How did the new notions affect conceptions of the prehistoric remains in the landscape?

Modification of the terrestrial paradigm

Although the new shore displacement model were launched and adopted in Stone Age research, it did not lead to an adjustment of rock art research in Bohuslän. Shore displacement was used to locate Stone Age settlements but when it came to the rock art, the method was not considered useful (Almgren 1912; Sarauw & Alin 1923; Fredsjö et al. 1956; Selinge 1966; Moberg 1971; Bertilsson 1987). Once again, this reaction can be likened to Fleck’s concept of the harmony of illusions (Fleck 1997: 28).

Thus, settlement archaeological practitioners seem to have been generally agreed that the action in the landscape could be related to different evolutionary stages. The mobile Stone Age savage inhabited and utilised the shore zone, while the more civilized sedentary BA farmer lived on the fertile land (Ekholm 1921; Almgren 1927, see also Bau-

dou 1997; Goldhahn 2005). But change was under way.

The geologist Erik Ljunger participated in the settlement archaeological provincial survey and his ocular estimation of the prehistoric shoreline in Tanum, from 1938, was frequently quoted by later rock art researchers (Nordbladh 1980; Bertilsson 1987). Ljunger also contributed an important modification of the terrestrial paradigm. He solved a problem that seems to have bothered his predecessors, namely why did rock art localities tend to be found on lower ground than Iron Age burials, situated higher up on sandy soil (Ljunger 1939: 29–34, see Eckhoff 1881; Almgren 1927). Ljunger’s hypothesis was that BA people had aimed for good pastureland and this could then explain the high frequency of rock art adjacent to the lower clay-soil plains; Iron Age settlements on higher ground were more favourable for agriculture. Ljunger’s modification became a further norm in the terrestrial paradigm (fig. 4.6).

However, rock art researchers appeared to be trapped in a terrestrial tradition or paradigm that obscured a symbiotic relationship between prehistoric man and the sea in Bohuslän. The significance of rock art in the terrestrial paradigm was only modified, restrictively and rhetorically, while Almgren’s agrarian harmony was transformed into pastoral competition and his divine communication into social and structural communication (Selinge 1966; Moberg 1971: 224).

The significance of the sea and its relation to the rock art were still being regarded as marginal, passive. In the late 1960s, however, Jarl Nordbladh



Figure 4.6. Panel with a pastoral scene from Bottna parish in Bohuslän (after Fredsjö 1970).

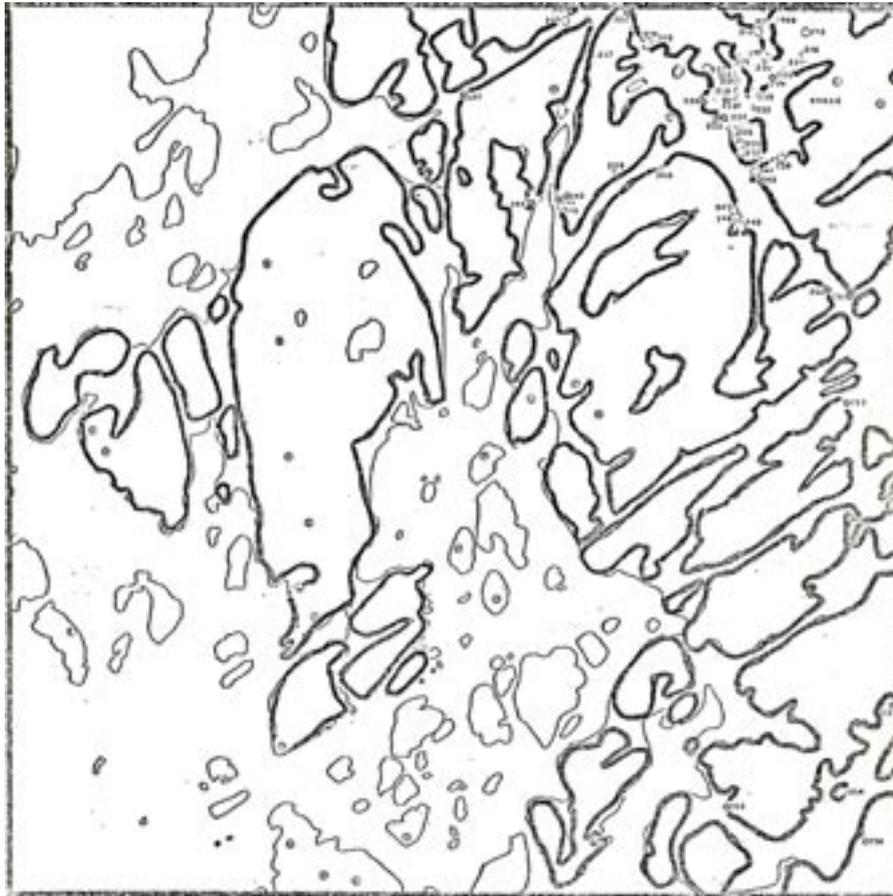


Figure 4.7. Map by Nordbladh showing the presumed shoreline during the Bronze Age and the distribution of rock art in the Svenneby and Kville areas (after Nordbladh 1980).

(1980) severely criticised the prevailing religious diffusionist perception in rock art research. He introduced an alternative interpretative methodology, based on structuralism and semiotics, and ever since he has been regarded as one of the major reformers in the Scandinavian rock art discourse (Mandt 1991; Tilley 1991, 1994; Bradley 1997, 2000; Goldhahn 1999a; Wahlgren 2000, 2002; Vogt 2006).

Nordbladh noted that earlier interpretations had reduced rock art to a divine medium between humans and gods. He emphasised that rock art instead was primarily a communicative act between living humans and could thereby have served as a further pragmatic and communicative classification of social actions in the landscape.

Nordbladh was also the first in the Bohuslän rock art discourse to plot the prehistoric shoreline on a map with the terrain and the prehistoric remains (fig. 4.7). He further emphasised the close con-

nection between settlement and rock art. Strangely enough, Nordbladh and later researchers relied on very old shoreline models, even though more accurate geological observations were available (see also Sarauw & Alin 1923; Ljunger 1939; Selinge 1966; Moberg 1971; Bertilsson 1987):

The cairns lie on hilltops partly inside the petroglyph area, partly out on the coast. Here one can distinguish a symbolic division of the landscape by the topography, with graves on the heights, far from presumed habitation and presumed agriculture and cattle farming, and then the petroglyphs lying nearer at hand. This also implies that graves are kept apart from the actual area of habitation (Nordbladh 1980: 44–45).

By this time, several proper shore displacement studies had been made in Bohuslän (Fries 1951;

Persson 1973) but rock art research was not able to compare, reflect and apply these results.

Almost a century after Brunius' thesis, Sven-Axel Hallbäck attempted to use the shoreline to deduce the maximum age of rock art in Bohuslän (Hallbäck 1944). His inductive conclusions, based only on the lowest locality in each "hundred", were that "some of the rock carvings must be dated to the Iron Age", and that "the rock carvings hardly could have been placed at the water's edge" (Hallbäck 1944: 54). Additionally, Johan Pettersson measured all the figurative rock art sites on the island of Tjörn. He concluded that the lowest depictions had

been sited just at the water's edge during the BA and that the general distribution varied from about 11 m.a.s.l to about 50 (Pettersson & Kristiansson 1977: 86pp).

In his much-quoted dissertation from 1987, Ulf Bertilsson endorsed Hallbäck's analysis and accordingly criticised Göran Burenhult (1980) and others who considered that during the BA many rock art panels might have been placed near the shore. However, considering the maps that Bertilsson published in his dissertation and his assumption concerning the BA level of the shoreline (fig. 4.8), it is clear that many sites with rock art in Tanum, Kville, etc., are,

in fact, situated on or adjacent to the BA shore. Consequently, these rock art-sites must have been deliberately located close to the sea. Despite this, Bertilsson concluded his analysis with the following statement:

The analysis of the general pattern of distribution in relation to levels has clearly demonstrated that there exists no direct correlation between rock carvings and the Bronze Age sea shore-line. Instead, it is obvious that, the distribution is correlated to the plain areas with open and arable land, which must have constituted the basis for subsistence economy (Bertilsson 1987: 167).

The sea is advancing

Göran Burenhult had already suggested that the rock art in Götaland had been made close to the shore (Burenhult 1980). Before him, Einar Kjellén and Åke Hyenström (1977) had stressed a close connection be-

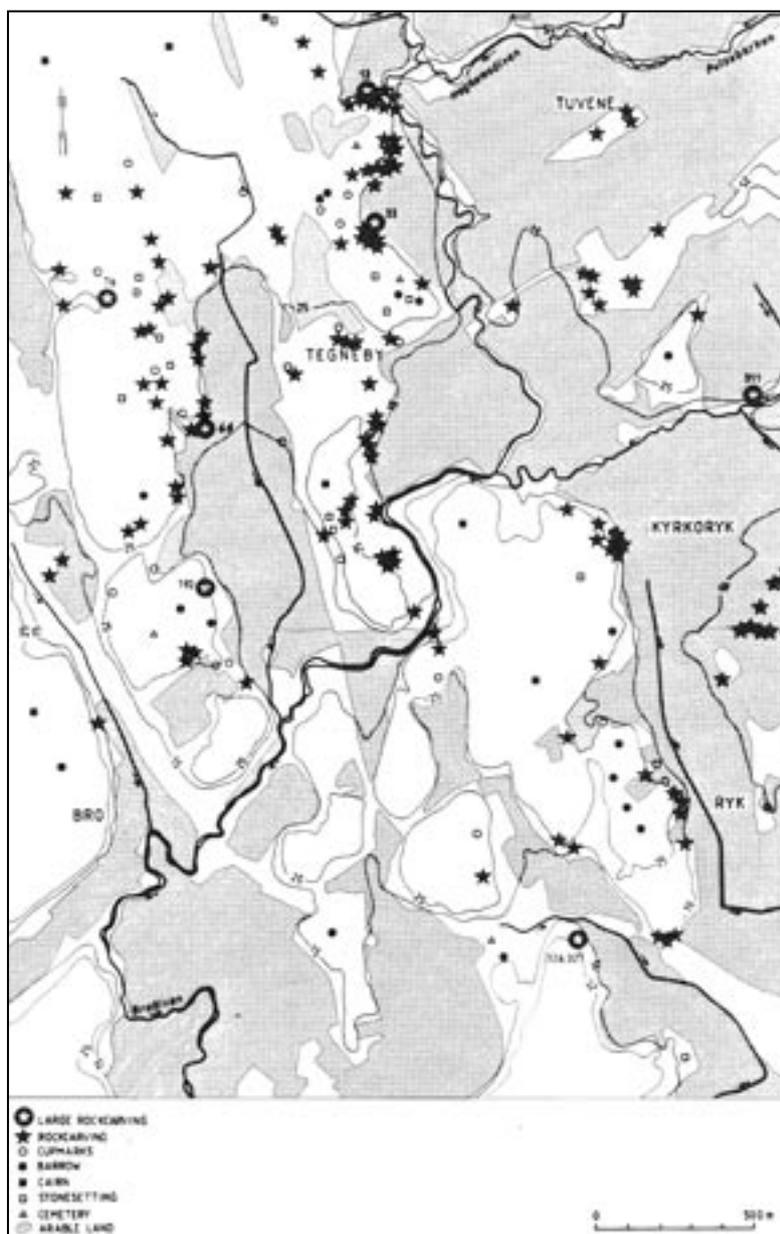


Figure 4.8. Bertilsson's map showing the location of rock art in the lower plain area in Tanum. Larger panels are marked with a black circle and a white star; smaller sites with a black star (reworked after Bertilsson 1987).

tween rock art and the shore in southwest Uppland. It was John Coles who introduced and used the concept “seascape” (Coles 1990) in a small guide book, “Images of the past: A guide to the rock carvings and other ancient monuments of Northern Bohuslän”. In this way, Coles was the first scholar to use extensive terrain maps of the Tanum and Kville area showing the general location of rock art and the ancient shoreline.

Coles further developed the seascape notion in his later landscape studies on rock art in southwest Uppland, where he discussed the location and altitude of the rock art in relation to the ancient seascape (Coles 2000). In his book “Shadows of a Northern Past. Rock Carvings of Bohuslän and Østfold”, Coles (2005) continued to discuss the presence of the seascape and its dialectical relation to the rock art. For instance, he emphasised the conscious choice of making rock art by the shore and stressed that land uplift’s transformation of the landscape may have had an historical impact on the making of rock art panels.

It is notable that these maritime observations and conclusions about the rock art came from a scholar who is from a country outside Scandinavia, untrammelled by the traditional terrestrial paradigm. Thus a new maritime framework was being established, based on new landscape, shore displacement and GIS studies (Coles 1990, 2004, 2005; Larsson 1994; Kristiansen 2002, 2004; Kvalø 2000, 2004; Ling 2004a, 2005, 2006; Sognnes 2003; Nordenborg Myhre 2004; Kristiansen & Larsson 2005; Ling & Bengtsson 2006; Linge 2006).

Moreover, several scholars claim that, with reference to archaeological boat finds from the Bronze and Early Iron Ages, the ship representations on the rocks are based on real boats, rather than mythological abstractions, and that this indicates a boat-building tradition rooted in the Late Neolithic or the Early Bronze Age (Larsson 1994; Kaul 1998, 2003; Kvalø 2000; Crumlin-Pedersen 2003b; Nordenborg Myhre 2004; Kristiansen & Larsson 2005; Østmo 2005; Linge 2006; Sylvester 2006).

However, the strongest challenge to the terrestrial paradigm came in connection with the World Heritage project in Tanum. The geologist Krister Svedhage (1997) made a shoreline study on the ba-

sis of three lakes, using traditional pollen methods combined with ¹⁴C dating of the lake sediments. He concluded that during the EBA the shoreline was about 25 m above the present level and then descended to 15 m during the transition between the LBA and the Early Iron Age (Svedhage 1997; Ekman 2002). Not surprisingly, this study evoked many protests from archaeologists. At a stroke, the BA landscape in Tanum had ceased to be a harmonious settled sedentary area and become extremely marine, or rather sub-marine! It followed that a major part of the rock art could not have been produced during the BA, but rather during the Iron Age.

However, the archaeologist Lasse Bengtsson (1999) criticized Svedhage’s assumption by analysing three panels in Tanum with typologically datable ship motifs from the EBA. Bengtsson compared different ship chronologies with Svedhage’s results and concluded that, according to the latter’s shoreline assumption, these panels would have been 5–10 m beneath the surface of the sea (Bengtsson 1999). Thus, there were many scientific grounds for rejecting Svedhage’s study as inaccurate (Ekman 2002; Pålsson 2003) and the terrestrial paradigm managed to survive even this crisis. The rock art remained above the water and the metaphorical ships continued to dwell in Tanum’s mystic boggy areas.

Recently, Kristian Kristiansen and Thomas B. Larsson have contributed a perspective on the rock art in South Scandinavia that could be regarded as innovative as well as traditional (Kristiansen 2002: 68, 2004; Kristiansen & Larsson 2005). They see the making of rock art in the context of the new maritime institutions that arose during the EBA and these institutions had an urge of transmitting new ideological symbols through Scandinavia. The rock art is thereby perceived as a direct medium of a new mobile identity in connection with sea journeys across the South Scandinavian seaways during the BA.

This is a very interesting and innovative analysis but its weakness is the assumption that the rock art was used primarily as a medium by travelling chiefs:

Long distance travels can be documented through the appearance of “foreign” ships on local rock

panels. Travelling chiefs were in this way documenting their visit, sometimes along with other motifs (Kristiansen 2002: 68, translated here).

In this way, Kristiansen and Larsson (2005) reduce a complex utterance to signify one very limited and specific social group's mark or identity. It would be more fruitful to assume that some of the ship symbols may have conveyed the whole identity of a travelling ship crew. One of those who argue for this viewpoint is Frode Kvalø (2000, 2004).

Finally, two of the most recent dissertations on rock art in Bohuslän almost entirely disregard the maritime location of rock art (Fredell 2003; Vogt 2006). The sea is virtually absent in these dissertations. For instance, Vogt treats the rock art's location in the landscape in Østfold as a matter of great importance. Yet although he uses Sørensen's newly produced shore displacement curve for this area, which shows that the altitude of the shoreline at the beginning of the EBA is about 20 m.a.s.l, followed by 13–12 m.a.s.l at the end of BA, he strangely but deliberately chooses to use the altitude of 10 m.a.s.l for the BA shoreline. This altitude is actually more representative of the Pre Roman Iron Age (PRIA) (Vogt 2006: 91pp). Vogt's choice is the same as the altitude of the shore that Brøgger used back in 1908. The reduction supports Vogt's general assumption that the rock art was made for competitive reasons to do with pastureland during the BA.

Conclusion

Rock art research in Bohuslän, traditionally but even today, is clearly governed by this terrestrial paradigm, due to a complex mixture of socio-historical, socio-scientific and methodological constraints (Kuhn 1970; Fleck 1997). Thus, two major trends

have characterised rock art research over the years. An earlier school, a maritime thought style, stressed the close relation between rock art and the sea, claiming this to be a reflection of a marine identity, activity, interactions of long-distance contacts and trade. A later school, the terrestrial paradigm, has had the greatest impact on contemporary research, which accentuates the close correlation of rock art with agriculture and settlements through features in the contemporary landscape. The theory of land uplift and the evolutionary conception of the BA sedentary farmer have been the major forces behind this thought style.

Consequently, the rock art in Bohuslän has been treated as sea-absent, agrarian fractions, settled on land that during the BA was actually seabed. The dominant ship motif has been perceived primarily as an icon for Indo-Germanic agrarian religion, not as a symbol of real or ritual maritime actions in the landscape. Only rarely has the discussion stressed the aspects of coastal activity, mobility and identity (Algotsson & Svedberg 1997; Bradley 1999; Hygen & Bengtsson 1999; Winter 2002).

However, a new maritime framework has now started to be established (Coles 1990, 2004, 2005; Kristiansen 2002, 2004; Ling 2004a, 2006). There are several publications that emphasize different maritime aspects of the rock art (Larsson 1994; Bradley 2000; Kvalø 2000, 2004; Kristiansen 2004; Nordenborg Myhre 2004; Kristiansen & Larsson 2005; Linge 2006). In order to provide further grounds for this view, I will first present some geographical analogies to rock art areas in Scandinavia where shore displacement has not been so pronounced. Thereafter I will return to our current understanding of this phenomena in northern Bohuslän.

5

ROCK ART AND SEASCAPES IN SOUTH SCANDINAVIA

Introduction

It is difficult to grasp the transformations the landscape of northern Bohuslän has undergone over more than 3000 years and to recognize that in the Bronze Age major parts of this landscape constituted a seascape, with its strikes, islands, isthmuses, bays and lagoons. Then there is the absence of certain perceptual and sensory features associated with a seascape, such as sounds, smells, light and specific animals and vegetation, for instance gulls, seaweed, salty winds and odours, accompanied by the presence of typical agricultural features, such as arable land, cattle, tractors, trees and land-based birds. All this seems to deny that the BA rock art was made in a seascape environment.

However, on the basis of the new shore displacement data in Bohuslän, I will argue that during the BA many rock art sites were placed in a seascape environment. In order to understand better the implications of this, and the changes the landscape of northern Bohuslän has undergone since the BA, it may help to look at some other rock art areas in Scandinavia. I will limit my examples to geographical analogies with rock art areas in western Norway, Dalsland in western Sweden and Scania in southern Sweden (fig. 5.1).

Features which these areas have in common are that land uplift has been less extensive and the rock art belongs to the south Scandinavian tradition.

These analogies may subsequently throw further light on rock art's original setting in northern Bohuslän



Figure 5.1. Map of the southern parts of Scandinavia; the numbers denote areas discussed in this chapter: 1: Sogn and Fjordane; 2: Rogaland and Stavanger; 3: Tisselskog in Dalsland; 4: Simris in Scania. The area shaded grey is Bohuslän.



Figure 5.2. A rock art panel connected with the shore, displaying ship images and cup marks; at Unneset in Sogn and Fjordane, western Norway (photo: Johan Ling).

West Norwegian rock art

The physical prerequisites for interpreting rock art in western Norway differ greatly from those of many other areas in Scandinavia. The difference has to do with land uplift in western Norway being very moderate (see fig. 6.1). As a result, since the BA the relationship there between rock art and the sea has changed only slightly (Nordenborg Myhre 2004). Let us first consider a cluster of rock art at Unneset, situated at the estuary of the great Sognefjord (Mandt 1991; Wrigglesworth 2005).

At Unneset a complex of rock art panels, along with several cairns of various shapes and forms, is situated just a couple of metres above today's shoreline (fig. 5.2). The altitude of these remains ranges in general from about 3 to 5 m above the current shoreline (Mandt 1991; Wrigglesworth 2000, 2002). This is interesting because some scholars claim that at the beginning of the BA the surface of the sea was about 5 m higher than at present and then descended to 3 m.a.s.l by the end of that period (Sognnes 2003). If these postulations are correct, all the remains were originally placed at the water's edge (fig. 5.2). And

even if there has been less, or no, land uplift, the remains are still clearly located in a seascape.

At Leirvåg in Askvoll, the same pattern between rock art, cairns and sea is repeated (fig. 5.3). It is still observed nowadays that splashes from the sea may reach the petroglyphs, which are situated at least 4.7 m above the present shoreline (Sognnes 2003: 193). Thus, both these places with their prehistoric remains constitute a liminal structure between land and sea. The close spatial correspondence between cairn, rock art and sea is indeed remarkable, especially in the context of Bohuslän. The sea is everywhere present and was undoubtedly the major consideration behind the location of all these remains, which mirrored prehistoric ritual activity.

The material in this area has been subjected to various kinds of rock art research for almost two centuries. In the past decade there have been two major studies of the BA remains in the area, by Gro Mandt and Melanie Wrigglesworth, respectively. They both favour a social or cognitive landscape analysis of this phenomenon.



Figure 5.3. Rock art panel located at Leirvåg just outside the great Sognefjord, western Norway. In the centre of the photo is a ship image just below a cairn on which heather grows (photo: Johan Ling).

Mandt analyses the variety of BA remains in this area and concludes that the archaeological material reveals an intentional and horizontal subdivision of the landscape that reflects different activities as well as identity and cosmology (Mandt 1991: 39). Rock art and cairns are located in an outer zone by the islands and isthmuses, and settlement finds in an inner and a middle zone. From this, Mandt concludes that the settlements were primarily situated in the inner and middle zones of the fjord, while the outer zone may have reproduced seasonal activity of an economic, socio-political and socio-religious character (Mandt 1991: 39).

In her study, Wrigglesworth favours Mandt's interpretation but also discusses alternative models of ritual behaviour, as manifested by the close spatial connection between the rock art, the cairns and the sea (Wrigglesworth 2002). Her major conclusion is that the complexes of rock art and cairns symbolize public arenas or *axis mundi* for the reproduction of identity and cosmology, primarily manifested by grave rituals (Wrigglesworth 2005).

We now leave the Sogn and Fjordarne area to go

south about 200 km to the Stavanger area in Rogaland. The main difference between these two areas is one of topography. The high mountains and dramatic archipelago of Sogn and Fjordarne give way to a much flatter and greener landscape, remarkably like many parts of southern Sweden and Denmark. The Stavanger area is renowned for its numerous BA remains (Nordenborg Myhre 1998, 2004). In addition to the rock art, grave barrows and bronze items, it has one of the largest numbers of flint daggers from the transition from the LN to the BA (Apel 2001).

Another outstanding feature in a Scandinavian context is the frequent finds of rock art slabs from graves (Fett & Fett 1941; Syvertsen 2002, 2005; Nordenborg Myhre 2004; Goldhahn 2007). All these finds indicate the major importance of this area during the LN and BA.

In her dissertation, Nordenborg Myhre emphasizes the close relationship between the BA remains and the sea (Nordenborg Myhre 2004). Thus, the ship images' interplay with natural features on the rock, such as prominent wavy veins of quartz, may have contributed to the rock being perceived as a



Figure 5.4. Rock art panel by the shore on the island of Åmøy in Rogaland, Norway (photo: Joakim Goldhahn).

kind of seascape. Moreover, inspired by David Lewis-Williams (2002) and Richard Bradley (1997, 2000), Nordenborg Myhre interprets the engraved rock as a kind of membrane or interface between two worlds. So the ship images on the rock may, in this context, have been intended to illustrate multiple notions and movements between life and death (Nordenborg Myhre 2004: 177pp).

Nordenborg Myhre manages to integrate the BA remains in a seascape context with reference both to the physical landscape/seascape but also with inspiring philosophical ideas of the action in the landscape. Her dissertation must therefore be seen as one of the most innovative with regard to recent rock art discourse.

Almost all of the complex rock art sites in the Stavanger area have a maritime location, on islands, isthmuses and straits (fig. 5.4). The ship is the dominant but by no means the only motif. The best-known rock art complex in this area is situated on the island of Åmøy. The ships depicted there are typical of the South Scandinavian tradition (fig. 5.5), with Early as well as Late BA features (Nordenborg

Myhre 1998, 2004; Kvalø 2004). It is fascinating to find that so many of the EBA ships seem to have been re-made, altered and augmented with different depths and techniques to fit the aesthetic norms that seem to have prevailed in the LBA (Ling 2005). This may represent a process whereby the ship symbolism was upgraded to fit contemporary social norms. Similar examples of this phenomenon have been noted in other places in southern Scandinavia (Wahlgren 2004). Thus, in the whole of the Stavanger area, the complex rock art panels with ships were placed primarily by the shore. The parameters concerning land uplift also reveal that a majority of the rock art images seems to have been placed deliberately just at the water's edge (fig. 5.4).

The BA settlement finds and graves, as well as the simpler images, are located towards the higher ground, at some distance from the maritime zone. Similar norms seem to have governed the horizontal and vertical subdivision, in terms of rock art and other BA remains, of the landscape in western Norway (Nordenborg Myhre 2004).



Figure 5.5. Ship images from site I (felt I) on the island of Åmøy in Rogaland, Norway (photo: Joakim Goldhahn).

Briefly, then, in order to concretize rock art's original location in areas, such as Bohuslän, that have been subjected to extensive land uplift, I have used two examples from western Norway where the rock art's current situation in the landscape closely resembles its original context. As to the placement of rock art in western Norway, it seems that the more complex localities were situated in maritime zones and the simplest images were associated with settlement areas. Some of these observations may later help us to explain some of the features behind the rock art settings in Bohuslän.

Högsbyn in Dalsland

The gently undulating terrain of Högsbyn, bounded by the lake to the south, is surrounded to the north, west and east by much higher rocky, heavily wooded hills which also stretch round the south of the lake, creating the impression of a very special place, an isolated, interiorized, cultural 'island' by the lake. Its location, more or less in the centre of a network of waterways

and lakes to the west of lake Vänern, implies that it was a site visited and left, as it may be today from the water (Tilley 1999: 134).

This case is cited here mainly to discuss how the rock art sites at Högsbyn – in Tisselskog parish, Dalsland, western Sweden – are situated in the landscape and hopefully thereby cast further light on the situation of the prehistoric rock art in Bohuslän. Christopher Tilley's excellent description of the prominent landscape features that surround the rock art area by Lake Råvarpen can serve as an introduction. In terms of communications, the Högsbyn area is sited very strategically by Lake Råvarpen, which connects with the larger lake systems in Dalsland and Värmland.

The known BA remains in Dalsland, which are mainly located by Lake Vänern (fig. 5.1), are quite sparse compared to those in Bohuslän. Dalsland has some 20 bronze items, Bohuslän about 233. Moreover, Dalsland's 313 cairns are few compared with about 1942 in Bohuslän. Gallery graves, on the other hand, are slightly more numerous in Dalsland:



Figure 5.6. The landscape by the well-known “procession panel” in Tisselskog, Dalsland (photo: Johan Ling).

98 as against 91 in Bohuslän. It is also noteworthy that Dalsland has almost as many flint daggers from the LN and EBA as Bohuslän, 408 compared to 427 (Apel 2001).

The main difference between these two counties in the present context lies, however, in the number of figurative rock art sites: about 1485 in Bohuslän (Bertilsson 1987) but only about 61 in Dalsland (Rex Svensson 1982). Interestingly enough, about 48 of the latter are located at Högsbyn, whereas the others are spread over 13 different places in the county. In addition to the rock art, Lake Råvarpen’s surroundings hold about 20 stone settings, 10 cairns, 1 gallery grave and 3 prehistoric settlement sites (FMIS).

Högsbyn’s rock art has been known since the 18th century but most of the documentation and interpretation was done in the late 20th century, primarily by Karin Rex Svensson (1982) and Tommy Andersson (1992, 1994, 2000, 2001). The designs generally follow the South Scandinavian code but it is also clear that the rock art images, not just in Högsbyn but in the whole of Dalsland, present a regional trait

or dialect of this code, with wavy lines, complex framed filled-in images and complex ring crosses. Moreover, the number of feet and hand designs is high in relation to other instances of the South Scandinavian BA tradition. The intricate arrangement of the panels and their complexity also seem to be a significant characteristic of the Dalsland grammar (Rex Svensson 1982; Andersson 2001).

Andersson’s interpretation, based on the so-called “procession panel” – showing a moving sequence of ships, warriors, voltigeurs, animals and other designs – is interesting but rather traditional, holding that the panel may illustrate celebrations of the seasons (Andersson 2001).

The most comprehensive interpretation of the rock art at Högsbyn is, however, the one launched by Tilley in “Body Metaphors in Southern Scandinavian Rock Art” (Tilley 1999). He claims that the location of the most frequent panels at Högsbyn reveals a general pattern of movement from the shore towards higher ground. Tilley also presumes that designs, such as cup marks, ring crosses, circles and wavy lines, reflect movements of celestial bod-



Figure 5.7. Jan Kindberg at the “Ormvindlingshällen” (Twisting Snake panel) in Tisselskog, Dalsland (photo: Johan Ling).

ies “and in particular the passage of the seasons” (Tilley 1999: 146). Tilley further argues for the notion of rock art as traces of seasonal agricultural actions in the landscape and his interpretation of the rock art in Högsbyn ends up by following the traditional, agriculturally-centred terrestrial paradigm (Tilley 1999).

The rock art’s obvious situation, context and relation with the lake are clearly toned down, which is rather remarkable considering the lake’s impressive presence by the rock art sites (fig. 5.6). It would be more logical to assume that the “rituals” manifested by the lakeside images relate to aquatic rather than agricultural encounters and interactions.

Turning to the rock art panels, these form a succession from farmsteads and pasture land on higher ground down towards the lake. The most complex localities are located in the proximity of the lake, e.g. the well-known Ormvindlingshällen (fig. 5.7) and the panels at the Rånarudden isthmus (fig. 5.8). Another interesting point is the existence of localities on small rocky islets in the lake. The lake’s presence by the rock art, its panorama, lighting and

motion, are so inspiring and prominent that it can be hard to focus on the images on the panels. The lake is, moreover, a major factor when it comes to interpreting prehistoric action and interaction in this landscape.

In this context it should be noted that before the lake was regulated, during the spring thaw its surface was liable to rise more than 5 m above the present level. This obviously transformed the surrounding landscape with its rock art sites. Even today, despite its regulation, the lake’s rocky islands become transgressed to such an extent that some sites are transformed into small islets (Tilley 1999).

So it seems that both the rock art’s situation and its images might reflect the lake’s seasonal movements. The motion of the lake may even have been directly represented by some of the rock art panels and images. A case in point could be the Ormvindlingshällen, which consists of wavy lines (fig. 5.7).

The succession of rock art from higher ground down to the shore and the close relationship to the large lake are instructive analogies to bear in mind



Figure 5.8. The largest rock art panel in Tisselskog, Dalsland, dominated by ship images, on the shore of Lake Råvarpen (photo: Johan Ling).

when considering the original settings of rock art in Bohuslän. The Tanum and Kville areas contain many examples of rock art sites that seem to have led down to the BA shoreline (Ling 2004a, 2005, 2006). This pattern is reminiscent of but more extensive than the Tisselskog setting for rock art.

The Simris area in Scania

The last of these geographical analogies concerns the rock art at Simrishamn, South-East Scania. This area has some of the most enigmatic figurative rock art in the whole of Sweden and has therefore been subjected to a long interpretative tradition (Holmberg 1848; Brunius 1868; Althin 1945; Burenhult 1980; Tilley 2004; Kristiansen & Larsson 2005; Skoglund 2005).

In addition to the figurative rock art, the area has yielded one of the most numerous finds and monuments related to the BA. For instance, no less than 99 swords from the EBA have been found in this eastern part of Scania, a larger concentration than in any other part of Sweden (Larsson 1986). A comparison of the number of bronze finds in this area

and in Bohuslän shows that for the EBA the Simris area dominates all three categories: swords, spears and axes. It is interesting, however, that more LBA swords have been found in Bohuslän than in Simris (Larsson 1986: 23, 53).

The Simris area is also renowned for the large number of BA barrows; not least the famous Kivik grave complex, with the reconstructed “royal grave” and rock art slabs, that is situated about 25 km north of this area. For these slabs there is also a long tradition of chronological, religious and social interpretations (Holmberg 1848; Brunius 1868; Althin 1945; Burenhult 1980; Randsborg 1993; Kaul 2004; Goldhahn 2005; Kristiansen & Larsson 2005; Skoglund 2005). New carbon dating of bones found in the cist demonstrates that deposits of human bones were made continuously from period II onwards to period V. The oldest deposit of human bones represents two persons who died at an age of about 13–15 years. This apparently refutes the “traditional” theory that the complex represents a single “royal” och chief burial (Goldhahn 2005: 245pp).



Figure 5.9 Jeanette Ling-Kasper investigating the panel Simris 19 in Scania, Sweden, located close to the shore (photo: Johan Ling).

Several authors have stressed the BA maritime interaction between Simris, Kivik, the island of Bornholm and the European continent (Althin 1945; Malmer 1981; Randsborg 1993; Kaul 2004; Kristiansen & Larsson 2005; Skoglund 2005). The high density of BA monuments, rock art and other finds has led many scholars to interpret the area as one of the most formative and innovative for the Scandinavian BA (e.g. Malmer 1981; Randsborg 1993). For instance, Kristiansen and Larsson argue that one of the first BA systems on the Scandinavian peninsula may have been established in this area and then spread to other areas further north (Kristiansen & Larsson 2005). However, other scholars stress that these “neo-diffusionistic notions in the material” are hard to discern or verify (Skoglund 2005; Goldhahn 2006).

To return to the rock art, most of the images are situated close to the shore, in the urban district of Simrishamn (fig. 5.9). Ships dominate the rock art images, along with axes in different sizes and combinations (fig. 5.10), presumably from periods Ib–III (Althin 1945; Randsborg 1993: 83; Skoglund

2005). Combinations and projections of ships and axes are, for instance, features of panels Simris 4, 19 and 27 and the latter two panels show axe bearers and large axes in opposed and successive scenes. Peter Skoglund suggests that the combination of these images reflects a fusion of old and new ideological traditions, with axes representing an older or current order and ships a newer concept that seems to have lasted into the LBA (Skoglund 2005: 111).

The altitude of the rock art ranges in general from about 7–15 m.a.s.l (Burenhult 1980; Skoglund 2005; FMIS). This is rather interesting because some scholars claim that at the beginning of the BA the sea level was about 2–3 m higher than at present and that it had fallen back to 1 m.a.s.l by the end of the period (Gedda 2007: 20). However that may be, even if shore displacement had not affected the area so much, the sea’s presence by the remains would still be very obvious (fig. 5.11).

Just as in western Norway and Dalsland, the rock art forms a liminal structure between land and sea. The close spatial distance between the rock art and the sea is indeed remarkable, especially in the



Figure 5.10. Ship and axes on the panel Simris 19, Scania (photo: Joakim Goldhahn).

context of Bohuslän. The sea is everywhere present and was undoubtedly the major consideration behind the location of the rock art.

This is not meant to imply that no rock art sites are situated on higher ground away from the shore. On the contrary, there are many examples, such as the famous dancer or swimmer at the panel Järrestad 4 and the rock art ships on the megalith roof slab in Gladsax (Althin 1945; Tilley 2004). From the rock art panel at Järrestad 4 one can in fact glimpse the sea. This panel is dominated by footprints (Bradley 1999; Coles 1999; Tilley 2004). It is remarkable that large human images, such as the dancer at Järrestad 4, as well as large human images in Bohuslän (see fig. 8.37i), tend to occur on higher ground away from the shore, while human images sited close to the shore seem to be more or less proportional to the ship images.

A reinterpretation of the rock art at Järrestad is presented in Tilley's "Materialities of Stone". He stresses that the rock art panel may have served as a canvas for a seascape, manifested by the interplay between the ship images and the rock's natural fea-

tures. In this context, Tilley (2004) interprets the depicted human figure as a shaman and/or swimmer.

Turning back to the landscape, the rock art seems to have been made in succession from higher ground down towards the sea. Just as in western Norway and Dalsland, the sea's presence here is very powerful and its appearance, light and motion tend to distract the viewer from the rock art images. Another interesting fact is that the Simris rock art is located today between 5–15 m.a.s.l (most of it between 5–10 m.a.s.l) and in the BA the sea level in this area was about 1–3 m higher than it is today. So a majority of sites seem to have been located at 3–7 m above the BA shoreline. As we will see later on, this is very similar to the situation of rock art in Bohuslän.

Conclusion

The combination of rock art and an expanse of water seem to be a common Scandinavian theme. Indeed, the element of water appears to be common to rock art in general, both on higher ground and in a maritime setting. There seems to be a close spa-



Figure 5.11. The close connection between the seascape, Bronze Age mound and rock art at Simrislund in Scania (after Goldhahn 2007).

tial relationship between rock art on higher ground and bogs, springs, streams, rivers and creeks. Water symbolism and rock art are accordingly a recurrent theme (Wahlgren 2002; Bengtsson 2004; Coles 2005).

With the knowledge gained from these South Scandinavian examples of rock art areas that have been less affected by shore displacement, it is time to move on to an analysis of the relationship between the sea and rock art in Bohuslän.



SHORE DISPLACEMENT, TIDES AND ALTITUDES

Introduction

This section briefly outlines the factors that govern the process of shore displacement and considers how this process could be used for a reconstruction of landscapes and a discussion of dating. The reason for this is twofold. First of all, many archaeologists do not fully understand the causes and effects of this process and how an actual estimation of shore displacement is carried out, which has led to many misunderstandings. It may therefore be well to recount some of the features, causes and effects of shore displacement. Secondly, the results from the recent studies of shore displacement in northern Bohuslän are also presented, more specifically the studies carried out in connection with this thesis.

The shore displacement phenomenon

Shore displacement is a result of two distinct vertical movements: glacio-isostatic uplift of the bedrock (isostasy) and global changes in the sea level (eustasy). These two processes are mutually independent, so shore displacement, in a general chronological perspective, should be regarded as an interplay between isostatic variations and global movements in sea levels (Mörner 1990; Åkerlund 1996; Pässe 2003). Thus, the displacements in the Swedish coastline include contributions from both these processes. However, as far as the regressive pattern of shore displacement from about 6000 BC

until recently in Scandinavia is concerned, the main cause has been glacio-isostatic uplift (Mörner 1990; Pässe 2003).

The glacio-isostatic uplift is primarily connected with the most recent glacial period, the Weichselian. Other geological features that affect the uplift include the tectonic nature of the bedrock and fault fissures. The possibility of neotectonic movements should be born in mind in any fissure valley landscape. Another factor that may affect the pattern of the uplift is seismic activity. As it happens, one of the “greatest known earthquakes during historic time in Scandinavia (1904) had its epicentre in the northern part of Skagerrak” (Kaislahti 2004: 14, also Eriksson & Henkel 1998). Still, the main cause of the uplift is the bedrock’s rebound that followed the melting of the inland ice, which had reached its maximum extension about 20,000 years ago. This uplift, successively initiated following the recession of the Weichselian ice sheet, occurred at a comparatively rapid rate to begin with and then slowed (Miller & Robersson 1988; Björk & Svensson 1998; Pässe 2001).

Glacio-isostatic uplift and thus a regressive shore-level displacement was extremely rapid around 10,300 years BC. This fast regression occurred simultaneously and in a similar way along the west coasts of Norway and Sweden as well as in the Baltic. The “drainage” of the Baltic Ice Lake

has been interpreted in the model as due to this rapid regression (Påsse 2001).

At its maximum extension, the last glacial had its epicentre in the northern Baltic area (Påsse 2003). The bedrock in that area was therefore subjected to the greatest pressure and its subsequent rebound occurred most rapidly. Further south, east, west and north of this epicentre, the ice sheet was less extensive and so, therefore, was the pressure on the bedrock. Areas such as Scania and southwest Norway, for instance, were so far away from this epicentre that land uplift there had just a minor effect on shore displacement. In other words, the rate of uplift differs between geographical zones and so, therefore, does the rate of shore displacement (fig. 6.1). In Bohuslän today, for instance, regressive shore displacement is estimated to be 2 mm a year (Påsse 2003).

The other main component of shore displacement is eustatic movements in sea levels (eustacy). The world's oceans are interconnected and changes in sea levels affect them all. This complex process is broadly governed by climate changes and movements in global and local sea currents but is also affected by the salinity and density of the sea water. Variations in gravitation may also affect eustacy (Risberg 1991; Påsse 2001). Thus, the interaction

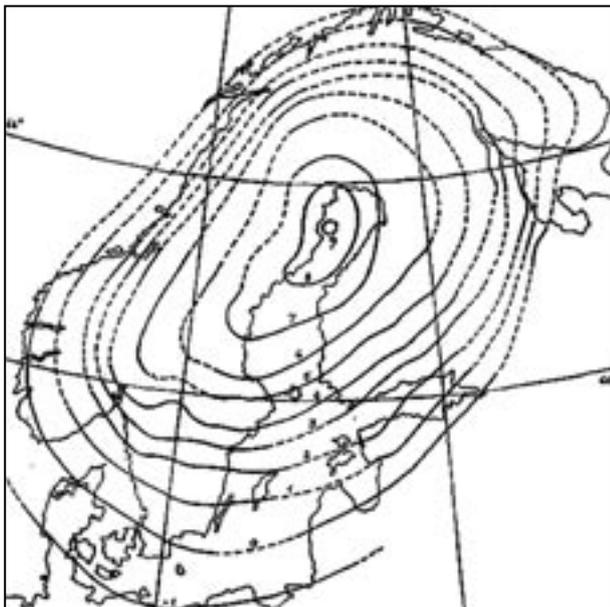


Figure 6.1. Today's rate of land up lift in Scandinavia in millimetres per year (after Påsse 2003).

between changes in sea levels and isostatic uplift can result in three alternative scenarios:

- Regression
- Transgression
- Standstill

Climate change can result in lower as well as higher sea levels (Påsse 2001). A lengthy and more extensive colder period leads to increased glaciation, whereby large amounts of water are transformed into ice and sea levels fall. In the long run, changes in sea levels are more apparent in areas that are affected by land uplift. This type of shore displacement process is called regression, i.e. the sea level falls in relation to the land uplift. A long warm period may lead to the opposite effect, so that the sea level rises or is constant in relation to land uplift. This type of process, a rising sea level in relation to land uplift, is called transgression. A standstill occurs when the eustatic and isostatic movements cancel out, "resulting in a stable situation lasting for a considerable period of time" (Åkerlund 1996: 84).

Post-glacial transgression has occurred in certain areas in Scandinavia in the Litorina I–II or Tapes I–II periods (Björck & Svensson 1998). In the Gothenburg area in western Sweden, Mesolithic dwelling sites from the "Sandarna" culture, about 8000–6000 BC, were subjected to transgressions.

In northern Bohuslän, however, transgressions did not occur because the rate of land uplift was higher here and exceeded the rise of the sea level (Påsse 2003). But there are some indications that transgressions may have occurred later, around 2500–2000 BC (Miller & Robertsson 1988). This may be confirmed by transgressed dwelling sites from Bohuslän and Halland dated to 3000–2600 BC (Persson 2005). As to the BA sea level, the nearest evidence of sea level variations is from Jutland in Denmark (fig. 6.2). At that time the sea level was slightly regressive, with periods of standstill (Clemensen 2001). But that is not evident in Bohuslän, probably because isostatic uplift here has been greater than in Jutland and may have outstripped the rise in the sea level during this period (Påsse 2003).

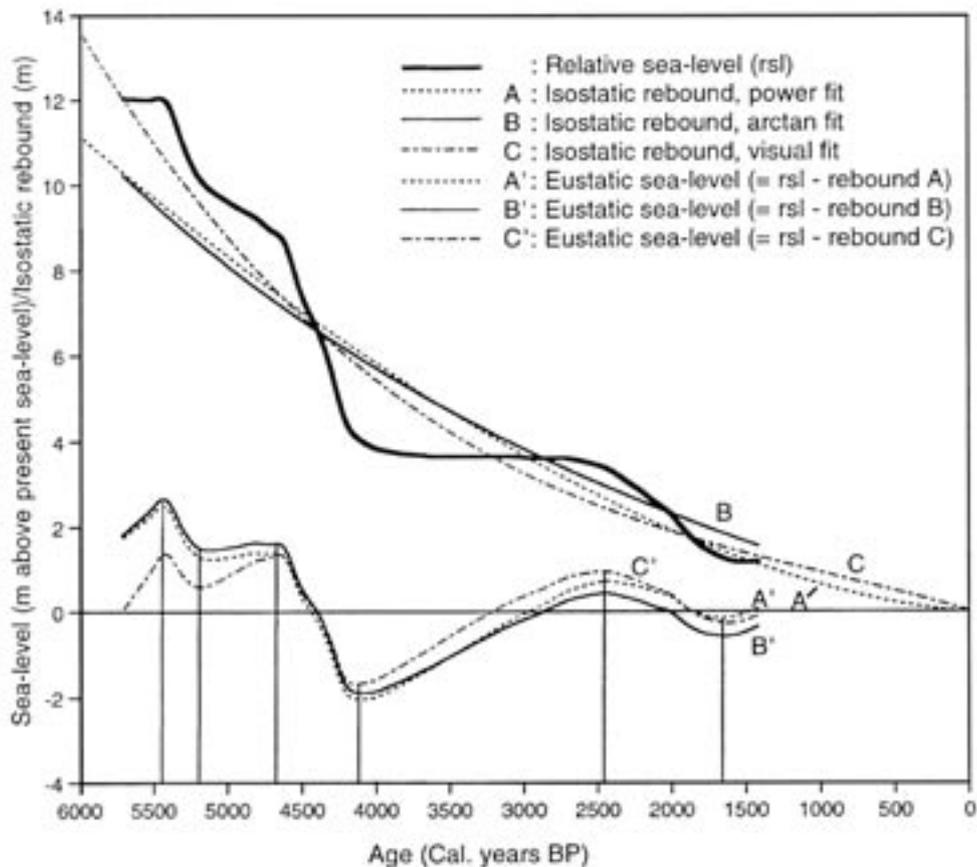


Figure 6.2. Variation in relative sea-level: isostasy and eustasy at Kandestederne, Skagen Odde. Eustasy is calculated by subtracting values for isostasy from the relative sea-level (after Clemensen 2001: 7, Fig. 8).

Dating and estimating shore displacement

Since the 1950s, shore displacement has usually been dated or estimated by analysing and dating sedimentary sequences in lakes and mires (Fries 1951; Persson 1973; Miller & Robertsson 1988; Risberg 1991; Påsse 2003). In basins below the highest historical coastline, i.e. on the west coast of Sweden, marine sediments are overlaid by lake (lacustrine) sediments. Samples from the accumulated sediments are collected with a “Russian” peat corer, preferably from the deepest part of the lake. The stage at which the lake was cut off from the sea, isolated, is then determined by analysing the diatom and/or pollen stratigraphy.

Diatoms are considered to be the best tool for determining isolation because they reflect the local environment and are sensitive to changes in salinity (Miller & Robertsson 1988; Risberg 1991; Björck & Wohlfarth 2002). When the isolation event has been determined, samples are taken for radiocarbon

analysis. In this context it must be stressed that radiocarbon dating based on bulk sediments, i.e. sections of sediments, is subject to greater uncertainties, such as marine and lacustrine reservoir effects, than is dating of terrestrial macrofossils, i.e. seeds selected from the sediments.

Thus, radiocarbon dates based on bulk sediments may result in misleadingly old ages (Risberg 1991; Barnekow et al. 1998; Hedenström 2001). Briefly, then, the most consistent way of dating a lake’s isolation event is to determine the isolation from diatoms and then select reliable seeds of terrestrial origin, taken from sections just above and below the isolation event, for radiocarbon dating (Miller & Robertsson 1988). The results of these analyses are then related to the altitude of the lake’s isolation threshold in order to estimate when the lake became isolated.

By repeating this procedure in lake basins at different altitudes, it is possible to reconstruct a graph

that indicates the course of shore displacement over time (Risberg 1991; Pässe 2003).

Another important factor is the depth of the lake and the altitude of its threshold. If a lake is too shallow, roots from recent vegetation may penetrate downwards and contaminate the sediments. A case in point is Krister Svedhage's (1997) analysis of the shallow lake Knäsmyr in the Tanum area, which caused much debate (Ekman 2002; Pässe 2003). Thus, to obtain a satisfactory shore displacement curve for an area, isolation studies are needed from several lakes, situated not too far apart and at different altitudes (Risberg 1991; Pässe 2003).

There is much more to be said about the methods connected with shore displacement but I will not go into all of that here. The problems are thoroughly considered in the attached study by Annika Berntsson (2006, see Appendix 1). This is one of the two studies made in collaboration with Jan Risberg at the Department of Physical Geography and Quaternary Geology, Stockholm University. The aim of these studies was to verify or modify the existing shore displacement estimates for the Tanum area and compare them with my own data on measured rock art sites.

Before recounting these results, something should be said about the background and aims of the new studies. Here I shall focus on the implications and potential of the latest shore displacement studies in northern Bohuslän (see Kaislahti's 2004 excellent history of research into these matters).

Shore displacement in Bohuslän

Various shore displacement studies have been made in Bohuslän since the 1950s (Fries 1951; Persson 1973; Miller & Robertsson 1988; Svedhage 1997; Pässe 2001, 2003). In the past decade there has been much debate about the BA shoreline in Tanum, in large measure due to Svedhage's study from 1997. In connection with the World Heritage project in Tanum, Svedhage studied Lake Knäsmyr, situated southwest of Tanum at an altitude today of 25 m.a.s.l, using both diatoms and traditional pollen to estimate its isolation event. Bulk sediment representing the isolation event was subsequently radiocarbon-dated with one sample. This sample indicated that today's altitude of the shoreline around

2000–1800 BC is about 25 m.a.s.l (Ekman 2002, cf. Berntsson 2006). However, Svedhage disregarded this result and chose to date the isolation by pollen correlation, which according to Ekman (2002) was not representative for the area. Thus, Svedhage's "controversial" study had many geological implications and also posed a major problem for archaeologists because it suggested that in this period a majority of the BA rock art sites would have been situated below the contemporary shoreline (Bengtsson 1999; Ekman 2002; Ling 2004a).

We can now draw on the results of the shore displacement study by the geologist Tore Pässe (2003). This is the first such study to cover northern Bohuslän. It was undertaken in connection with the Stone Age project "From Coast to Coast". Earlier studies had mostly covered central and southern Bohuslän (Miller & Robertsson 1988). Pässe's intention was to use new observations to reconstruct the shoreline's regression from 7000 BP up to the present:

Sixteen lakes and ancient lakes are investigated within the Strömstad area, with the aim of dating when these lakes were raised above the sea level. In the Strömstad area lakes at different levels exist within a small area, which is a prerequisite for constructing a complete shore level displacement curve. The isolations are determined by pollen analysis and thereafter dated by C14-analysis (Pässe 2003: 31).

A new shore displacement curve was then produced on the basis of the observations from Strömstad. This study was compared with Pässe's general empirical model of glacio-isostatic movement and shore displacement in Fennoscandia. The combined results were further used to modify earlier attempts from Halden in Norway and from central and southern Bohuslän (Pässe 2003, see Appendix 1, Fig. 2–3). In general, Pässe's study seems to correspond well with the archaeological data in Bohuslän (Ling 2004a, 2005; Sjögren 2003; Claesson & Munkenberg 2004a) and his empirical model of glacio-isostatic movement and shore displacement seems reliable. The results have some methodological implications concerning the BA and hence the rock art in the areas of Tanum and Kville.

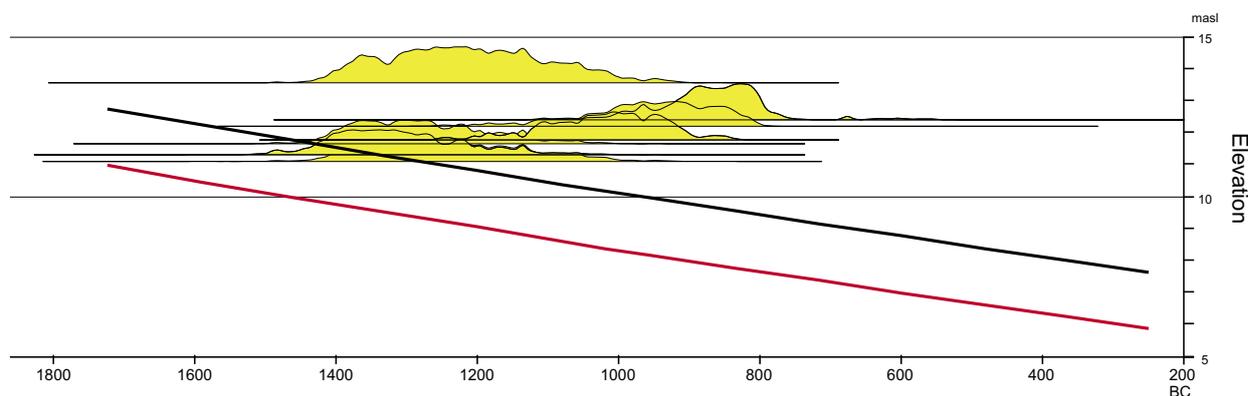


Figure 6.3. The altitude of radiocarbon dated features at Ellös on the island of Orust in relation to Pässe's shore displacement model (lower curve). The upper curve represents +1.8 m, which is the difference between Pässe's model and Berntsson (2006) in the Tanum area. The dated archaeological features, all interpreted by Lindman (1997: 18) as Bronze Age "cooking pits", were accordingly made on the ancient shore (figure by Per Persson).

Firstly, the study was made in the Strömstad area, which is further north than the rock art areas of Tanum and Kville. Consequently, the shore displacement curve for the Strömstad area constitutes a model for the latter areas, not a study made within them. Secondly, none of the basins that feature in the study were isolated during the BA. This part of the shoreline model is based on interpolation between the isolation events of two lakes, i.e. Lake Lången, which was cut off from the sea in the Late Neolithic, and Lake Botten, isolated during the Early Iron Age, resulting in a gap of almost 2000 years (Pässe 2003: 36, 45). Other methodological implications include the use of pollen instead of diatoms for the estimation of isolation events, the dispersion of the radiocarbon-dated samples and the use of bulk sediment instead of terrestrial macrofossils for dating.

These problems are thoroughly discussed by Berntsson in Appendix 1 to this volume and are therefore not considered here. It should be added that Pässe does emphasise that his study is to be seen as a general model that may differ by 1–2 m (Pässe 2003: 34, pers. comm. 2004).

Aims and outcome of the new shore displacement studies in the Tanum and Kville areas

As stated above, Pässe's study seems to broadly correspond with the archaeological record (Ling 2004a, 2005; Sjögren 2003; Claesson & Munkenberg 2004a). However, one of the main reasons why

these new studies were initiated was the fact that Pässe's model of Tanum demonstrated discrepancies in the altitudes of rock art sites dated archaeologically (Ling 2005; Ling & Bengtsson 2006). Taken together, the archaeological observations seemed to form a different shoreline (fig. 6.3, 6.4). This alternative "archaeological" shoreline, based on rock art sites but also on radiocarbon dates from archaeological sites dated from the BA to the Iron Age, was evident to some extent from Gothenburg in the south of Bohuslän to Tanum in the north (Algotsson & Svedberg 1997; Andersson & Ragnesten 2005; Ling 2005, 2006; Ling & Bengtsson 2006).

One striking fact with this "archaeological" shoreline was that its values were consistently about 2 m higher than Pässe's new shore displacement curve. One concrete example of this discrepancy was the altitude of carbon dated archaeological features on the island of Orust in relation to the shore displacement model that Pässe has suggested for this area. These features were interpreted to have been made just on the shore (Lindman 1997: 18) but with Pässe's model these features would not have such a location.

However, using a value for shore displacement that are slightly (+1.8 m) higher gives the same differences as those that were obtained in Tanum between Pässe's calculation and the new study carried out by Berntsson 2006. Starting from this higher value of shore displacement for the BA at Orust, the

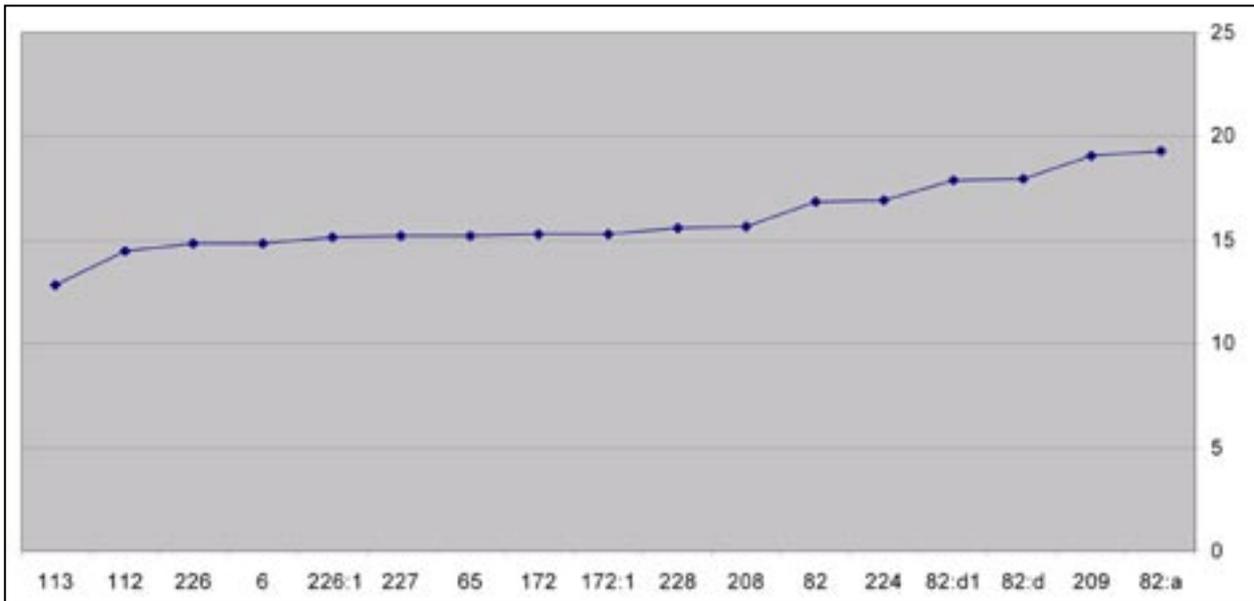


Figure 6.4. The altitude of 17 measured rock art sites in Kville parish. The horizontal axis shows the Raä number of each site and the vertical axis the altitude in m.a.s.l.

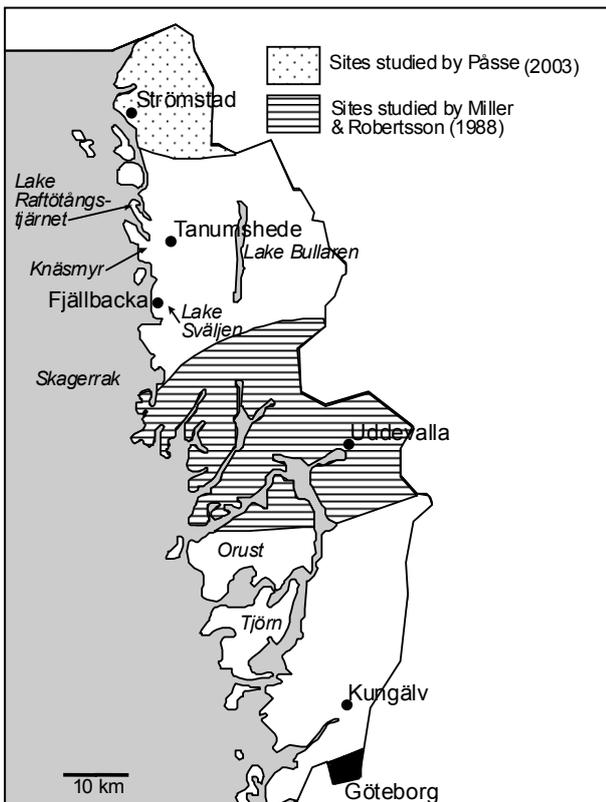


Figure 6.5. Bohuslän with Lake Raftötångstjärnet in relation to sites studied by Miller and Robertsson (1988), Svedhage (1997), Pässe (2003), Kaislahti (2004) and Berntsson (2006: 12, Fig. 7).

archaeological features would correspond better to Lindman's interpretation, that these features were then shore connected (see fig. 6.3, Ch. 7).

Another illustrative example of this fact is the location of the rock art site Solberga 50 in Solberga parish, close to Kungälv, presented in chapter 7. Could this indicate that the rate of shore displacement since the BA has been slightly faster than suggested by Pässe? Or was this an utterance of a BA behaviouristic trait or prohibition, suggesting that the low lying rock art images were then made consistently at least about 2 m above the shoreline? That would indeed be strange because in other parts of Scandinavia, such as western and northern Norway, Scania, Dalsland, Värmland and Norrland, a majority of rock art sites were made close to water, some at the water's edge (Althin 1945; Helskog 1999; Sognnes 2001, 2003; Goldhahn 2002; Heimann 2004).

To be able to verify, reject or modify the existent shore displacement models of the Tanum and Kville area and the alternative "archaeological shoreline", it became necessary to initiate new local shore displacement studies. In this context I was fortunate to be able to collaborate with Ass. Professor Risberg at the Department of Physical Geography and Quaternary Geology, Stockholm University. Thus,

Depth (cm)	Lab. no.	Dry weight	¹⁴ C yrs BP	Cal. yrs BP ± σ	Cal. yrs BP ± 2σ	Calendar yrs BC ± σ	Calendar yrs BC ± 2σ
289 - 291.5	Poz-10906	2 mg	2550 ± 30	2750 - 2540	2750 - 2490	800 - 590	800 - 540
299 - 301.5	Poz-10907	7 mg	2860 ± 30	3070 - 2920	3080 - 2870	1120 - 970	1130 - 920
309 - 311.5	Poz-10908	7 mg	3005 ± 35	3320 - 3080	3330 - 3070	1370 - 1130	1380 - 1120
319 - 321.5	Poz-10909	2 mg	3080 ± 35	3360 - 3260	3380 - 3210	1410 - 1310	1430 - 1260
329 - 331.5	Poz-10910	4 mg	3140 ± 35	3440 - 3335	3450 - 3260	1490 - 1385	1500 - 1310

Table 6.1. “Results of the radiocarbon analysis. Ages are given in conventional ¹⁴C years, calibrated years BP (Before Present, present = AD 1950) and calendar years BC to enable comparisons with other results. All dates are in the Bronze Age (1700–500 BC)” (after Berntsson 2006: 25, Tab. 5).

Risberg initiated and supervised two undergraduate examination works by Annika Berntsson (2006) and Päivi Kaislahti Tillman (2004). Consequently, those studies had their own specific aims and issues (cf. Berntsson in Appendix 1). Even so, the studies can be said to address the following general questions:

- How do the results correlate with existing shore displacement studies in northern Bohuslän?
- Can the determined isolation age contribute to the discussion of local rock art chronology?

All in all 6 lakes were tested for this purpose but only 2 of them contained suitable lithologies for further investigation: Lake Sväljen, east of Fjällbacka, and Lake Raftötångstjärnen northwest of Tanum (fig. 6.5). The results showed that Lake Sväljen, a small, shallow water with an isolation threshold at 17.4 ± 0.5 m.a.s.l., was isolated from the sea 2600–2400 cal yrs BP, or about 650–450 BC. However, after the report had been completed, additional radiocarbon dates indicated the existence of a possible hiatus in the isolation event of Lake Sväljen, so these dating results should be seen as less reliable (Kaislahti 2004).

Lake Raftötångstjärnen presented more favourable conditions, such as a depth of 3–4 m and an area of 136 x 132 m (Berntsson 2006: 11). However, the most promising condition of this lake was its altitude. The threshold measured about 13.8 m.a.s.l. and according to Pässe’s shoreline model of the area, this altitude indicated that the lake would have been isolated at the beginning of the BA. The following samples were taken for analysis:

In all 27 cores were collected for stratigraphic analyses, two overlapping cores from different levels for diatom and carbon analysis and 25 cores from approximately the same depth for macrofossil samples. Maximum sample depth was 395 cm. The diatom analyses demonstrated that the isolation event had taken place at a depth of 300–310 cm and the organic carbon content verified this to some extent. Five samples consisting of terrestrial macrofossils were extracted for radiocarbon dating. These were obtained from 5 different depths covering the isolation event (Berntsson 2006: 14).

The dating of these samples demonstrated a very coherent chronological sequence (tab. 6.1). Very few cases have in fact demonstrated such a coherent chronological series of an isolation sequence (Risberg pers. comm. 2005, cf. Pässe 2003; Berntsson 2006). The outcome of this study resulted in the following conclusions:

- Lake Raftötångstjärnen was isolated from the Atlantic about 1400–1170 yrs BC (2 σ) or expressed with one σ: 1385–1200 yrs BC.
- The isolation age fits relatively well with the shore displacement curve describing the uplift of northern Bohuslän (Pässe 2003). Thus, it confirms the general accuracy of that curve concerning the altitude: 14 m a.s.l. The results differ by 1.3–2.3 m or c. 250–480 yrs from the values in the Tanum version of the curve. The discrepancy is likely due to the fact that somewhat different methods have been applied.
- Rock art panels in Tanum situated below 13.8

The Bronze Age shoreline in Tanum

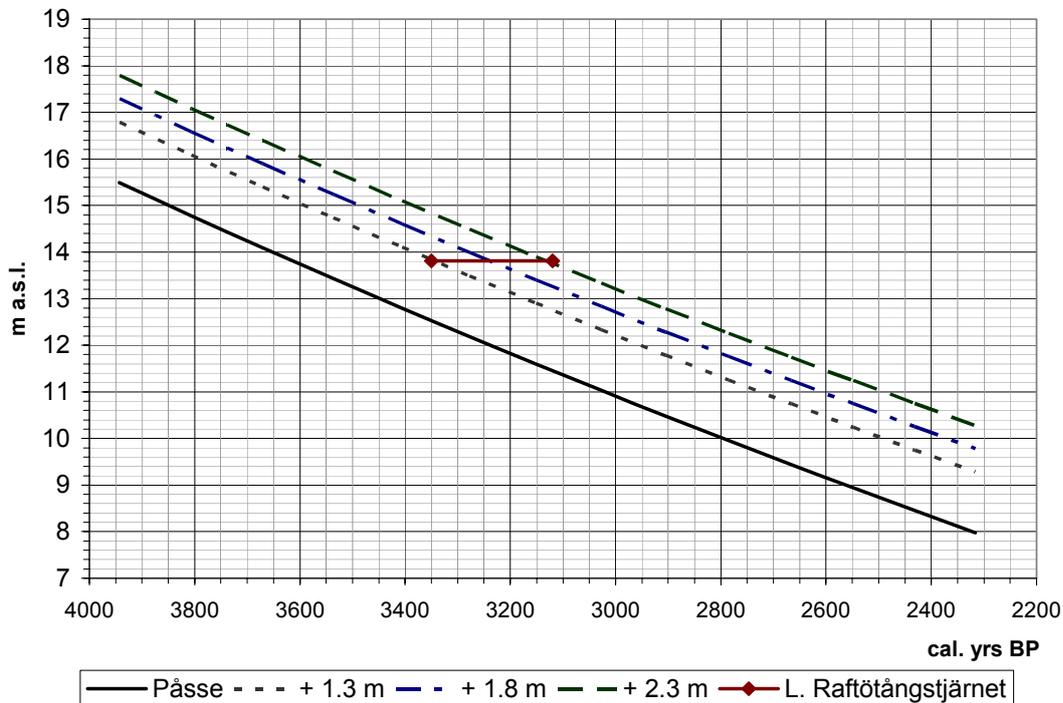


Figure 6.6. The new Bronze Age shoreline in Tanum (upper curve) in relation to Pässe's model (lower curve, see also Berntsson 2006 in Appendix 1). "The isolation age of Lake Raftötångstjärnet has been extrapolated, using the gradient from the shore displacement curve for Tanum, by adding 1.3–2.3 m (the mean value 1.8 m is also marked) to Pässe's values. The additions represent the difference between the altitude of the Lake Raftötångstjärnet isolation threshold and the altitudes for the corresponding age in the Tanum shore displacement curve. All ages are in calibrated years BP" (Berntsson 2006: 32, Fig. 22).

± 0.5 m a.s.l, i.e. the threshold level of the lake, will according to this study be younger than 1400–1170 yrs BC (2σ) or 1385–1200 yrs BC (σ). Rock art at higher altitudes than 13.8 ± 0.5 m a.s.l can be either older or younger than this isolation age (Berntsson 2005: 35).

Thus, this new study indicates an altitude for the BA shoreline that is slightly (about 1.8 m) higher than the one suggested by Pässe (2003), probably due to an improvement in the methodology (Berntsson 2005: 33). It suggests that the altitude of the shoreline around 1300–1200 BC was closer to 14 m a.s.l (fig. 6.6). Berntsson also put forward a model of shore displacement in the Tanum area during the BA. This "hypothetical" curve is highly interesting because it supports the hypothesis based on the measured altitude and estimated age of Kville

and Tanum rock art (Ling 2004a, 2005, 2006). The new curve fitted well inside the interval of about 1–2 m for errors that Pässe stresses for his study in Strömstad (Pässe 2003). This makes it possible to use Pässe's model and calculate with a shoreline altitude for the northern and central parts of Bohuslän that is slightly (about 1.2–2.3 m) higher.

Moreover, this geological prerequisite gives us a general idea of the rock art's location in the pre-historic landscape. As we will see in the following chapters, the most interesting aspect of this new study is that the altitude of the measured rock art ships suggests a similar altitude for the BA shoreline. This implies that the archaeological method of comparative dating is a quite reliable relative method of dating. Moreover, when these two independent methods correspond, they may be combined into a tool for determining rock art's maximum age.

Altitudes and tides

Before proceeding to the case study, there are some essential circumstances that are crucial for the interpretation of the ancient landscape. In this context, three conditions of major importance need to be emphasized, namely:

- (i) The erroneous altitudes on the existing economic map.
- (ii) The long-term agricultural process in the lower part of the plain area in Tanum and Kville, with the associated accumulation of deposit.
- (iii) The high and low tide in Bohuslän and its effect on the study.

(i) First of all, as will become evident time and time again in the following chapters of this thesis, the terrain measurements of altitude often diverged 1–3 m, sometimes even 4 m, in relation to the economic maps! This has to do with the general fact that areas which have not been surveyed for exploitation or other reasons tend to be depicted on the economic map with rather arbitrary and erroneous height data. The explanation, according to Swedesurvey AB and others, has to do with the earlier method of interpreting and creating economic maps on the basis of air photography (Engberg 1998: 25; Eklundh 1999: 15). These errors were confirmed in almost every area in Tanum by the GPS system, which had an accuracy of 2 cm for longitude, latitude and altitude, basically using its own reference station but occasionally also SWEPOS' references.

Thus, altitudinal studies of prehistoric sites and monuments in the area cannot solely rely on the economic map's arbitrary altitudes but have to resort to specific GIS measurements. In that the positions of rock art sites have been determined by general measurements and ocular estimation, their location and altitude on the economic map must be regarded as arbitrary. In view of this, the new measurements have revised not only older altitudinal assumptions regarding the rock art (e.g. Bertilsson 1987; Coles 1990, 2005) but also the general data concerning the terrain curves in the area. Much of this work is dealt with in the cases that follow.

Thus, the rock art and the terrain were measured with GPS and sometimes with total station. Each

measurement was made just beneath the lowest ship motif on each panel. Occasionally entire rock art panels were also measured. All reliable coordinate systems, local, regional and national, were tried, applied and compared. Initially the coordinate system used for measurements was RT 90 7,5 gon west. This system was further compared with the other major system RT 90 2,5 gon west (Engberg 1998: 25). For this purpose several fix points within each area were measured and correlated. Moreover, discussions with land surveyors active in the areas in question contributed empirical knowledge about the reliability of these two systems.

The GPS system in use SWEPOS RTK (Real-Time Kinematic) with the reference systems SWEREF 99, RH 2000 gave an accuracy of 1-3 cm longitude, latitude and altitude:

SWEPOS is a national network of permanent reference stations for GPS. The purpose of SWEPOS is to provide data from the GPS satellites for several applications – from real-time positioning with metre accuracy for, among other things, navigation and data collection for geographic databases, to studies of crust movements of the Earth with millimetre accuracy. GPS data from SWEPOS are registered continuously from 21 reference stations all over the country, from Kiruna (Esrange) in the north to Hässleholm in the south. To achieve redundancy and secure data access, we have equipped each reference station with two parallel systems (<http://swepos.lmv.lm.se>).

In all areas these systems corresponded within the sources of error allowed for this study, a common distributed error of about 5 cm considering longitude, latitude and altitude.

(ii) The second crucial condition concerning the lower parts of the Tanum plain that must also be presented and discussed is the long-term agricultural processes in the plain areas. The lower plain areas have been cultivated intensively for at least two centuries, some of them since medieval times (Lindholm 1997: 2). This long-term agricultural process has entailed the accumulation of cultural sediments and their removal from higher ground towards the

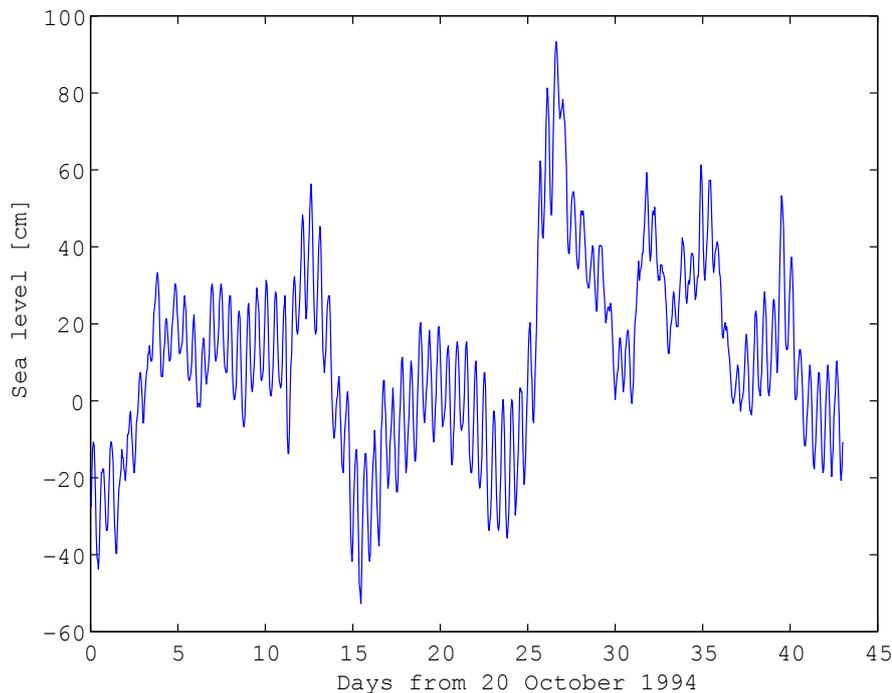


Figure 6.7. Measured variations in sea-level at Ellös, northern Orust (revised by Rydberg 2007, after Rydberg et al 2000).

lowest arable land in the plain areas. Recent archaeological surveys in these lower plains confirm that at least 1–1.5 m of sediment has accumulated through later agricultural processes (Algotsson & Swedberg 1997). Early Iron Age settlement and grave finds, as well as data on shore displacement and pollen, indicate that the lower part of the plain area was already being cultivated and utilised at that time (Bertilsson 1987; Algotsson & Swedberg 1997; Lindholm 1997; Svedhage 1997). This makes it reasonable to deduct at least 1 m of sediment from the low-lying parts of the arable land.

Taken together, all these altitudinal adjustments leave us, in general, with a closer relationship between the rock art and the sea. This warrants the general statement or perspective that during the BA, the sea was very adjacent and present to the rock art sites in Tanum. Parts of the area may therefore be defined as BA seascapes, which opens up for a new discussion concerning the action and dating regarding rock art in Tanum.

(iii) A third crucial condition concerns the maximum sea level variations and whether these affected the placing and making of the prehistoric rock art.

Today's tides in central and northern Bohuslän are very small in comparison with most coastal areas of the world; the range is typically 30 cm only. Larger fluctuations in the west-coast sea level depend mainly on winds (particularly those over the North Sea) and on air pressure (Rydberg 2000). While strong winds may cause a set-up or set-down of 50 cm or more, air pressure may cause maximum elevations of ± 30 cm. Thus, on the open coast the combined effect of winds, tides and air pressure may cause a sea level variability of max. ± 100 cm. Such large variations are readily seen in the record shown in figure 6.7.

This site, Ellös on Tjörn, is situated on the open west coast. In narrow estuaries, the local wind may increase the maximum sea level by another 50 cm, while for example the Gothenburg maximum high level is 169 cm, and the low level is -110 cm. These large variations occur primarily during the fall and the winter season (Pettersson 1982; Rydberg 2000). During the spring and summer the variations in sea levels are considerably less, in general ± 50 cm. It is likely that these variations in sea level were similar in the region during the BA (Rydberg pers. comm.

2005). With all these facts in mind, it seems far more logical that rock art in general was made during the spring and summer (Helskog 1999). A normal sized ship depiction takes about 10 hours to finish (von Arbin et al. 1995) and it is logical to assume that the images were placed and made on locations where the making of rock art was not interrupted by the tide.

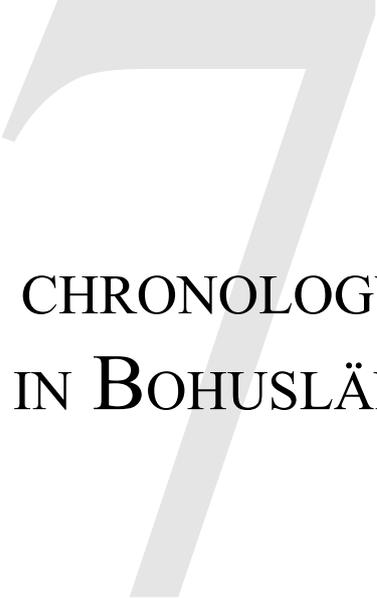
On the basis of these general statements, the following questions may be addressed:

- Is there any specific or general pattern concerning these particular rock art sites' altitude, content, composure, exposure, visibility and context?
- In what specific ways did the ancient shoreline affect these rock art localities as well as the ad-

jacent landscape?

- How do the new data on shore displacement relate to the comparative typological/chronological dating of the rock art?
- For how long were the panels in use?
- How close was the sea to the rock art sites?
- Were some of the images made at the water's edge?
- Was the sea a major factor for locations and if so, would these observations throw more light on rock art as a means of communicating forms and public norms during the BA?

These questions and statements are considered in greater detail in the connection with the case studies in the following chapters.



ROCK ART CHRONOLOGY AND SEASCAPE IN BOHUSLÄN

Introduction

An essential aim of this study is to present new chronological aspects of Bohuslän rock art. The following analysis uses measurements of low-lying rock art localities with ship depictions from different parts of Bohuslän. For this purpose 104 rock art panels have been sampled that together contain a total of 686 ship depictions from the Gothenburg area in the south to the Tanum area in northern Bohuslän. Two independent approaches to dating – shore displacement and comparative chronology – are then applied to the same rock art material. The resultant local rock art chronology is based on images from the Bohuslän landscape, not on images taken from bronze items or graves. Finally, I discuss how this chronology could contribute to a wider understanding of the rock art's social and spatial traits in the landscape. First, however, it may be as well to present a short historical background to this issue.

Rock art chronologies: traditions and concepts

The notion of dating rock art soon became a major research topic (Åberg 1839, 1842; Brunius 1839, 1868; Holmberg 1848; Hildebrand 1869; Montelius 1874, 1885). The resemblance between ship renderings on bronze items and images on rocks in the landscape was already being stressed in the early 19th century by Lennart Åberg, though he did not relate the ship images primarily to the Bronze Age.

A BA dating of the rock art was proposed about 40 years later by Bror Emil Hildebrand, whose main contribution was a stylistic comparison between typologically determined BA swords and the pecked swords on rock art panels at Ekenberg in Norrköping, Östergötland. Hildebrand (1869) considered that this chronology would also hold for the rock art in Bohuslän. Hildebrand's comparative chronological method was accepted as a dating norm by other rock art researchers (e.g. Montelius 1874, 1885; Ekholm 1916, 1921; Almgren 1927; Dahlgren 1932; Fett & Fett 1941; Althin 1945; Marstrander 1963; Glob 1969; Mandt 1972, 1991; Rostholm 1972; Burenhult 1980; Malmer 1981; Kaul 1998, 2004; Sognnes 2001; Nordenborg Myhre 2004).

As a method for dating BA rock art, shore displacement has conventionally been regarded as inadequate or too arbitrary (Holmberg 1848; Ekholm 1916, 1921; Burenhult 1980; Bertilsson 1987). The possibilities of using shore displacement for dating rock art and the associated problems were first discussed in the 19th century by Brunius (1839: 79), Holmberg (1848: 17), and Hildebrand (1869, see Ch. 4). It was, however, Gunnar Ekholm who, in Uppland, made the first comprehensive attempt at evaluating rock art in relation to assumed altitudes of the BA shoreline (Ekholm 1921). With reference to an altitudinal distribution of ship renderings that distinguished between "primitive" renderings on

higher ground and “elaborate and less primitive” renderings on lower ground, Ekholm first argued in favour of an altitudinal chronologic sequence that he subsequently dismissed (Ekholm 1916, 1921). Almost thirty years later, Sven-Axel Hallbäck used the shoreline in an attempt to deduce the maximum age of rock art in Bohuslän (Hallbäck 1944). His inductive conclusion, based on just the lowest locality in each ‘hundred’, was that “some of the rock images must be dated to the Iron Age and [...] the rock images hardly could have been placed at the water’s edge” (Hallbäck 1944: 54).

Attempts to construct rock art chronologies have been influenced by certain notions and methods. A common approach in this context has been to base the conceptions and methods on comparisons and styles. Two major schools can be distinguished. One is the “Danish school”, which focuses dating on a few qualitative elements and mainly uses and

compares ship renderings on bronze items or graves to determine the chronology of ship images on the rocks (Glob 1969; Rostholm 1972; Karlenby 1987; Kaul 1998). Representatives of this school or trend include Danish researchers such as P. V. Glob, Hans Rostholm and Flemming Kaul. The most recent contribution of this kind is Kaul’s comparative study of ships on bronzes and on rocks (fig. 7.1); his comprehensive approach has been cited and advocated by a number of scholars for its method as well as its material (Kaul 1998, see Fredell 2003; Bengtsson 2004; Ling 2004a; Skoglund 2005; Coles 2005).

Other scholars have criticised these attempts and argued that the taxonomies simply confirm Montelius’s typology, where the bronze items lay down the rock art’s chronological order (Nordbladh 1980; Goldhahn 1997; Sognnes 2001; Wahlgren 2002; Nordenborg Myhre 2004).

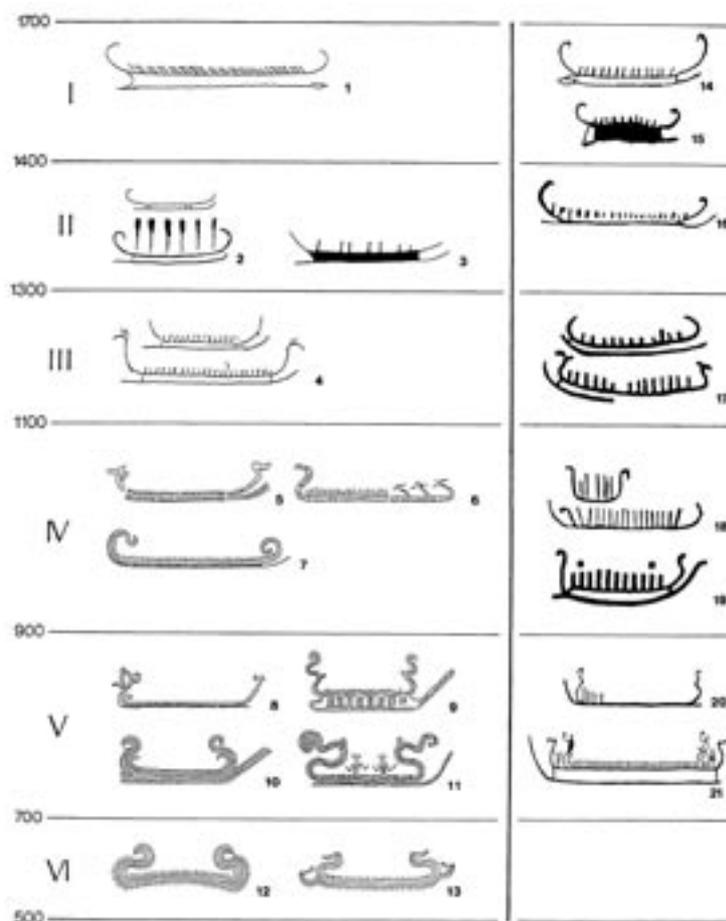


Figure 7.1. Flemming Kaul’s chronological-typological diagram of ship renderings from the Scandinavian Bronze Age (after Kaul 1998).

The other school is represented by Norwegian and Swedish researchers such as Eva and Per Fett (1941), Gro Mandt (1972, 1991), Göran Burenhult (1980), Mats P. Malmer (1981) and Kalle Sognnes (2001). Their taxonomies are also comparative but tend to rely more on typological and/or quantitative records of styles and techniques (such as single lined, double lined, contour lined, pecked or entirely pecked ship hulls), but also to some extent on shore displacement (e.g. Sognnes 2001), to determine the age of the open-air ship images. Unfortunately, these taxonomies are extremely complicated, with far too many classes and subclasses of ship renderings (Kaul 1998: 76pp).

The constructive aspects of these attempts are a strong emphasis on the rock art materiel itself and an open attitude to the possibility of the rock art being earlier or later than the BA. Some of these scholars have, for instance, argued in favour of rock art ships from the Early Iron Age (Mandt 1972, 1991; Østmo 1990; Sognnes 2001).

However, neither of these two approaches works solely by itself and an interaction between them has been the rule rather than the exception (Marstrand-er 1963; Malmer 1981; Kaul 1998; Østmo 1990; Sognnes 2001). This outline of the concept of ship chronology simply illustrates some broad trajectories within South Scandinavian rock art research.

Chronological standpoint

An examination of the mentioned taxonomies led to the decision mainly to use Kaul's substantial classification, essentially because of its regularity and logic. But of course there are other attempts and observations of great importance that have been applied and exercised, for instance Marstrand-er's work from 1963, Glob's attempt from 1969, Ros- tholm (1972), Mandt (1972, 1991) Sognnes (1983, 2001), and others.

However, Kaul's comprehensive attempt must be seen as an empirical and methodological development of the comparative method because it encompasses more than 400 bronze items with more than 800 ship renderings (Kaul 1998). A majority of these items are well dated from their contexts, mainly graves from the LBA, period IV–V (Kaul 1998: 117pp). There are considerably fewer bronze

items with ship renderings from the EBA, so far only two, namely the Rørby sword, dated to period Ib (Malmer 1981: 31–32; Vandkilde 1996: 231; Kaul 1998: 85), and the famous Wismar horn, which later scholars date to either period III or the end of that period (Glob 1969: 49–55; Malmer 1981: 33; Randsborg 1993: 98–99; Kaul 1998: 92). However, other dating assumptions, mainly ranging from periods II to V, have been suggested for the Wismar horn; period I/II (Kristiansen 2004), period II/III (Oldeberg 1947: 19), period IV (Marstrand-er 1963: 338), period IV/V (Ørsnes 1959: 72), and period V (Sprockhoff 1956: 252).

The early phase of Kaul's ship chronology is accordingly based on ship images from grave contexts, for example the ship renderings on the slabs of the Kivik and Sagaholm graves, dated to period II or III (fig. 7.2, 7.3, see Wihlborg 1978; Randsborg 1993; Goldhahn 1999a, 2005; Kaul 2004). Lise Norden- borg Myhre writes as follows concerning the dating assumptions for the Kivik and Sagaholm graves:

The typology of ships is also anchored in the images from the Kivik grave, which have inward curved stems and a slightly upturned keel extension. Analyses of the grave goods and carvings on the cist slabs have led to a typological dating to period 2 or the transition to period 3 (Rands- borg 1993, 1995: 50). The complex iconography of the Kivik grave with its contextual relation to horses and ships has also been a major criterion for the dating of the Sagaholm grave (Bu- renhult 1980, Wihlborg 1978, Randsborg 1993, Goldhahn 1999). [...] During the excavation of the Sagaholm barrow a bottom layer below the grave construction was C-14 dated to 3256 ± 130 BP. This layer is probably older than the barrow, and a recent analysis of the iconography of the rock art has dated the construction to period 2–3 (Nordenborg Myhre 2004: 186–187).

There are also some less certain grave contexts, presumably from the EBA, that include typical ship images from this period, with inward curved stems and a slightly upturned keel extension, such as the slabs from Tuna in Södermanland (Ekholm 1916: 283), the Klinta stone from Öland (Goldhahn 2005) and

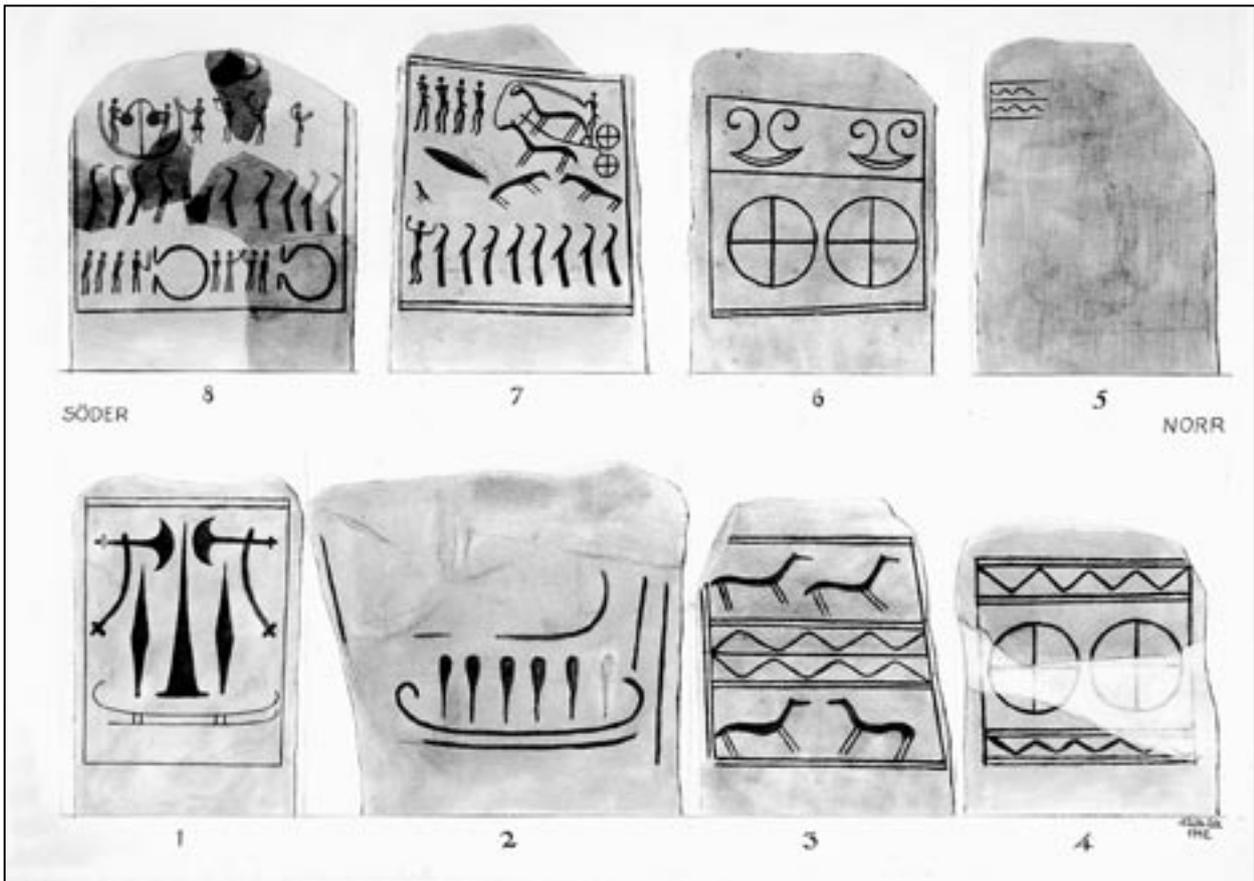


Figure 7.2. The slabs with rock art from the Kivik grave (documentation by Harald Faith-Ell 1942, after Goldhahn 2005).



Häll N° 6 0 40 cm

Figure 7.3. Slab 6 from the Sagaholm barrow (after Goldhahn 1999a).

the Villfara stone from Scania (Althin 1945: 78). These may further contribute to the significance of the comparative ship chronology.

Bearing this in mind, the earlier phases of the ship chronology are more problematic and less substantial than those of the LBA. But in this perspective it is worth mentioning the interesting discussion concerning the dating of what is considered to be the point of departure in this ship taxonomy, namely the ship rendering on the Rørby sword, dated to period Ib:

With Rønne's splendid new examination of the Rørby swords, it has been conclusively demonstrated that the decoration was not punched or engraved into the sword but that it had been cast together with the sword. The ornamentation had simply been carved on the wax-model (Rønne 1990) and is thus contemporary with the produc-

tion of the sword, and the same applies to the ship-representation. [...] The ship-picture also suggests that the ship-building tradition that prevailed throughout the whole of the Bronze Age had already been developed by then (Kaul 1998: 74).

For his dating method, Kaul emphasises the importance of the keel feature and the prows (fig. 7.1, see fig. 10.1). A keel extension that is horizontal or slightly upturned is a typical feature in the EBA, while one that is high and vertically raised is typical in the later periods. The prows are also significant, being inturned in earlier phases but later, in period III, tending to turn out and to end in animal heads, a tendency that then becomes more pronounced in the subsequent periods. However, as Kaul puts it:

The ships on the bronzes, for example, show that inturned prows (which are particularly characteristic of the Early Bronze Age) can occur in per. IV and per. V. Here it is necessary to get an overall picture of the individual ship and it is not only when the keel extension on a rock-carving ship is horizontal or slightly raised that one can be reasonably certain that the ship is an early rock-carving ship (Kaul 1998: 89).

According to Kaul (1998: 91pp), the comparative method could be used for dating bronze items as well as rock art. Kaul's attempt has been criticized for being just an example of an orthodox typological taxonomy in accordance with Montelian evolutionistic ideals (Wahlgren 2002; Nordenborg Myhre 2004). However, these opponents have not presented an alternative constructive dating method.

The analysis

The discussion above broadly favoured the logic of Kaul's chronology, especially the emphasis on the prow and keel features of the ship images (fig. 7.1). I have therefore tried to summarise some of the most significant chronological criteria of the rock art ship at the end of this chapter. The following analysis takes a closer look at Kaul's chronology and considers how it corresponds with the observations of low-lying rock art ships from different parts

of the Bohuslän landscape. Two independent dating approaches, shore displacement and comparative chronology, are accordingly applied to the same rock art material. The analysis includes 104 rock art panels that contain 686 ship depictions, sampled mainly from the Tanum and Kville areas in northern Bohuslän but also from areas further south, such as Svarteborg, Uddevalla, Solberga and Gothenburg (fig. 7.4, see also Appendix 2). This basis broadens the analysis and makes it geographically more substantial, which is particularly important in a discussion of shore displacement and its specific and general spatial relation to rock art in the region.

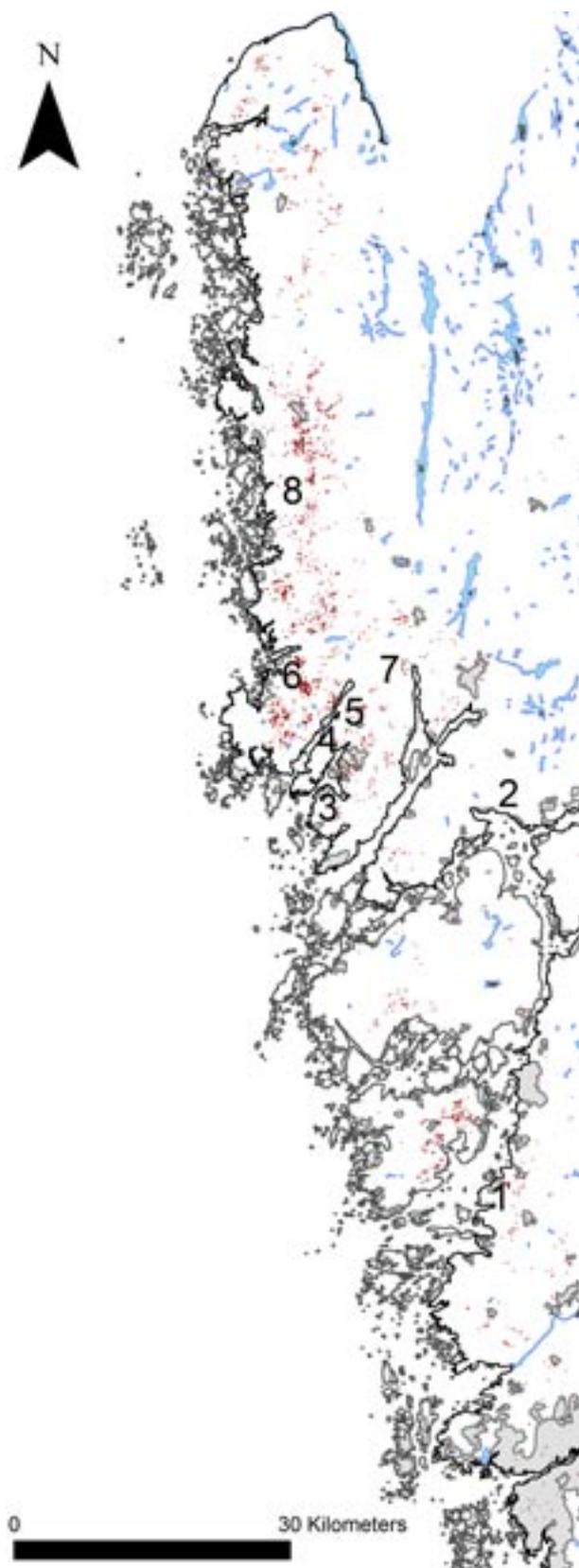
Then I will argue that these two methods can contribute to a wider understanding of the chronological, spatial and social traits behind the making of the rock art in the landscape. This tentative attempt has three main starting points:

1. The data obtained on the altitude of the rock art in the areas (in relation to).
2. The new parameters concerning shore displacement in the areas (in relation to).
3. Comparative chronology, such as Kaul's latest scheme of ship renderings (1998, 2003, 2004, 2006).

The new shore displacement study, made in the Tanum area, serves as an instrument for establishing the rock art's maximum age. The general outcome suggests that rock art panels in Tanum situated today below 14 m.a.s.l are younger than 1385–1200 BC, while those situated above this altitude could be either older or younger (Berntsson 2006: 35). Two ways of applying this result are presented below.

1. In the first way, the age and altitude of the isolation of Lake Raftötången are used as a single point. Consequently, rock art sites situated below this altitude must be younger than 1385–1200 BC. Appendix 2 presents rock art sites that have this low altitude. The images at the following sites may therefore be younger than 1300–1200 BC:

- 2 ship images and other features from Kville 172.
- 4 ship images and other features from Kville 114.



- 1 large rock art ship from Svarteberg 13.
- 2 ship images from Tanum 234:1–2.
- 3 ship images from Tanum 425:1–2.

2. The second way is to use Berntsson's (2006) hypothetical BA shoreline, which is a modification of Pässe's shore displacement curve for the area (note that Berntsson's curve is based on a single isolation event). The new shore displacement model makes it possible to include many more rock art sites in a dating sequence. Thus rock art sites situated about 10–20 km south of Tanum, from Kville and Svarteberg, are also included in this discussion. According to Pässe's calculations, the geographical distance between these areas would entail a discrepancy of only about 0.5 m for each chronological phase. This small divergence does not affect the general outcome of the suggested rock art chronology (Pässe pers. comm. 2004). Pässe's calculation model will be applied for the areas to the south of north/central Bohuslän. However, a value for shore displacement that is slightly higher, up to 2 m (as indicated by the new study in Tanum and other archaeological observations from the Gothenburg and Kungälv area, see Ch. 6 and Appendix 1–2), will also be demonstrated in the same model.

The general setting of the rock art in relation to shore displacement

The broad trend is that the majority of these low-lying localities date from the LBA and the general outcome clearly demonstrates that these images could not have been made before the BA. Moreover, some of the localities can be assigned chronologically to the EBA, while other localities have the LBA as their earliest date. This implies that the archaeological method of comparative dating may be relatively reliable. When these two independent methods correspond, they may serve as a tool for setting the maximum age of rock art.

Figure 7.4. Map of Bohuslän showing the areas with the measured rock art sites: 1 = Solberga 50; 2 = Herrestad 58; 3 = Brastad 123; 4 = Bro 636; 5 = Bro 622; 6 = Tossene 107; 7 = Svarteberg 13; 8 = the Kville and Tanum area. Red dots = rock art sites.

On the whole, this study supports Kaul's comparative chronology and demonstrates a clear chronological correspondence between the typologically estimated ship depictions on the panels and shore displacement. However, some examples of ship depictions do clearly diverge from Kaul's schema and these observations may help to modify the chronological conception of Bohuslän rock art.

Although these two independent methods do pose problems, especially concerning the earlier phases of the ship chronology but also as regards shore displacement, it is possible to apply both of them to one and the same material. That does not mean that the analysis is capable of providing a definitive instrument for dating rock art images. Instead, it represents an alternative way of dating rock art in Bohuslän. Unlike other chronological attempts, this study is based on rock art images from the local landscape in Bohuslän, not on images from distant bronze items or graves.

The specific chronological setting of ship features in the landscape

It would be neither meaningful nor possible to illustrate all the observations of low-lying rock art with typologically datable ship depictions (see Appendix 2). In the following, an account will therefore be given of some of the most significant panels from the mentioned areas, which have the most qualitative examples of low-lying rock art with typologically datable ship depictions that fulfil both the general and the specific criteria of Kaul's ship chronology.

Out of a total of 104 localities holding 686 ship depictions, 16 rock art localities with a total of 159 ship depictions have been abstracted. The altitude and content of these localities make them qualitative examples that will be used in a discussion regarding these ship types' chronologies in relation to shore displacement and comparative chronology. It is important to stress that the main chronological analysis of rock art in relation to shore displacement focuses on the Tanum and Kville area where the new study by Berntsson (2006) has been carried out. As for the rock art areas located further south, the dating assumptions should be regarded as more uncertain and tentative. The following localities have been sampled as tentative examples of low-

lying rock art sites located south of the Tanum and Svarteborg area (fig. 7.4):

Southern and central Bohuslän

Kungälv area: Solberga 50

Uddevalla area: Utby 58:4

Northern Bohuslän

Lysekil area: Bro 622, 626

Sotenäset area: Tossene 107

The following low-lying rock art sites in the Tanum and Svarteborg area constitute the real concrete examples for the final dating discussion in relation to the new shore displacement study:

Svarteborg area: Bärby 13

Kville area: Kville 112, 114, 172

Tanum area: Tanum 234, 241, 311, 369, 425, 427, 468

Additionally, some of the rock art sites are described and treated comprehensively in the next chapter and are therefore not presented here. For the other areas with rock art, a brief description of the archaeological environment follows.

The Kungälv area (Solberga 50)

One of the most fascinating rock art sites in Bohuslän is situated in the inner part of Valby kile bay, in the Flögen area in Solberga parish (fig. 7.5, 7.6). This narrow bay contains a good many prehistoric remains. A circle with a radius of 500 m from the rock art panel encompasses two barrows, a prehistoric grave field and a prehistoric settlement. There is also a cluster of cairns 1.5 km northwest of the rock art site, at the northern inlet of the bay. Moreover, two gallery graves are situated about 2 km northeast of Solberga 50 and there is a figurative rock art site about 1 km further northeast with a cluster of 26 cup mark-sites. One of these sites has no less than 700 cup marks and some ring marks.

The rock art panel Solberga 50 is situated approximately 100 m north of the present sea shore, on a vertical outcrop of gneiss just a few metres from a farmstead (fig. 7.5). The location of the rock art panel is rather unusual because the sea is still



Figure 7.5. Panorama of the area with the rock art site Solberga 50. The panel is located at the vertical outcrop on the right, marked with a circle (photo: Johan Ling).

visible from it. Furthermore, it is located at a height of 4–5 m on the vertical outcrop. The only way to reach the highest part of the engraved panel today is by ladder or sky-lift, which was how the panel was documented (fig. 7.6).

The platform of the sky-lift was raised 3–4 m above the ground, to a height of 10.7 m.a.s.l, which must have been more or less the position from which the rock art was made. The panel measures 6 x 1 m and faces due south onto the shore of the bay (which runs east–west). The rock art were discovered recently by coincidence by Mrs Märta Andersson, who dwells on the adjacent farmstead. She has actually lived by the vertical cliff with the rock art since the 1950s and lately she had taken to looking at a large loose boulder, worrying that it would fall. One evening, when the sun was shining on the panel obliquely from the west, she detected several ship images that the light had caused to “pop out” of the rock. The rock art images had previously been unknown because the rough surface of the rock makes them hard to see. The rock had accordingly kept this secret for more than 3000 years.

The figurative depictions on the panel

The panel consists of 6 rather large ship depictions, about 0.5–1.3 m long and 0.2–0.5 m high. There are also another fragmentary ship, an animal figure, and some presumptive cup marks (fig. 7.7). The four ship on the highest part of the panel have typical EBA features, such as inward turned stems and horizontal or slightly upturned keel extensions and crew lines (fig. 7.7). The largest ship has a semicircular bowed stem that ends in a point or dot. These traits are typical of the earliest ship depictions, which may be assigned to period I (Kaul 1998: 88; Ling 2006).

Several ship depictions in the Tanum and Kville areas in northern Bohuslän have also been related to this period on the basis of similar traits (localities such as Tanum 22, 66, 1740, and Kville 156, 157). However, an atypical feature of this ship is the inward turned stem, which seems to have been made as a direct extension of the keel line. The other three ships, on the upper part of the panel, do not have a stem that rises from the keel line but they show similar general traits, such as inward turned stems, a horizontal or slightly upturned keel extension and



similar crew lines (fig. 7.7). These characteristics also indicate an early date for these particular ships, presumably period I–II (Kaul 1998: 96–97).

The ship image in the lowest section of the engraved panel, at an altitude today of 11.66 m.a.s.l, has different forms and traits (fig. 7.6, 7.7). Unlike the ships higher up on the panel, its stem is turned outward. The crew strokes are also quite different from those of the other ships on the panel, some of them being more anthropomorphic or zoomorphic in character. The outward turned stem also suggests a later date for this ship, presumably period III–IV.

Thus we have found two general criteria that distinguish this particular ship from the others, namely altitude and style. The animal figure beneath the two highest ships may also contribute to a discussion of dating (fig. 7.7). It represents either a bull or a horse. In the areas of Tanum, Kville, Svenneby and Bottna, bull depictions often occur on low situated rock art panels with ship depictions from the EBA (e.g. Tanum 12, 25, 62, 311, 304, and Bottna 334, see Högberg 1995; Fredsjö et al. 1971) or on panels on higher ground also with ship depictions from the EBA (e.g. Kville 161, 163, Svenneby 214, see Fredsjö et al. 1971, 1981). Horses, so-called sun-horses, are also to be found on panels with ship images typi-

cal of the EBA, such as Tanum 311 and 210 (Kaul 2004).

The most striking example of this combination is, doubtless, the sun-horse from Balken in Tanum parish (Tanum 262). This panel also presents several ship depictions from the EBA. Moreover, the representations of horses on bronze items and in graves from the EBA, such as the Sun disc from Trundholm, the bronze horse figurines from Tågaborg, or the horse representations from EBA graves such as Sagaholm and Kivik (Goldhahn 1999a: 73–76; Kaul 2004), may contribute to the chronological and symbolical interpretation of the animal figure on this panel.

The pecking technique

Parts of the vertical gneiss outcrop with the rock art panel Solberga 50, are severely weathered. Despite this, some interesting observations can be made about the pecking technique of the different images. First, the lowest ship depiction on the panel seems to have been pecked with a technique that differs from the depictions higher up, being rougher and broader (fig. 7.7). This part of the panel is admittedly much more weathered but it is still clear that the execution of this depiction differs from that of those

higher up. Regarding the latter images, both the ship depictions and the animal seem to be executed in a similar way, using a more distinctive, smooth and graceful technique. It is noteworthy that the highest ship depiction, on the left part of the panel, is pecked with the most distinctive technique.

From these observations the following conclusions can be drawn. The ship depictions at the top of the panel demonstrate a similarity not only of style but also of pecking technique, especially in relation to the ship depiction in the lowest part of the panel. The latter, at an altitude of 11.66 m.a.s.l, diverges considerably in both technique and style.

Altitude, making and dating of the rock art images in relation to shore displacement

Let us turn to one of the main topics of this analysis, namely the altitude of the rock art images at Flögen. The altitude of the panel ranges from 11.66 to 12.51 m.a.s.l, a span of 0.85 m (fig. 7.6). The lowest ship depiction, at 11.66 m.a.s.l and equipped with an outward turned stem, could have been made by a person standing on the small shelf in the outcrop, situated

beneath the engraved panel at 9.9 m.a.s.l. During the documentation of this particular ship this shelf was actually used as a platform. The rock art higher up, at an altitude today of 11.88–12.51 m.a.s.l, was out of reach for documentation from this position; a ladder or sky-lift was required. Moreover, the shelf beneath the rock art is too small and too inclined for a ladder or other construction.

Consequently, three general criteria distinguish the higher ships from the lower one; namely, altitude, technique and style. These aspects in relation to the area's shore displacement data may therefore help to answer the following questions:

- (i) How were these images originally made?
- (ii) To which chronological period could they be related?
- (iii) Could the shore displacement data shed more light on these issues?

According to Pässe's shore displacement model of the area, the shoreline should have been closer to 9 m.a.s.l in the beginning of the BA, and about 6



Figure 7.6. Lasse Bengtsson documenting the panel Solberga 50. In order to document the site, the sky-lift was elevated 3–4 metres to a total height of 10.7 m.a.s.l (photo: Johan Ling).

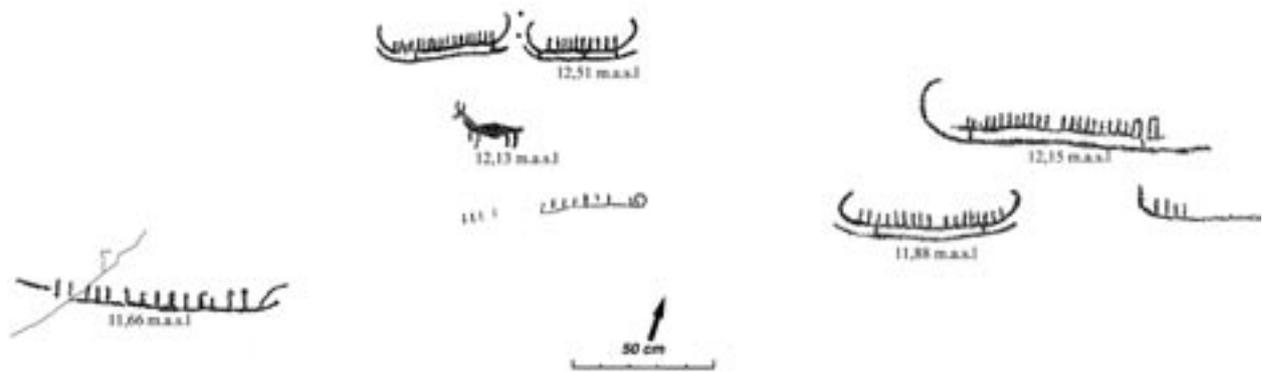


Figure 7.7. The images on the rock art panel in Flögen, Solberga 50, showing the altitudes of the images (documented by VM).

m.a.s.l. towards the end (fig 7.8). This means that the ship images could not have been made during the BA, rather during an earlier phase, between the LN I–II. However, there is no evidence in Scandinavia of ship images of this kind from the LN period and the ship images on the highest position on the panel are typical for period I–II. Let us instead calculate with a slightly higher value, +1.8 m, for the shoreline during period I–II in the area (fig. 7.8), the same general difference in altitude as Berntsson’s study of shore displacement in the Tanum area showed in relation to Pässe’s calculation.

If we apply the higher value of +1.8 m, on Pässe’s shore displacement model of the area, as shown in figure 7.8, this opens up for a further interpretation as to how the images could have been made. With this slightly higher value it would have been possible, during period I–II, to stand in a boat or on the ice while pecking the images. This panel supports the notion that the shoreline in this area could have been slightly higher during the EBA (fig. 7.8). Indeed, it would not have been possible to make the ship images if the shoreline was lower than 10 m.a.s.l. Thus the location of this panel, the new shore displacement study in Tanum (fig. 6.6), the measured rock art sites in Tanum and Kville (fig 6.4, 8.35) and the altitude of carbon dated features from Ellös at Orust (fig. 6.3) altogether favour the addition of Berntsson’s (2006) slightly (+1.8 m) higher value to Pässe’s shore displacement calculations even for locations situated further south of Tanum. Starting from this assumption, the area’s shore displacement data demonstrate that the shore-

line was about 11 m.a.s.l. in the beginning of the BA and about 7 m.a.s.l. towards the end (fig. 7.8, cf. Pässe 2003; Berntsson 2006: 33).

First of all, this indicates that the rock art could not possibly have been made during the LN II, when the shoreline was about 12.5–13 m higher than today. The highest ship depiction, at an altitude of 12.51 m.a.s.l., could theoretically have been made at that time but only during low tide, which seems rather unlikely. It is more reasonable to assume that this ship was made when the tide no longer affected or interrupted the pecking process. This could have been the case during the beginning of the EBA because the shoreline was then closer to 11 m.a.s.l. During period III the shoreline had retreated to approximately 9–10 m.a.s.l. Finally, during the end of the BA the shoreline had retreated to about 7 m.a.s.l. (fig. 7.8). Based on the shore displacement data, the earliest date for the rock art panel could be the period LN II. The panel rose out of the sea at the transition between LN II and EBA period I. During the subsequent EBA phase it would have been possible to peck on the entire surface.

The shoreline parameters could not directly determine the maximum age of this particular rock art site. However, in the following I will argue that the altituded, position and style are all factors that point to the rock art images being made during the EBA.

In order to document and understand the process of making the images on the higher part of the panel, we had to use a sky-lift platform that was raised to an altitude of 10.5–11 m.a.s.l. This is the estimated altitude of the shoreline during the EBA period I–II

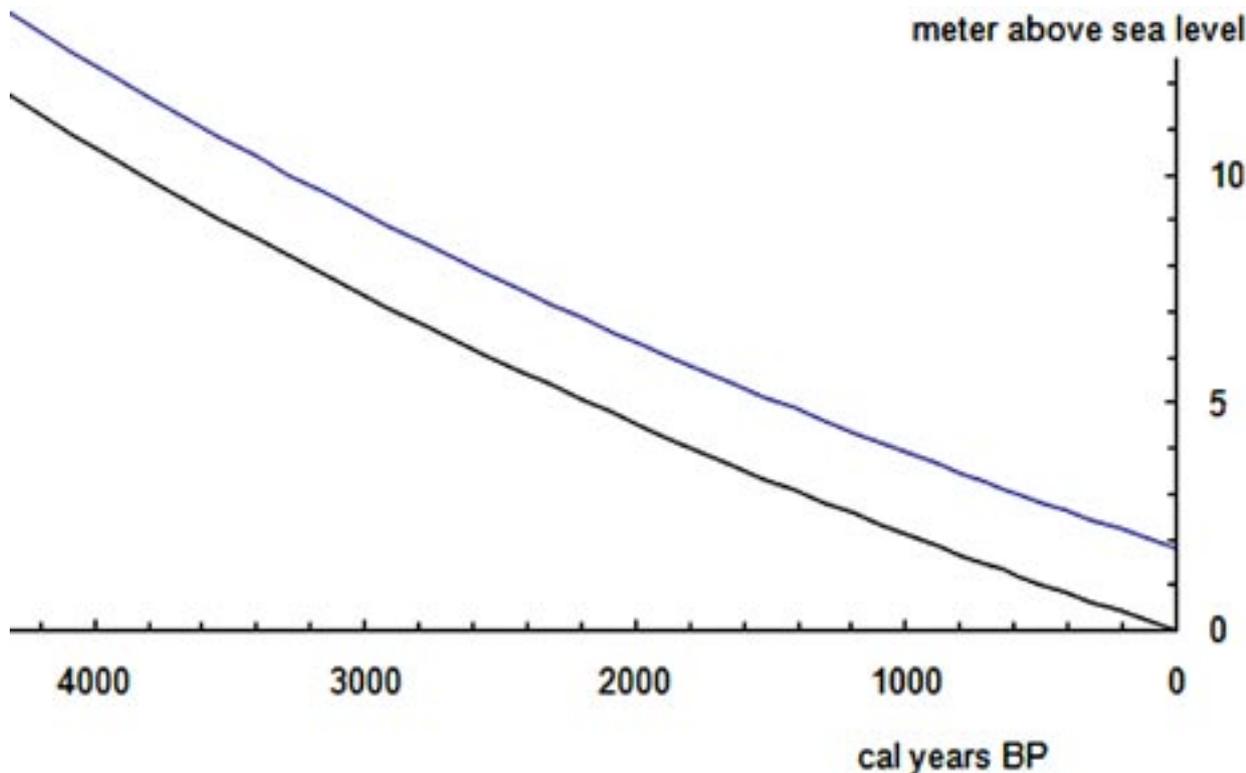


Figure 7.8. The lower black curve shows the shore displacement in the Kungälv area according to Pässe's model (Pässe 2001). The upper curve represents the difference (1.8 m) between Pässe's model and Berntsson (2006) in Tanum, adapted to Pässe's model of shore displacement in the Kungälv area (figure by Pässe, remade by the author).

(fig. 7.8). This is highly interesting because it correlates to the comparative dating of these particular ship depictions. Moreover, to make the lowest ship depiction, at 11.66 m.a.s.l, with typological traits of period III, the most favourable position is the small shelf beneath the panel at 9.9 m.a.s.l. Interestingly enough, during period III the shoreline was actually about 9–10 m.a.s.l (fig. 7.8).

Thus, the conditions for making the rock art correlate with the comparative dating of the panel's ship depictions. In fact, the altitude, technique, and style of the rock art in relation to shore displacement all favour the assumption that the images were made on different occasions during period I–III, from the sea, presumably from a boat. Could this actually be the case?

Interpretation

The inaccessible setting of the rock art on the vertical cliff leads us to the last matter that may throw

light on the dating issue: how were these images made? In any event, the maker must have used the surface of the sea as an infrastructure, which means that the work was done from a boat or standing on the frozen sea (fig. 7.6–7.8).

The "rock smith" could of course have worked with the aid of a rope fixed from above but this seems unnecessarily complicated, especially as the shoreline was just beneath the images. The notion that the maker worked the surface from a boat or from the ice seems more logical. The boat-or-ice theory has in fact been proposed for rock art in Scandinavia that is situated on vertical cliffs adjacent to water (Brunius 1868; Gjessing 1936; Østmo 1990).

The closest parallel to the siting of the rock art images in Flögen is the rock art localities at Lake Tyrifjorden, Berget, northeast of Oslo in Norway (Østmo 1990: 35–44). Here, several ship depictions from the period I–II are situated on vertical outcrops approximately 1.7–1.8 m above the surface of the

lake (fig. 7.9). There are indeed many similarities in the situation, altitude and style of the localities at Berget and Flögen, respectively. Moreover, according to Einar Østmo, the most logical way to make the engravings at Berget must have been from a boat (Østmo 1990: 35, 121).

The boat theory presupposes some basic conditions, for instance that the boat could be firmly anchored and held steadily in place with ropes. These conditions are fundamental for any kind of activity at sea. Another condition is some physical feature for attaching the boat to the cliff. At first glance, this cliff does not seem to offer any such feature in the vicinity of the rock art panel. However, above the images there is a small shelf which could have been used as a hold during the pecking process. During the warm days of late spring and summer, when the sea is very calm, especially in inner bays like this, working the surface from a well-anchored boat would have been rather easy. Moreover, as the climate was warmer during the BA, such conditions may have been even more frequent than at present. Bearing this in mind, there is much that favours the boat theory.

The ice theory also seems reasonable until one considers that during the BA the area with the rock art was not just the narrow bay it has become. In those days the bay was five times larger and also deeper. Moreover, during the BA the climate was generally up to 2° warmer. That makes it less likely that sufficiently thick ice would have formed on what was then a rather extensive and deep bay. Finally, if ice did form beneath the panel, it would have tended to be very fragile at this spot on account of the effect of the vertical outcrop.

On the other hand, there are some facts that favour the ice theory, not least the solid foundation that a person could have used to stand or kneel on while making the images. Some features of the panel favour this hypothesis: it faces south and just above the depictions there is a small shelf that protects the panel from water. According to Mrs. Andersson at the farmstead, ice does not form on the panel even during the coldest days. Moreover, while making some additional documentation of the images during a cold winter's day, the authors noticed that even if there was ice on other parts of the rock,

the panel was ice-free. These conditions seem to support the ice theory.

On the whole, there is much more in favour of the boat theory than the ice theory. The strongest argument may have to do with the time and the occasion for pecking the images. The average time it took to make one of the larger ships on the panel may have been 8–10 hours (von Arbin et al. 1995). This suggests that the surface was worked on several occasions. It is also logical to assume that rock art in general was made during the ice-free season (Helskog 1999: 93). In that case, the rock art on the vertical cliff at Flögen could have been made on a repeated basis, presumably from a boat, in accordance with the conditions for interaction and communication with the sea. The content and situation of the panel may also favour the assumption that these images were meant to reflect actions, conditions, traditions, or ideals at sea. When it was made, this particular rock art site was, in fact, visible only from the sea, at least from a short distance.

Moreover, the ship depictions make their impact and dominate the panel on account of not only their size and frequency but also their elaborate styles and utterances. So it seems that the making, situation, and content of the panel could be connected to human interaction with the sea.



Figure 7.9. The rock art site Berget III (after Østmo 1990).



Figure 7.10. Panorama of the area with the rock art sites Herrestad 58:1–4 (marked with circles). The panels are located by the foot of the hill to the right (photo: Johan Ling).

These assumptions lead us to the key issue of this case. For what purpose, meaning and action were these images made? Making rock art must in general be regarded as a ritual and/or a symbolic action. Nevertheless, the situation and content of this maritime panel call for specific interpretations. Although most of the BA rock art in Bohuslän seems to have been made close to the sea, only one other site, located in the Tanum area (Tanum 234), resembles the site discussed here in its extreme maritime connection (Ling 2006), and in the significance of the engraved panel.

Conclusion

Relating the ship types to the shore displacement data resulted in the following general conclusions (see fig. 7.6–7.9):

- The engraved panel rose out of the sea at the transition between LN II and EBA period I.
- During period II it would have been possible to peck on the entire surface.
- The situation of the ship features, on a vertical cliff, serves, at least indirectly, as a dating device.

- The altitude, technique, and style of the rock art in relation to shore displacement favour the notion that the rock art images were made in different periods during the BA, presumably period I–III.

- During the BA, this particular rock art site would have been visible only from the sea.

- The makers must have used the level of the sea as a favourable structural factor, in the sense that he/she most likely worked the surface from a boat or perhaps from the ice.

- The content and situation of the panel may also favour the notion that these images were meant to reflect actions, conditions, traditions or ideals at sea.

The Uddevalla area, Utby (Herrestad 58:1–5)

Rock art is very sparse in the Uddevalla area, with a total of 6 different localities. The rock art in Utby, Herrestad 58, encompasses 5 separate panels with a total of 18 ship images, a couple of ship fragments, one ring cross, one human figure and 108 cup marks (fig. 7.10). Remarkably enough, one of the panels has not only a ship depiction, a ring cross and two cup marks but also a rune inscription. The latter is,



however, considerably younger than the rock art. There are two interpretations of the rune inscription, of which one sees it as possibly related to the ring cross and to some fertility conception.

In the whole of Bohuslän there is only one other rock art panel with rune inscriptions. It is located in Tanum (Tanum 441) and likewise includes a ring cross, which in this context may be seen as a common configuration. Just above the panels towards the east there is a rather prominent quartz vein that seems to have been subjected of some kind of extraction or working. It is tempting to relate this activity to the rock art (e.g. Goldhahn 2007: Ch. 5–6). Excavations in front of rock art sites often yield quartz debris, which is more common at these sites than ceramics and flints (Bengtsson 2004). All the rock art panels here are situated on the lower part of an outcrop and are facing the nearby sea to the southwest (fig. 7.10). The presence of the sea is very clear from the panels, which are now just 80 m or so away, and an undulating meadow leads straight down to the present shore. This presence would have been even more evident during the BA. The ship images on the panels demonstrate typical traits of period V, except the ship on the panel 58:4, such as vertically raised keel extensions, outward turned stems that mostly end in stylistic S-shapes though some are clearly horse-shaped, and animal heads (Kaul 1998:

88). Instead of these typical features, the ship on the panel 58:4 has traits, such as a raised keel extension, that could place it roughly between period III–IV. A line has also been drawn from the last crew stroke in the fore towards the keel extension in the aft. Some ship types from the LBA in the Kville area show similar traits (e.g. Kville 209).

There are close parallels between the ship images on the rest of the panels with other Scandinavian sites with similar rock art images, such as Bornholm in Denmark (Kaul 2006), Enköping in southwest Uppland in Sweden (Coles 2000), the island of Åmøy in the Stavanger area (Fett & Fett 1941; Nordenborg Myhre 2004), and Bardal in Nord-Trøndelag in Norway (Gjessing 1936). Measurement of the images on the panels gave the following altitudes: Herrestad 58:1, 17.22 m.a.s.l.; 58:2, 17.92 m.a.s.l.; 58:3, 15.22 m.a.s.l, and 58:4, 14.02 m.a.s.l.

Conclusion

These altitudes ruled most of them out of a discussion of maximum age in relation to the parameters of the BA shoreline. However, panel 52:4 (fig. 7.11, 7.12), with the ship from period III–IV, has an altitude of 14.02 m.a.s.l and relating this ship to the shore displacement data resulted in the following general conclusions (see fig. 7.10–7.14):

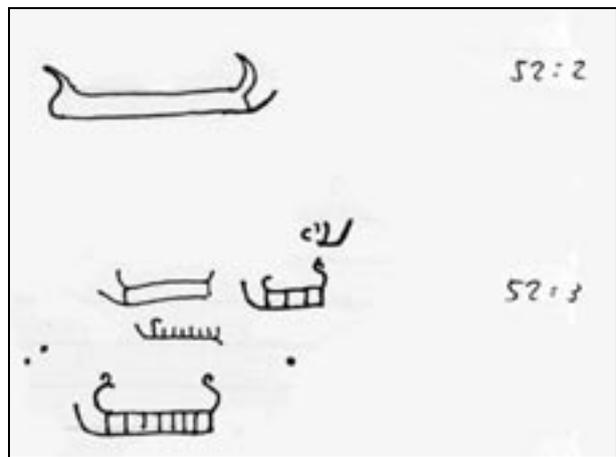
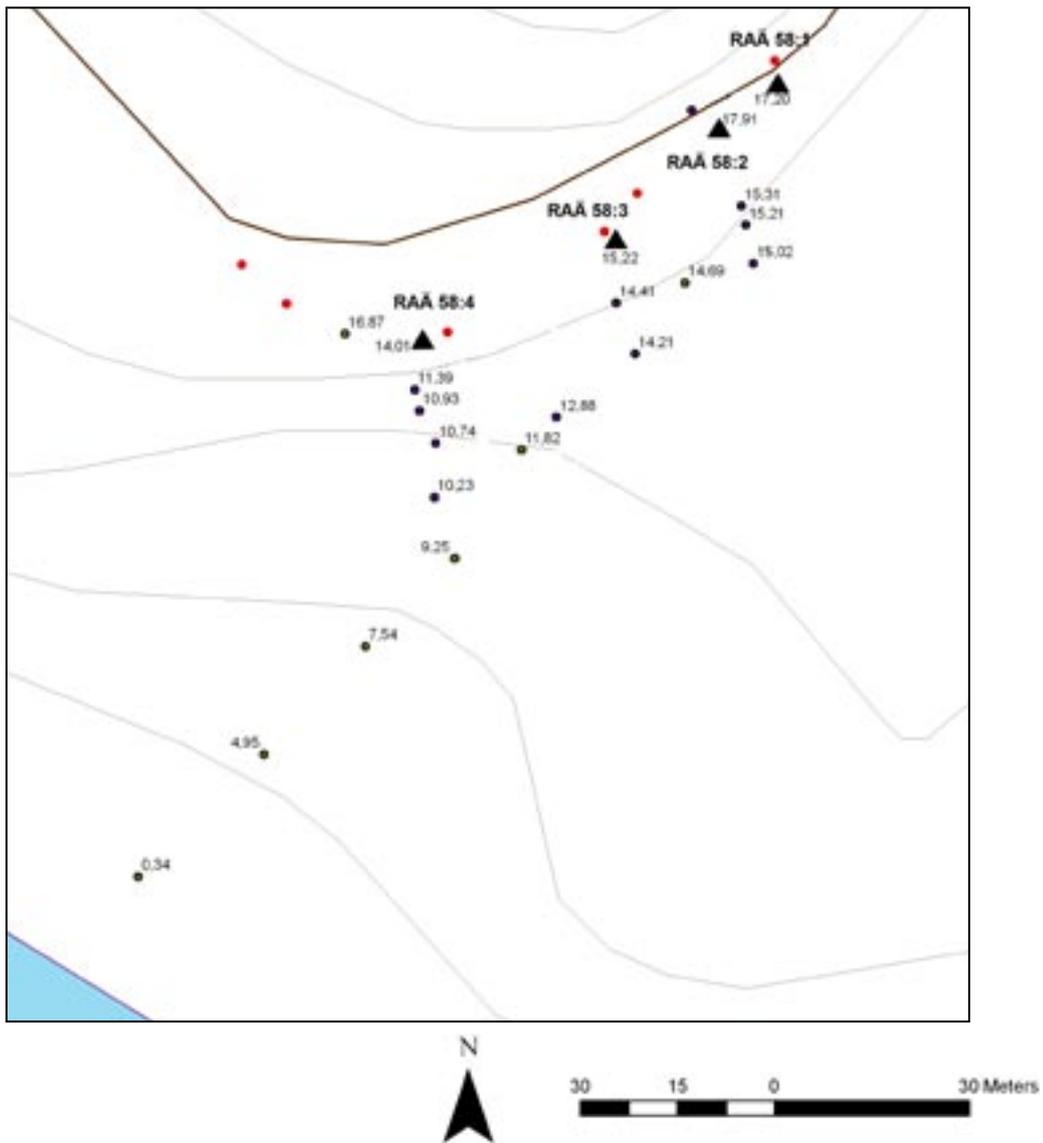


Figure 7.11. Top, map of the measured terrain and rock art sites Herrestad 58:1-4, triangles denote the altitude of the lowest image on each panel. Bottom left, the lowest ship image of the rock art site Herrestad 58:4 (photo: Johan Ling). Bottom right, documentation of some the ship images (after FMIS).

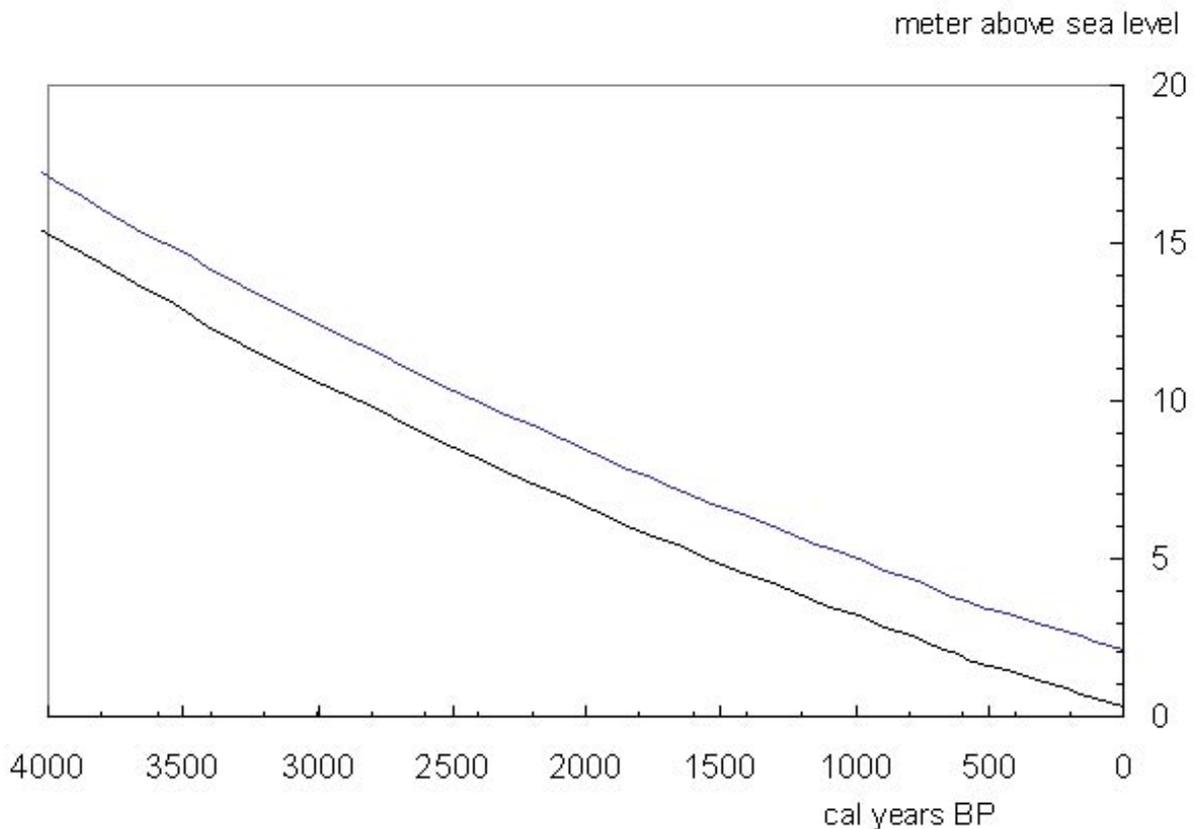


Figure 7.12. The lower black curve shows the shore displacement in the Uddevalla area according to Pässe's model (Pässe 2001). The upper curve represents the difference (1.8 m) between Pässe's model and Berntsson (2006) in Tanum, adapted to Pässe's model of shore displacement in the Uddevalla area (figure by Pässe, remade by the author).

- Based on shoreline dating, an earliest date of the ship image from period III–IV, situated at an altitude today of 14.02 m.a.s.l, is either period I–II or, most probably, period III. The altitudinal parameters and the comparative dating of the rock art panel matched in general the parameters of shore displacement.
- During the LBA, these ship-dominated rock art panels were made successively from the water's edge up the shore. The area with the rock art subsequently became a shallow bay, which may have been highly suitable for various kinds of maritime activity, such as departure and arrival, but also for launching ships. It therefore seems that the ship depictions were made during the BA.

Maritime rock art at the Stångenäset isthmus (Bro 622, 636, Brastad 123)

The following three examples do not directly contribute to the dating discussion. Instead, these rock art sites present some interesting features as regards their location in the landscape. These three examples may therefore throw further light on issues concerning visual aspects and perspectives of landscapes or seascapes.

At the foot of Störreberget hill and adjacent hills there are no less than 65 rock art sites. The majority face the extensive, low-lying arable land in the Bro valley. Just west of Störreberg, several vertical outcrops seem to form a mighty stone wall that encloses this landscape.

The panel Bro 622 is located on a small rock that juts out into the field. The panel displays 2 ship images and some fragments of ships; one of the ships

has outward turned stems ending in stylistic animal heads and a vertical keel extension, typical of period V. It is noteworthy that this ship image is cut over another ship image that shows traits from the EBA, such as inward turned stems and a horizontal keel extension (fig. 7.13). However, the altitude of the lowest ship images on the panel is 15.14 m.a.s.l, so these images cannot directly contribute to a dating discussion. However, the ship images could not possibly been made earlier than LN II.

What is most interesting here in the present context is the adjoining low-lying arable land. Today's altitude of the lowest parts is 8 m.a.s.l, which indicates that the area was a small bay until the PRIA. So most of the panels at Störreberg should be assessed as being made in the context of a small maritime bay. Just like many rock art sites in South Scandinavia (see Ch. 5), the rock art is situated on outcrops facing the sea in a natural maritime arena.

The second of these three examples of rock art panels, Bro 636, is located about 3.5 km southwest of Brodalen, at Lännestad. The panel is on a small impediment that sticks up like a small island, surrounded by arable land. It displays 2 ship images, one fragment and 4 cup marks. Both ships hold crews, a double line on one and entirely chopped on the other. One ship has features that indicate period III.

The most interesting point in this case is that the sea is still visible from this panel (fig. 7.14). The observation led to speculation about the altitude and age of this low-lying panel in relation to shore displacement. However, the GPS measurements of the panel put an end to the speculation. They demonstrated that today's altitude of the lowest image on the panel is 14.72 m.a.s.l and the highest 15.02. Like the rock art site at Brodalen, this site gives the impression of being at a lower altitude than the GPS measurements demonstrated. The gently undulating terrain towards the sea contributes to this perception. Measurements of the terrain showed that today the sea is, in fact, about 500 m away from the rock art panel (fig. 7.14). Thus, the false impression was a result of both the altitude of the panel and its distance from the sea, coupled with the gently undulating terrain and the sea's presence.

From period III onwards, the rock art site was

only 10–20 m away from the sea, so these images were made on the shore. This location is similar to the rock art sites in western Norway, Dalsland and in Scania (see Ch. 5).

The last example from Stångenäset, Brastad 123–4, includes several panels and has a total of 16 ship images, 4 human images, two foot soles and some other depictions. The economic map plots this panel at about 15 m.a.s.l but the GPS measurements gave an altitude of 19.6 for the lowest image. The proximity of the sea today makes it easy to be mistaken about the altitude of this site.

A lesson that can be drawn from these examples is that prehistoric rock art with much the same altitude today, about 15–20 m.a.s.l, and projected against the sea, may be regarded as having a connection with the shore. This is even more evident when one considers that during the BA a majority of the rock art sites in Tanum or Kville were situated at an altitude of about 5–10 m.a.s.l.

The Sotenäset area (Tossene 107)

This rock art site, Tossene 107 in the parish of that name, is located at a recent stone quarry, just outside the small coastal town of Bovallstrand at Sotenäset (fig. 7.16). Tossene parish has the second highest number of rock art sites in Bohuslän; only Tanum has more. Recent inventories of the area, using the most up-to-date methods for documentation and localization of rock art, have resulted in a doubling of the number of sites in the parish, from 192 to 404 (Bengtsson 2004).

Another interesting fact is that a majority of the rock art sites are located on higher ground close to prehistoric settlements, away from the land that constituted the BA shore. However, the largest site, the renowned Tossene 73 at Åby, which includes some spectacular scenes and the highest number of ship images of all the sites in the parish, did have a maritime projection and location in the BA, just by Åby fjord.

The measurements gave the lowest part of this panel an altitude today of 19.02 m.a.s.l and the highest 23.08. Turing back to rock art locality Tossene 107, we have a rather large ship, 1.2 m long and 0.3 m high (fig. 7.17), with an outward turned stem that ends in an animal head, and a slightly upturned keel

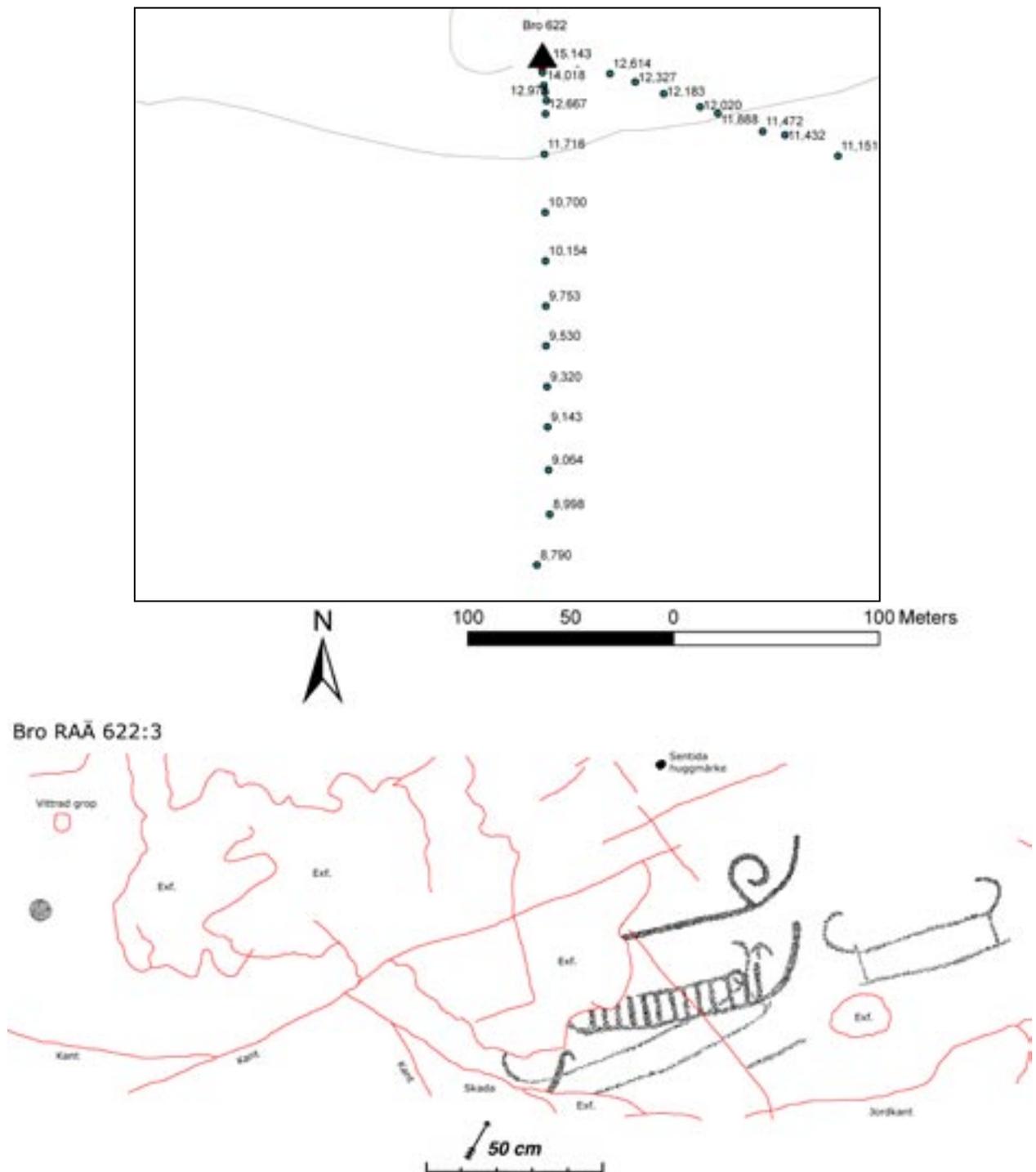


Figure 7.13. Top, map of the measured terrain and rock art site Bro 622; the triangle denotes the altitude of the lowest image on the panel. Bottom, documentation of the rock art (by VM).

extension. There is also a smaller ship without these stem features. In addition, there are human figures with circular objects, probably representing shields. These “warriors” indicate a late date, presumably period III–V.

However, applying Kaul’s ship chronology to the two ship images on the panel suggests that they could be related to either period III or IV. Could the altitude of the ship images in relation to shore displacement throw further light on this issue? The



Figure 7.14. Terrain map and photo of Bro 636, with the sea visible in the distance (photo: Johan Ling).

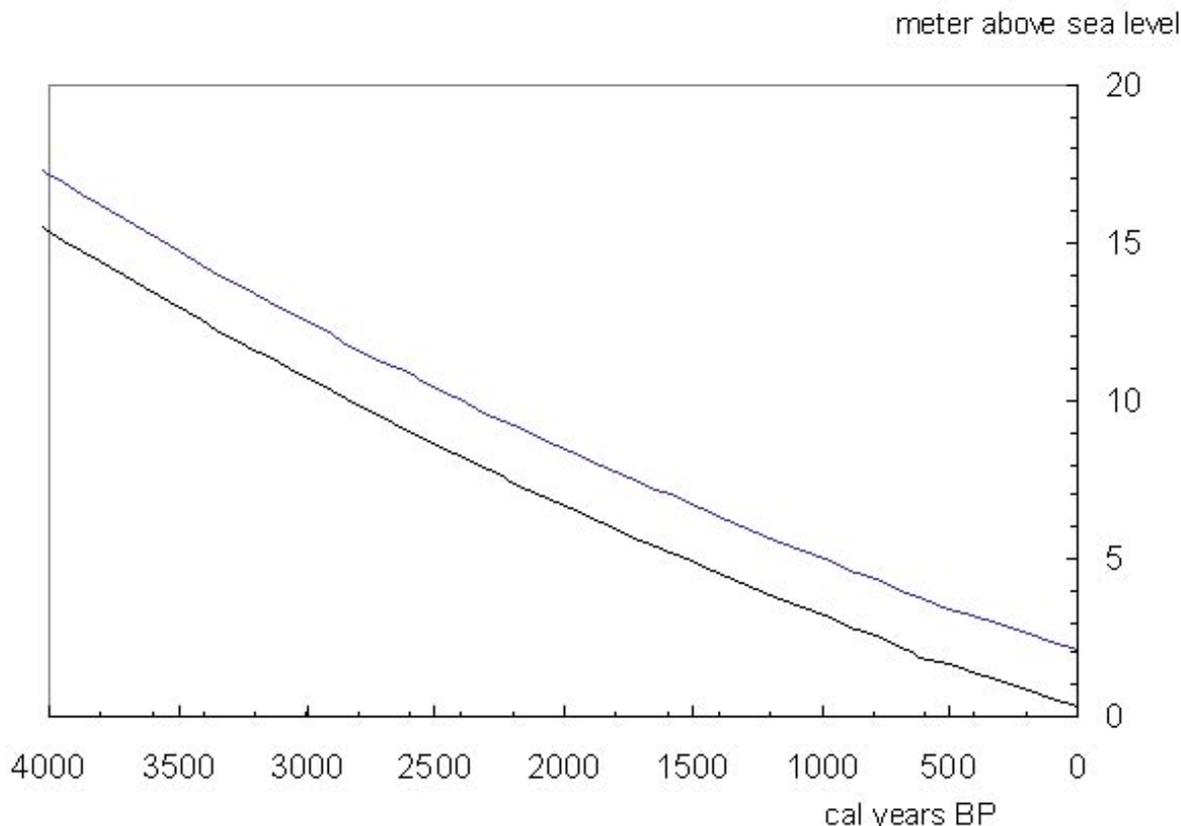


Figure 7.15. The lower black curve shows the shore displacement in the Stångenäset area according to Pässe's model (Pässe 2001). The upper curve represents the difference (1.8 m) between Pässe's model and Berntsson (2006) in Tanum, adapted to Pässe's model of shore displacement in the Stångenäset area (figure by Pässe, remade by the author).

large ship has a measured altitude of 12.92 m.a.s.l and the smaller one has 12.88. These low values may, indeed, contribute to a dating discussion. The shore displacement curve for the area shows an altitude of 15–16 m.a.s.l for the shoreline at the beginning of the EBA and about 9–10 m.a.s.l towards the end (fig. 7.18). Thus, today's altitude of the shoreline during the EBA is somewhere around 13 m.a.s.l. This is roughly the same altitude as the two ship images on the panel, which points to period III as a maximum age for the panels. However, taking into account the effect of the tide, it is more likely that the images were produced in a later phase, presumably during period IV.

Conclusion

Relating the ship types to the shore displacement data resulted in the following general conclusions (see fig. 7.16–7.18):

- In relation to shoreline dating, an earliest date for the ship images, situated today at altitudes of 12.92 and 12.88 m.a.s.l respectively, seems to be period III. However, taking the effect of the tide into account, it is more likely that the images were produced later, presumably during the period IV.
- The subsequently engraved panel rose out of the sea during period III, when the shoreline had retreated to 13 m.a.s.l.
- During period IV the sea had retreated to approximately 12 m.a.s.l and it would thus have been possible to peck on the panel without being interrupted by tidal movements.

The Svarteborg area (Svarteborg 13)

This well-known rock art site is located on the Dingle plain in Svarteborg parish, on a small, low-ly-

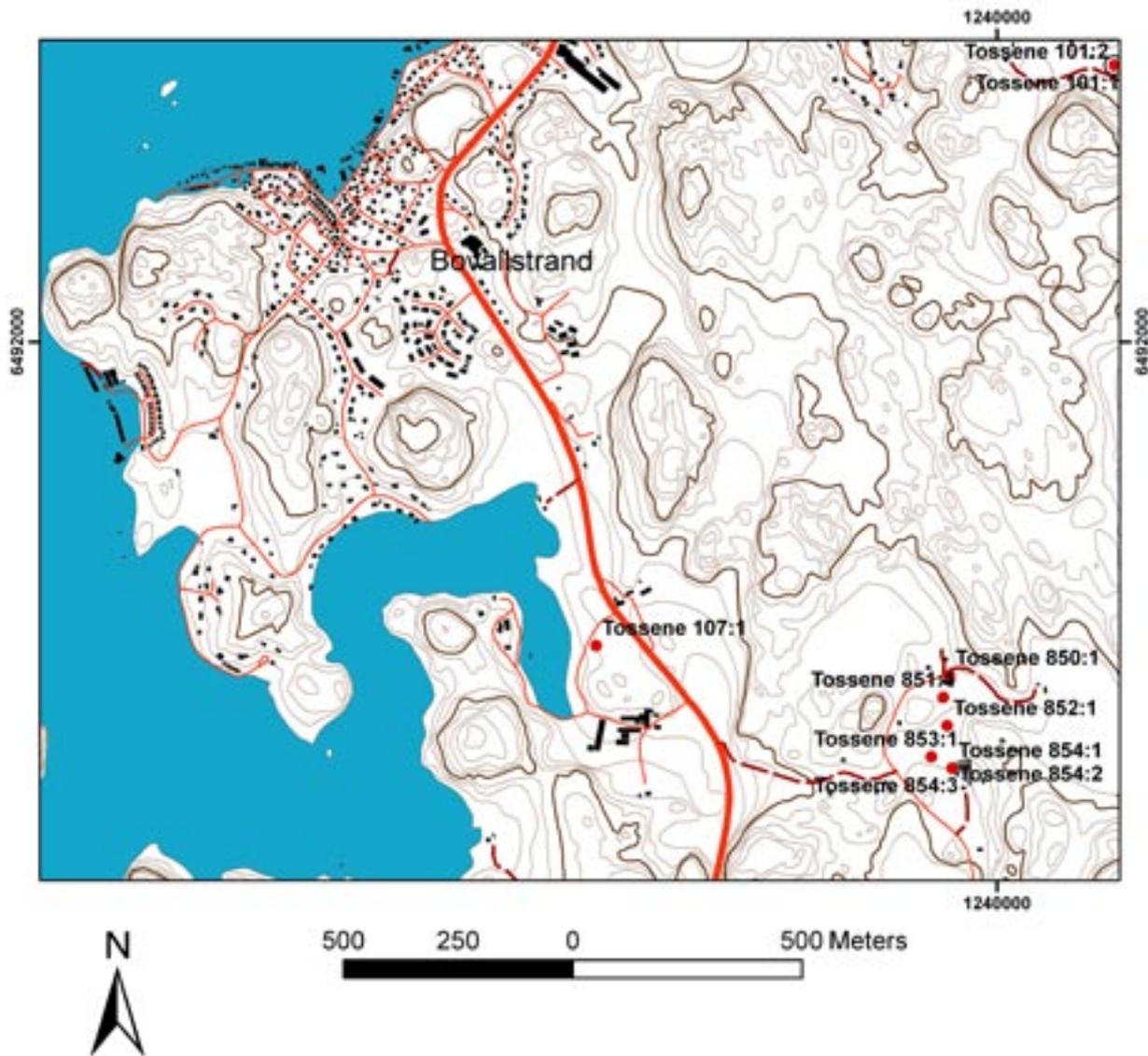


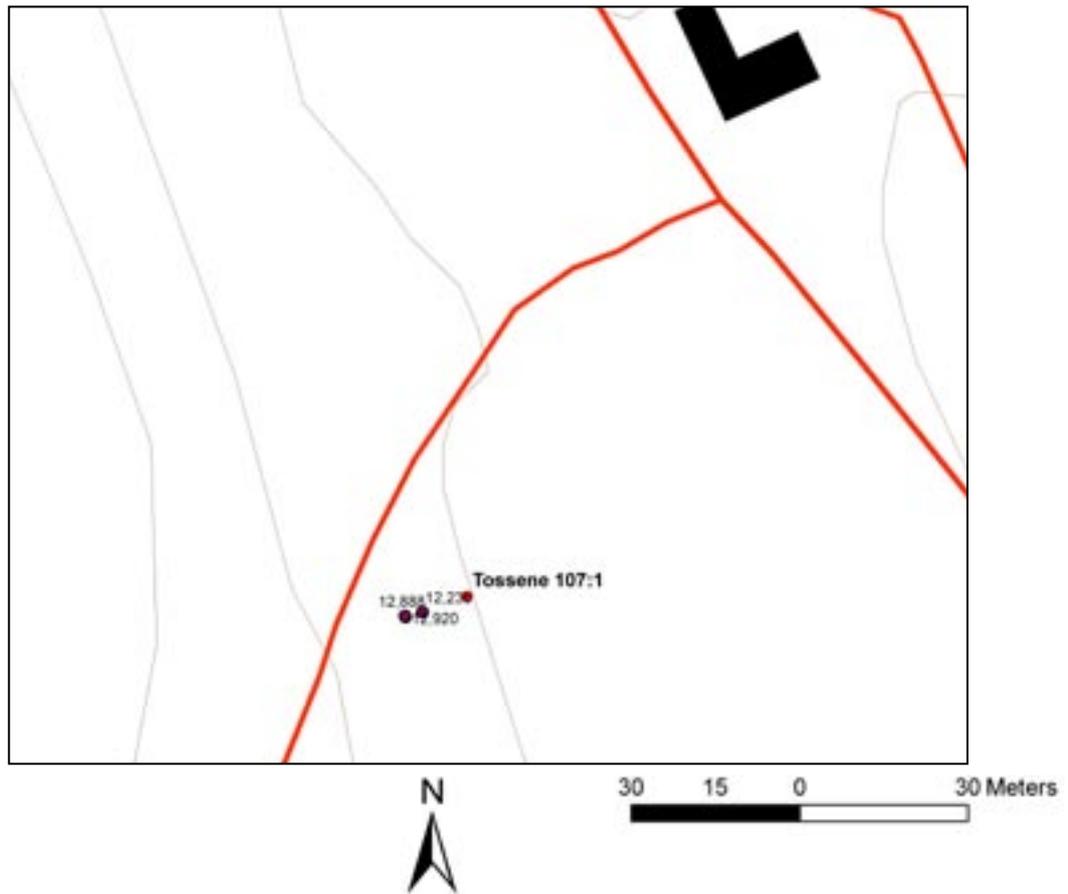
Figure 7.16.. Extensive map of the area around Tossene 107 close to Bovallstrand.

ing outcrop about 150 m south of a prominent hill, Buråsaberget. Antiquarians have been discussing the site since the late 19th century. This is an area with a considerable number of prehistoric remains. Another 40 rock art sites, 20 barrows, 15 stone settings and two cairns are to be found not more than 2 km away from Svarteborg 13.

The construction of the E6 motorway led to the excavation of several of the prehistoric remains. The most spectacular find, about 2 km northwest of the present site, is a large stone-paved monument that covered rock art, burials and house structures (Munkenberg 2002). Carbon dating of the monu-

ment pointed mainly to the Pre-Roman and Roman Iron Age, but also to the LN II and the LBA. It has been suggested that the stone-paved structure covering the rock art images was the latest phase or activity on the site and the rock art was the first (Munkenberg 2002).

The ship depictions have inward curved stems and slightly raised keel extensions, typical traits of the EBA. The altitude of the panel is about 17 m.a.s.l. The ship depictions were thus interpreted as belonging to the first work that was done on the cliff while this was still in contact with the sea.



Tossene Raä 107:1

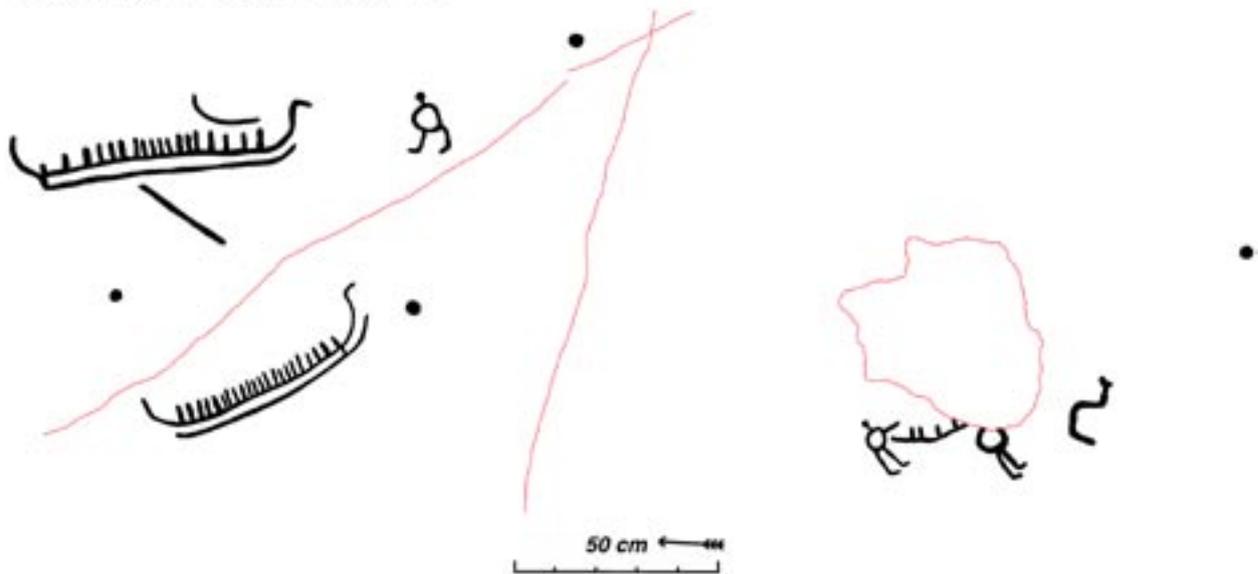


Figure 7.17, Top, map of the measured terrain and rock art site Tossene 107; the points denotes the altitude of the lowest ship image on the panel. Bottom, documentation of the rock art (by VM).

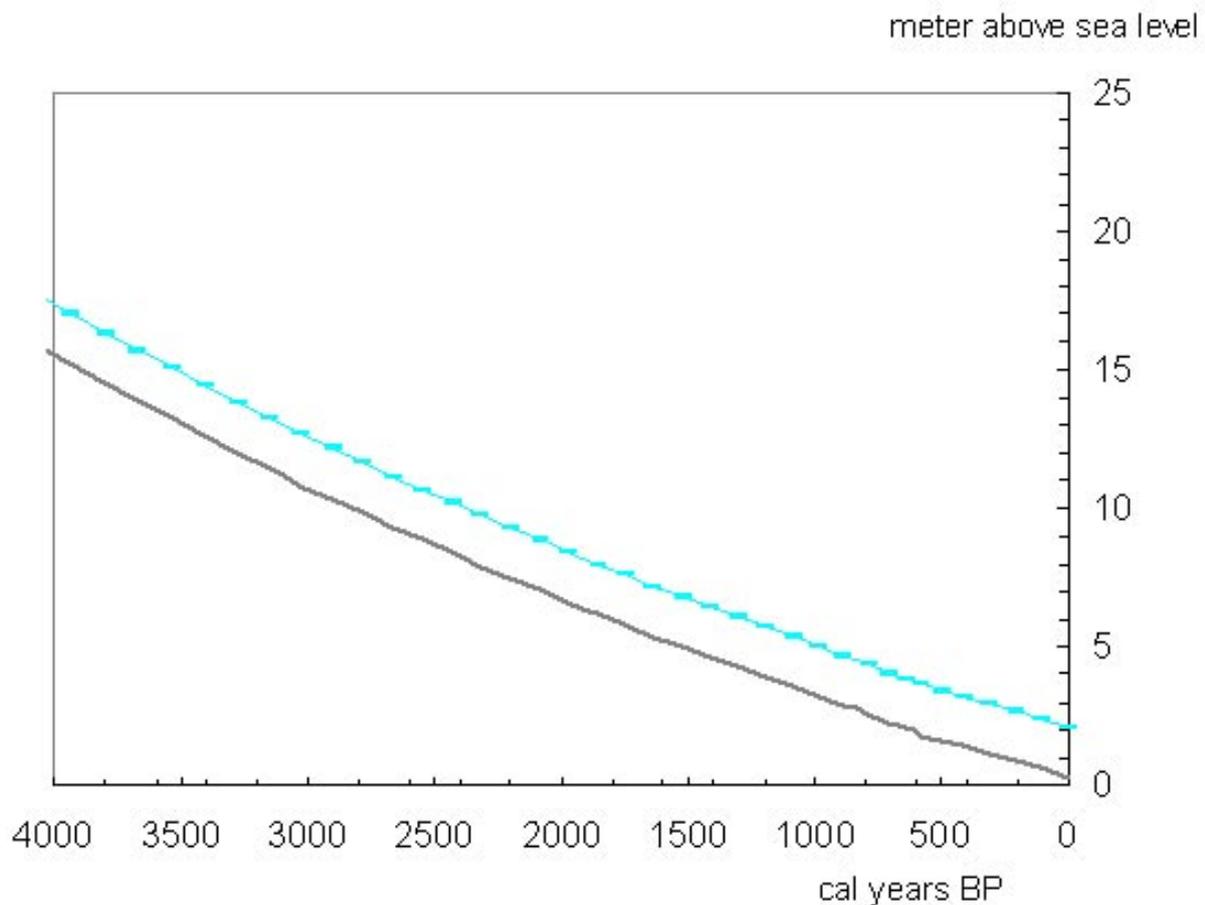


Figure 7.18. The lower black curve shows the shore displacement in the Sotenäset area according to Pässe's model (Pässe 2001). The upper curve represents the difference (1.8 m) between Pässe's model and Bern-tsson (2006) in Tanum, adapted to Pässe's model of shore displacement in the Sotenäset area (figure by Pässe, remade by the author).

Svarteberg 13, the subject of this section, displays a large ship, 1.2 m long and 0.5 m high, with outward turned stems and a vertical keel extension (fig. 7.20). The stems end in stylistic animal heads with double axe-shaped attributes, typical of period V (Kaul 1998: 88). On the ship are 3 armed warriors with raised axes and swords attached to their hips; 3 more figures, depicted above the ship, could signify goats (cf. Tanum 61).

The lowest parts of the ship are at an altitude today of 13.18 m.a.s.l and the highest are at 13.73 (fig. 7.19). These low altitudes are highly interesting, especially in relation to the new shore displacement curve of the Tanum area which broadly covers the Svarteberg area as well (fig. 6.6). The combination of the low altitude and the ship's very precise and elaborately articulated traits makes this one of the

most qualitative chronological items in this study. Given the new shoreline study, this ship image could not have been produced during the EBA because the altitude of the shoreline at that time was about 14–16 m.a.s.l. During the transition between periods III and IV the shoreline retreated to 13–14 m.a.s.l, which would have made it possible to make the ship on the panel.

Even then, the tidal movement of 0.5 m would have interrupted the work. It may therefore be more logical to assume that the lower part of this panel was made when the shoreline had retreated from the entire surface. In period V the shoreline in this area was at about 11–12 m.a.s.l, which corresponds very well with the comparative interpretation of the ship image. It would also make sense if there had then been a tongue of land or shore between the rock art

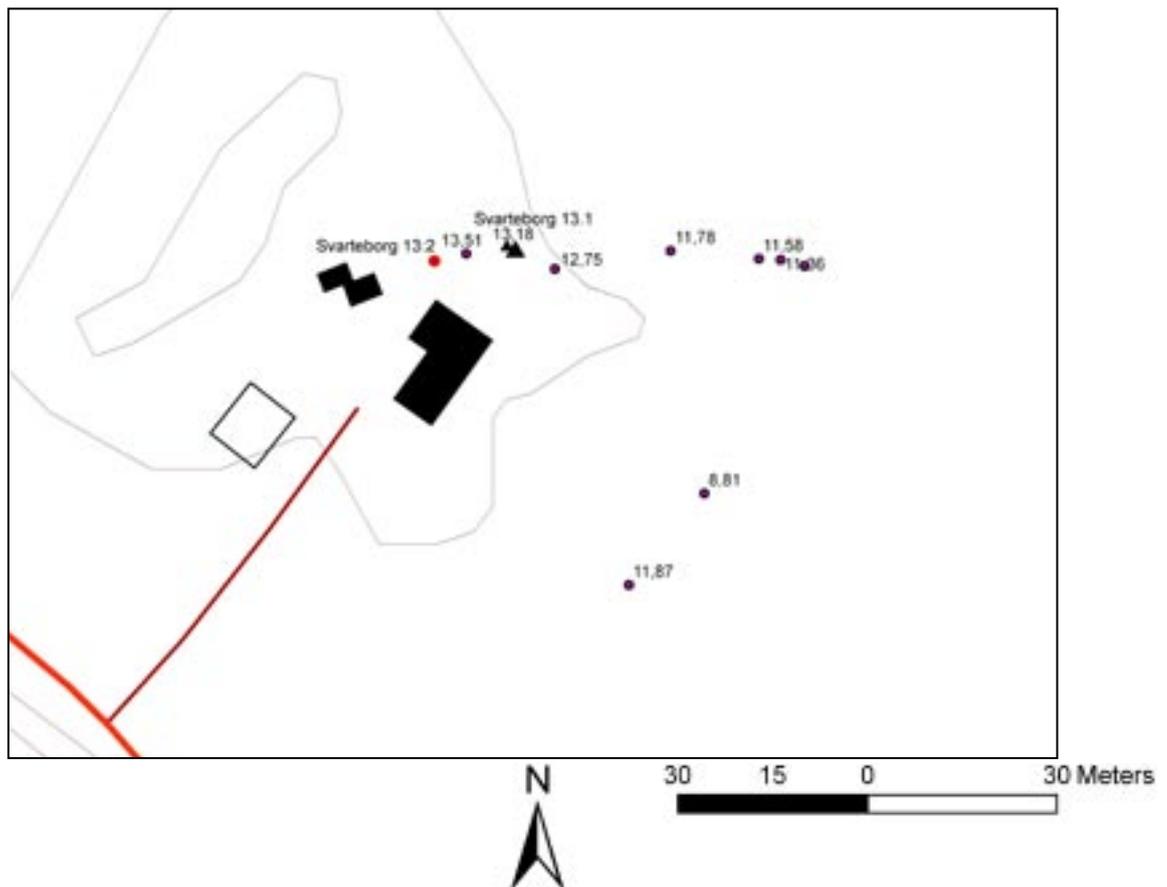


Figure 7.19. Map of the measured terrain and rock art site Svarteborg 13; the triangle denotes the altitude of the lowest ship image on the panel.

sites. The altitude of the terrain beneath the panel does, in fact, suggest that a small land tongue could have existed here during period V.

Conclusion

Relating the type of ship image to the shore displacement data led to the following general conclusions (see fig. 6.6, 7.19–7.20, see also fig. 11.2):

- In relation to the shoreline dating, a maximum age of the ship image, situated today at an altitude of 13.18 m.a.s.l, seems to be period IV.
- The subsequently engraved panel rose out of the sea during period IV, when the shoreline had retreated to about 13 m.a.s.l.
- During the next phase, period V, the sea had retreated to approximately 11–12 m.a.s.l and it would then have been possible to act on the panel without being interrupted by tidal movements.

- During the LBA, the rock art panel was positioned on a small isthmus facing the rock art on the opposite, steep side of the small strike or bay. All the rock art in the area was in contact with the shore and this pattern may indicate various forms of maritime activities and rituals, for instance departure and arrival at sea, but also launching ships.

The Kville area (Kville 172, 114)

This rock art panel, Kville 172, in the southern part of Ödsmål is undoubtedly one of the most important panels in the present context. It is situated at the foot of a rocky hill, adjacent to a low-lying clayey plain and only 2 m northwest of a stream. The panel displays 7 ship figures, 3 other figures (a weapon? and a razor?) and 230 cup marks (Fredsjö 1981: 172–173). Some of the cup marks are fairly large, up to 10 cm in diameter. The figurative and



Figure 7.20. Photo of the ship image on the panel Svarteborg 13 (photo: VM).

non-figurative rock art on this panel seems to have been arranged in accordance with a general spatial structure or code (fig. 7.21).

Thus, a majority of the cup marks occur on the lower part of the panel and the ship figures on the higher part. The ship depictions have atypical as well as typical features and traits.

Thus, 3 of the ships have clearly inward curved stems, a chronological trait that is typical of the EBA; the stems are outward turned on one of the other ships and neither outward nor inward turned on the remaining 2. The 3 ship depictions with inward curved stems also have fairly tall keel extensions, not as tall as the common ship types of the LBA but more accentuated than the horizontal or slightly upturned keel extensions of the EBA (e.g. Glob 1969; Kaul 1998).

Measurement of the figurative ship depictions gave the following sequence (fig. 7.22): 13.88 m.a.s.l for the lowest ship, followed by 14.01 for the broadest ship, with inward turned stems that are reminiscent of the ship image from Truehøjgård on Jylland in Denmark (see fig. 7.1: no. 15); next came altitudes of 14.12 m.a.s.l for the ship with outward turned stems and 14.16 for the large ship above that one, depicted with a so-called stabiliser, a trait that is said to indicate an early phase of the EBA (Glob

1969; Rostholm 1972; Kaul 1998, 2006); finally, the highest ship is at an altitude of 14.23 m.a.s.l. These rather interesting data may contribute to this study's most central issue: how the comparative ship chronology relates to shoreline dating.

Conclusion

Relating the ship types to the shore displacement data resulted in a stratigraphic division of the panel into three chronological phases (see fig. 6.6, 7.22):

- The upper part of the panel rose out of the sea at the transition between period II–III, when the altitude of the shoreline was around 14–14.5 m.a.s.l. The highest ship images could have been pecked at that time.
- During the latter part of period III, the shoreline retreated to approximately 13 m.a.s.l and it would then have been possible to peck on a large part of the panel.
- During period IV the sea retreated to about 12–12.5 m.a.s.l, thereby exposing the whole of the panel, though the lowest engravings would have been just at the water's edge.

These deductions pointed to the following general conclusions:

- A majority of the ship features on this panel seem to have originated in a late phase of period III. The earliest images may have been initiated sometime between periods II and III. Some traits of these ships have previously been assumed to indicate a specific chronological period, the period I or II. One example is the rather broad ship with inward turned stems, reminiscent of the ship depiction from Truehøjgård in Denmark (Kaul 1998: 88); another is the so-called stabiliser on the highest ship depiction, which has also been claimed to indicate period I or II (Kaul 1998: 88, 2003: 110). The present observations indicate a later date, presumably period II or III.

The low-lying rock art at Edstensdalen (Kville 114)

This rock art site, located in the upper part of a valley, Edstensdalen, is situated on the edge of a small outcrop adjacent to a road and arable land. It consists of 3 ship figures, 2 net figures, 1 animal figure, 2 circle figures, 1 wheel cross, 1 snake, 1 foot print, 7 cup marks and 4 other figures (fig. 7.23).

The present altitude of the lowest image, the circle figure with two straps, is 12.80 m.a.s.l and that of the lowest ship figure is 12.83, while the highest image on the panel, an abstract design, is at 13.13 m.a.s.l. This makes the site the lowest-lying of all the measured figurative rock art panels in the Tanum and Kville areas. Moreover, these low-lying ship images present some very definite forms. They are symmetrical and have bifurcated stems fore and aft. These traits are assumed to be typical chronological features of the PRIA (Østmo 1990; Kaul 1998, 2003: 192–195).

Conclusion

Relating the ship types to the shore displacement data resulted in the following general conclusions (see fig. 6.6, 7.23):

- The upper part of the panel rose out of the sea around 1200–1100 BC, when the altitude of the shoreline was about 13–13.5 m.a.s.l.
- The lower part of the panel emerged from the sea around 1100–1000 BC, which corresponds to period IV. The maximum age of the lowest

images can be assigned to this period.

- However, taking the tidal movement of 0.5 m into account, an earliest date for the images would be 900–800 BC, which corresponds to period V.

Thus, the shoreline dating failed to confirm the comparative dating of the ship to the PRIA. However, during the PRIA this was one of the few areas where the rock art was still in contact with the sea. The altitude of the symmetrical ships with bifurcated stems may indirectly favour the notion that these images were produced during the PRIA.

In that case, rock art with Iron Age images was still being made on the lower outcrops of this narrow inner skerry.

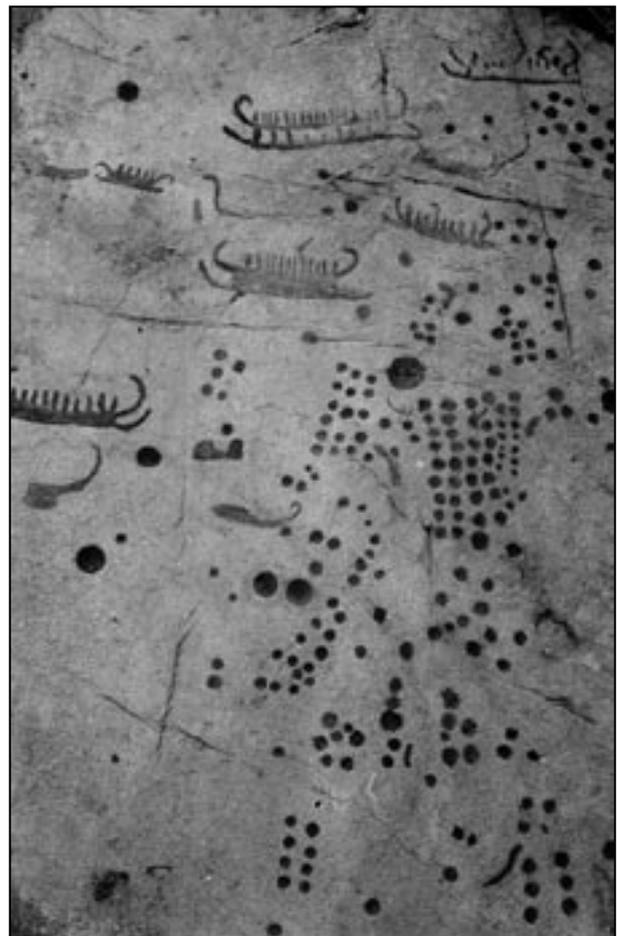


Figure 7.21. Some of the rock art at Kville 172 (photo: Jansson 1931).

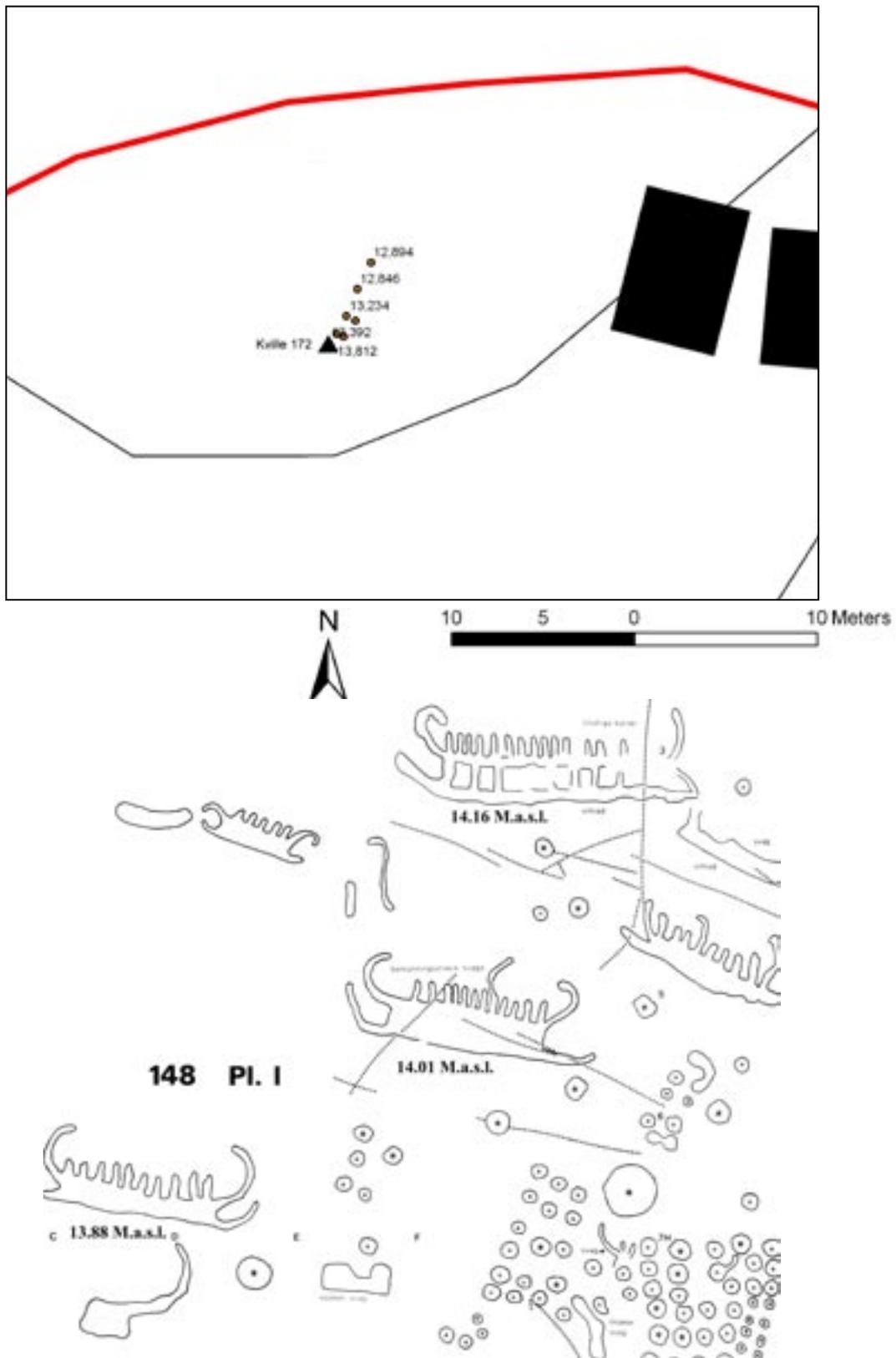


Figure 7.22. Top, map of the measured terrain and rock art site Kville 172; the triangle denotes the altitude of the lowest image on the panel. Bottom, documentation of the panel (remade after Fredsjö 1981). The altitudes of the measured ship images in the panels are also indicated.

The Tanum area, the “Runohäll” at Ryk (Tanum 311)

...the Gerum locality (311) is situated out on the plain instead of at its edge. The other unusual factor is constituted by the fact that it lies on the edge of a ravine today filled with a stream [...] The level of the panel is exactly 15 metres too above the sea. This value is the lowest for all the large localities in the Tanum area (Bertilsson 1987: 148).

“Runohäll” (the runic panel), located at Ryk, some 30 m from the Gerum River, is one of the most outstanding rock art panels in the Tanum area. It faces southeast, is rather large, 9 x 6 m, and parts of it are inclined at a considerable angle (up to 50–60°). It consists of no less than “84 ships, 36 human figures, 23 animals, 14 foot soles, 3 ring crosses, 2 circles, 1 mast like figure, 3 obscure figures and 119 cup marks” (Högberg 2000: 36, see fig. 7.24, 7.25). There are some remarkable figures and combinations of animals, such as the scene with several interconnected animals as well as an extremely large bull-like figure and a sun-horse connected to a ship (Fredell 2003: 164; Kaul 2004).

One of the most discussed images is a complex pole figure to which are attached various kinds of lines and humans, traditionally interpreted as an archaic depiction of a “maypole” (Almgren 1927; Almgren 1987; Bertilsson 1987; Hygen & Bengtsson 1999; Fredell 2003; Kaul 2004). The images indicate that the panel was in use for a long time, presumably for most of the EBA up to the end of the LBA (Fredell 2003).

Attempts have been made to date some of the ship images on the panel. For instance, some scholars have claimed that the panel presents ship features from period Ib onwards (Kristiansen 2002, 2004; Fredell 2003), others that ship features from period II onwards are represented (Almgren 1987; Bertilsson 1987). The low altitude of this large, complex rock art panel is very unusual, especially compared with other complex rock art sites in the Tanum area (Bertilsson 1987: 148). It seems that the panel was in contact with the sea throughout the BA. Today’s measured altitudes of the images on the panel are

notably low, ranging from the lowest ship depiction at 14.7 m.a.s.l to the highest at 16.2 (fig. 6.6, 7.25).

Relating the GPS measurements of altitudes on this panel to the parameters concerning shore displacement in the area suggests that the panel can be divided stratigraphically into three chronological phases (fig. 7.25, 7.26):

1. The upper part of the panel emerged from the sea during the transition between period I–II, at which time the shoreline was about 16–16.5 m.a.s.l; this includes a tidal movement of 0.5 m. It would then have been possible to make the ships at the top of the panel (fig. 6.6, 7.26).
2. During the subsequent period II the sea level retreated to approximately 15–15.5 m.a.s.l, making it possible to peck on a large part of the surface, though the work would have been interrupted by a tidal movement of 0.5 m. Bearing this in mind, it may be more logical to assume that the lower part of the panel was made when the shoreline had retreated below the entire surface.
3. During the next phase, period III, the sea retreated from the entire panel to an altitude of 14–14.5 m.a.s.l (fig. 7.26). The lowest engravings would still have been close to the water’s edge.

A closer examination of the rock art images on this panel, seen in relation to the two independent dating methods, comparative chronology and shoreline dating, suggests the following. Of all the depicted features, the most frequent and dateable is clearly the ship. However, there are plenty of ship images as well as other features and scenes, such as human figures with weapons and head gear, that point to a late date, presumably period V. During the LBA the sea level retreated to 12 m.a.s.l, which means that the shoreline cannot serve as a deductive dating parameter of the LBA features of the panel.

It is therefore necessary to concentrate on the earlier ship images, which are fortunately the panel’s dominant features. At first glance it seems that the panel has ship depictions from period Ib but a closer stylistic examination of these ships and their relation to the ancient shoreline suggests another chronological conclusion. The ships at the top left

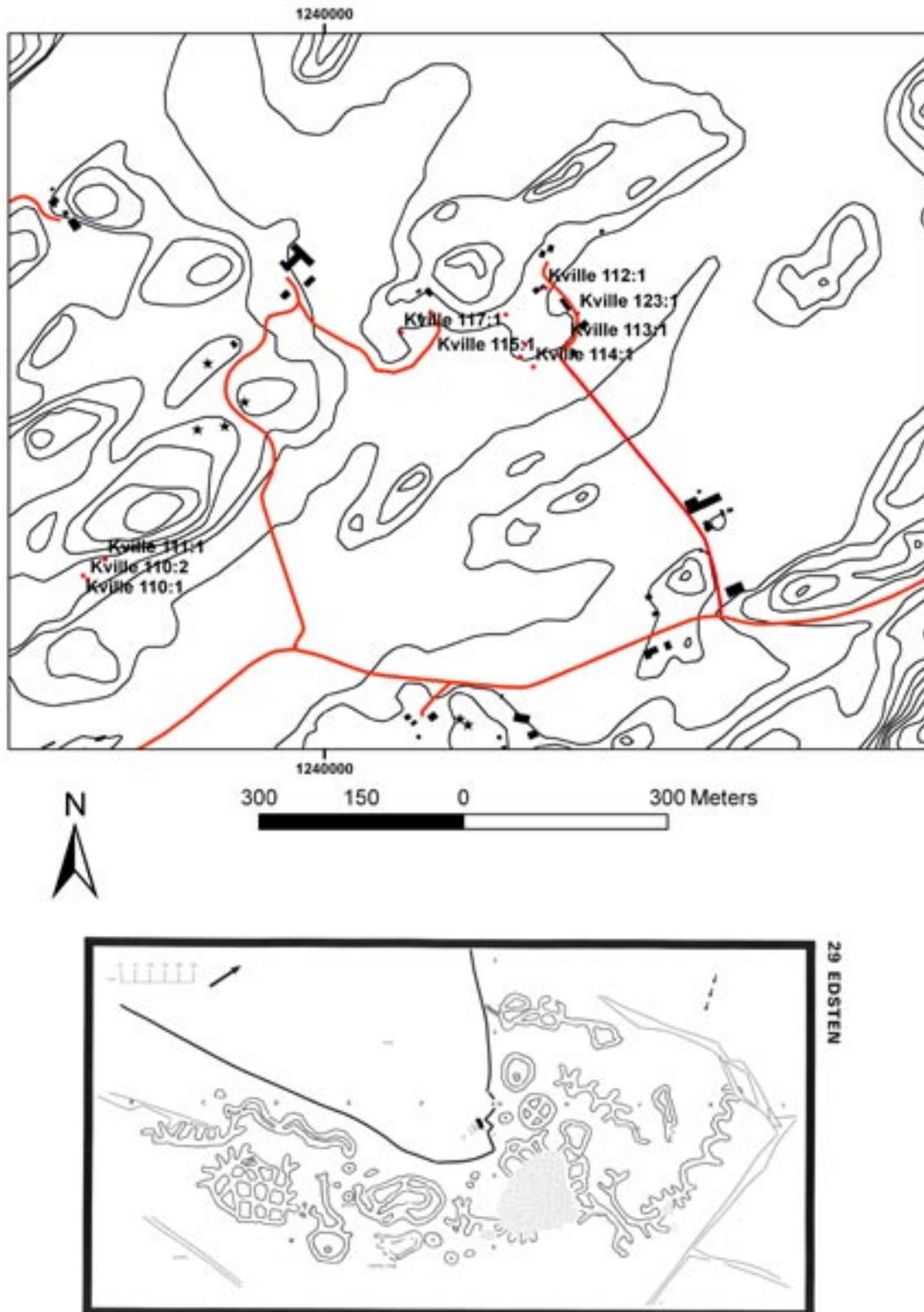


Figure 7.23. Top, map of the area at Kville 114. Bottom, documentation of the panel (remade after Fredsjö 1981).



Figure 7.24. GIS measurement of the rock art site Tanum 311 (photo: Per Stenborg).

of the surface, above the “bulls”, show these traits, such as inward turned stems, two paired crews and slightly upturned keel extensions. But some of them also display animal heads, which suggests a later date, presumably period II–III.

Beneath the large bull there is a cluster of 7 ship depictions of great interest (fig. 7.26). All these ships have inward turned stems and horizontal or slightly upturned keel extensions and some have paired crew strokes. Today, the altitude of the ship just under the bull is 15.88 m.a.s.l and that of the lowest ship in this cluster is 15.24. In terms of Kaul’s chronological scheme, at first glance these ships seem to match the Rørby ship of period Ib (Kaul 1998: 88). However, a closer examination shows that the stems of some of these ships are almost vertical and that the keel extensions are not horizontal, like the Rørby ship’s, but rather upturned (cf. fig. 7.1, no. 1).

Moreover, two ship images to the left in this cluster strongly resemble the ships on the slabs of the Sagaholm barrow, dated to period II or III (fig. 7.2, 7.26, Goldhahn 1999a: 144, 150). Nevertheless, the altitude of these ships in relation to the BA shoreline suggests an earliest date of period II rather

than period I, particularly when the tidal movement is taken into account.

The strongest argument for the later date is another, similar ship situated at a lower altitude on the panel. This ship has been cut over by another ship depiction that bears a strong stylistic resemblance to the ships of the Wismar horn. Its location and shape can clearly contribute to a dating discussion. The ship is almost identical with the ship features beneath the large bull (fig. 7.1, no. 4). Its altitude today is 14.95 m.a.s.l and the altitude of the shoreline at the beginning of period II is in the region of 15 m.a.s.l. The tidal movement makes it reasonable to assume that this ship was not made until the shoreline had retreated to 14–14.5 m.a.s.l. The conclusion is thus that the over-cut ship may be related to period II or to an early phase of period III, when the shoreline was closer to 14 m.a.s.l.

This particular ship, with so many traits in common with the ship features in the mentioned cluster – inward turned, almost vertical stems, slightly raised keel extension, a line between the stabiliser and the aft stem, similar crew strokes – suggests a dating from the same era, in this case period II–III.

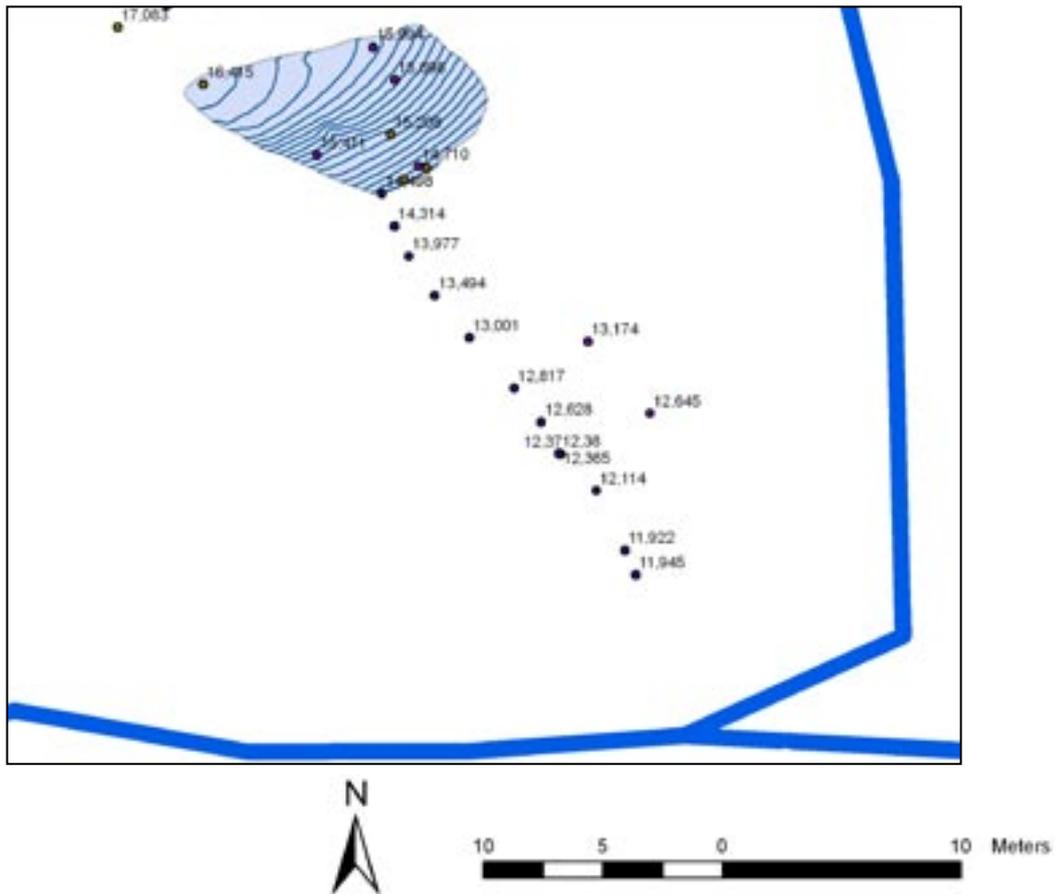


Figure 7.25. Map of the measured terrain and a terrain model of the rock art site Tanum 311.

The main factor behind this dating assumption is the altitude of the shoreline.

It is also noteworthy that several “Wismar-style” ships occupy the lowest engraved area and the lowest of them all bears a striking resemblance to the ship types on the Wismar horn. Starting from period III as the estimated date of the Wismar horn (Glob 1969: 49–55; Malmer 1981: 33; Randsborg 1993: 98–99; Kaul 1998: 92) and taking the features of the rock art panel and the shoreline in this epoch into account, suggests the following interpretation: During period III the entire engraved area was fully exposed because by then the shoreline had retreated to 14 m.a.s.l. Under these circumstances, the ship features on the upper left-hand part of the panel, with their strong resemblance to ships from Saga-holm slab no. 6 (see fig. 7.3), contribute to the panel’s chronological interpretation.

Thus, with reference to comparative chronology and shoreline dating, it seems that a majority of the

ship features on this panel primarily originated in a late phase of period II or III. Even if some ship features were made over a long period of time, most of them seem to have been pecked during period III. But the first rock art does appear to have been initiated during period II.

Apparently, the making of rock art on this panel became a tradition that lasted through the entire BA, most probably because of the panel’s maritime location in the seascape.

Conclusion

Relating the ship types to the shore displacement data resulted in the following general conclusions (fig 6.6, 7.24–7.26):

- The upper part of the panel emerged from the sea in period Ib.
- During the following phase, period II, it would have been possible to peck on a large part of the

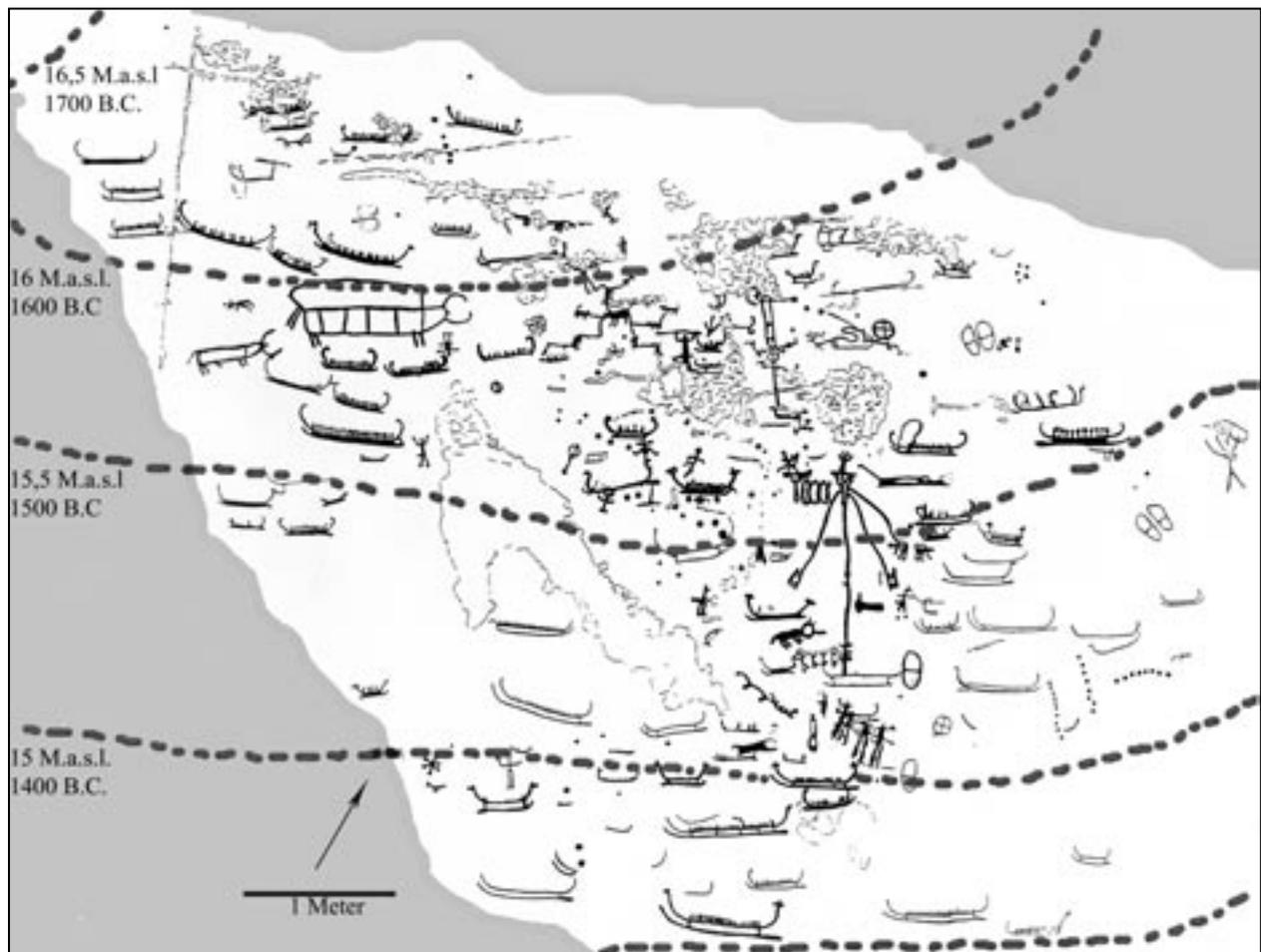


Figure 7.26. The “Runohäll”, Tanum 311, with the measured terrain curves (documentation by Gerhard Milstreu & Henning Pröhl 1996), showing the altitude and when, during the Bronze Age, the site rose out of the sea. It would not have been possible to make the rock art during period I; it is more likely that it was made during later phases, 1500–1000 BC.

panel.

- During period III, the sea retreated from the entire panel down to an altitude today of 13.5–14 m.a.s.l.
- In terms of comparative chronology as well as shoreline dating, it seems that a majority of the ship features on this panel primarily originated in a late phase of period II or III. Some of the ship features cover a long time span but most of them appear to have been produced in period III onwards. In this maritime context, the ship formations or scenes on the panel may manifest maritime meetings, communications or initiations between social formations, positions and traditions.
- This structure apparently became a tradition

that lasted through the BA, most probably because the panel’s maritime site could have functioned as a significant landing-place.

The vertical cliff at Tyft (Tanum 234)

A rock site with a remarkable setting is located at the foot of the southern part of a hill, Göpaberget, adjacent to the railway. Two ship images are situated “on a concave, vertical and smooth rock face” (Högberg 2000: 27). Their measured altitudes are 13 and 13.74 m.a.s.l, respectively (fig. 7.27). The lower image, situated 2 m above the surrounding land, consists of a single lined ship, 55 cm long, with crew. The higher image is situated 2.75 m above the land and consists of a 60 cm long, partly fragmented, double lined ship with accentuated keel

extension and one outward turned prow ending in a stylistic animal head (fig. 7.27).

The unusual setting raises many questions and ideas about the making and significance of these particular images (fig. 7.28). Firstly, an earliest date for these two ship features can be considered in relation to the ancient shoreline. Secondly, the inaccessible setting of these particular images prompts a discussion about the making and meaning of these images in the landscape.

The area's shore displacement curve shows that at the beginning of the BA the shoreline was about 16.5–17 m higher than today and during period II it had retreated towards 15 m.a.s.l (fig. 6.6). This means that these two ships could not have been made in period I or II. By the beginning of period III, however, the shoreline had retreated to 14 m.a.s.l, which means that, at 13.75 m.a.s.l, the higher of the two ships could theoretically have been made then but only during low tide, which seems fairly unlikely. It is more reasonable to assume that this ship was made at the beginning of period IV, when the shoreline was closer to 13 m.a.s.l. The lower ship image could also have been made during period IV, though with a location at the water's edge. It seems more logical to assume that this ship feature was made in an even later phase. Single lined ship types like this often occur in Tanum together with other features from the PRIA (see Högberg 1995: 47, 2000).

The rather unusual setting of these two ship images on this vertical cliff brings us to the second issue, which may also shed light on the first issue concerning maximum age. We have found that the earliest date for the higher ship is period IV and for the lower one the transition from period IV–V. But how were these images made? The vertical cliff does not provide any means for climbing or hanging (fig. 7.28). The producer could, of course, have been suspended from a rope fixed from above but this seems too advanced, especially as the shoreline was immediately below the panel.

A more logical assumption seems to be that the “rock-smith” worked the surface from a boat or from the ice, using the sea as an infrastructure (for a more detailed discussion of these matters, see Solberga 50 above).

Conclusion

Relating the ship types to the shore displacement data resulted in the following general conclusions (see fig. 6.6, 7.27–7.28):

- In relation to shoreline dating, an earliest date for the two ship images, situated today at altitudes of 13.75 and 13 m.a.s.l, respectively, is period IV for the former and period IV–V for the latter.
- The panel can be divided stratigraphically into three chronological phases: The upper part of the panel emerged from the sea at the transition between periods III and IV. During the following phase, period IV–V, it would have been possible to peck on a large part of the surface. By period VI, the sea had retreated from the entire panel down to an altitude today of 10–11 m.a.s.l, making it possible to stand on firm ground in front of the panel.
- The unusual setting of these particular ship depictions prompts a discussion about inaccessible and accessible settings for rock art in the former seascape. It is suggested that the panel represents an inaccessible maritime site because it could only be reached and seen from the sea. In this it differs from many other localities in the area with complex image combinations that may have been both accessible and visible from the land as well as the sea (see below).

A low-lying panel in the Kalleby area (Tanum 425)

Tanum 425, located on the edge of an outcrop about 600 m southeast of the vertical panel Tanum 232, comprises two panels. The lower one, at an altitude today of 13.02 m.a.s.l, consists of a single lined ship with crew strokes and some cup marks. The upper panel, at 13.20 m.a.s.l and 2 m west–northwest of the lower one, presents two ship images, one with traits typical of period V, such as a vertical raised keel extension and outward turned stems that end in stylistic animal heads. This ship's very precise, elaborate traits and its low altitude make this site one of the most qualitative chronological contributions in this study.

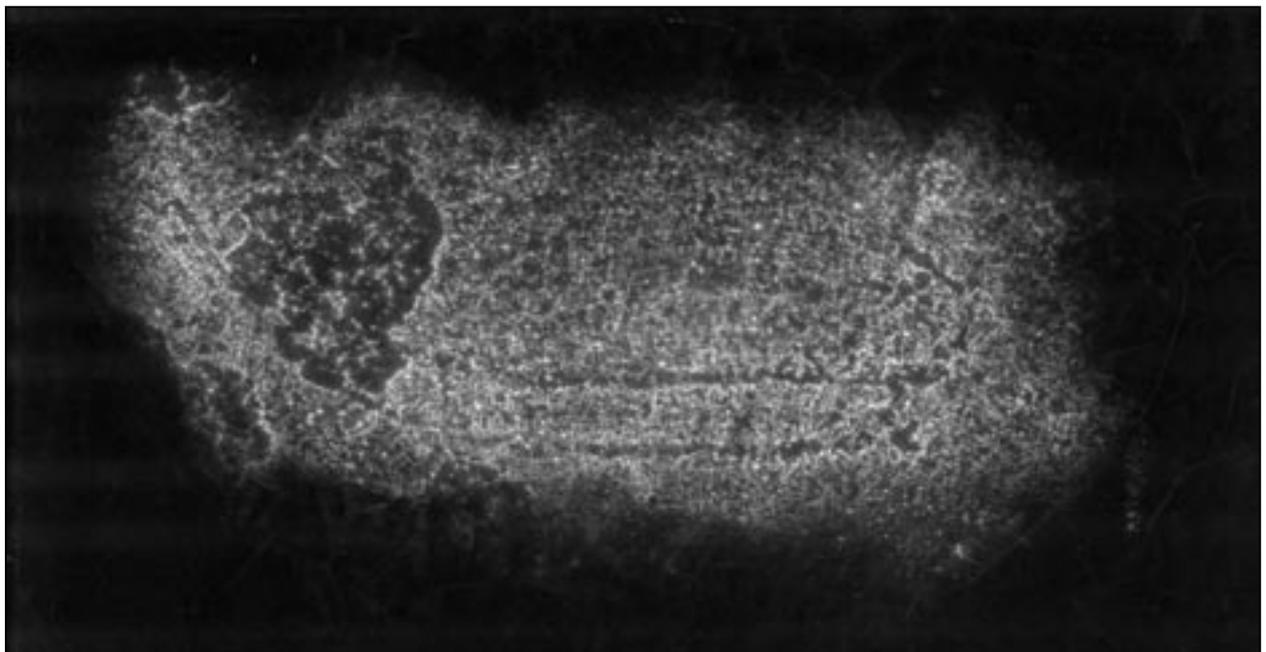
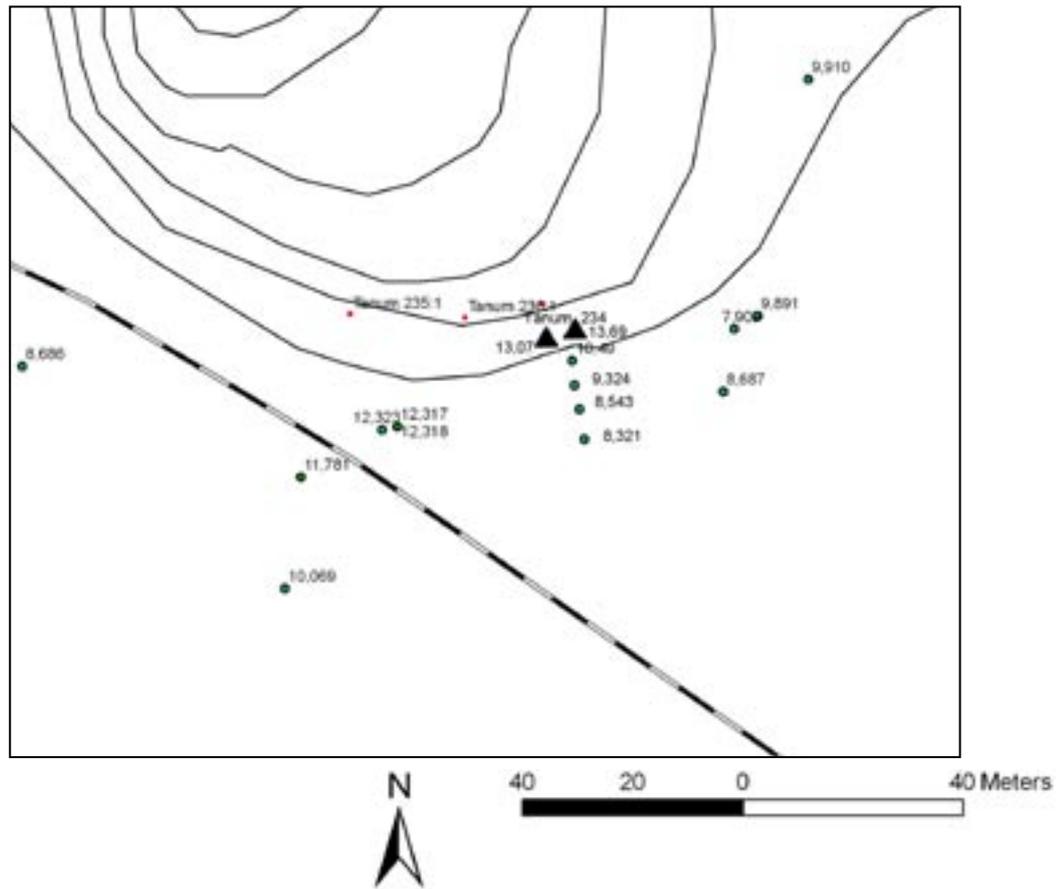


Figure 7.27. Top, map of the measured terrain and rock art site Tanum 234; triangles denote the altitudes of the two lowest images on the panel. Bottom, documentation of the panel (by VM, see also fig. 7.35).

Conclusion

Relating the ship types to the shore displacement data resulted in the following general conclusions (see fig. 6.6, 7.29):

- In relation to shoreline dating, an earliest date for the two ship images, situated today at altitudes of 13.20 and 13.02 m.a.s.l, respectively, seems to be period IV for the former and period IV–V for the latter.
- The engraved panels rose out of the sea during period IV.
- During the following phase, period V, the sea retreated to approximately 12 m.a.s.l and it would then have been possible to peck on both panels without being interrupted by tidal movements.

The “Wismar and Kivik” panel in Kalleby (Tanum 427)

This low-lying panel is located about 350 m west of Tanum 425, just 7 m northwest of a road that passes through a farmstead. The panel is made up of 8 ship images, 0.2–0.6 m long, that occupy a surface measuring 2 x 1 m on a rather flat outcrop facing the low clayey pastureland towards the north and west. The low altitude of this rock art panel compared to other sites in the area is noteworthy and the measured altitudes of the ship images are of direct interest for shoreline dating. Four of the images were made in a vertical row along a small fissure in the panel. Another large ship occupies the lowest part of the panel on the other side of the fissure. Four of the ships have inward turned stems and two have outward turned stems that end in an animal head (fig. 7.30). They all display horizontal or slightly upturned keel

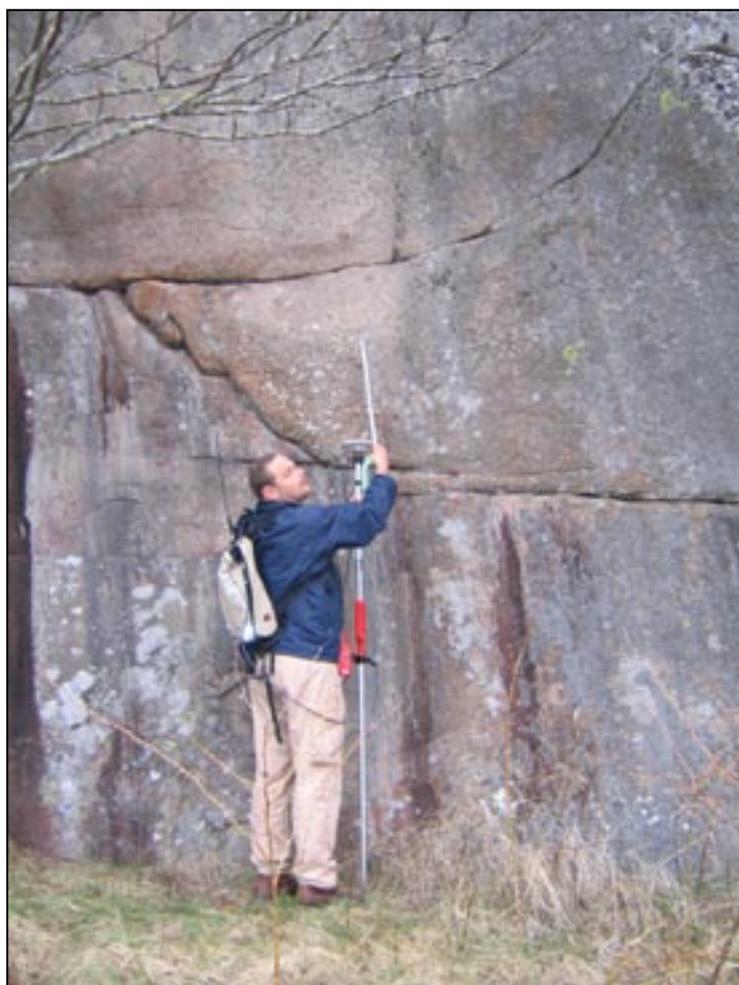


Figure 7.28. GPS measurement of the higher ship image on Tanum 234 (photo: Manuel Santos).

extensions and some have crew strokes. Furthermore, they all seem to have been pecked with the same technique.

The large ship images have some interesting traits. The lowest, with three crew strokes in the aft, strongly resembles the ship images of the Kivik

cairn (fig. 7.2), with their inward turned stems and horizontal keel extensions. This image is also notable for its low location, an altitude today of 14.73 m. Another large ship, on the other side of the fissure at an altitude of 14.75 m, looks like a combination of a Kivik ship and ship types with a broad or flat

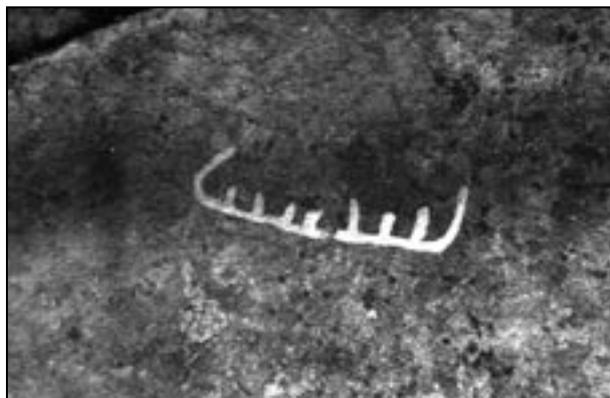
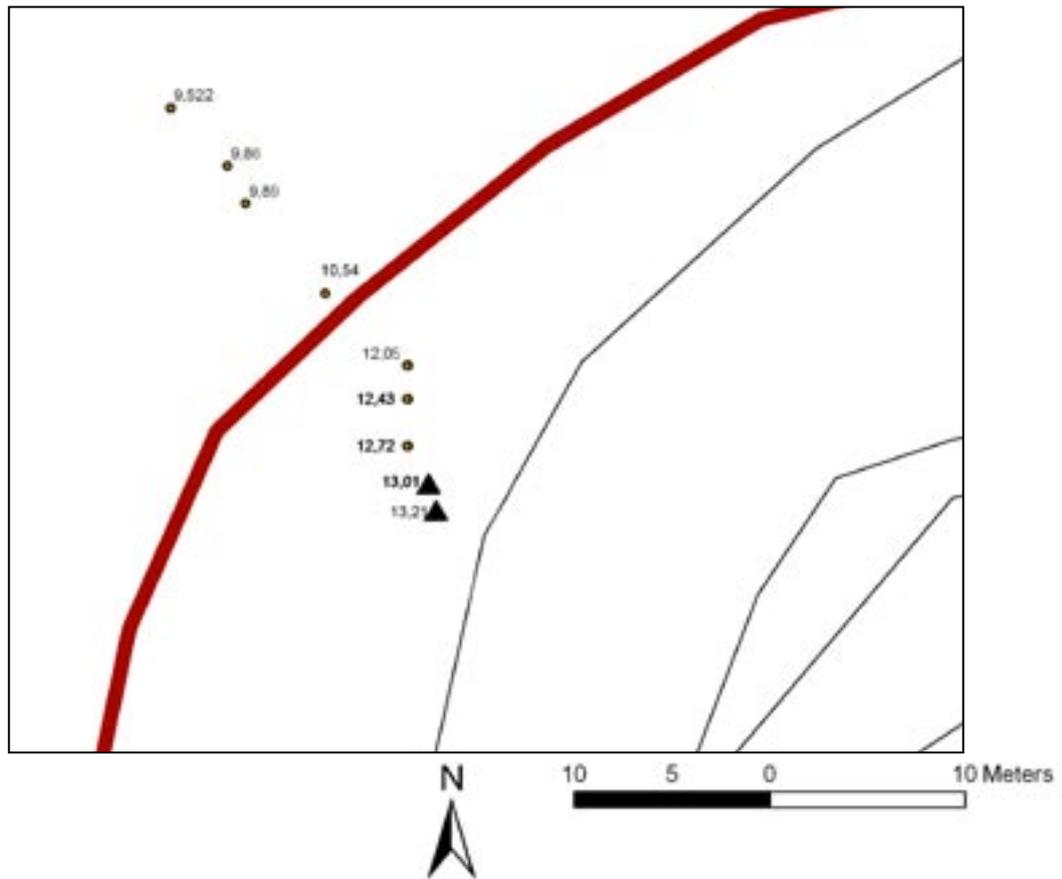


Figure 7.29. Top, map of the measured terrain and rock art site Tanum 425; triangles denote the altitudes of the two lowest images on the panel. Bottom, the lowest (left) and next lowest (right) ship images on the panel (photos: VM).

hull, such as the one on the stone at Truehøjgård in Denmark and ships from Torsbo (Kville 156, 172). It also brings to mind ship images on the Vitlycke panel (Tanum 1). The closest parallel is, however, the ship on the lower right-hand part of the panel Tanum 311.

The third ship of interest, located at the top of the vertical row at an altitude of 14.89 m, has outward turned stems that both end in animal heads, probably representing a horse (fig. 7.30). It has many similarities with the ship images on the Wismar horn, but even more with the lowest ship images on Tanum 311. However, the symmetrical shape of the fore and aft keel extensions is very different from the asymmetry of the ship images on the Wismar horn and on Tanum 311.

Discussion

Relating the measured altitudes of the ship images on this panel to the area's shore displacement data motivates the following statement:

- The upper part of the subsequently engraved panel rose out of the sea during the transition between period II–III. At that time the shoreline, including the tidal movement of 0.5 m, was about 14.5–15 m higher than today.
- During the following phase, period III, the shoreline retreated to approximately 14 m.a.s.l., making it possible to peck a large part of the panel's surface, though such activity would probably have been interrupted by the tide. Bearing this in mind, it might be more logical to assume that the lower part of the panel was made when the shoreline had retreated below the entire surface. The lowest of the images would then still have been at the water's edge.

A look at the panel's rock art images in relation to the two independent dating methods, comparative chronology and shoreline dating, suggests that the panel contains ship depictions from period II to III. However, a closer examination of these ships and their relation to the ancient shoreline points to a more limited chronological conclusion. Two of the ships strongly resemble the ship images on the slabs of the Kivik cairn, dated to period II, i.e. the 14th

century BC (Goldhahn 2005: 245pp). Moreover, the ship at the top of the panel is very similar to the ships on the Wismar horn. The altitude of these ships in relation to the BA shoreline suggests an earliest date in period II–III, rather than period I, particularly when the tidal movement is taken into account. It is interesting to see how these two independent dating methods once again correlate. Consequently, in relation to both comparative chronology and shoreline dating, it seems that a majority of the ship features on this panel primarily originated in a late phase of period II or early in period III.

However, the closest matching with the ship images on the current panels is doubtless the ones that have been pecked on the lower part of Tanum 311. The similarities between some of these ship images are striking (see fig. 7.26, 7.30). What is even more interesting is that the similar ship images on these two spatially separated panels (Tanum 427 is located about 2.5 km south of Tanum 311) are at much the same altitude, between 14.7–14.9 m.a.s.l.

Another interesting aspect is these panels' similar setting in the landscape. Both were projected against a seascape throughout the BA. Finally, the similar setting and style of the ship images on these two panels indicate that the rate of shore displacement was rather constant during the EBA.

Conclusion

The analysis of the ship types combined with the shore displacement data resulted in the following general conclusions (fig. 6.6, 7.30):

- The upper part of the panel emerged from the sea in period II.
- In period III, the sea had retreated from the entire panel down to an altitude of 14 m.a.s.l. In keeping with the comparative chronology as well as the shoreline dating, it seems that a majority of the ship features on this panel primarily originated in a late phase of period II, or, more likely, period III.

In this maritime context, the ship formations or scenes on the panel may manifest maritime meetings, communications or initiations involving different social formations, positions and traditions.

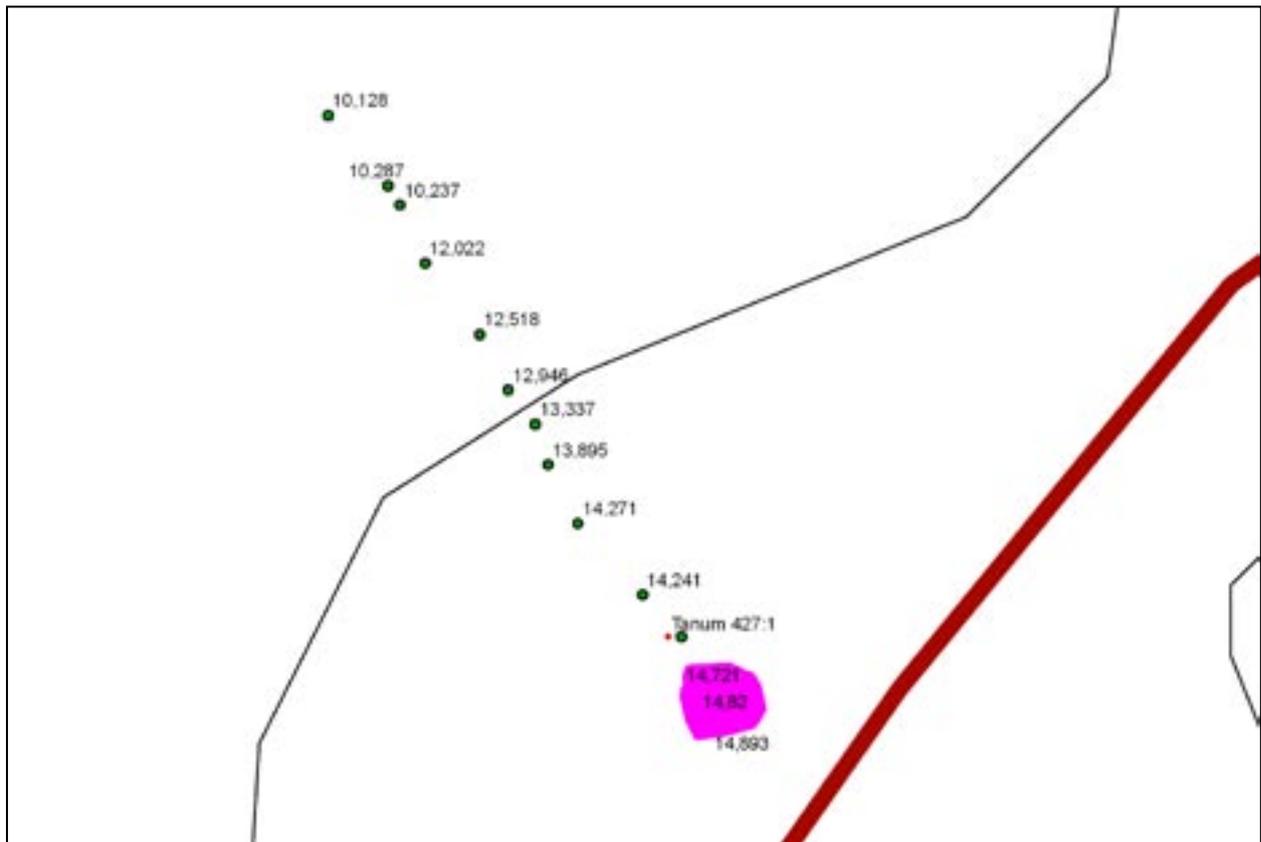


Figure 7.30. Top, map of the measured terrain and rock art site Tanum 427, showing the panel (indicated by a pink polygon) and the altitudes of the lowest, middle and highest ship images. Bottom left, photo of the panel in the landscape; bottom right, the ship images (photo: Johan Ling).

Rock art sites in the Orrekläpp area (Tanum 241, 369)

The last area in this analysis is situated on low ground between two small ridges that form a rather narrow passage. The first locality here, Tanum 241, contains two panels that present 3 symmetrical ships, 2 animals, 1 horseman, 6 cup marks and some lines (Högberg 1995: 91, fig. 7.31). The symmetrical ships and the horseman with a rectangular shield are typical PRIA features (Marstrander 1963: 62–63; Kaul 1998: 104pp). The largest ship depiction is often cited as an open-air analogy to the Hjortspring ship (Kaul 1998, 2003).

The panel was measured in the 1940s by Sven-Axel Hallbäck, who reported an altitude of 12.38 m.a.s.l, which is lower than any other rock art in Tanum. However, it is not clear which feature he measured on the panel in question. Today, the measured altitude of the land beneath the locality is 9 m.a.s.l. Just an ocular estimation from the panel to the ground is enough to tell that Hallbäck's measurement of the panel cannot be correct. The lowest ship was subsequently measured and found to be at an altitude of 14.14 m.a.s.l. So either Hallbäck measured something else or he transposed the data from 14.2 to 12.4 m.a.s.l, which seems possible. In any case, the new measurement, 14.14 m.a.s.l, is still one of the lowest for rock art in this area (fig. 7.31). Taken together, the altitude of the lowland, 9 m.a.s.l, the PRIA depictions on the panel and the shoreline during this period demonstrate that this panel also faced a narrow sea strike.

The other panel, Tanum 369, is rather complex and consists of 11 ships, 2 horsemen and 1 human figure (Högberg 1995: 99–100). All the ships are symmetrical in character and together with the animals and horsemen they indicate a very late date (fig. 7.32), most probably the PRIA (Marstrander 1963: 62–63; Kaul 1998: 104pp, 2003). The altitude of the lowest ship feature here was found to be 13.69 m.a.s.l (fig. 7.32), which showed it was one of the lowest ship features in Tanum.

Bearing in mind the altitudes of the panels Tanum 369 and 241, 13.69 and 14.14 m.a.s.l, respectively, and the estimation of their maximum age in relation to shore displacement, this discussion can be taken a step further. The latest shore displacement

curve shows that at the beginning of the BA the shoreline was about 16–17 m higher than today and that during period II it retreated towards 15 m.a.s.l, which means that these two ships could not have been made at that time (fig. 6.6). By the beginning of period III, however, the shoreline had retreated to 14 m.a.s.l, which is the same altitude as Tanum 241 and just 0.3 m above Tanum 369. As argued earlier, the theory that images were made at low tide suffers from the weakness that the activity would have been interrupted each time the tide came in (cf. Tanum 311). It is more reasonable to assume that this ship was made when the tide no longer caused an interruption (see Ch. 6), in this case at the beginning of period V when the shoreline was closer to 12 m.a.s.l (fig. 6.6).

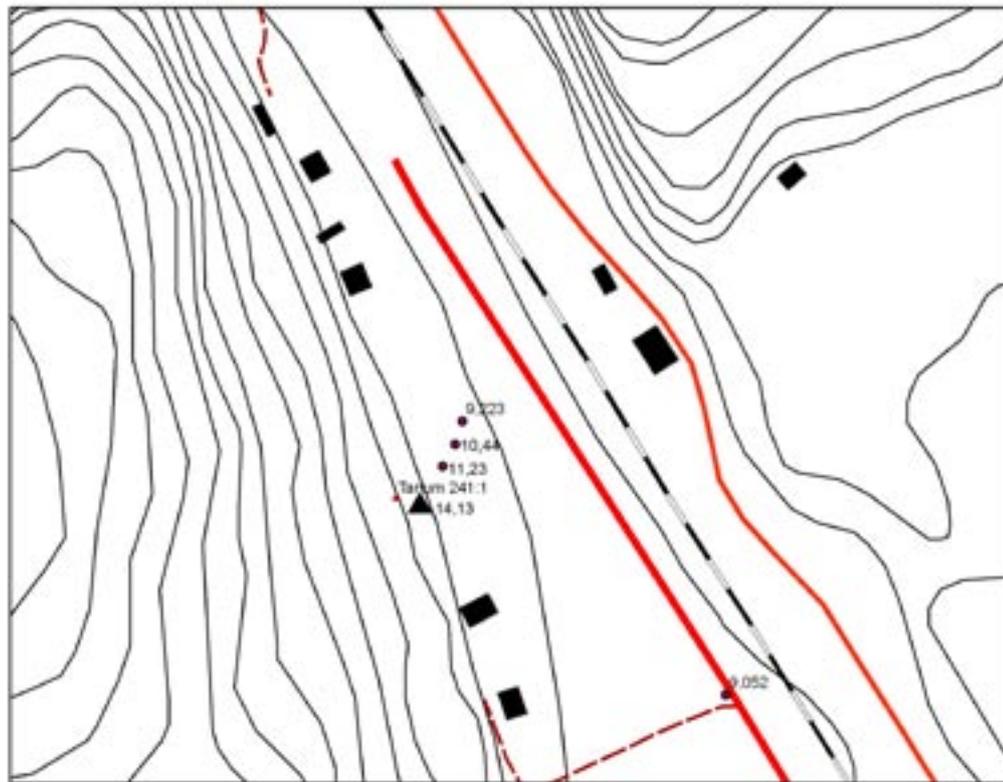
However, even this assumption is refuted by the very time-specific ship images on these panels, which clearly derive from the very beginning of the Iron Age. There is not a single BA artefact or grave that presents ships, figures or other images which correspond to these specific aesthetics and utterance, whereas several Iron Age finds, such as the Hjortspring context and other items, do have these characteristics (Kaul 1998, 2003). Still, it is the panels placing in the landscape, with the low-lying terrain around the sites, that is probably the strongest argument in this case.

During the PRIA this was one of the few areas with rock art that remained in contact with the sea. The production of rock art continued with Iron Age images on the lower outcrops of this narrow inner skerry.

Conclusion

The observations concerning these panels lead to the following conclusions (fig. 6.6, 7.32):

- In relation to the shoreline dating, an earliest date for the two ship images, situated today at altitudes of 13.20 and 13.02 m.a.s.l, respectively, indicates that the former could have been made during the transition between period III and period IV and the latter in period IV.
- The panels are dominated by PRIA ship depictions, which agrees with the shoreline at that time. During the PRIA this was one of the few



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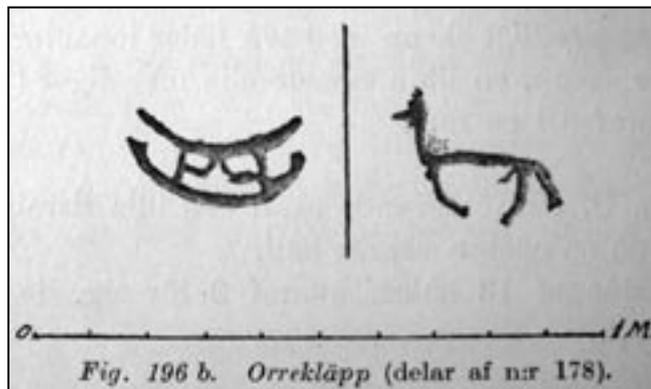


Figure 7.31. Top, map of the measured terrain and rock art site Tanum 241; the triangle denotes the altitude of the lowest ship image on the panel. Bottom, documentation of the images on the panel 241 (after Almgren 1912).

areas in Tanum with rock art that remained in contact with the sea.

A tentative ship chronology of the landscape

In this final section, the most significant ship images in this case are considered in relation to shore displacement simply by placing them in the new shore

displacement schema for the Tanum area. Figures 7.33 and 7.34 clearly show that the ship depictions at the highest altitude have inward curved stems and horizontal or highly upturned keel extensions. The more upturned keel extension on the later ship images distinguishes them from the earlier ships. This is the case with the ships from Kville 172.

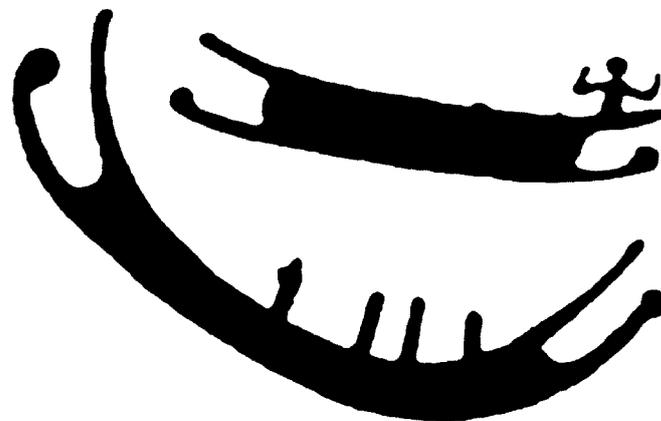
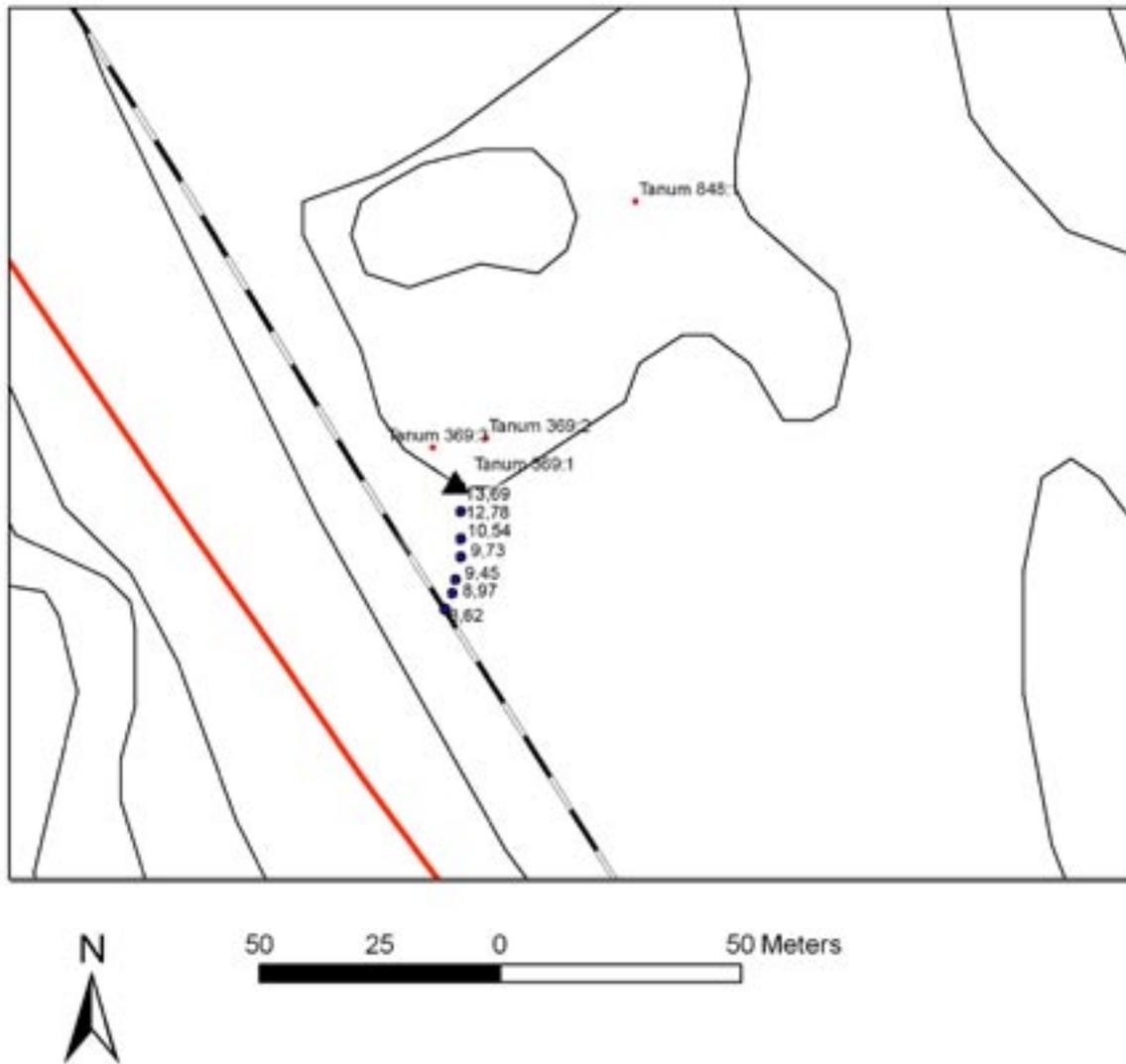


Figure 7.32. Map of the measured terrain and rock art site Tanum 369; the triangle denotes the altitude of the lowest ship image on the panel. Bottom, ship images from Tanum 369 (remade after Högberg 1995).

The keel extension becomes even more accentuated during period IV–V, as in the case of Tanum 425 and Svarteberg 13 (figs. 7.21, 7.23). The stems appear to be a less significant chronological feature than the keel extension, because inward turned stems also occur at localities with typical LBA features, for instance Tanum 62 (Högberg 1995: 30) and Kville 228 (Fredsjö 1981: 293). The altitudes of these particular localities likewise indicate period I–II. Other Scandinavian examples with ship features, such as the Hjortekrog grave (Widholm 1998), present similar chronological traits (Kaul 2005: 124). Moreover, Kaul has stressed this with regard to bronze items (Kaul 1998).

Nevertheless, the shore displacement data show that the lowest ship images with outward turned stems that end up in an animal head could not have been made before period IV. The ship feature from Tanum 425 illustrates this. In addition, it presents a bird-like animal head, a trait that is typical of period IV (Kaul 1998: 89).

Finally, the lowest of the measured ship depictions have some very specific characteristics. They are symmetrical and have a bifurcated stem fore and aft. These characteristics are assumed to be typical chronological features of the PRIA (fig. 7.31, 7.32, Kaul 2003: 192–195). However, shore displacement made it possible to create these ship images as early as the transition between periods IV and V, so these observations do not automatically justify dating these ships to the PIRA. On the other hand, such a dating is supported by the fact that localities with typical PRIA features, such as symmetrical Hjortspring-like ships and horse riders with rectangular shields, are situated at the lowest altitudes, for instance Tanum 241, 369 and 474. Moreover, single-lined ship features are also represented on the lowest panels, for instance Tanum 234 and 425:2.

Another observation concerns localities with ship depictions that display traits which are typical of the earliest phase of the EBA, period I, traits similar to the ship depiction on the Rørby sword, dated to period Ib. This applies to localities such as Tanum 22, 66 and 1740 (Högberg 1995, 1998; Milstreu & Pröhl 1996), Kville 156 and 157, and Svenneby 21, 30 and 40 (Fredsjö 1971, 1981). All of these ship depictions present traits that are typical of the earli-

est phase of the EBA. These rock art ships have the following characteristics:

- Symmetrical and horizontal keel lines.
- Horizontal or slightly upturned keel extensions or prows.
- Sterns with an oval stabiliser made horizontal or sloping slightly downwards.
- Convex, semicircular stems that end up in dots.
- Figures or features on or in the ship consist of crew lines only; sometimes one in the stern, one in the aft and the rest pairwise, sometimes just pairwise.

None of these localities is at an altitude today below 19 m.a.s.l. This may indicate that these ship images were made before the BA, presumably during the LN. That would, indeed, be a logical assumption, especially considering the large amount of LN material in these areas. It would also suggest that the depicted ships were based on real vessels and an existing boat-building tradition and knowledge (e.g. Marstrander 1963; Kaul 1998, 2003; Østmo 2005).

Another noteworthy fact is that some of the ship depictions at these high altitudes are very similar to some of the Norwegian ship images that have been connected to the LN II (Mandt 1991; Sognnes 2001, 2003; Nordenborg Myhre 2004; Østmo 2005). So why are all these early ship images located at such high altitudes? Why have none of these typical ship images been placed closer to the seashore, like the later ship images from period II to the PRIA?

Might it be logical to assume that open-air rock art, such as ship images, was first made and articulated in the landscape and was then acknowledged as functional social and ritual symbols which later ended up on bronze items and graves? There is, however, no other material evidence, such as ships depicted on items, graves, etc., to support such an assumption.

But if the altitude of the rock art in the areas considered here does not have anything to do with the rock art's age, why are so many ship features from the BA and the PRIA sited at specific altitudes, the former on higher ground and the latter towards lower ground?

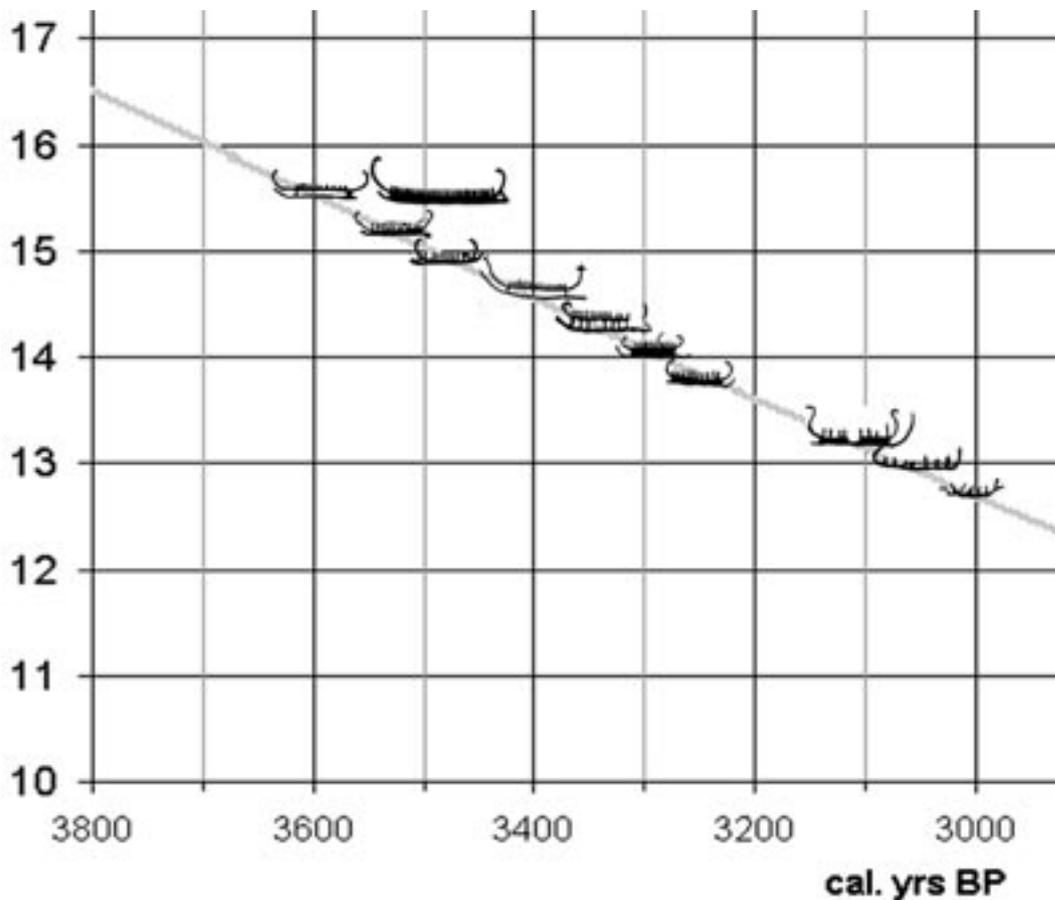


Figure 7.33. The lowest of all the measured ship images in relation to the new shore displacement curve. The figure is based on major parts of Berntsson's shoreline figure for Tanum (cf. fig. 6.6). The grey shoreline represents the earliest date when these particular ship images could have been made. All ship images are shown to scale. Note that this figure refers only to the lowest ship images and does not indicate the general altitudinal distribution of these ship types in the landscape.

This attempt at a tentative ship-chronological synthesis of the landscape is illustrated by figure 7.35. The concept of chronology that has been outlined so far is primarily based on the altitude of the ship types in relation to shore displacement. This final ship scheme, however, is based on the agreement between, or a synthesis of, two chronological methods that seem to harmonize very well, namely shore displacement and comparative chronology.

This generalisation may be of some chronological relevance for rock art in Bohuslän but one should be cautious about removing or abstracting ship features from their landscape context. It is preferable to study the context of motifs on these panels and the setting of the specific panels in relation to shore displacement.

Conclusion

In general, none of these panels present ship features that diverge considerably from the comparative chronological sequence in relation to shoreline dating, including a normal tidal movement of approximately 0.5 m. Some of the ship depictions do, however, diverge from Kaul's schema. The observations may contribute to a modification of Kaul's schema as regards Bohuslän. For this purpose, some of the most significant chronological criteria are summarised below, together with additions and elaborations (see fig. 7.35).

Period I: 1700–1500 BC

Ship no: 1 – Tanum 22:2, 27 m.a.s.l

Example of bronze items: The Rørby sword

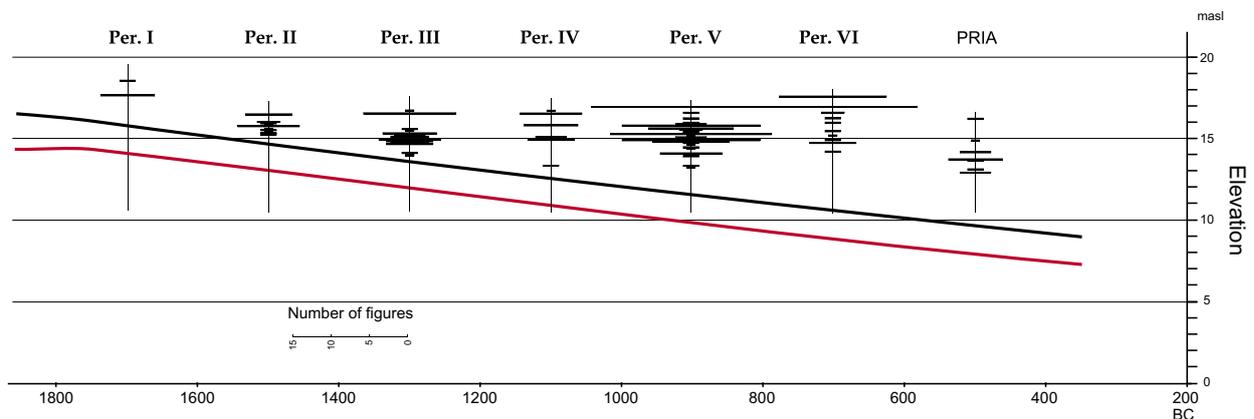


Figure 7.34. The number and altitude of the ship images and the chronological phase to which they belong. The ship images are classified on the basis of the earliest date of the lowest ship images in Tanum in relation to shore displacement. The higher black curve = Berntsson's (2006) estimation of the shore displacement in Tanum; the lower red = Pässe's (2003) (figure: Per Persson).

Examples of rock art localities: Tanum 22, 66, 1740, Kville 156, 157, 162, Svenneby 21, 30, 40

Keel line: Symmetrical, horizontal

Keel extension, prow: Horizontal or slightly upturned

Stern: Stabiliser oval, horizontal or slightly downwards

Stems: Inturned and convex, semicircular bowed stems that end in a point or dots

Features in the ship: None or few crew lines; one in the stern and one in the aft, the rest pairwise. All the crew are shown leaning and with a point or dot for a head

Period II: 1500–1300 BC

Ship no: 2 – Tanum 311, 15.69 m.a.s.l.; 3 – Tanum 311, 15.66 m.a.s.l.; 4 – Tanum 311, 15.88 m.a.s.l.; 5 – Tanum 311, 15.23 m.a.s.l

Examples of bronze items: None

Examples of burial context: The Kivik cairn (and maybe the Sagaholm barrow)

Examples of rock art localities: Tanum 1, 66, 468, (311), Kville 162, 163, 210

Keel line: Asymmetrical, vertical

Keel extension, prow: Slightly upturned (horizontal)

Stern: Line joining the stabiliser with the stem, stabiliser oval, horizontal or slightly downwards

Stems: Inturned and convex bowed stems, not semicircular as in period I but still tending to end in a

point or dots

Features in the ship: None or few crew lines, occasionally one in the stern and one in the aft, the rest pairwise. All the crew are shown leaning with a point or dot for a head

Period III: 1300–1100 BC

Ship no: 6 – Tanum 311, 14.73 m.a.s.l.; 7 – Tanum 427, 14.75 m.a.s.l.; 8 – Kville 172, 14.14 m.a.s.l.; 9 – Kville 172, 14.02 m.a.s.l.; 10 – Kville 172, 13.88 m.a.s.l

Examples of bronze items: The Wismar horn

Examples of burial context: The Sagaholm barrow

Examples of rock art localities: Tanum 1, 3, 12B, 25, 65, 66, 311, 427, Kville 162, 171, 227

Keel line: Asymmetrical, vertical

Keel extension, prow: Upturned (or slightly upturned)

Stern: Often a straight line or stabiliser

Stems: Outturned or inturned bowed stems, sometimes ending in an animal head

Features in the ship: None or few crew lines, occasionally one in the stern and one in the aft, the rest pairwise. Lures as for Tanum 66, 311, and Kville 162.

Period IV: 1100–900 BC

Ship no: 11 – Tanum 425, 13.20 m.a.s.l

Examples of bronze items/graves: razors

Examples of burial context: the Hjortekrog cairn

Examples of rock art localities: Tanum 1, 12, 25, 66, 311, 325, 326, Kville 224, 227

Keel line: Asymmetrical, vertical

Keel extension, prow: Markedly upturned, vertical

Stern: Often a straight line or stabiliser

Stems: Outturned bowed, often ending in an animal head, horse or aquatic bird

Features in the ship: Crew, armoured warriors, battle scenes etc.

Period V: 900–700 BC

Ship no: 12 – Svarteborg 13, 13.20 m.a.s.l; 13 – Tanum 234, 13.74 m.a.s.l

Examples of bronze items: razors

Examples of rock art localities: Tanum 1, 234, 326, Kville 59, 216, 227

Keel line: Asymmetrical, vertical

Keel extension, prow: Vertical or markedly upturned, sometimes attached to the prow with a line

Stern: Often a straight or slightly downturned stabiliser

Stems: Elaborate outturned, ending in an S-shaped animal head, often stylized horses with spiral shaped head (or birds?)

Features in the ship: Crew, armoured warriors, battle scenes, etc.

Period VI: 700–500 BC

Ship no: 14 – Kville 208, 15.65 m.a.s.l

Examples of bronze items: razors

Examples of rock art localities: 1, 61, 62, Kville 216

Keel line: Symmetrical, vertical

Keel extension, prow: Vertical or heavily upturned, distorted, prow and keel extension integrated symmetrical with the stem

Stern: Stabiliser?

Stems: Outturned, ending in an S-shaped animal head, stylistic horse (or bird?)

Features in the ship: Crew, armoured warriors, battle scenes, etc.

PRIA: 500–1 BC

Ship no: 15 – Tanum 234, 13 m.a.s.l; 16 – Tanum 369, 13.64 m.a.s.l; 17 – Kville 114, 12.84 m.a.s.l

Examples of bronze items: None

Examples of graves: None

Examples of rock art localities: Tanum 30, 75, 76, 478

Keel extension, prow: Symmetrical hull and keel extension, same features fore and aft.

Stems: Outturned and symmetrical, some are attributed with bifurcated stems fore and aft

Features in the ship: Armoured warriors, animals.

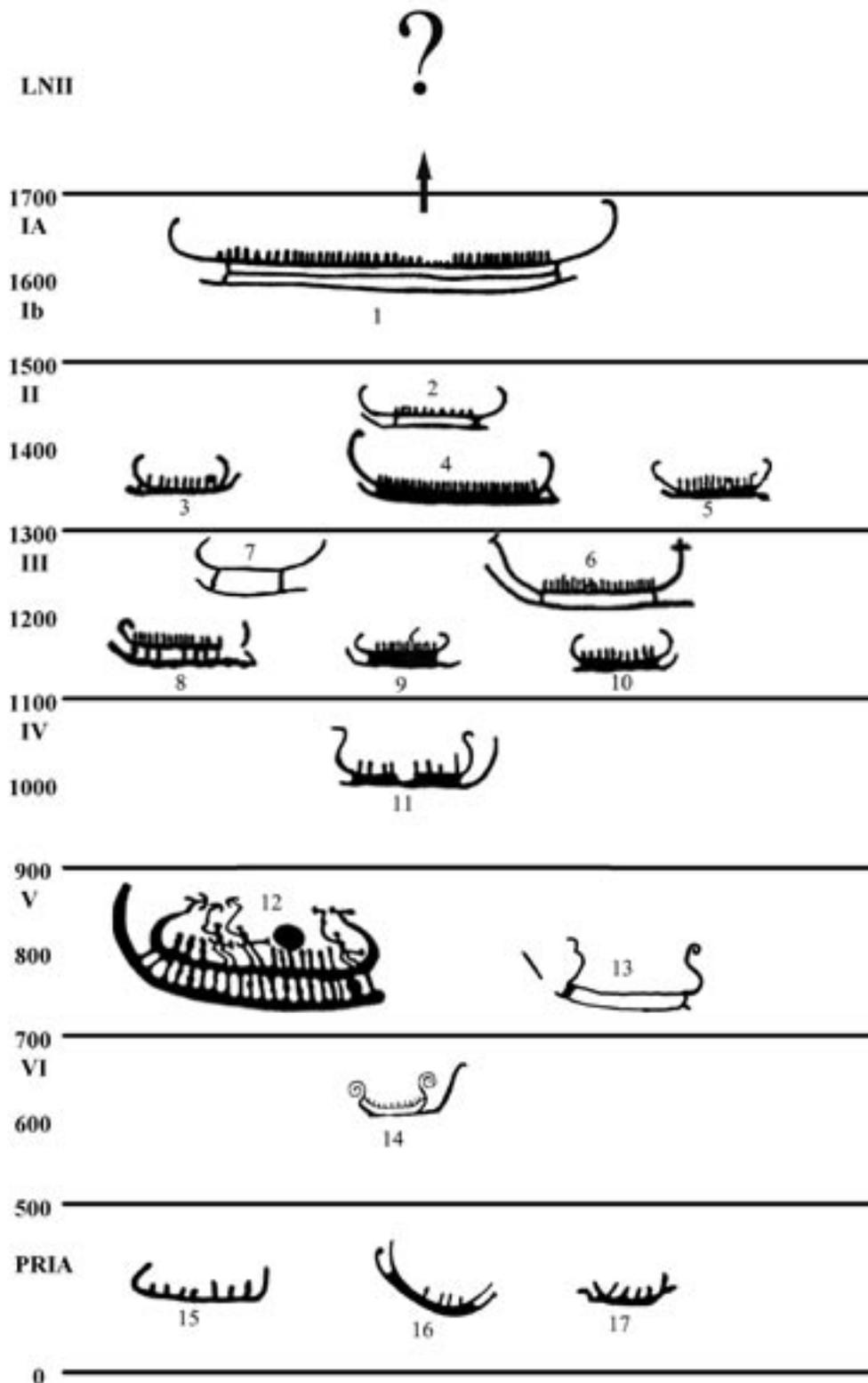
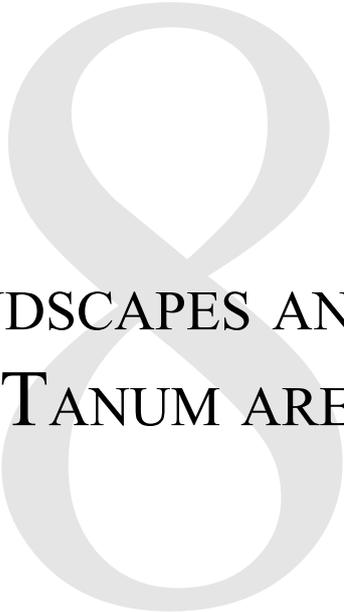


Figure 7.35. Measured ship depictions in relation to shore displacement. Ship images with inward turned prows dominate during the Early Bronze Age, about 1700–1100 BC, while outward turned prows ending up in animal heads are characteristic of the Late Bronze Age, 1100–500 BC, as are symmetrical ship images of the Pre Roman Iron Age, 500–200 BC.



MODELING LANDSCAPES AND SEASCAPES IN THE TANUM AREA

Introduction

A major hazard when working with rock art in the landscape of Tanum is the tug-of-war between shore displacement and the power and impact of today's landscape. Sometimes it feels like chasing a ghost because even if the GPS clearly demonstrates that the terrain and the rock art sites in question were once incorporated in an ancient seascape, it is hard to picture this lost scene.

Furthermore, it is the present agrarian landscape that has traditionally inspired rock art research in Tanum, much due to a misunderstanding of shore displacement but also to evolutionary conceptions of Bronze Age society (e.g. Almgren 1927; Bertilsson 1987; Fredell 2003; cf. Ling 2004a, 2005, 2006; Nordenborg Myhre 2004; Coles 2005, 2006).

Aims

This chapter presents the fieldwork, the measuring of rock art and the surrounding terrain in Tanum. It aims to launch new detailed facts, perspectives and questions about how the rock art and the landscape in Tanum could be perceived, reconstructed and understood in relation to shore displacement and the proposed chronology. As stated earlier, a majority of the rock art in northern Bohuslän seems to have been sited close to the contemporary BA shore. About 70 percent of the rock art sites in the World Heritage area of Tanum have low locations near to

what in the BA were shallow bays, estuaries and inlets (fig. 8.1, 8.2). However, this statement needs to be further developed. As it was not possible to make a detailed map of each and every site or locality in question, I have sampled some of those that are most relevant for the present purpose.

The rock art panels that are most significant for a dating discussion have been presented in an earlier section, as has an argument for a new ship chronology. As most of the rock art sites are located at comparatively high altitudes, that discussion focused on a smaller set. Even so, relating the chronology of the ship images on the panels and the panels' altitudes to shore displacement makes it possible to arrive at a broad picture of how the landscape by the rock art in Tanum was constituted during the BA, which is the primary aim of this chapter.

Some of the panels have already been accounted for but here we are more concerned with aspects of the landscape and the relation to other prehistoric remains than merely with chronology. However, the interaction between these two aspects – landscape and chronology – is central to a discussion about different temporal aspects of the landscape in relation to the rock art. Various observations and ideas will therefore be presented about the relation between these rock art sites, the landscape, shore displacement and other prehistoric remains. Each locality has specific traits and relationships that need to be

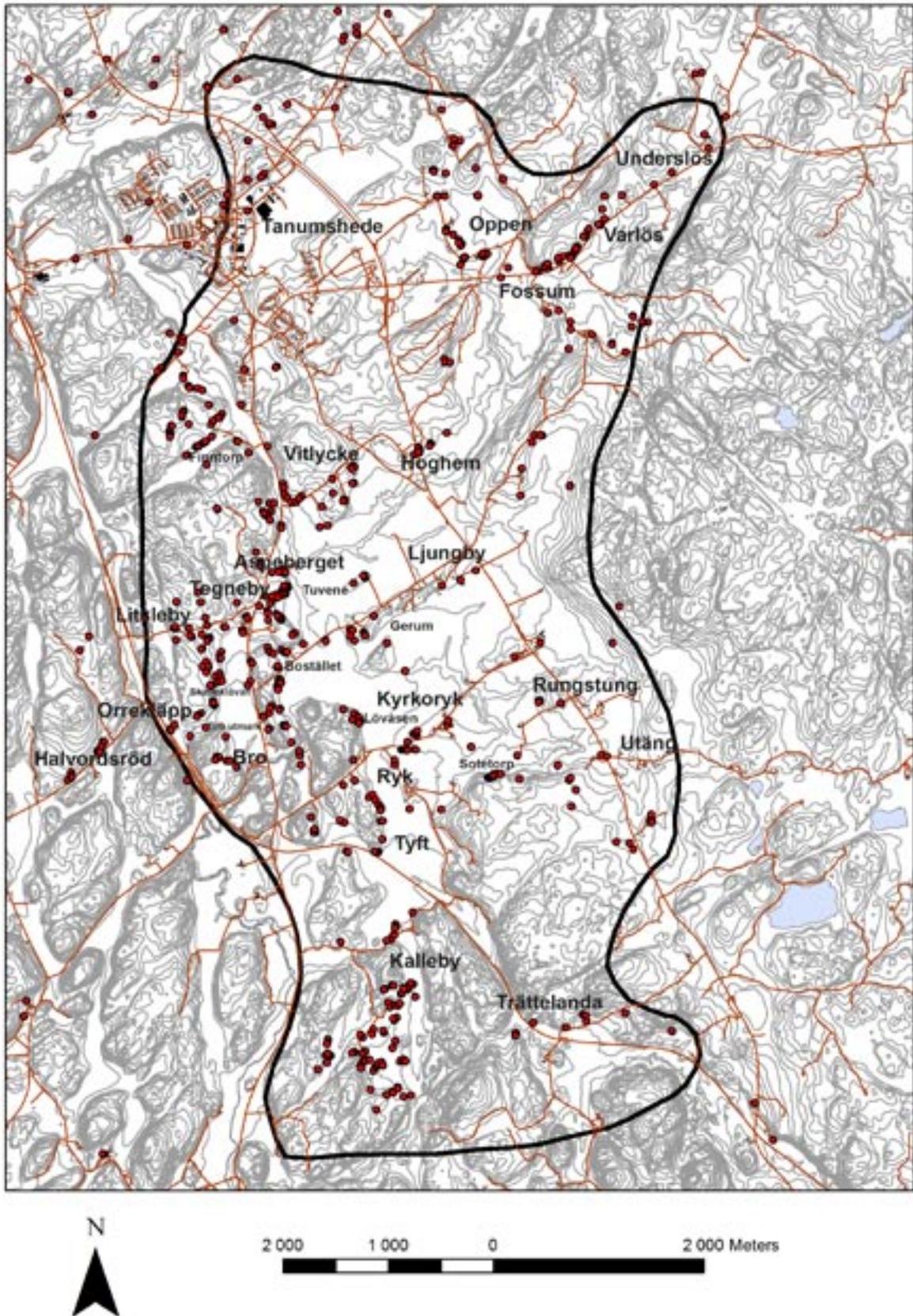


Figure 8.1. Map of the rock art in the World Heritage area in Tanum; red dots indicate the distribution of the rock art sites.

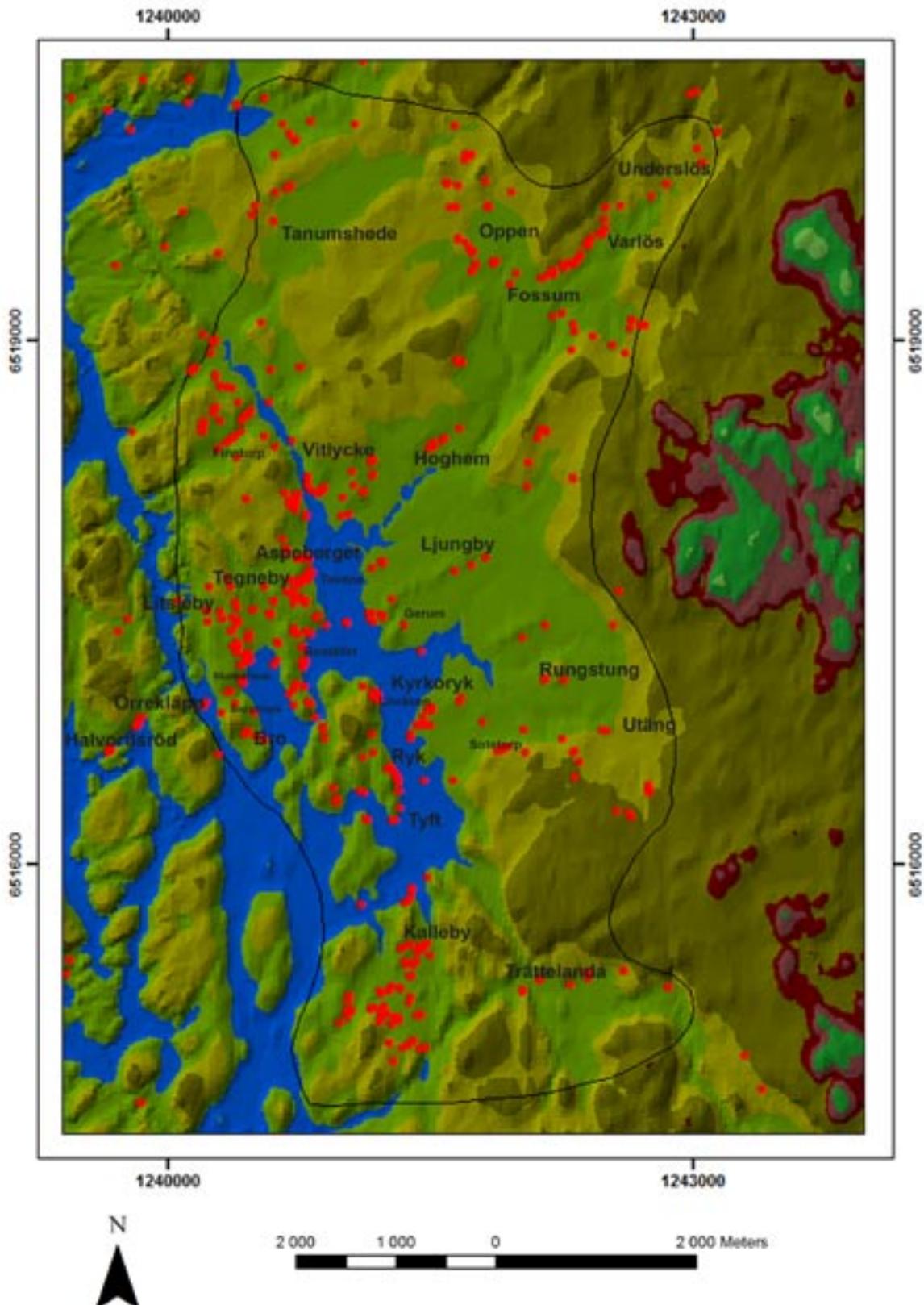


Figure 8.2. Map of the rock art in the World Heritage area in Tanum in the Bronze Age, when the shoreline corresponded to today's altitude of about 13 m.a.s.l; red dots indicate the distribution of the rock art sites.

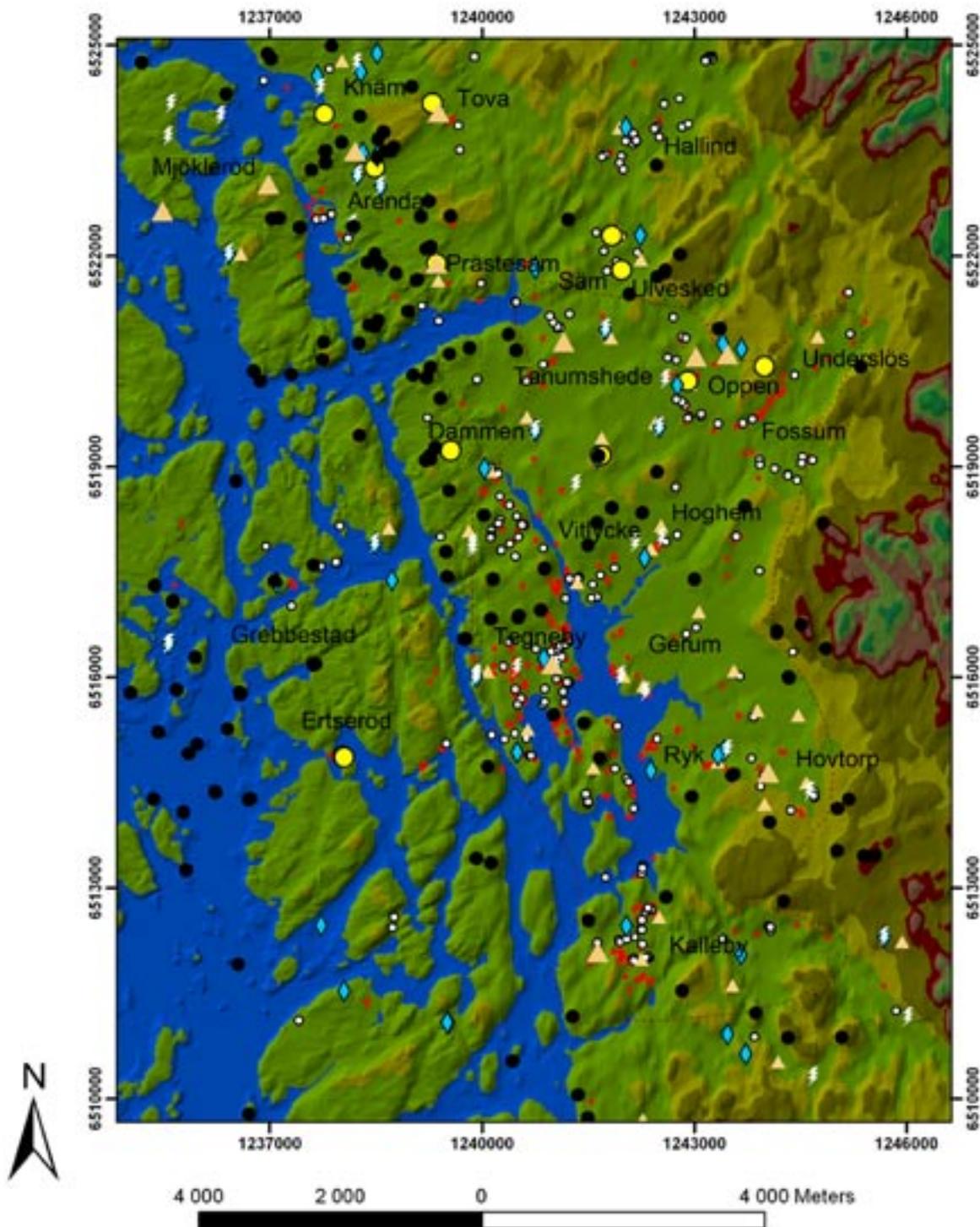


Figure 8.3. Map of the Tanum area in the Bronze Age showing the shoreline about 13–14 m.a.s.l.; red dots = rock art sites; white dots = cup mark sites; black dots = cairns; large buff triangles = settlement finds (carbon dates, ceramics, or other features) dated to the Bronze Age; small buff triangles = indicative settlement sites from the Bronze Age; yellow dots = bronze items; blue diamonds = daggers from LNI-EBA II; white flashes = sickles from LNI-EBA II (information based on FMIS; Bertilsson 1987; Algotsson & Svedberg 1997; Kindgren 1999; Aulin & Gustafsson 2002; Bengtsson & Strid 2005; Munkenberg & Gerdin 2005).

stressed; these observations were made in connection with the fieldwork in the area. To be able to understand the following discussion about rock art and landscape, it is necessary to bear in mind the observations at these localities and the comments on them. Some famous areas with rock art sites, located on higher ground, will not be dealt with here, for example the areas of Fossum, Finntorp and Litsleby. Most of the rock art sites are located towards the lower parts in the area, and it is some of them that are analysed here.

It should also be stressed that many of these rock art panels display a very complex set of images and compositions. This calls for a more developed theoretical approach and for this purpose a part of the dissertation has been dedicated to a more thorough consideration of these issues (see Ch. 9–12).

After these general statements, the questions addressed in this case study are as follows:

- In which specific ways did shore displacement during the BA affect these rock art sites?
- For how long were these panels in use?
- How close was the sea to the rock art sites?
- Was some of the rock art made at the water's edge?
- Was the sea a major factor behind the choice of sites and if so, would these observations alter our perception of the rock art as a means of social and ritual communication during the BA?

Finally, before presenting this case study I will once again stress the major conditions, listed in Chapter 6, which are crucial for an understanding of the prehistoric landscape/seascape, namely:

1. Shore displacement and deforestation.
2. Tidal movement in Bohuslän and its effects.
3. The arbitrary and erroneous altitudes on the existing economic maps of the area.
4. The long-term agricultural process on the lower part of the plain in Tanum.
5. The cognitive understanding of an altered landscape.

The landscape and Bronze Age in Tanum

The landscape of the Tanum area is characterized

by fissure valleys, with gravel deposits on higher ground and extensive low-lying plains with clayey soils. Granite ridges and hills, outcrops and rocks frame and define this landscape with its open plains, narrow valleys and passages. All these landscape features were formed by ancient geological forces such as the inland ice and shore displacement. Another major feature is the large interconnected lowland area, the Tanum plain. This clay-soil plain is one of the most extensive lowlands in the whole of central and northern Bohuslän. Areas with sand and moraine occur northeast of the plain (e.g. the Fossum-Hoghem area), as well as to the east and southeast (the Utäng-Hovtorp area) and to the west in the Tegneby area (Bertilsson 1987; Svedhage 1997; Lindholm 1997).

Several small rivers run from higher ground and conjoin on the plain. On the lower, western parts of the plain, where the high granite hills form a narrow passage, there are some peaty lands/salt marshes (fig. 8.2). According to the economic map, the altitude of the lower parts of the plain ranges from 10–20 m.a.s.l and the higher parts from 20–25. However, as I will show, these data are both arbitrary and erroneous. According to the most recent shore displacement study in the area (fig. 6.6), the altitude of the shoreline at the beginning of the BA should be approximately 16–17 m.a.s.l, with a descent to 10–11 m.a.s.l towards the end of the BA (Berntsson 2006).

This geological frame can be used to derive a general idea of the prehistoric landscape. Another factor is that the lower plain areas have been intensively cultivated for at least two centuries, in some parts since medieval times (Lindholm 1997: 5). As a result of this long-term agricultural process, cultural sediments have accumulated and sometimes shifted from higher ground towards the lowest arable land in the plains. Recent archaeological surveys in these lower plains confirm that at least 1–1.5 m of sediment has accumulated in connection with agricultural processes (Algotsson & Swedberg 1997). That means that in prehistoric times the altitude of these parts of the terrain must have been at least 1 m lower than today (Påsse 2003; Risberg pers. comm. 2005). It should be added that PRIA settlements and graves, as well as pollen analysis and shore displacement,

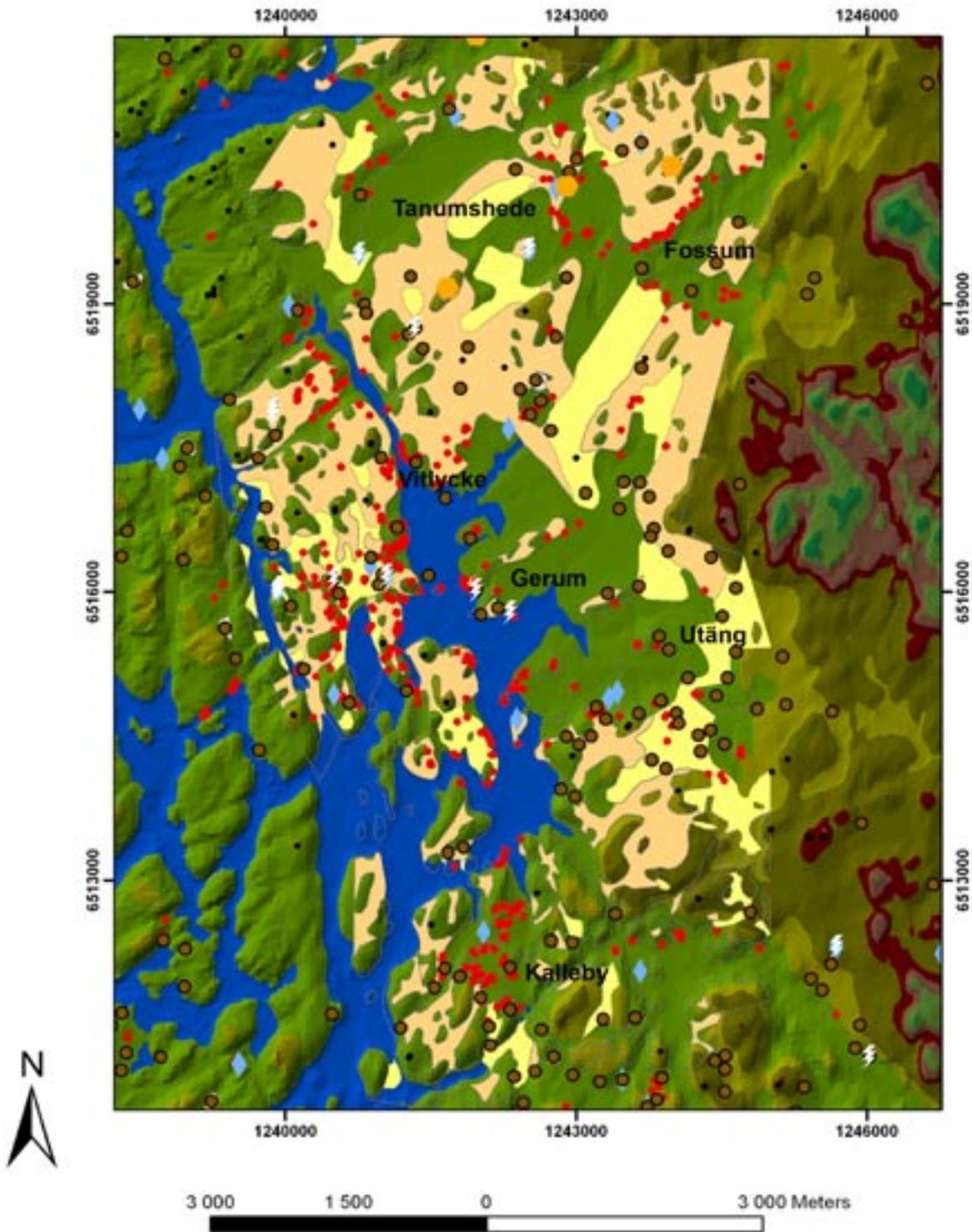


Figure 8.4. Map of the Tanum area showing geological and archaeological features; soil types represented by yellow or orange are mainly sandy soil on higher ground; brown dots = prehistoric settlements, which are mainly located on the sandy soil; red dots = rock art sites; yellow dots = bronze items; blue diamonds = daggers and sickles from LN-EBA; cairns = black dots.

indicate that some parts of the lower plain were already being cultivated and utilised during the PRIA (Bertilsson 1987; Algotsson & Swedberg 1997: 15; Lindholm 1997: 2; Svedhage 1997: 9–10).

Most of the rock art sites are situated on the edge of granite hills, adjacent to lowlands. The area has the highest number of rock art sites in the whole of Scandinavia, more than 630, and has accordingly attracted and engaged researchers for more than two centuries (Brunius 1839, 1868; Holmberg 1848; Montelius 1874; Eckhoff 1881; Almgren 1912, 1927; Bertilsson 1987; Hygen & Bengtsson 1999; Fredell 2003; Bengtsson 2004; Coles 2005; Vogt 2006). The high frequency of rock art has placed the Tanum area on UNESCO's World Heritage list (1994).

Higher up on the granite hills there are numerous cairns (163), stone settings (292) and barrows (112) (fig. 8.3, 8.38). Compared with the cairns, the barrows and stone settings have a considerably closer spatial connection with the rock art. About 14 cairns and 6 stone settings have been excavated over the years, most of them in the late 19th and early 20th century (Holmberg 1848; Montelius 1874; Hallström 1917; Gerdin 1999: 62–66). Their chronology is rather heterogeneous but mainly concentrated to the BA (Gerdin 1999: 66pp). All the investigated barrows in the area have been dated to the Roman period of the Early Iron Age (Montelius 1874: 370; Bertilsson 1987: 149; Munkenberg & Gerdin 2005: 15pp). However, there are some unexcavated barrows that might date to the BA, for instance those at Bro Utmark and Solbräcke (Bertilsson 1987: 128).

The parish contains only 2 gallery graves but there is a considerable number of settlement finds (178) as well as stray finds (76) and hoards (24), mainly dating from the Neolithic to the Iron Age. The majority of the settlement finds occur on the higher land (fig. 8.4, 8.5), approximately 500–1500 m east and southeast of the lower plain area where the majority of rock art sites are located (Bertilsson 1987; Algotsson & Swedberg 1997; Aulin & Gustafsson 2002; Munkenberg & Gerdin 2005).

So far, the area has not yielded a solid house structure that could be dated to the BA. However, a damaged house structure has been exposed at Finntorp, just 1 km north of the Vitlycke area. The

excavated segment consists of a side wall 19 m long and 0.4 m wide, with clusters of postholes adjacent to the inner side of the wall; the whole building is estimated to have been about 24 m long and about 6 m wide. The ceramic finds indicate that the house is from the Early Iron Age (Aulin & Gustavsson 2002: 11pp). Excavations of complex settlement features and rock art have also been carried out at Lilla Öppen, 2 km northeast of the Tanum plain. Radiocarbon and ceramic dating indicate that the rock art and settlement features had been used during the transition between the LBA and the PRIA, 650–340 BC (Aulin & Gustavsson 2002: 86).

More evidence of BA activity has been recorded at Ryland, Prästesäm and Håkeby, about 2–5 km north of the Tanum plain (fig. 8.3). It is, in fact, in the areas north and northeast of the Tanum plain that most evidence of BA activity has been found; excavations of settlement features and burial complexes have resulted in artefacts and radiocarbon dating which show that these areas were intensively used from the EBA to the LBA (Munkenberg & Gerdin 2005: 35, 101pp).

The use of GIS to plot and visualise the distribution of period-specific features and finds in the Tanum area has revealed patterns or clusters of presumptive dwelling sites from the BA (fig. 8.1). Future systematic surveys of these clusters may add to our knowledge of the BA settlement pattern in these areas and further discoveries may throw new light on house structures and settlement sites, as well as their uses in these areas during the BA.

Moreover, excavations carried out at 6 separate rock art sites in the Tanum area have provided some interesting results. C14 analyses have demonstrated a clear chronological connection between the prehistoric activity and images on the rocks, and artefacts and features of a ritual character have in some cases been exposed (Bengtsson 2004; Bengtsson et al. 2005). The parish has the highest numbers of flint daggers and sickles in the whole of Bohuslän, with dates ranging from the LN to the EBA. These finds include 81 daggers, 14 triangular arrowheads, 88 sickles from various sources, such as hoards (33), graves (7) and stray finds (143, see Algotsson & Swedberg 1997; Apel 2001). The flint daggers have apparently been imported from Jutland, which

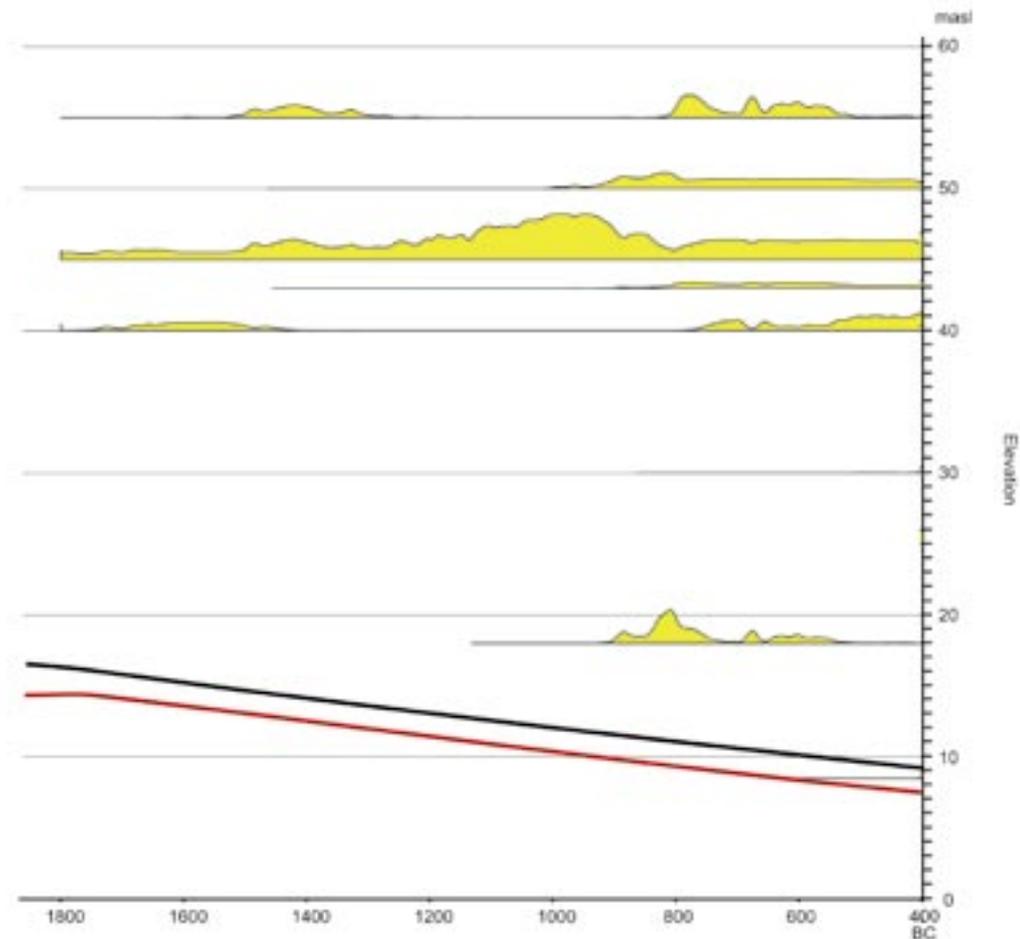


Figure 8.5. Altitudes of 51 different carbon dated archaeological features in Tanum in relation to Berntsson and Risberg's model of shore displacement in the area (upper curve) and to the model suggested by Påsse (lower curve). The figure shows that most of the BA activity was located on higher ground (C14 based on Algotsson & Svedberg 1997; Aulin & Gustafsson 2002; Bengtsson & Strid 2005; Munkenberg & Gerdin 2005, figure by Per Persson).

illustrates the area's potential and significance for dwelling and interaction during the LN–EBA (Apel 2001).

The bronze finds in the parish total 18. They include 4 flanged axes dating from the transition from the LN II and BA period I (Herner 1999: 18pp; Vandkilde 1996, pers. comm. 2005), as well as a hilt-plate sword from period II or III, a bronze-hilted sword from period II, 2 swords from periods IV–V and 5 socketed axes from periods V–VI. There are also 2 neck rings from the LBA and, finally, a sword pommel and a tutulus from period II (Bertilsson 1987; Algotsson & Swedberg 1997; Herner 1999).

Maritime models of the Vitlycke area (Tanum 1, 833)

The 100 or so rock carving sites in this critical area include many that are large in size, extensive in the variety of images and prominent among the craftsmanship and artistry shown (Coles 2005: 114).

Vitlycke, the most renowned rock art area in Scandinavia, lies where the Tanum River makes its way towards the open plain, passing two major hills. The rock art is situated on the lower parts of these two granite hills. Today, the river's altitude here is 10–11 m.a.s.l and the lowest parts of the terrain, on the



Figure 8.6. The major part of the famous Vitlycke panel Tanum 1 (photo: Björn Olson).

river's brink, are at 12. All the undulating terrain between the river and the outstanding Vitlycke panel (Tanum 1) has been measured (fig. 8.6, 8.7).

The large, complex panel has been the subject of many analyses and interpretations that now span almost two centuries (Brunius 1839, 1868; Holmberg 1848; Almgren 1912, 1927; Yates 1993; Hygen & Bengtsson 1999; Coles 2005). The images on the monumental Vitlycke panel occupy a surface measuring 8 x 20 m and include about 97 ships, 66 human figures, 27 animals, 7 foot soles, 4 circles, 5 other figures and 170 cup marks arranged in various social, ritual, antagonistic and sexual positions, actions and scenes (fig. 8.6). The concave panel makes a massive impression that is hard to put into words. Few localities display a comparable set of images and combinations and it makes a fitting conclusion to the numerous rock art sites in the area.

Most scholars have focused on the extravagant types of image on the panel, such as the wedding scene, the scenes with warriors and the one with the bull. But while these scenes are highly interesting, what really strike you as you approach the panel

is not these particular images so much as the ship images and ship scenes in different sizes and positions. The former images have a peripheral location on the panel, while most of the ship images are in the centre and make the greatest impact, dominating the surface with its 30° slope not only by their size but also with their elaborate styles and utterances (fig. 8.6).

Here it can be noted that the earliest ship image on the panel, with inturned prows, horizontal or slightly upturned keel extensions and crew strokes, probably dates from period II (fig. 8.6). However, most of the images seem to be from a later date, for example the LBA for the ships with outturned prows ending in stylistic animal heads, vertical raised keel extension and warriors with weapons, shields and extended calves. There are also warriors with rectangular shields that could date to the PRIA (Almgren 1927: 65; Marstrander 1963; Bertilsson 1987: 183). The measured altitude of the lowest image on this panel, a ship depiction, is 23.4 m.a.s.l and that of the highest is 25.9 (fig. 8.7). The locality is the lowest-lying of all the rock art localities situ-

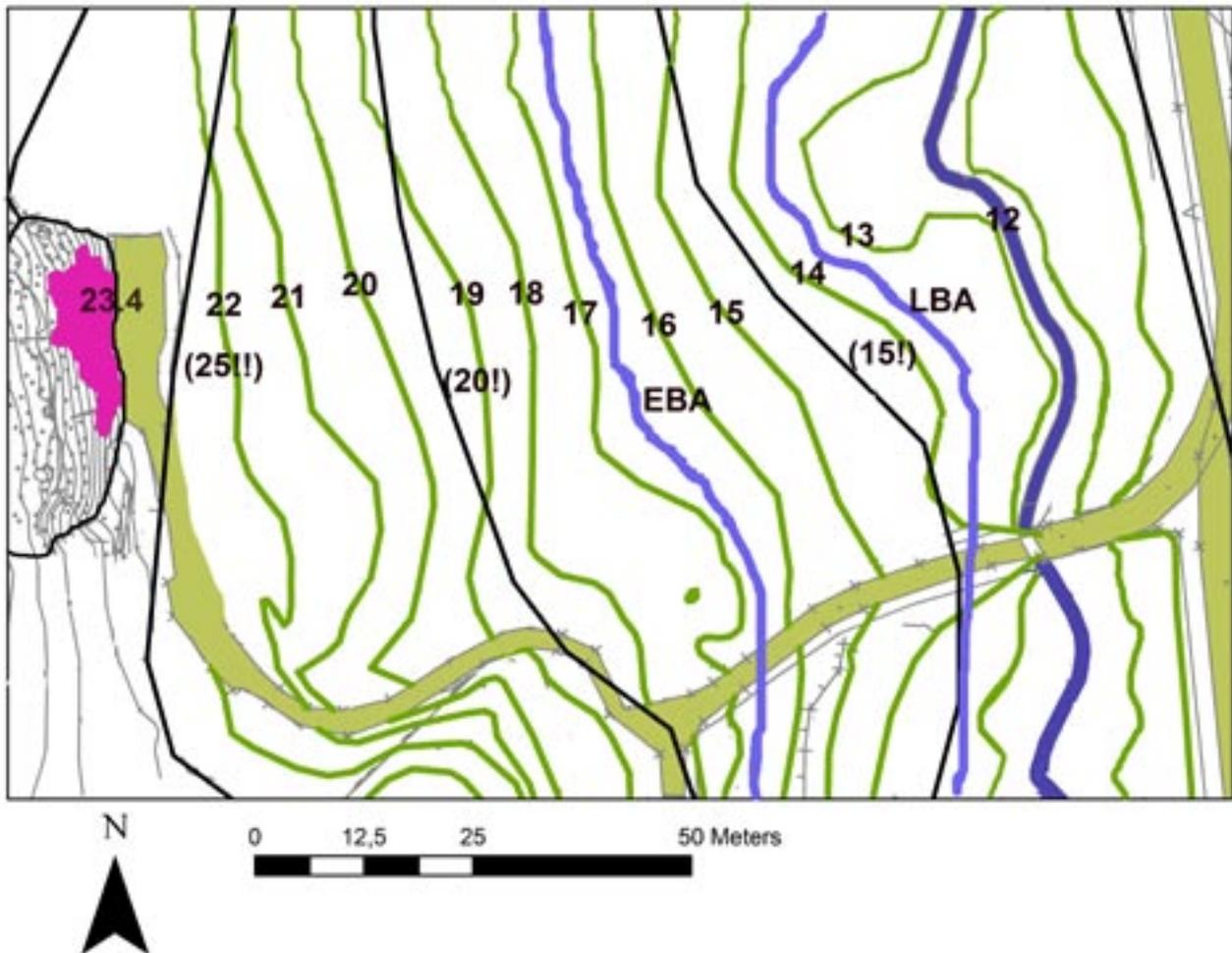


Figure 8.7. Terrain map of the area with the rock art panel Tanum 1; the height contours and the panel were generated on the basis of measurements by land surveyor Bo Nilsson and GPS measurements by Johan Ling. Tanum 1 is represented by the pink feature and the altitude of 23.4 m.a.s.l refers to the lowest image on the panel. The approximate EBA and LBA shorelines are represented by the higher and the lower blue line, respectively. The data in parentheses are the altitudes derived from the economic map and illustrate the arbitrary nature of this information in relation to the altitudes obtained with GIS measurements.

ated west of Vitlycke museum.

The next panel, Tanum 833, is situated on the opposite, eastern side of the Tanum River (see Högberg 2000: 77). It is oriented towards the west, facing Tanum 1, on a 10° slope and presents 23 ships, 4 human figures, 2 animals, 2 lines and 37 cup marks. The chronological sequence of images is similar to that of Tanum 1, with ship features from period II with inturned prows and horizontal or slightly upturned keel extensions, as well as ship features from period V with outturned prows ending in stylistic animal heads and vertical raised keel extensions. There are also human figures with extended calves,

presumably from period V–VI, as well as single and double lined ship features and some animals that indicate a PRIA action (Högberg 2000: 77). The lowest engraved part of the panel, a ship feature from the EBA, is at a measured altitude of 21.7 m.a.s.l and the highest is at 23.5.

One of the ship images is, interestingly enough, attributed with a sail that is attached to the inturned prows. This is a very atypical feature but it does occur at some rock art sites in southern Scandinavia (Althin 1945; Marstrand 1963; Burenhult 1980; Bengtsson 2003).

Landscape reconstruction

These observations warrant the following statements (fig. 6.6, 8.7, 8.8, tab. 8.1):

- The measured altitudes of the rock art sites demonstrate a close spatial connection with the shoreline throughout the BA, with a suggested horizontal distance of 30–50 m during the EBA, about 50–70 m during the LBA and about 70–100 m during the PRIA.
- The chronological succession of images on the panels Tanum 1 and 833, from the EBA to the PRIA, indicates that these panels were in use for over 1100 years. Thus, some images were initially made in the presence of the sea, others when the sea in this area had more or less disappeared. The action of making rock art on these panels seems to have become a tradition that continued through the BA and the PRIA.
- It is the ship depictions, positions and formations that make the greatest impact and dominate the panels, not only by their size and frequency but also with their elaborate styles and utterances. The best-known images on the panel Tanum 1, the wedding couples, the warriors, are in fact peripheral for a visitor, while most of the ship images are in the centre. The predominance of ship depictions and the orientation of the panel towards what was a BA seascape may indicate a pragmatic perception of the environment.
- The rock art's strategic maritime setting in a transitional shore zone may reflect different forms of maritime movements, interactions, positions, initiations, ideals or traditions. These panels may also have served as meeting points in the landscape/seascape.

Discussion

Knowing that the most of the panels in the Vitlycke area overlooked a seascape throughout the BA lends a certain perspective to time and space. For instance, the view from the ship-dominated panel Tanum 1 towards the seascape must have been prominent during the BA and the rock art images faced the sea.

Another landscape feature that needs to be considered and related to the rock art sites in the Vitly-

cke area is the Tanum River. Throughout the BA the river's outlet to the sea must have been this narrow passage. The river may have influenced the symbolic assignment of the rock art in this transitional zone (cf. Helskog 1999; Goldhahn 2002) and it could either have ensured the continuity of sea-going communications or acted as a stop. In this transitional shore zone, the rock art may have constituted maritime signs connected to different forms of maritime movement or interaction in this landscape. It is notable, for instance, that the sites at Vitlycke seem to follow the same maritime path or trail (fig. 8.6–8.8). Coles (2005: 114) describes this as follows: "The sites appear as clusters, linear in outlook, and focused on the waterways".

The low-lying area between Vitlycke and Aspeberget was measured on both sides of the river. At the lowest parts near the river, the land is at an altitude of 11–13 m.a.s.l and the river is at 9. This is highly interesting, particularly as the economic map puts the lowest land here at an altitude of 15 m.a.s.l (fig. 8.7, 8.9).

The Aspeberget area – a maritime aggregation site? (Tanum 17, 19, 120)

The Aspeberget hill with its many elaborate rock art panels is a central node in relation to all the rock art sites adjacent to the low plain in Tanum. The hill rises to an altitude of about 40 m.a.s.l. About 15 years ago there was an extensive view from here over much of the Tanum plain (Högberg 1988a), but today it is obscured by the trees that have grown up along the river.

This hill has 20 rock art panels, most of them on the eastern slope close to the Tanum River, which is joined by the Hoghem River just before Aspeberget. Some of these rock art sites include elaborate compositions of human scenes, ships, warriors, animals, wagons, etc. There are also images, such as shielded warriors, ship features and disc designs, that are very similar to some of the engraved features on bronze items from period III (Almgren 1927: 90–91; Bertilsson 1987: 108; Fredell 2003: 130). The lowest rock art panels on this hill slope are Tanum 120, 17 and 19 and their position calls for a closer description.

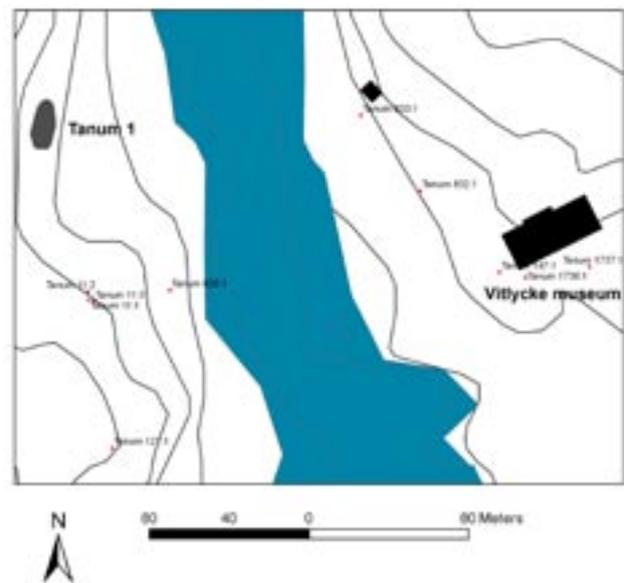
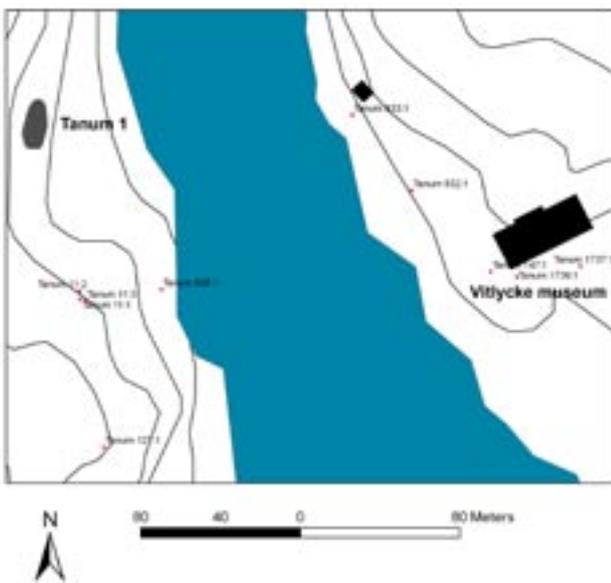


Figure 8.8. Reconstruction of the landscape around the Vitycke area, illustrating what the area may have looked like during the EBA (left), when the shoreline corresponded to today's altitude of about 14–15 m.a.s.l, and the LBA (right), when the shoreline corresponded to about 12–13 m.a.s.l (the upper figures by Chris Sevara and Johan Ling).

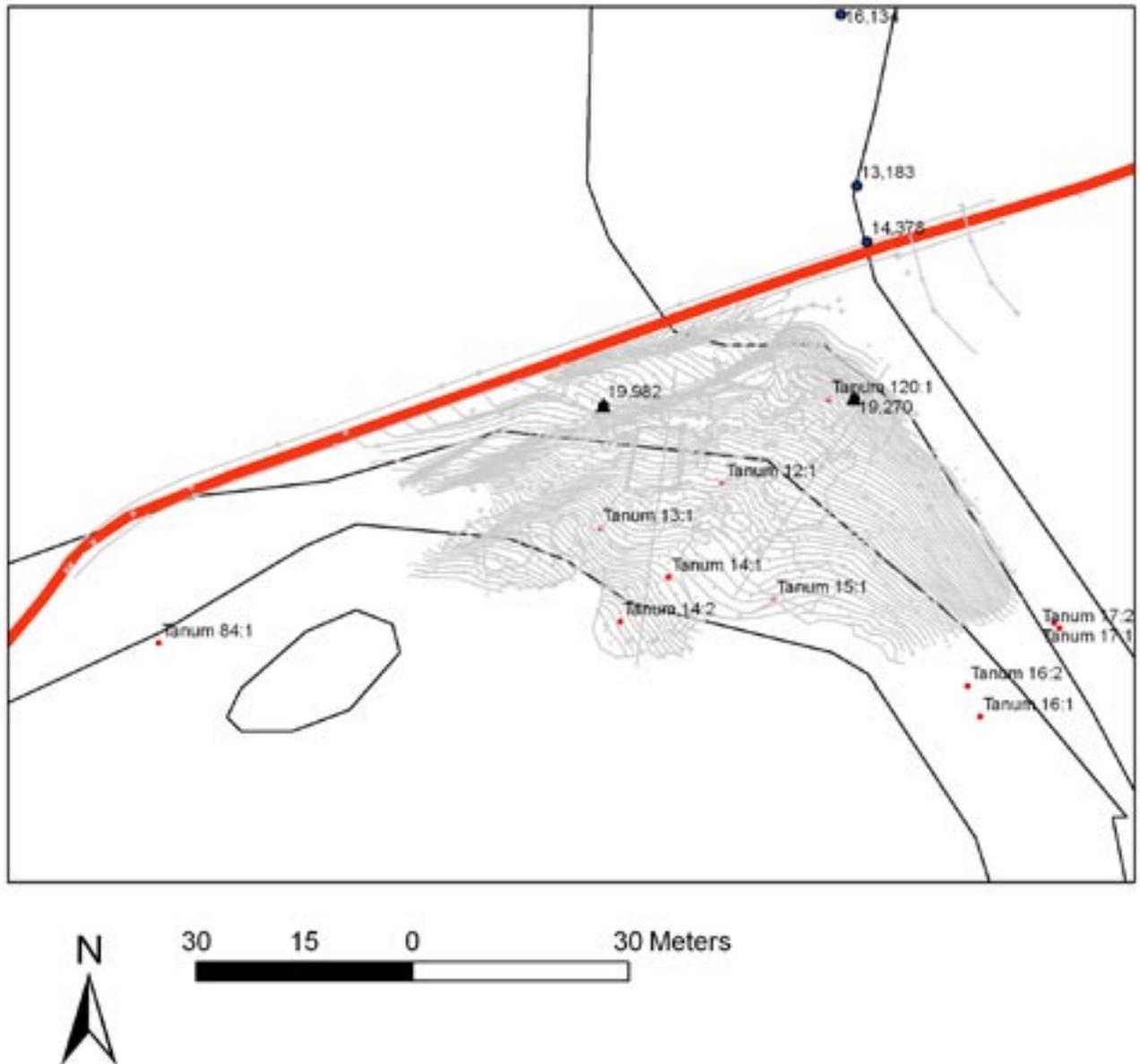


Figure 8.9. Map of the northeastern part of Aspeberget; triangles denote the altitude of the lowest image on each of the panels (contours by land surveyor Bo Nilsson).

The panel Tanum 120 is located on the northeastern side of the hill. This part of the rock face slopes so steeply that a bridge has been erected for the public to be able to see the panel without falling into the river (fig. 8.9). The lower part of the panel slopes at 40–50°, which raises questions about how the rock art was made and for what communicative purpose. The panel consists of 6 ships, 11 human figures, 1 animal, 1 circle and 42 cup marks (Högberg 1988a: 5). The most interesting image is a human figure with a more or less rectangular pattern of cup marks (4 rows, each with 7 cup marks) placed

just above an abnormally large hand (fig. 8.10). Other human figures have rectangular bodies and weapons in their hands, which indicate a dating to the PRIA. All the ship features on this panel display typological features of either the LBA or the PRIA. Two of the ships are symmetrical variants of the Hjortspring ship (Kaul 2003: 192–194). Measurements showed that the lowest image on this panel, a ship from the LBA, is at an altitude of 19.04 m.a.s.l and the highest is at 22.43.

The next rock art panel, Tanum 17 (fig. 8.11), is situated some 30 m south of Tanum 120:2, on a

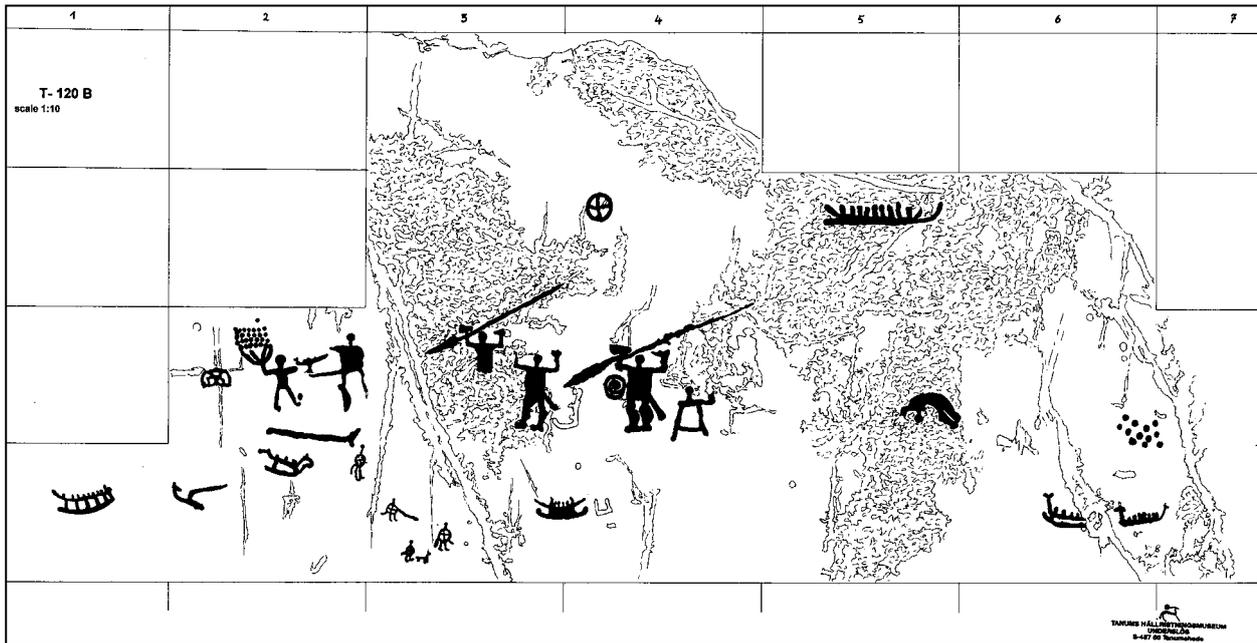


Figure 8.10. Documentation of Tanum 120 (after Milstreu & Pröhl 1996).

30–40° slope, some 3 m above a steep drop (fig. 8.9, see also Högberg 1988a: 15). It consists of one ship feature that typologically could be related either to the latter part of period III or to period IV–V. The slightly inturned prows may indicate an early date but these features are also common in later periods (Kaul 1998: 95–97) and a later date seems reasonable in relation to the other ship depictions on this hill (Högberg 1988a: 15).

However, the most interesting issue here is the panel's striking, inaccessible position, just above a steep drop. At whom were these images directed? What messages might they convey? The setting has never been thoroughly discussed (cf. Almgren 1927: 90–91, 109; Bertilsson 1987: 108; Fredell 2003: 130), which has to do with a tradition in rock art research of focussing primarily on the images, not on the panels' situation or context in the landscape (Helskog 1999; Goldhahn 2002, 2005 for criticism).

The last of these low-lying localities, Tanum 19, is situated on the southeast part of the hill, about 150 m south of Tanum 17. The rock slopes at 20° and presents 1 ship, 1 human figure, 1 foot sole, 2 birds, 1 animal, 1 circle cross and 20 cup marks (Högberg 1988a: 15). The opposed birds make a truly fascinating scene that can no doubt be associated with

the Vogel-Sonnen-Barken-style that occurs during period IV–V (Montelius 1917; Broholm 1948; Thrane 1975: 64; Kaul 1998: 27). The ship depiction has typical traits of period V, such as vertical keel extensions and inturned prows with stylistic animal heads (fig. 8.11). But perhaps the most interesting of these depictions is the downward-pointing foot sole, seemingly leading down to the aquatic sphere (e.g. Bradley 2000). The lowest image, a cup mark, has a measured altitude of 19.04 m.a.s.l and the highest 23.04.

Landscape reconstruction

These observations warrant the following statements (see fig. 6.6, 8.9–8.12, tab. 8.1):

- The measured altitudes of the rock art sites demonstrate a close spatial connection with the level of the sea throughout the BA, with a suggested horizontal distance of 0–30 m during the EBA and 8–30 m during the LBA and the PRIA.
- The hill's central position and the fact that all the rock art sites faced a seascape throughout the BA suggest that the hill may have served as a maritime arena of aggregation or initiation.
- The predominance of ship images on the panels at Aspeberget and their orientation towards

a seascape during the BA may indicate a pragmatic perception of the environment.

- Some of the panels have what were inaccessible maritime locations on steeply sloping rocks.
- The succession of localities, with older images on higher ground and later features towards lower ground, is accompanied by a chronological continuity, revision and revitalisation of the panels on higher ground.
- The mixture of inaccessible and accessible rock art settings, together with the complex scenes and images of ships and humans, may reflect multiple and additive interactions.

Discussion

What action could these rock art sites indicate or convey? Could this hill have served as a maritime arena of aggregation, interaction or initiation during most of the BA? Or did this hill, with its maritime outlook, constitute an arena for other local or trans-local maritime actions where ideals, signs, symbols and traditions were made, vitalised and re-vitalised by the rock art? The above observations suggest that the BA rock art activity on Aspeberget partly followed the regression of the shoreline and partly did not. The sea's withdrawal clearly transformed the surrounding landscape but one wonders how aware successive generations were of this process and whether some of the rock art was made in the light of it.

We have already seen clearer examples of rock art being made or adjusted in relation to the shore-



Figure 8.11. Above, documentation of Tanum 17, right Tanum 19 (by RockCare).



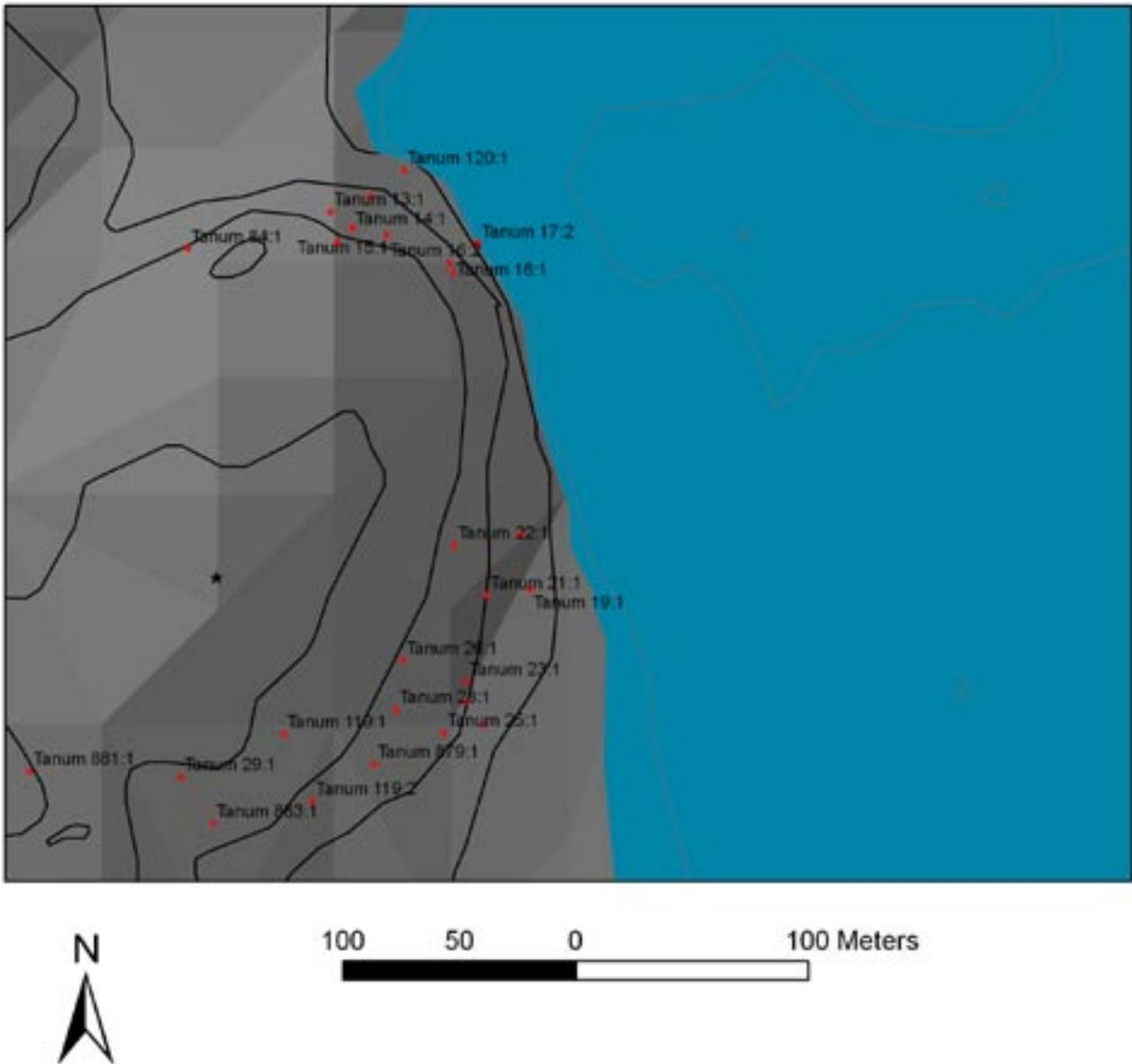


Figure 8.12. Reconstruction of the Aspeberget area in the beginning of the Late Bronze Age, about 1000 BC, when the shoreline corresponded to today's altitude of about 12–13 m.a.s.l. Red dots = rock art, black stars = cairns.

line during the BA. These matters have been considered by Coles, who comments as follows:

It is an interesting if, I suppose, ultimately futile debate on how the communities witnessing the withdrawal of the sea would seek to explain it; tradition would certainly assert that, two or maybe three generations previously, the shoreline was 'here', and the waves once reached 'here', but now were away 'there'. That the sea

was withdrawing, rather than the land rising, must have been widely accepted (Coles 2005 104).

The BA situation of the rock art on Aspeberget is strongly reminiscent of the location of the rock art in western Norway. For instance, the original settings of the sites Tanum 12, 120 and 19 may have resembled those of rock art localities at Unneset and Leirvåg (see Ch. 5).

Tanum	1	833	836	12	17:2	19	120:2
M.a.s.l	23.7	21.7	19.1	19.98	19.4	19.4	19.1
Slope	30°	10°	15°	10°	30–40°	20°	45–50°

Table 8.1. Altitudes of the lowest image on panels at Vitlycke and Aspeberget and the slope of the surface.

Another striking characteristic revealed by comparative chronological dating is that older panels on higher ground seem to have been altered, revitalised and upgraded in later periods. This is evident at many rock art sites, such as Vitlycke, Tegneby and Litsleby (Fredell 2003; Coles 2005, see Höberg 1995; Milstreu & Pröhl 1996). Such actions can be seen in terms of two concepts: depictions of social landscapes and depictions of social memory of a place. Some rock art sites were originally chosen close to the sea in order to illustrate, connect or reflect maritime conditions, actions or ideals. When the seascape was transformed into a landscape, some sites continued to be used and/or became remembered, renegotiated and re-vitalised into places of memory and tradition (see fig. 8.6).

Aspeberget seems to represent something of the general spatial and chronological structure of the rock art in Tanum, a structure that appears to follow specific rules regarding space, place and time. A structure constantly negotiated and re-negotiated by the rock art in the landscape/seascape. A further discussion of these issues is presented in part III of this thesis.

Terrestrial landscapes and images at Tanum 33

The lower terrain south and east of Aspeberget, on both sides of the river, was also measured and the GPS results again illustrated the erroneous and arbitrary nature of the contours on maps of this area (fig. 8.13). The 15 m.a.s.l contour was fairly accurate but the 20 m.a.s.l contour much less so, being sometimes more than 40 m away from its proper position.

The lowest rock art site in this area is Tanum 33 (Höberg 1995: 8) on a 20° slope. The measured altitude of its lower part is 21.9 m.a.s.l, which means that shoreline dating is not applicable. However, the panel has typical PRIA images (fig. 8.14), with 14 symmetrical ship depictions, 54 horses and 17

horsemen, 2 of which hold a rectangular shield and spear (Marstrander 1963: 62–63; Kaul 1998: 104, 2003: 192, 2004: 308, see also Höberg 1988a, 1995, 2000). In addition there are 18 aquatic birds and 7 foot soles that seem to be crossing the surface, with one pair cut over the head of one animal and the legs of another (fig. 8.14). This demonstrates that the foot soles are contemporary with or more recent than the animals from the PRIA. The overall impression of the panel is terrestrial, not maritime like so many others.

The ship images are very similar to those on the low-lying “maritime panel” at Orrekläpp, Tanum 369 (fig. 7.32). The low altitude of the latter panel makes it possible to apply shoreline dating, which indicates period IV–V. The similarity of the ship images accordingly favours a late date for Tanum 33.

Landscape reconstruction

These observations warrant the following statements (see fig. 6.6, 8.13–8.15, tab. 8.2):

- The measured altitude of the rock art site witnesses to a fairly close spatial connection with the sea during the PRIA. It suggests a horizontal distance of 220 m during the PRIA, calculated from a line declining at 20° from the horizontal, drawn from the lower part of the engraved panel towards lower ground at an altitude of 11 m.a.s.l. Thus, the sea was still visible from the rock art site.
- The predominance of depicted horses and horsemen on the panel and its exposure towards pastureland during the PRIA may indicate a pragmatic perception of the environment. It seems as if ship depictions were now being replaced by horse depictions and this could be interpreted as an interchange of new images and ideals in accordance with the changes in the landscape.

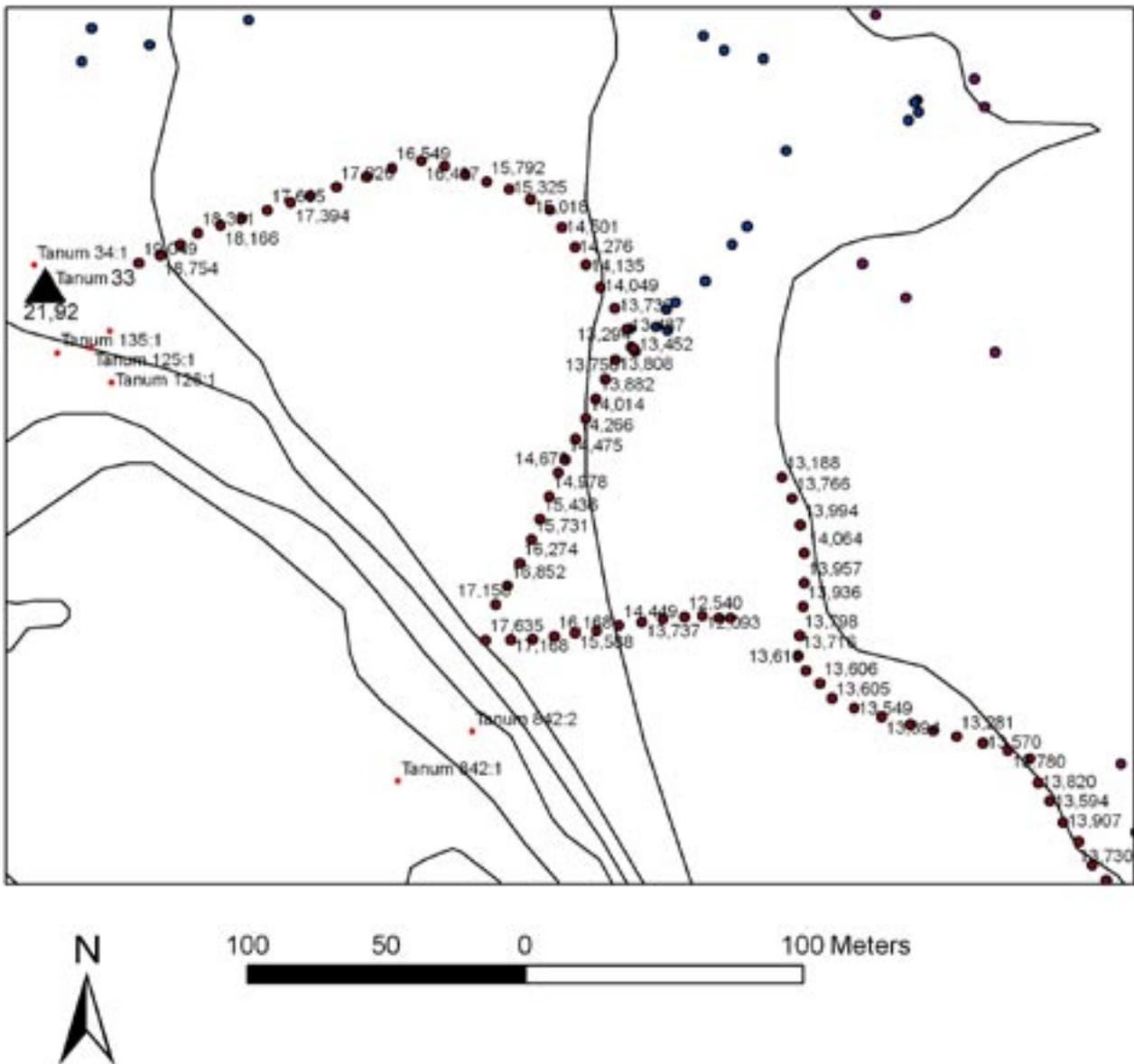


Figure 8.13. Map of the Bostället area in Tegneby; the triangles denote the altitude of the lowest image on the panel Tanum 33.

Discussion

The predominance of horses and horsemen on this panel is particularly intriguing, especially in a landscape perspective. The comparative chronological dating of the features on the panel in relation to shore displacement suggests the following interpretation. During the beginning of the PRIA the sea had retreated further down towards the southeast. The former seabed had become a rather extensive clay-soil plain that could be used for grazing (e.g. Bertilsson 1987). Consequently, it seems likely that

the depictions of horses and horsemen were made as the area in front of the panel became suitable for riding and as pasture. The sea was never far away and was probably still visible from the rock art site, at a distance of 200 m.

It is reasonable to presume that in this “terrestrial” landscape, horses and horsemen replaced ship depictions. Other panels with a maritime content were still being made on lower ground, for example Tanum 369, 369:2, 241. These circumstances could be interpreted as an interchange of new images and

ideals in accordance with the changes in the landscape (Kaul 1998: 104, 2003: 192).

The measured altitude of the land is generally lower than the economic map indicates. On both sides of the river the GPS gave an altitude of 13 m.a.s.l as again 15 m on the economic map. The altitude of the arable land east of the river is lower than on the economic map and for most of the BA much of the clayey lowland was connected with the shore (fig. 8.3).

Sea shores and rock art in the Tegneby area, Bostället (Tanum 48, 61–64, 105:3, 345, 346 and 490)

Most of the rock art in this area is situated on low-lying granite outcrops west and northwest of arable land (fig. 8.15, tab. 8.2). Tanum 105:3 is located north of the road on higher forest land at an altitude of about 23.7 m.a.s.l (fig. 8.16). The panel displays 7 ships, 2 human figures, 18 cup marks and 1 figure with 4 clover leaves surrounding a cup mark (Högberg 1995: 56). This complex “iconic” scene is very similar to those at Aspeberget (Tanum 25) and Vitlycke (Tanum 1, 204). The composition is generally considered to be comparable to the scene on the bronze lure from Wismar (Ekholm 1916; Almgren 1927: 90–91; Marstrander 1963; Glob 1969; Bertilsson 1987: 108; Fredell 2003: 130).

The localities south of the road are in general at lower altitudes. The arable land just beneath the granite with the rock art ranges from 12–13 m.a.s.l. Once again, the GPS measurements showed that the altitudes on the economic map are faulty (fig. 8.15).

Most of the rock art localities on this particular granite ridge display typical traits of the LBA, such as highly elaborate ship depictions with inturned prows and stylistic animal heads, presumably from period V–VI (Högberg 1995: 35–38). Two localities, Tanum 61 and 62 (fig. 8.17, 8.18), face east-northeast towards the arable land. They share a similar style and technique. The measured altitude of the lowest image on panel Tanum 61 is 14.8 m.a.s.l and on panel Tanum 62 it is 17.45.

The lower of these two panels, Tanum 61, is located on rock that juts out into the field with a slope of 45°. It consists of 6 ships and 6 animals

(fig. 8.17), “including a he-goat and a horse with a rider” (Högberg 1995: 28–30). The animal and ship images indicate a late date, presumably period VI or PRIA (Kaul 1998; Fredell 2003). Moreover, riders of this kind often occur as rock art images from the PRIA (Marstrander 1963: 62–63; Kaul 1998: 104, 2003).

Tanum 64 measured 16.01 m.a.s.l; the panel consists 5 ships, 2 humans and animals, a wheel/sun cross and 92 cup marks.



Figure 8.14. Documentation of Tanum 33 (after Högberg 2000).

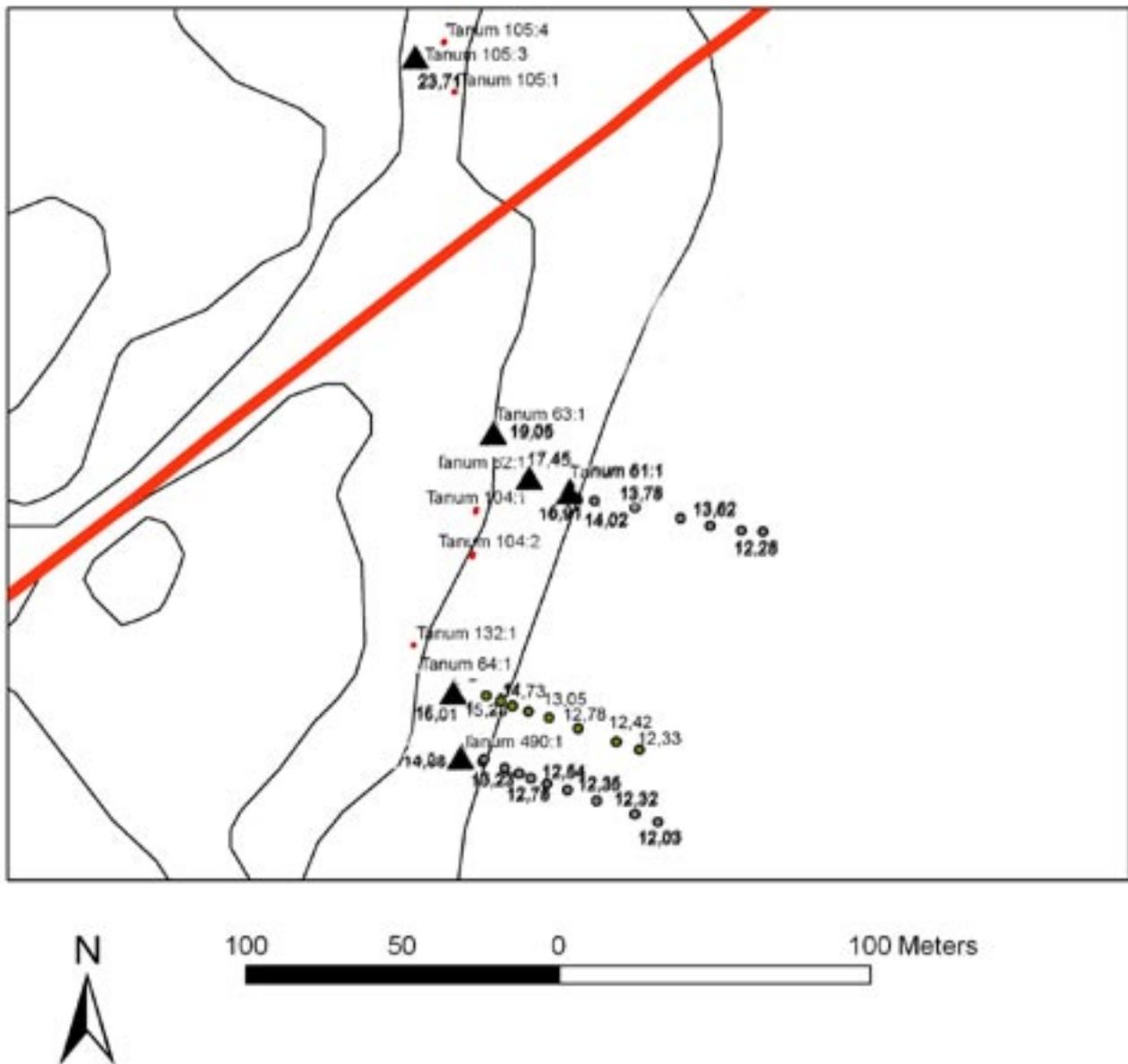


Figure 8.15. Map of the Bostället area in Tegneby; triangles denote the altitude of the lowest image on each panel,

Tanum 490 also has a low location, it measures 15.28 m.a.s.l., facing the lower plain area towards the east. It holds three ship images presumably from period V, an animal figure attached to a cup mark, an adorant and other cup marks.

Landscape reconstruction

The following can be stated about the rock art in this area:

- The measured altitudes of the rock art sites demonstrate a close spatial connection with the

sea throughout the BA. This suggests a distance of 5–20 m during the LBA and 10–30 m during the PRIA.

- An earliest date of the ship images on the panels Tanum 61 and 490 based on shoreline dating seems to be period II–III, probably period II.
- An earliest date of the ship image on the panel Tanum 64 based on shoreline dating seems to be period I–II, probably period I.
- Most of the panels' could not have been made at the beginning of the EBA.
- The panels maritime outlook towards a BA and

PRIA seascape indicates that some of them may have been meant to indicate or relate to conditions, actions, ideals and positions at sea.

Discussion

Only one or perhaps three of these rock art sites were applicable for shoreline dating, namely Tanum 61 and 490, and to some extent, Tanum 64. The lowest image, a rider, on the panel Tanum 61 is at a measured altitude of 14.8 m.a.s.l and the highest image on this panel is at 16.9. The altitude of the ground just beneath the outcrop is 13.2 m.a.s.l (fig. 8.15). The altitudes of Tanum 61 and 490 indicate an earliest date to period II–III, which only partly confirms the comparative dating of the images. However, these panels had a close location and orientation towards the sea-shore throughout the BA, as well as during the PRIA.

During the beginning of the EBA the sea covered most of the panel and during the LBA the sea-shore was just a few meters away. However, the majority of rock art sites on this ridge could be dated on a comparative basis to the late LBA or the PRIA, when the sea-shore was 5–30 m away. What seems clear is that all these rock art panels were originally made on outcrops on the shore and some of them could not possibly have been made before the EBA.

Ships and seascapes at Skatteklåvan in the Tegneby area (Tanum 65–67)

Most of the rock art in this part of Tanum is situated on the lower part of a granite outcrop adjacent to low clayey arable land, approximately 500 m south-east of the well-known panels with rock art at Litsleby. Three panels are of interest in this analysis: Tanum 65, 66 and 67. According to the economic map, today’s altitude of the panels Tanum 65 and 66 is about 20 m.a.s.l but the GPS measurements demonstrated lower altitudes not only for these particular sites but also for the land below them (fig. 8.19).

Tanum 67 is situated on the upper part of the hill, in a place that provides an extensive view over



Figure 8.16. Documentation of Tanum 105:3 (after Högberg 2000).

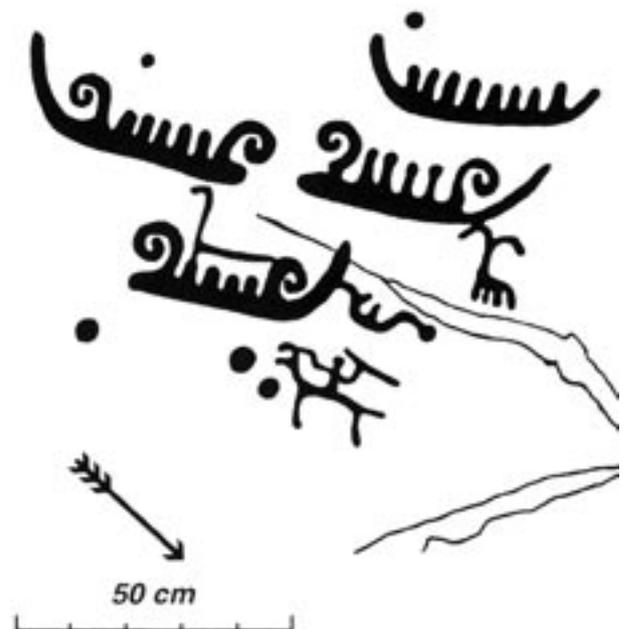


Figure 8.17. Documentation of Tanum 61 (after Högberg 2000).



Figure 8.18. Documentation of Tanum 490 (after Högberg 2000).

the lower plain to the south. The panel consists of 4 ships and 5 cup marks, faces south-southeast, slopes at 6°–10° and has a measured altitude of about 24.01 m.a.s.l. The ship images have vertical prows that extend directly from the keel and hull (fig. 8.20). This kind of ship is less frequent in Bohuslän but more common in western and northern Norway (Fett & Fett 1941; Sognnes 2001, 2003; Nordenborg My-

hre 2004, cf. Linge 2007: 73pp). Norwegian rock art researchers seem to be generally agreed that this ship type derives from the late Neolithic or the beginning of the EBA (Fett & Fett 1941, 1979; Mandt 1972, 1991; Helskog 1999; Sognnes 2001; Nordenborg Myhre 2004). A similar ship type occurs on high ground in Litsleby (Högberg 1995: 45) and at Aspeberget (Högberg 1988a: 15), as well as in the

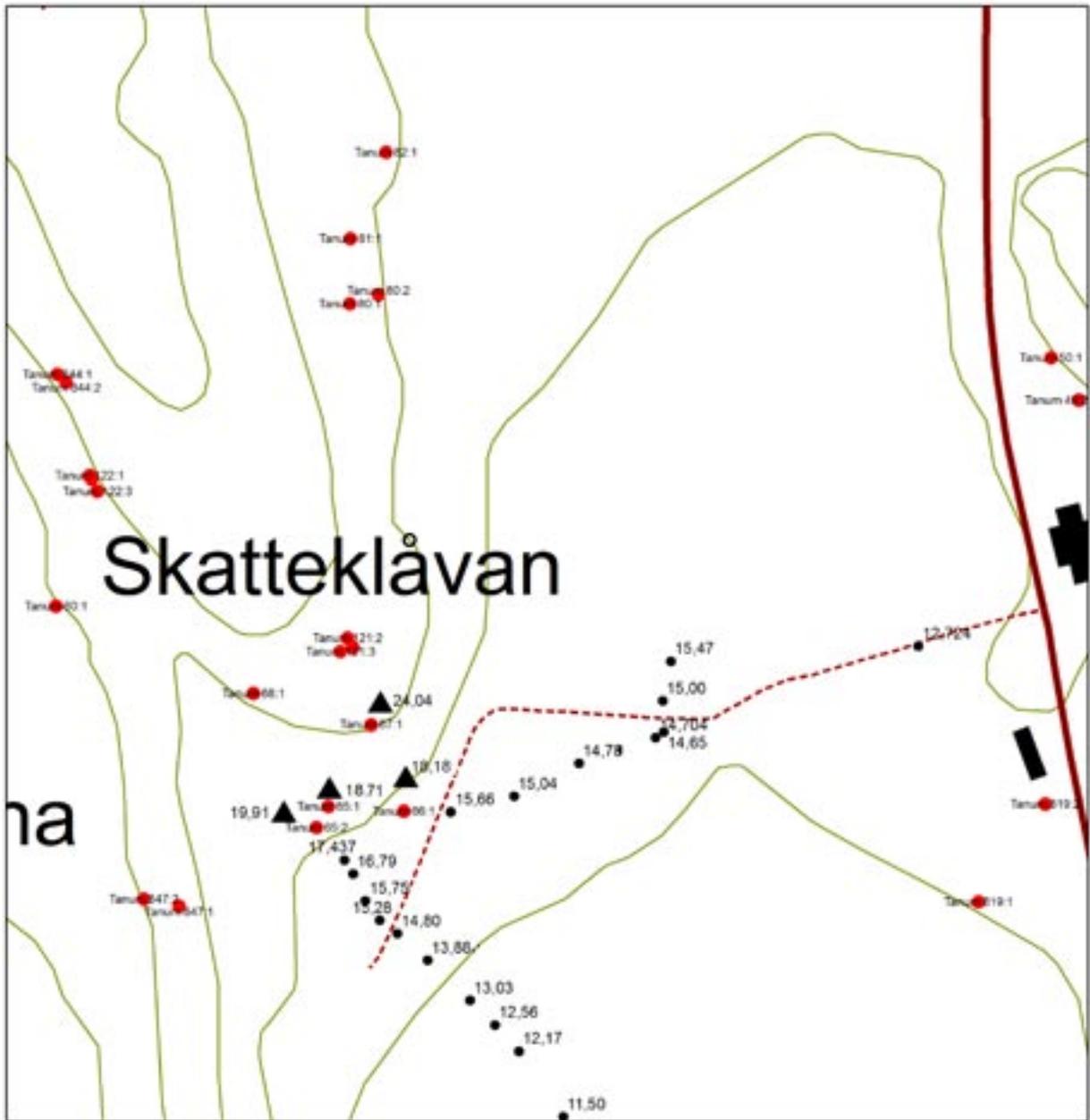


Figure 8.19. Above, map of the Skatteklåvan area in Tegneby; triangles denote the altitude of the lowest image on each panel. Top left, documentation of Tanum 65 (after Högberg 2000). Bottom right, documentation of Tanum 66 (after Högberg 2000).

Figure 8.20. Right, photo of the Late Neolithic or Early Bronze Age ship from Tanum 67 (Photo: VM).



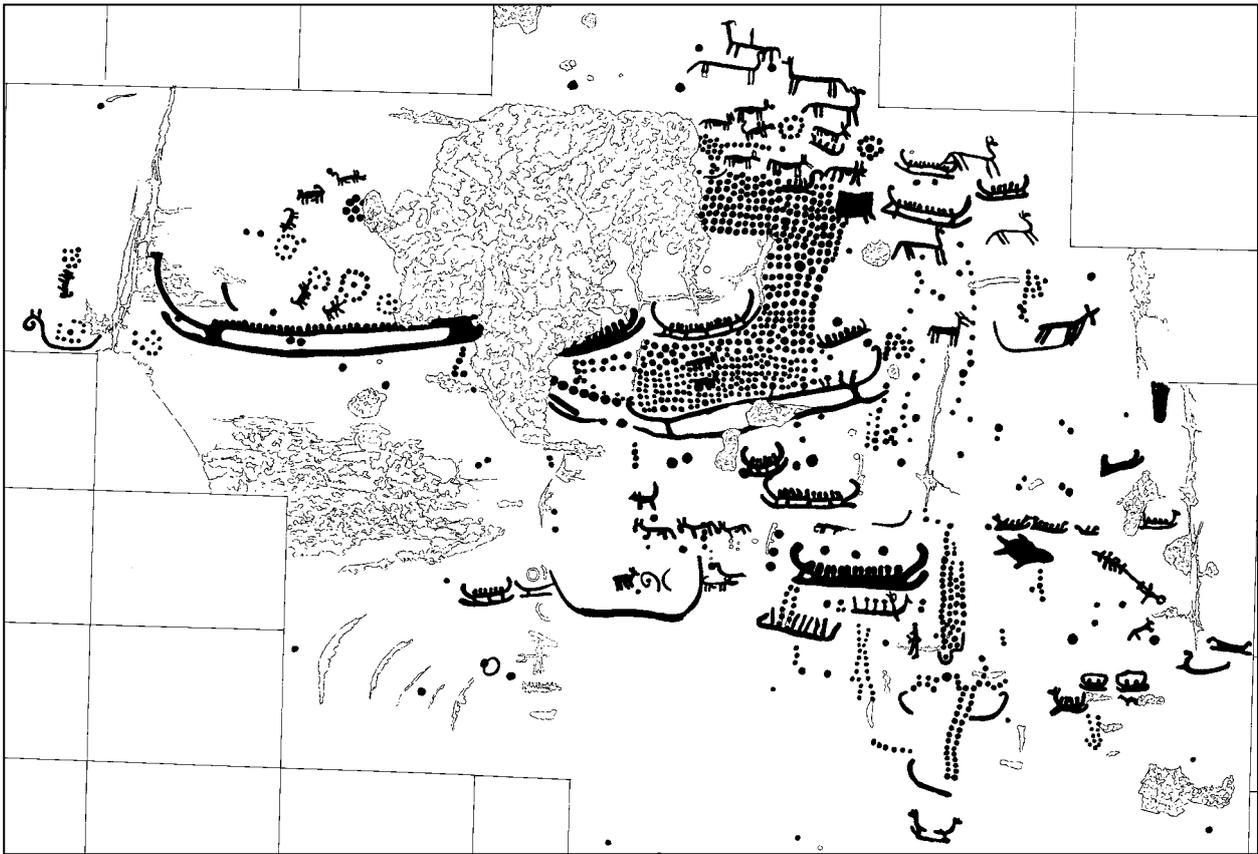


Figure 8.21. Documentation of Tanum 66 (by RockCare).

Kville and Svenneby area, and is often located at the same altitude as ship types from the EBA I (Fredsjö 1971: 54, 1981: 187). Interestingly enough, all the ship images of this type in Kville and Tanum seem to have been placed at high altitudes, closer to 25 m.a.s.l today. Thus there are two factors, altitude and style, that may speak for an early date of these particular ship features.

Just 30 m downhill from this panel is Tanum 66 (fig. 8.21), with more images than any other known panel in northern Bohuslän (Bertilsson 1987: 96, 99). The panel faces southeast and slopes about 10°. The lowest image on it has a measured altitude of 18.18 m.a.s.l. The panel presents no less than “996 cup marks, 31 ships, 36 animals, 6 human figures, 2 axes, 2 rings, 1 wheel figure, 1 bird, 1 tree and 1 footsole with toes” (Högberg 1995: 36–37). The images form a chronological succession, with ships from the EBA, ships with vertical keel extensions and stylistic animal heads from the LBA and animal figures that are presumably from the PRIA (fig.

8.21).

Two rather large ships, presumably from the EBA, dominate the panel. The larger, fragmented, of the two has an animal head which, according to the comparative ship chronology, ought to indicate a late phase of the EBA, presumably period III.

However, the most striking feature is the elaborate composition of cup marks. It looks as if the cup marks and animal figures represent departures from the large ship. It also seems as if the “carvers” actively have used the rather large exfoliation at the centre of the panel in the composition. This gives the impression that one ship is departing from this feature while another enters it. There are several rock art locations in southern Scandinavia where features on the rock panel, such as cracks and exfoliations, seem to have been deliberately used to accentuate the utterance of the rock art composition (Nordenborg Myhre 2004; Coles 2005; Goldhahn 2005).

This elaborate panel raises many questions. The chronological and stylistic complexity may indicate

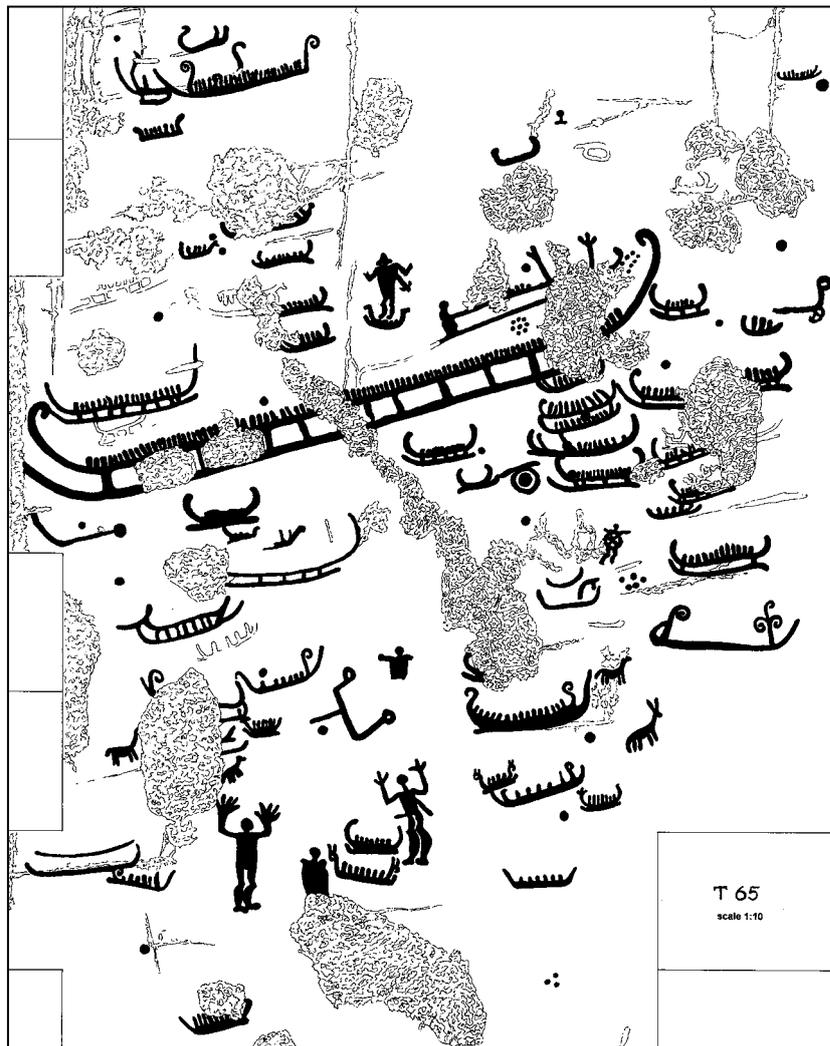


Figure 8.22. Documentation of Tanum 65 (by RockCare).

that the panel accumulated and was in use over a long period. This would be similar to the use of some prehistoric grave fields from the BA to the PRIA.

The panel Tanum 65 is located about 30 m west of Tanum 66. It faces south-southeast, has a 5–10° slope and the lowest image has a measured altitude of 18.71 m.a.s.l. It consists of 81 cup marks, 51 ships, 11 animals, 4 singular marks and 2 rings. A large ship depiction, 3.35 m long, dominates most of the panel and has traits typical of period I–II, with inturned prows and paired crew strokes. However, other features of this large ship suggest a more precise dating to a later phase of the EBA (fig. 8.22). One is that the keel extension, instead of

being slightly or vaguely upturned, is rather angled upwards, a trait connected with ship types from later periods, the transition from the EBA to the LBA, that is, periods III–IV. Moreover, the ship has two paired opposed lures, a trait that is not considered to occur before period III (Glob 1969: 49–55; Malmer 1981: 33; Randsborg 1993: 98–99; Kaul 1998: 92). Furthermore, the ship just above this one fulfils almost all the criteria for a ship from period III (fig. 8.22).

All this, together with the fact the majority of ship depictions on this panel, as well as the human figures and animals, seem to derive from the LBA, suggests that the large ship feature in question is most probably from a late phase of the EBA.

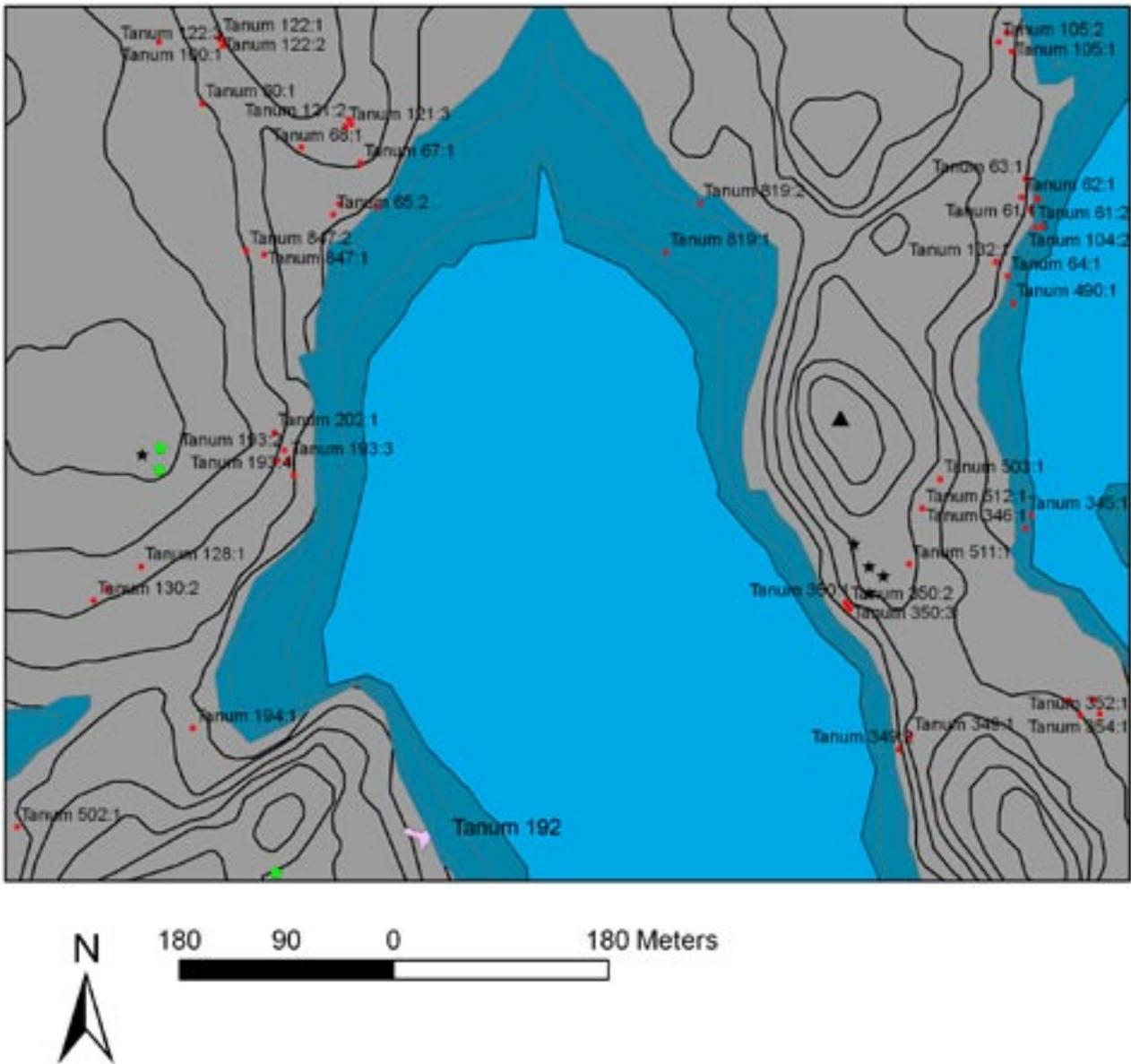


Figure 8.23. Reconstruction of parts of the Tegneby area, indicating the shoreline in the beginning of the EBA (dark blue) and during the LBA (light blue). Red dots = rock art sites except for Tanum 192:1, which is marked here in pink, black stars = stone settings, green dots = barrows, and black triangles = cairns.

Tanum	48	61	62	63	64	65	66	105:3	345	490
M.a.s.l	19.3	14.8	18.12	19.5	16.1	19.2	18.2	23.7	20.9	15.2
Slope	10°	45°	20°	15°	10°	5–10°	10°	3–10°	6–20°	8–12°

Table 8.2. Altitude of the lowest image on each panel at Bostället and Skatteklåvan in the Tegneby area and the slope of the surface.

Landscape reconstruction

The rock art activity at the foot of this hill prompts the following statements (fig. 6.6, 8.19–8.23, tab. 8.2):

- The succession of localities seems to present ship types from the LN on higher ground (Tanum 67) and images with later features from the EBA–LBA towards the lower ground (Tanum 65, 66).
- The measured altitudes of the rock art sites demonstrate a close spatial connection with the sea throughout the BA. This suggests distances of 2–15 m between the panels Tanum 65, 66 and the sea during the EBA and 15–30 m during the LBA.
- The large number of rock art and the complex sets of images and scenes may indicate continuous action on the panels Tanum 66 and 65 throughout the BA.
- The accessible maritime setting of the rock art sites suggests that these sites may have been suitable points or nodes for maritime interaction, imagination, ideals or traditions.

Discussion

Thus these two low-lying localities have the following lowest and highest altitudes: 18.2 and 18.6 m.a.s.l, respectively, for Tanum 66, and 19.2 and 19.7 m.a.s.l, respectively, for Tanum 65. Taking the shoreline at the beginning of the EBA to have been at about 16–17 m.a.s.l, with a 0.5 m tide, the sea would have reached close to 17.5 m.a.s.l, which means that some images on the panel Tanum 66 could have been made just above the water's edge. There is at least one ship on this panel, the large one with all the cup marks, that shows stylistic traits from period I–II. There are also some early axe depictions, most probably representing flanged axes from period I–Ib, that support the theory of early action on this panel. The early ship depictions on the panel Tanum 65, with ship images from period II–III, likewise suggest that at least the first depictions may have been placed near the contemporary shore, which in this case was situated further down at an altitude today of approximately 14–15 m.a.s.l on what is now arable land.

Embarking and disembarking by Bro Utmark (Tanum 192)

Bro Utmark was, and is, one of the largest and most striking rock art sites in all of northern Bohuslän. The quality of the images seen at Bro today is certainly unusual. The firmness and evenness of line is exceptional (Coles 2004, 2005: 154).

John Coles has established some important facts about this panel, which is one of the largest in the area and also one of the most displayed and discussed rock art sites in Bohuslän. Over the years, it has been subject to many different documentations and interpretations (e.g. Brunius 1839, 1868; Holmberg 1848; Baltzer 1881; Almgren 1912, 1927; Bertilsson 1987; Burenhult 1988; Högberg 1995; Coles 2004, 2005; Vogt 2006). The main panel, Tanum 192:1, measures about 26 x 10 m and parts of it slope quite steeply (Högberg 1995; Coles 2004: 176). It contains about 310 images: 90 ship images, 40 humans, 40 animals, 4 feet, 3 crosses and 130 cup marks (Högberg 1995: 68pp; Coles 2004). The most displayed and discussed images are the combat scenes of warriors and the ship images showing sitting or kneeling crew with paddles, weapons or other items (fig. 8.24).

The location of the panel in the landscape has recently been described and documented in detail by Coles (2004), so these facts will not be repeated here. Coles also presents some interesting interpretations that will be discussed below.

There is, however, one crucial condition about this panel that needs more elaboration, namely its altitude and its relation to BA shore displacement. Today's altitude of the panel has been estimated roughly by earlier researchers on the basis of the economic map and found to be about 25 m.a.s.l (Bertilsson 1987: 128; Burenhult 1988; Coles 2004: 202). I therefore originally decided not to measure this panel. But when I was measuring the adjacent arable land and approaching this site, I realized that its altitude must be considerably lower than the economic map indicates. Thus, measurement of the lowest parts of the adjacent arable land gave altitudes of 10–11 m.a.s.l, while the grove between the field and the rock art panel measured about 13 m.a.s.l and the land beneath the panel about 15 (fig. 8.23, 8.25). As to the ship images on the panel, the

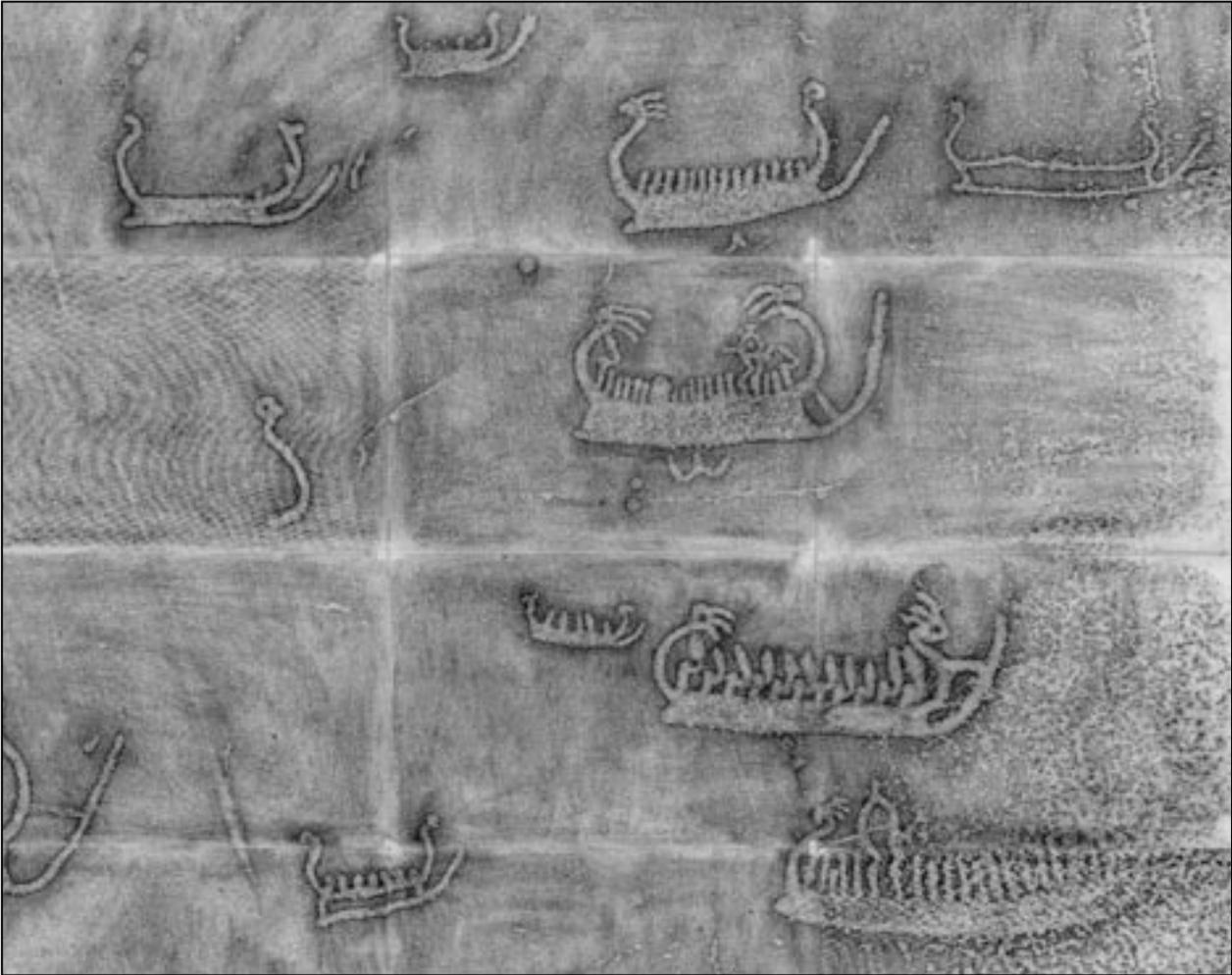


Figure 8.24. Documentation of some ships from Tanum 192:1 (by RockCare).

lowest was found to be at 16.7 m.a.s.l and the highest, at the top right of the panel, at 22.5.

These measurements gave a rather different picture of the setting and thereby of the basis for interpreting the panel.

Landscape reconstruction

The location of this panel in the landscape warrants the following statements (fig. 6.6, 8.23–8.25, tab. 8.3):

- The measured altitudes of the terrain and the rock art site demonstrate a close spatial connection with the sea throughout the BA. The distance between the panel and the shore seems to have been 0–5 m during the EBA, 5–30 m during the LBA and about 30–50 m during the PRIA.
- The large number of rock art and the complex

arrangement of images and scenes may indicate continuous action on the panel from period III to the PRIA (Coles 2004, 2005).

- The cluster of combat scenes related to ship images is a common feature of the panel.
- The accessible maritime setting of the panel suggests that this may have been a suitable point or node for maritime initiations, interactions, imaginations, ideals or traditions.

Discussion

The measurements show that this panel was exposed to a shallow bay throughout the BA and also during the PRIA (fig. 8.23, 8.25). Old photos and maps from recent historical times document intensive agricultural activity close to the panel (fig. 4.4). This activity indicates that at least 1 m of sediment has been deposited on the adjacent ground, which means

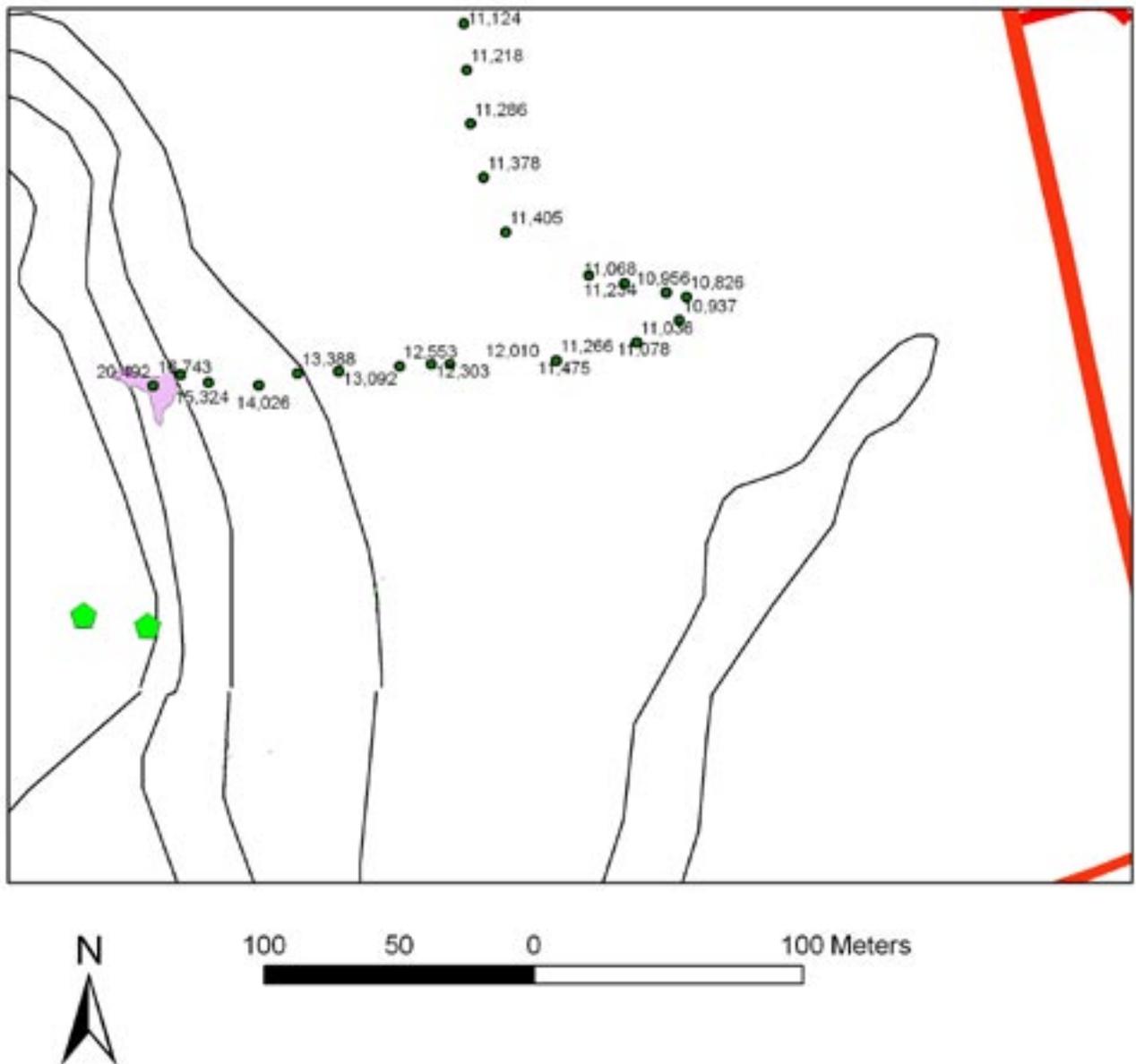


Figure 8.25. Map of measurements of the terrain and the rock art site Tanum 192:1 (pink polygon) in the Bro Utmark area (see also fig. 8.23). Green dots = barrows.

that in prehistoric times the sea was even closer to the site than today's altitude of the land suggests. A couple of ship images on this panel can be related to period III–IV, when the shoreline was just a couple of metres from the panel. It would almost have been possible to embark on and disembark from a real boat right from the panel.

During period V, when most of the images on the panel were made, the shoreline was about 10–20 m away but the panel would still have been a good landing-place. There may have been a short beach

between the panel and the sea and it is tempting to imagine that the real BA boats were pulled up here. Moreover, the setting of this site resembles that of the rock art at Unneset and Leirvåg in western Norway (see Ch. 5).

The spectacular clusters of combat scenes and the frequent and elaborate ship images on the panel evoke notions of maritime antagonism and ritual. Coles' suggestion that the clusters on the panel reflect an intentional form of narration seems very reasonable (Coles 2005: 204). A common feature of

the panel is the clusters of combat scenes related to ship images.

Of special interest are the ship images in the top right cluster, with sitting or kneeling crew holding paddles or weapons (fig. 8.24). Similar corporal actions and rituals are evident in many maritime cultures, for instance the displays on so-called war canoes (see Ch. 10). Codes of social inequality also seem to be represented in the ships, such as scenes with enlarged warriors in clearly commanding positions and a smaller anonymous crew.

Furthermore, several scholars have suggested that the two adjacent barrows, just 80 m from the panel, are from the BA (Bertilsson 1987: 128; Coles 2004: 202). If so, it is tempting to suppose that these spatially separate yet chronologically related features may have been made in the same event, such as a maritime burial. Some early scholars claimed that rock art could have been made in connection with burial praxis and this theme has been discussed more recently by scholars such as Joakim Goldhahn (1999a, 2005, 2007), Kate Syvertsen (2002, 2005), Melanie Wrigglesworth (2002, 2005), Lise Nordenborg Myhre (2004) and Trond Linge (2006, 2007).

However, Coles is the first scholar who has tried to understand and interpret the rock art at Bro Utmark in relation to the seascape that seems to have dominated the landscape here during the BA (Coles 2004, 2005):

The objects depicted on the rocks are real, boats, people, animals, weaponry, torches or paddles and their presence here is entirely logical – a landscape dominated by water and occupied by a society well-furnished with equipment and in control of wide areas of both land and sea (Coles 2004: 205).

It seems that someone who has not been shaped by the Scandinavian terrestrial thought style is needed to see these connections between rock art and the seascape.

Reconstructing Tanum 311 – a maritime approach

Another outstanding rock art panel in Tanum is “Runohällen” in the Ryk area, some 30 m from the

Gerum River. Some of the major chronological and spatial features of this panel are presented in chapter 7, but there is more to say about the panel’s situation in the landscape. The position of this large, monumental panel is unusual, especially compared with other complex rock art sites in the Tanum area (e.g. Bertilsson 1987: 148). The low altitude means that the panel was connected with the sea throughout the BA. Ulf Bertilsson has noted another important context that many seem to disregard, namely the close relationship between the rock art and some barrows from the Roman Iron Age:

Another of those extraordinary features connected with the locality is the existence of a cemetery situated next to it. It consisted of sixteen small burial mounds with cremations. In one of these mounds a beaker of cut glass was found together with a ring of gold and cremated bones. The beaker is of Roman origin and the burial and probably the entire cemetery can thus be dated to the Roman period of the Early Iron Age (Montelius 1876: 370, no. 223 with references). Thus the Gerum locality constitutes another case of a very close spatial relationship between rock carvings and burial grounds, which can be observed in other places in the study area (Bertilsson 1987: 149).

There are correlations between cemeteries, presumably from the Roman Iron Age, and rock art not only here but also in several other areas in Bohuslän, such as Torsbo in Kville parish (Kville 157–161) and by the church in Tossene parish (Tossene 58). Bertilsson’s interpretation seems very reasonable:

In our opinion, it is obvious that this relationship cannot be of spatial nature solely. It must have wider implications of a social and ideological nature. The phenomenon to place the Iron Age burials on or adjacent to the Bronze Age rock carvings could not have been accidental (Bertilsson 1987: 149).

One of the most discussed images on this panel is a complex mast-like or pole figure with various kinds of lines and humans attached to it (see fig. 7.26).

Two successions with warriors are clearly connected to this figure, one below and the other above, and they seem to be proceeding towards the event, which has traditionally been interpreted as an archaic depiction of a “maypole”, a celebration of the season, an interpretation that agrees with agrarian notions of rock art (Baltzer 1911; Almgren 1927; Almgren 1962, 1987; Bertilsson 1987; Hygen & Bengtsson 1999; Fredell 2003; Kaul 2004). Högberg, however, discerned similarities between this pole image and rituals in Mexico (Högberg 2000: 35pp).

Recently, the panel was thoroughly documented and discussed by Fredell (2003: 164), who argued that this particular scene illustrates a ritual that is aiming upwards; she considered that the mast-like figure could represent a structure of an initiation rite rather than an action connected with seasonal movements. Thus, interpretations of this panel seem to have been governed by three general themes; one has focused on agrarian rites or Indo-European rituals with references to the maypole (Almgren 1927; Hygen & Bengtsson 1999; Odner 2006), another has centred on the ship features and their chronology (Almgren 1987; Kristiansen 2002, 2004) and the third dwells on the relationship between the rock art panel, the landscape and the Roman Iron Age cemetery (Bertilsson 1987).

What has not been discussed is the location of the panel in the landscape in relation to the shore displacement (fig. 8.26, 8.27); the maritime setting is very evident. Another argument to this effect is the fact that the panel is dominated by ship images, not “maypoles” or “sun horses”. A maritime interpretation of the panel therefore seems far more logical than the traditional terrestrial. With reference to Fredell’s idea about the mast-like figure, one possibility is that this represents a maritime initiation rite, conducted either before, during or after an event at sea.

Landscape reconstruction

These observations warrant the following statements (fig. 6.6, 8.26–8.27, see also fig. 7.25–7.27, tab. 8.3):

- With reference to comparative chronology as well as shoreline dating, it seems that a majority

of the ship features on this panel originated in a late phase of period II or III. But there are also many ships and features from the LBA, as well as footprints that may be related to the PRIA. The chronological succession of images suggests that the panel was used or reused for a variety of purposes for over a millennium.

- In this maritime context, the ship formations or scenes on the panel may manifest maritime meetings, communications or initiations between different social formations, positions and traditions. The action of making rock art on this panel seems to have become a tradition that continued through the BA, most probably due to the panel’s maritime position, which could subsequently have functioned as a significant maritime landing-place.
- There is a close spatial relationship to the excavated cemetery from the Early Iron Age.
- The rock itself may have functioned as a maritime backdrop or canvas, representing the sea, and movements of the sea could have enlivened the ship images into a sort of slow motion.
- The maritime situation and content of this panel indicate various forms of maritime movement, tradition, interaction, position, initiation or ideal. The panel may also have functioned as a strategic landmark or meeting point between land-going and sea-going communications.

Discussion

The low altitude of this large, complex rock art panel gives it an unusual setting, especially compared to other complex rock art sites in the Tanum area (Bertilsson 1987: 148). Knowing that the panel overlooked a seascape throughout the BA lends a certain perspective to time and space. The content, the many ship images and the projection of the panel towards an ancient seascape all underpin this assumption. With this projection and content, the panel may even have reflected the sea, while the sea could have reflected the ship images. Thus the rock itself may have functioned as a kind of maritime backdrop or canvas that represented the sea, just as the movements of the sea may have enlivened the ship images into a sort of slow motion (fig. 8.26). Three or four large clusters of ships dominate the panel in

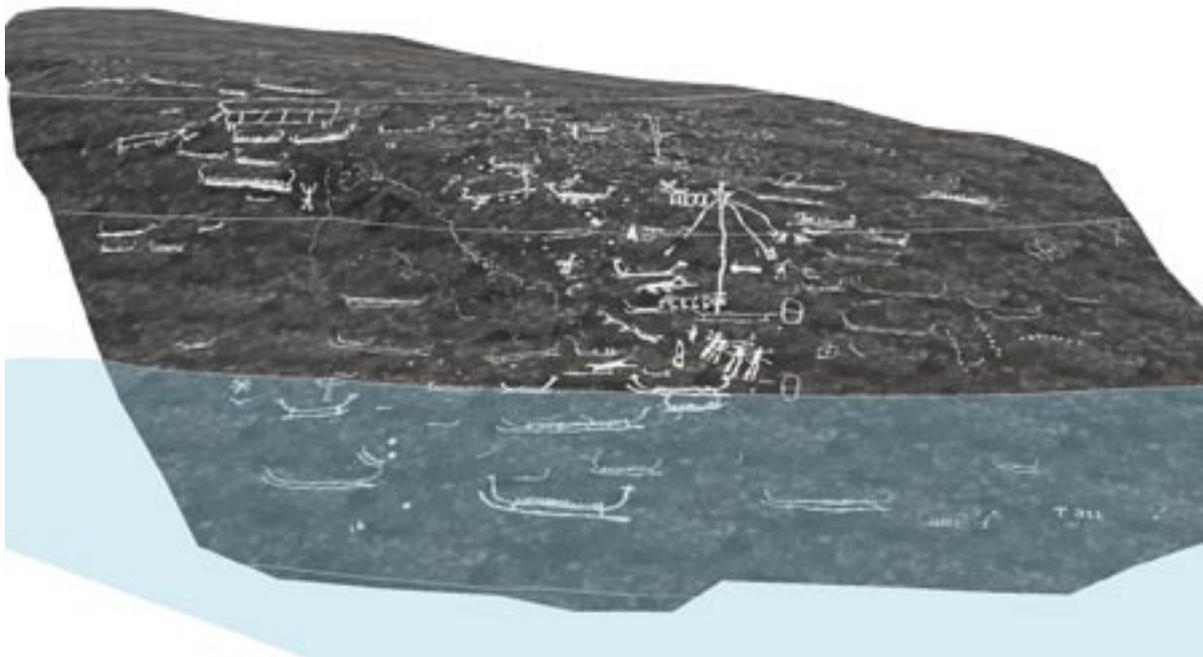
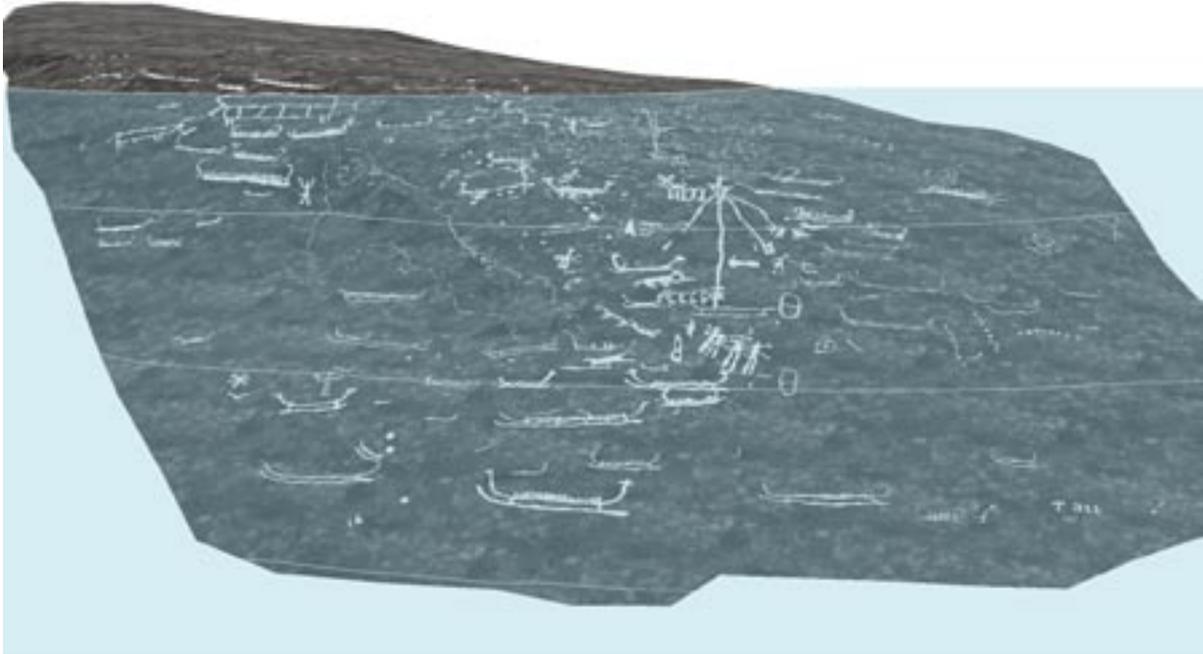


Figure 8.26. Two 3D-reconstructions of Tanum 311 (by Chris Sevara). Top, with a shoreline of about 16 m.a.s.l corresponding more or less to the altitude of the shoreline 1600 BC. Bottom, with a shoreline of about 15 m.a.s.l corresponding more or less to the altitude of the shoreline 1400 BC.

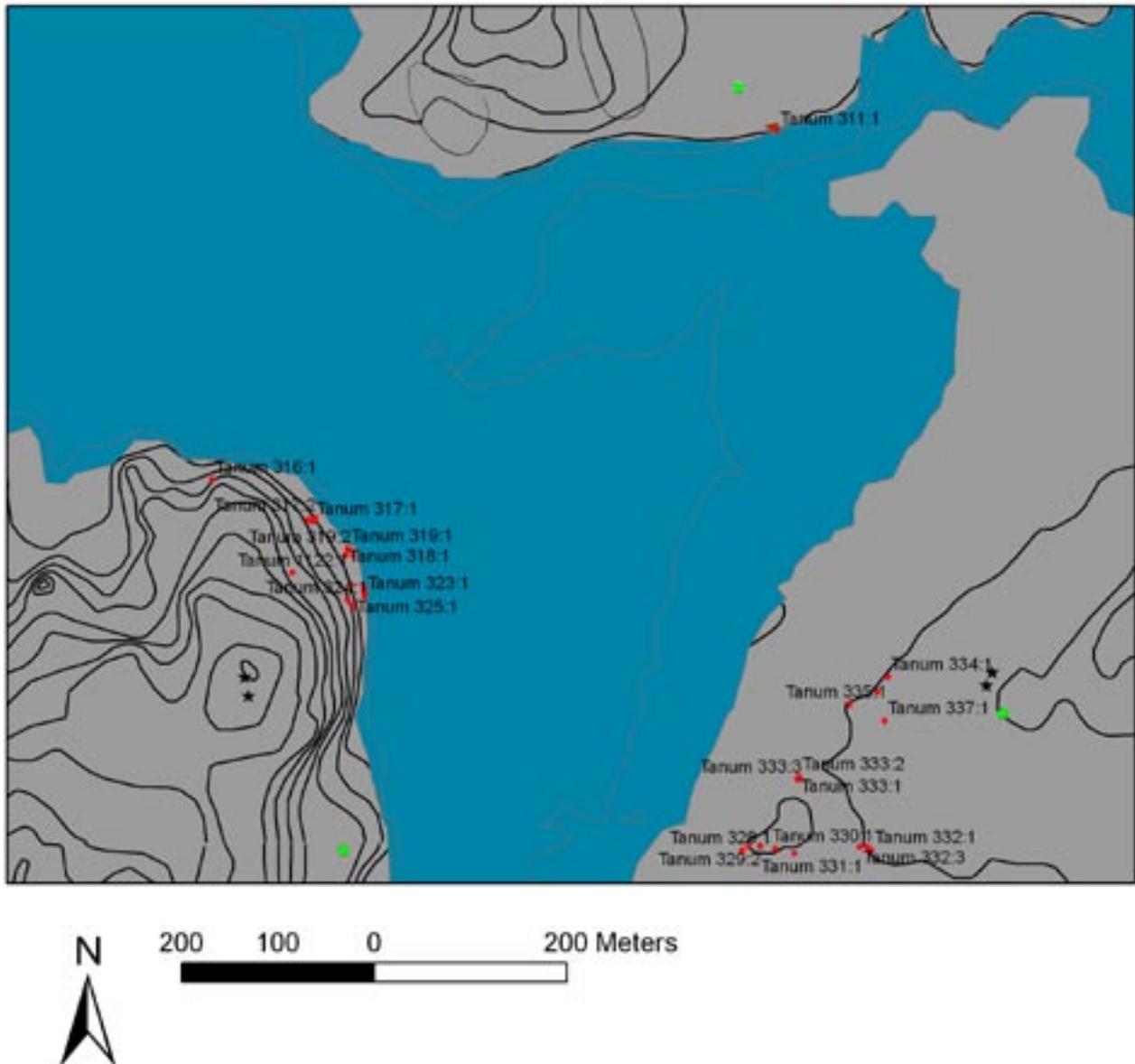


Figure 8.27. Reconstruction of parts of the Kyrkoryk and Gerum area, illustrating the shoreline in period III. Red dots = rock art, green dots = barrows, and black stars = stone settings.

what seems to be an intentional manner; they appear to form social or geographical positions.

The footprints crossing the panel, from the aquatic sphere up towards the former cemetery, are cut over some ships and features from the EBA. It is interesting that these footprints can be related to the Early Iron Age, both with reference to excavated barrows and to the panel Tanum 33, which includes footprints that can be dated to at least the PRIA. In this context it is tempting to associate the cemetery and the panel with a maritime funeral. Of all archaeological features, barrows and stone settings

do, in fact, have the closest spatial relationship to rock art in the Tanum (Bro Utmark, Listleby, Ryk) and Kville (Torsbo, Jore, Vidingen) areas.

Finally, the location of the panel and the fact that it is dominated by ship images, not “maypoles” or “sun horses”, suggests a maritime rather than the traditional agrarian interpretation. With reference to the ships and warriors connected to the mast-like figure, one suggestion is that this structure represents a maritime initiation rite, conducted before, during or after an event at sea. The panel’s maritime position, “like a maritime face or eye”, also suggests that



Figure 8.28. The panels at Lövåsen, 319, 321 and 325 (photo: Johan Ling).

it could have functioned as a significant landmark in connection with various forms of maritime movement or as a strategic meeting-point between land-going and sea-going communications. In this context, the panel may reflect a pragmatic perception of the surrounding maritime landscape.

Maritime positions in the Kyrkoryk and Ryk area (Tanum 213, 216, 217, 219, 321, 325, 335, 336)

There are many other rock art sites in this part of Tanum but there is not enough room to describe them in detail. Some of these panels have been the subject of interesting case studies. For instance, Coles recently published a new documentation of the rock art panels at Lövåsen (Coles 2006). Coles stresses the fact that the jutting panels at Lövåsen were facing a seascape during the BA. Altogether, the panels at Lövåsen make a massive impression in position, style and composition (fig. 8.28). Their position evokes questions about how these images were made (fig. 8.29). The panels include several interesting and elaborated images with phallic men with headgear and accentuated calves, as well as in-

teresting representations of warriors, acrobats and humans in the ships, some in commanding positions, others kneeling and posing (fig. 8.30).

The depictions on the panels share many similarities regarding performance, chronology and style with other adjacent rock art sites located in the southern part of the plain area, such as Tanum 192 and Tanum 62–64. This could indicate that the same “carver or carvers” have operated here (cf. Bengtsson 2004: 85pp; Goldhahn 2007: Ch. 4).

Some of these panels have images from the EBA but most of the images, scenes and other designs clearly point to period IV–VI, with some ship images from the PRIA (Coles 2006:326). The lowest panels at Lövåsen measured 17.27 (Tanum 325), 17.54 (Tanum 321) and 17.73 m.a.s.l (Tanum 319) and the ground just beneath the panels measured about 16–16.5 m.a.s.l (fig. 8.29). The similar altitude of the low located panels at Lövåsen could have been chosen intentionally to illustrate a shore line (e.g. Bradley 2000). A couple of ship images on this panel can be related to period II–III, when the shoreline was just a couple of metres from the panel. During period V, when most of the images on

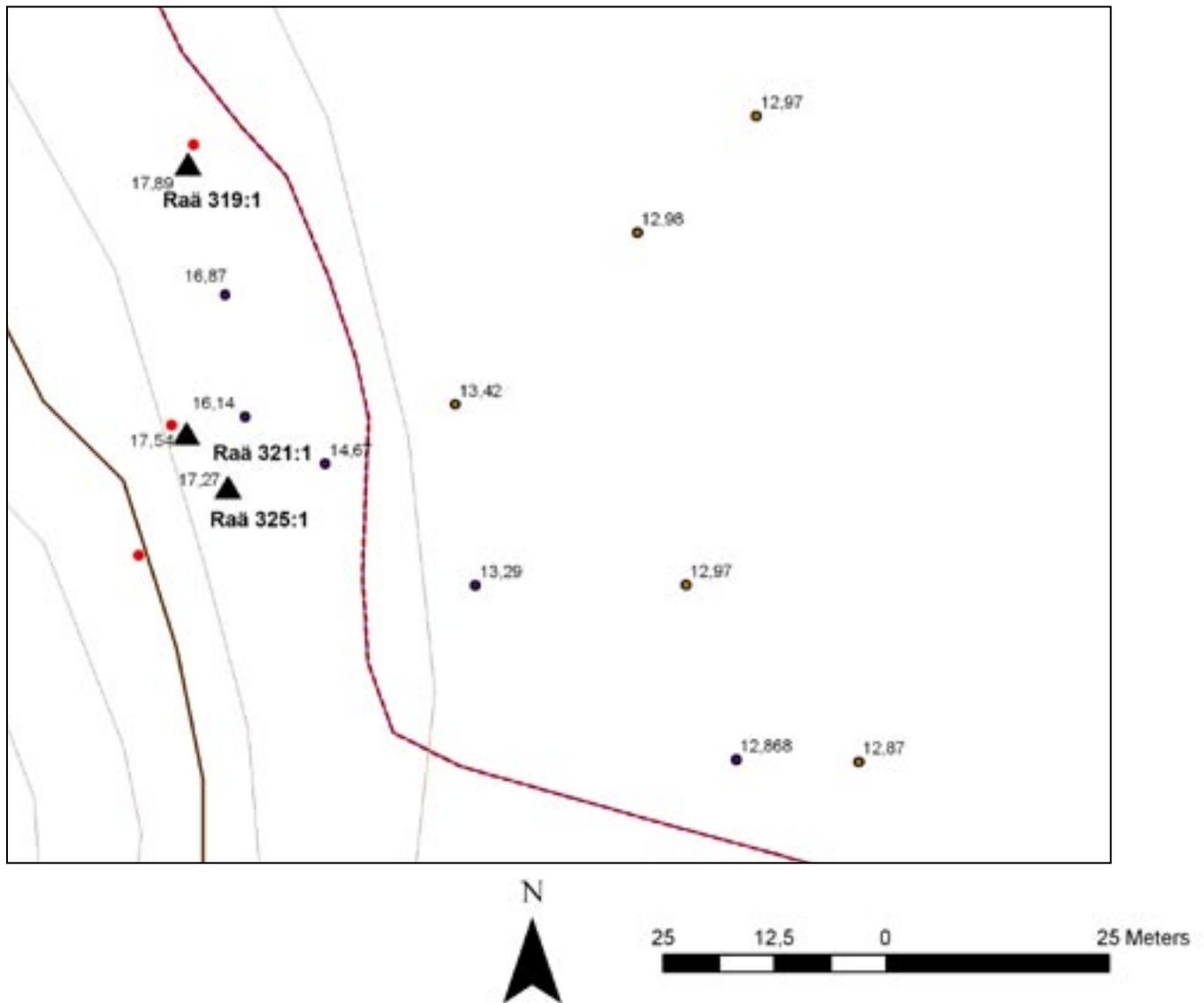


Figure 8.29. Map of the Lövåsen area in Kyrkoryk; triangles denote the altitude of the lowest image on each panel.

the panel were made, the shoreline was about 10–20 m away but the panel would still have been a good landing-place, or as Coles puts it “a beacon on the ridge” (Coles 2006). Once again, images by the water have constituted an important socio-ritual feature of the location of rock art.

Furthermore, in connection with the Tanum project, Lasse Bengtsson excavated on the opposite side of Lövåsen, in front of Tanum 336, and dated charcoal from a hearth located some 2 m from this panel; the results pointed to 900–790 BC (Bengtsson et al. 2005: 105). This is highly interesting be-

cause the dating agrees with the typological dating of the ship images on Tanum 336 and the adjacent panel 335, to period V (Högberg 2000: 50). These panels have a similar performance, style and cluster of ship images from period V and both tend to overlook the low-lying arable land.

The measured altitudes of the panels in the area range from about 14 to 20 m.a.s.l (fig. 8.29). The lowest panel at Lövåsen, Tanum 321, is at 18.3 m.a.s.l and most of the sites here are on higher ground. However, the localities further south, such as Tanum 213, 215 and 219, are lower down and



Figure 2.30. Documentation of ships and the “shaman” on Tanum 321 (by RockCare).

could not have been made in the beginning of the BA. All the panels in this area have images from the LBA and some from the PRIA. Today’s altitude of the arable land adjacent to these sites ranges from about 8 to 13 m.a.s.l, which means that these panels were connected with the shore throughout the BA. During the LBA the sea was adjacent to these sites, generally about 5–30 m away, and during the PRIA about 30–60 m away (fig. 8.31). The GPS measurements of the rock art and terrain demonstrate that during the LBA and the PRIA the sea was considerably closer to these rock art sites than the economic maps indicate. Moreover, all the panels were made on outcrops that faced the sea during the BA and this may indicate that they were meant either to reflect social actions at sea or to be seen from the sea, at least from a short distance. These panels then had a location and setting in the landscape during the BA that were similar to that of rock art today in areas such as Tisselskog in Dalsland, western Norway or Simris in Scania (e.g. Althin 1945; Wriggelsworth 2002, 2005; Nordenborg Myhre 2004: 116).

Conclusion

The following statements can be made concerning the rock art in this area (fig. 6.6, 8.27–8.31, tab. 8.3):

- The measured altitudes of the rock art sites demonstrate a close spatial connection with the sea throughout the BA, with a suggested distance of 5–30 m during the LBA and about 30–60 m during the PRIA.
- The ship depictions make the greatest impact and dominate the panel not only by their size and frequency but also with their elaborate styles and utterances. Their dominance and the orientation of the panels towards a seascape during the BA may indicate that the panels were meant either to reflect social actions at sea or to be seen from the sea, at least from a short distance.

Revisiting the vertical cliff at Tyft (Tanum 236)

Aspects of dating and making this particular rock art was considered in chapter 7; this account concentrates on other issues. The site is one of the most interesting in the Tanum area. The closest parallel in terms of shore displacement and the vertical setting is a rock art site in the Kungälv area, Solberga 50. The measured altitudes of the two different rock art ships are 13 and 13.75 m.a.s.l (see Ch. 7). The setting is rather unusual and evokes many questions and ideas about the making of these particular images. The lower of the two ships is situated just 2 m above

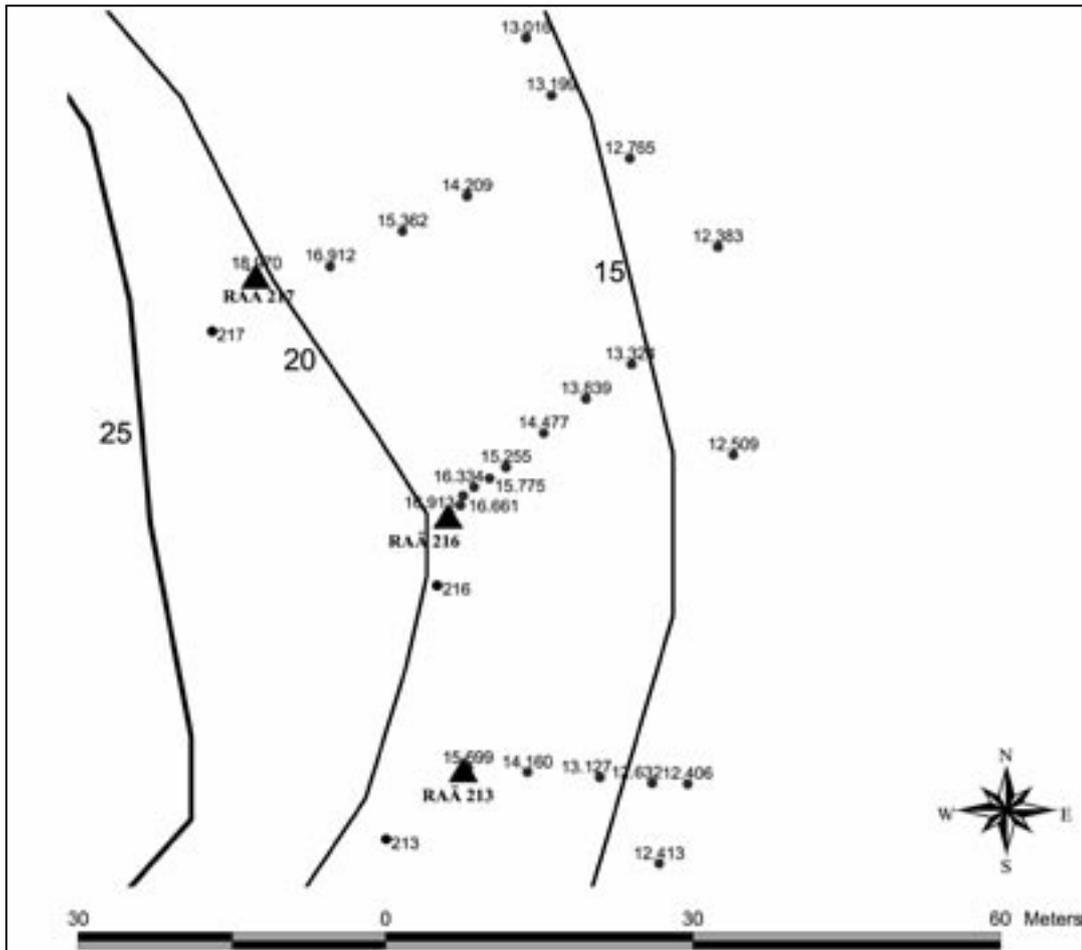


Figure 8.31. Top, map of the rock art in the Ryk area; triangles denote the altitude of the lowest image on each panel. The altitudes on the contours are derived from the economic map and illustrate the arbitrary nature of this information in relation to the altitudes obtained with GIS measurements. Triangles with Raä numbers show the actual position of the rock art localities, while dots with Raä numbers show the presumed but arbitrary position according to the economic map. Bottom, a ship image from the rock art site Tanum 213 (photo: Torsten Högberg, VM).

Tanum	213	215	216	217	219	311	321	325	335	336
M.a.s.l	15.63	15.85	18.91	18.91	17.73	14.74	17.54	17.27	18.4	20.4

Table 8.3. Altitude of the lowest image on each panel at Gerum, Kyrkoryk and Ryk in Tanum.

the ground and is 55 cm long, single lined with crew. The other ship feature is 2.75 m above the ground and is 60 cm long, partly fragmented, double lined with accentuated keel extension and one prow (fig. 7.28–7.29). The setting of these depictions prompts a discussion concerning inaccessible and accessible settings for rock art in the landscape.

In any case, this inaccessible surface with two ship depictions may convey a particular action or meaning, especially in relation to the other rock art panels in the area that are more accessible and have considerably more images, such as Tanum 216, 217, 219, 326 (see Högberg 2000; Fredell 2003: 168). For instance, Tanum 326 is one of the most complex rock art panels in the entire area, with combinations of images and scenes from period IV to the PRIA (Fredell 2003: 168). The figures on this panel have recently been documented and interpreted by Fredell. The panel, at a measured altitude of 17 m.a.s.l, overlooked a seascape during the BA. Consequently this locality may then have been accessible from both the land and the sea, besides being visible from land and sea.

Our present subject, Tanum 236, on the other hand, is on a vertical cliff and would have been accessible and visible only from the sea. In this context it is relevant to refer to Richard Bradley's distinction between complex rock art sites located at accessible places in the landscape and simple rock art sites located at more inaccessible places (Bradley 1997: 6). In the present context, however, it is more apt to talk of a seascape (Coles 1990, 2005).

Conclusion

The rock art activity on the vertical cliff at the foot of this hill prompts the following statements (fig. 6.6, 7.28–7.29, tab. 8.3):

- The measured altitude of the ship depictions demonstrates a close spatial connection with the sea throughout the BA, with a suggested distance

of 0–3 m during the LBA and 3–5 m during the PRIA.

- The unusual setting of these particular ship depictions leads to a discussion concerning inaccessible and accessible rock art settings in the former seascape. The panel can be seen as a maritime inaccessible site because it could have been reached and seen only from the sea. This is in contrast with many other localities in the area with complex image combinations that may have been accessible as well as visible from both the land and the sea.

- The exposure of ship depictions towards an ancient seascape must be said to indicate that these ship features were meant to be seen from the sea or, more likely, marked or reflected the sea's presence. This may testify to a pragmatic perception of the environment.

Landscapes and seascapes in the Kalleby area (Tanum 425, 427, 419, 944, 420, 421, 418, 417)

The final case deals with some of the rock art in the Kalleby area. The figurative rock art sites at the lowest altitudes in this area, namely Tanum 425 and Tanum 427, have already been presented. Both these localities were included in the dating discussion and the former was assigned to period IV–V, the latter to period II–III (see Ch. 7). There are also localities with cup marks only (Tanum 997:1–2, 998) that seem to be at an even lower altitude than these two, indicating that these were perhaps produced in the Early Iron Age. However, they were not measured because they lie outside the purpose of this study, which focuses on figurative rock art.

The Kalleby area is renowned for its numerous rock art sites (Högberg 1988b), about 50 in an area that measures about 1.8 x 0.8 km (from north to south and east to west). The images include large and magnificent lure blowers, several wedding couples, sun horses, horned warriors and, of course, ships. The area is naturally delimited by granite hills

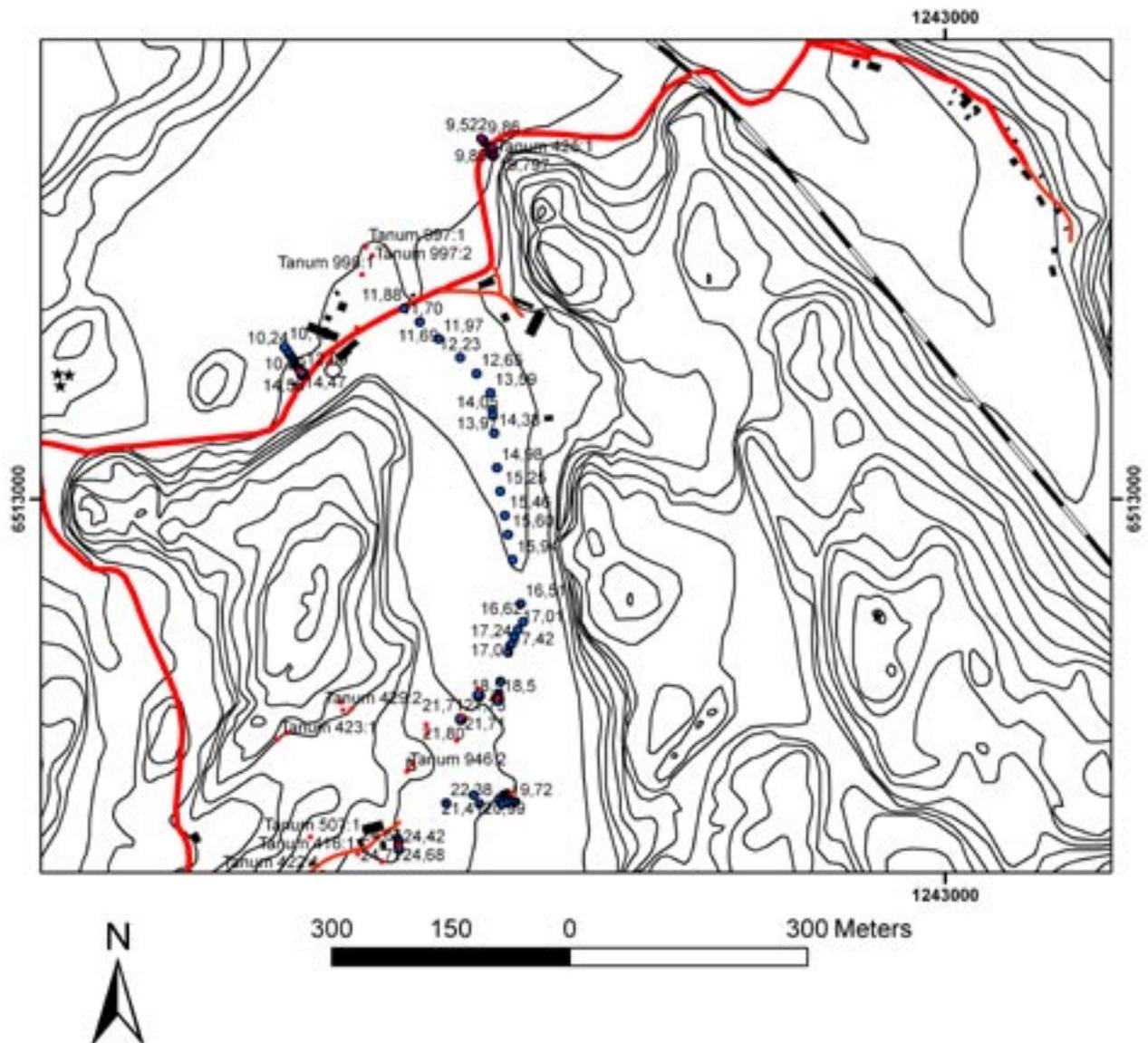


Figure 8.32. Map of the measured rock art in northern parts of the Kalleby area.

and ridges, on top of which are cairns and stone settings. The rock art is sited on lower granite outcrops bordering the arable land. Its altitude today is generally rather high, ranging from 20 to 55 m.a.s.l (fig. 8.32). The aim was not to measure all the sites in this area but to test a hypothesis about the perception of some of the rock art localities in its north-eastern part. However, the terrain around the sites was subsequently measured, starting from the lower northern plain, and the results showed that the sea, then about 100–300 m away, would have been visible from these sites throughout the BA. The lowest site is Tanum 419, at 18.7 m.a.s.l, followed by

Tanum 944, at 19.7. Both these localities display ship images from period V. The highest panel here is at 24.7 m.a.s.l and presents ship images presumably from period II–III, but also period V–VI.

Conclusion

This pattern prompts the following statements (fig. 6.6, 7.29–7.30, 8.32–8.34, tab. 8.4):

- The lowest panels in this area, Tanum 425 and Tanum 427, were made during the BA just 0–5 m away from the sea.
- The rock art sites on higher ground demonstrate

Tanum	234	214	369	425	427
M.a.s.l	13.07	14.13	13.84	13.01	14.73

Table 8.4. Altitude of the lowest image on each panel at Tyft, Orrekläpp and Kalleby in Tanum.

a rather close spatial connection with the sea throughout the BA, with a suggested distance of 100–200 m during the EBA and 200–300 m during the LBA.

- The ship depictions make the greatest impact on these particular panels and the panels' outlook onto a seascape during the BA may indicate that they were meant either to reflect actions at sea or to be seen from the sea.

Discussion

The rock art in Kalleby is best known for the figurative images, for instance, the large and elaborately lure blowers on panel 405 (fig. 8.33). These figures



Figure 8.33. The well-known lure blowers from the panel Tanum 248 in Kalleby (after Coles 1990).

have been depicted over ship images but nevertheless stand in a ship. This fact seems to have been ignored by many scholars. It is not unusual for rock art researchers to detach humans from other features such as ship images (Ohlmarks 1946; Bertilsson 1987; Yates 1993; Fredell 2003; Bengtsson 2004). This procedure is debateable, especially if the aim is to reconstruct and discuss the idea or mentality that may have governed the production of the images. The ship is an important context that should not be reduced or ignored in relation to other images on a panel. The frequency of ship images can be taken to indicate that these were the most important features to depict. The size of these human figures is rather impressive, especially compared with the ship images. The large human figures in Kalleby illustrate a trait that is evident in the rock art rich areas in northern and central Bohuslän: large human figures tend to have been made on higher ground away from the sea, while panels dominated by ship images were made close to the BA shore (fig. 8.34, 8.37). Human figures on these lower panels seem to have been more or less adjusted to the size of the ships.

The following sites on higher ground in this area illustrate this trait: Tanum 405 and 417 in Kalleby, Tanum 248 and 255 in Fossum, Tanum 158 in Hoghem, and Tanum 75 in Litlesby. The same trait is evident in the adjacent parish, as manifested by sites such as Kville 12, 59, 124, 125 and 143.

Concluding remarks

The conclusions drawn from the measured altitudes of the rock art and terrain in the Tanum World Heritage area have generated some general ideas about the placing and making of rock art during the BA (fig. 8.35–8.37, tab. 8.5). Another result of this study is that it draws attention to some specific circumstances that need to be acknowledged. The findings suggest that altitudinal studies of prehistoric sites in the area cannot rely on the arbitrary altitudes on the economic maps. Instead, it is necessary to use specific GIS measurements of the rock art sites and terrain.

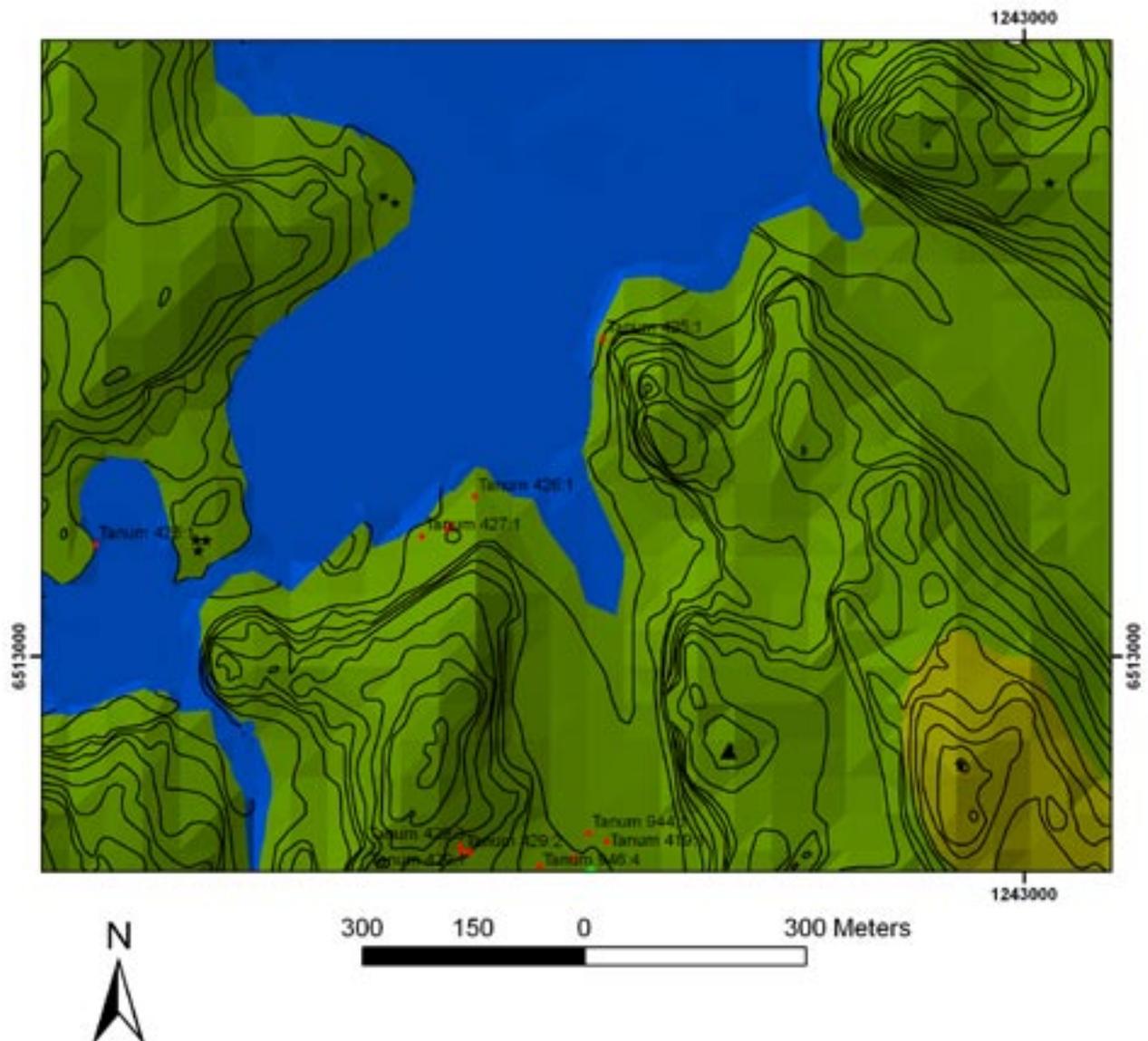


Figure 8.34. Reconstruction of the northern parts of the Kalleby area, illustrating the shoreline during the LBA and showing that the rock art here was made close to the shore.

Specific information about shore displacement and land use in the area is also of crucial importance. As demonstrated in the following, this approach may contribute to an alternative understanding of rock art's original setting in the landscape.

There are a number of reasons why the study of ancient sites and monuments in relation to shore displacement cannot rely on the economic maps. For one thing, the GPS measurements show that the altitude of both the land and the rock art localities diverges considerably from data on the economic maps; in general there was a discrepancy of 1–3 m,

sometimes even more. Secondly, the lower plain areas have been intensively cultivated for at least two centuries, some parts since medieval times. Recent archaeological surveys in these areas show that at least 1–1.5 m of agricultural sediment has accumulated and shifted from higher to lower ground. This means that the altitude of this lower land must have been at least 1 m lower in prehistoric times.

These altitudinal adjustments gave a lower altitude for the land and the rock art sites by the Tanum plain. It follows that during the BA the sea was considerably more present and closer to these rock art

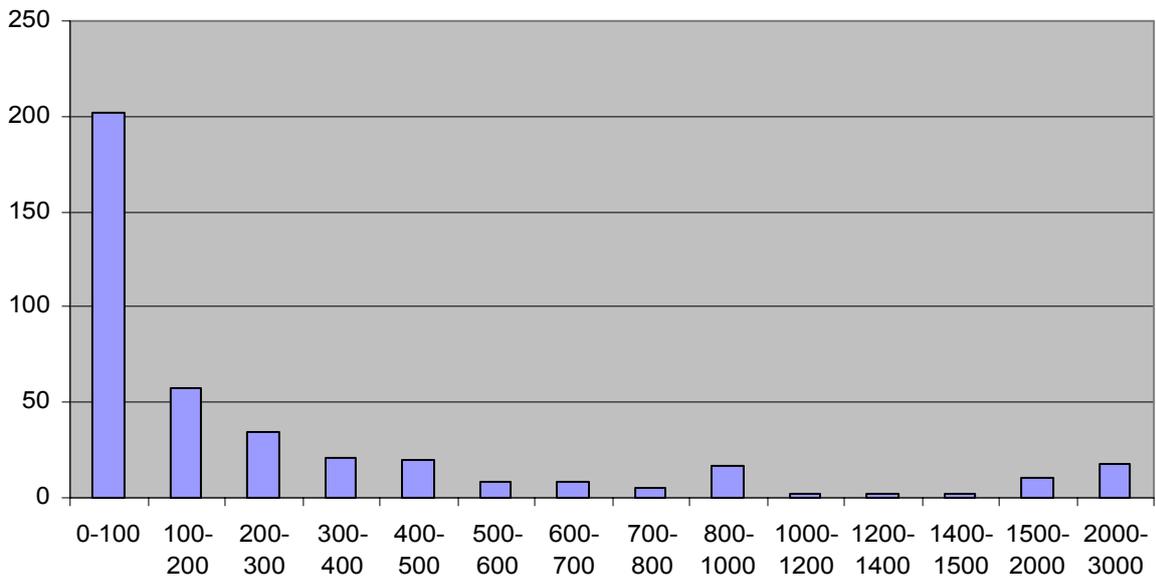
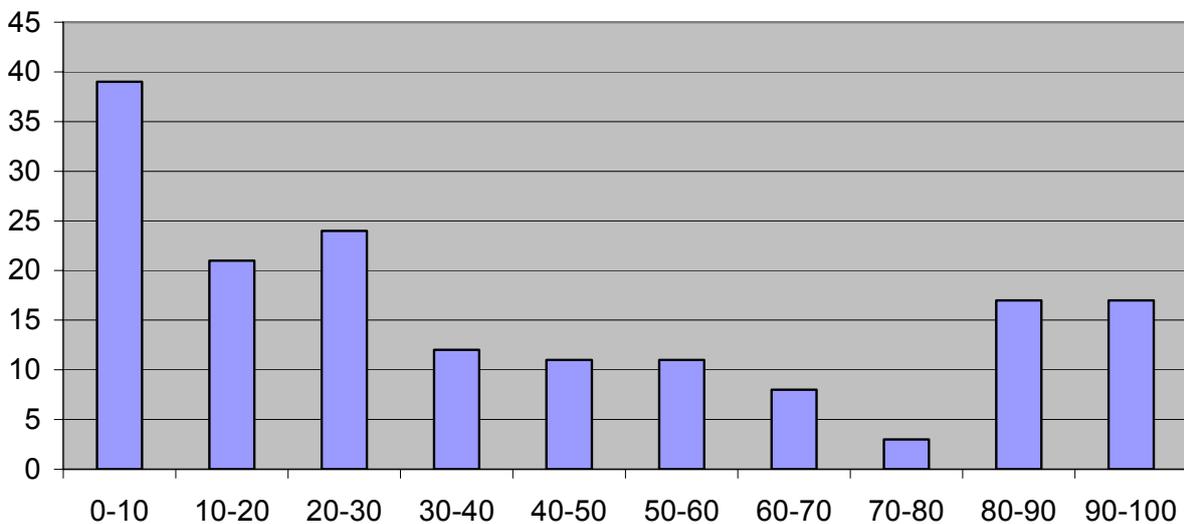


Table 8.5. Above, distribution of the rock art sites in Tanum in relation to their measured horizontal distance from the Bronze Age shoreline, at 100 metres equidistance. Vert axis: No. of sites, Hor axis: Metres. Below, distribution of the rock art sites in Tanum in relation to their measured horizontal distance from the Bronze Age shoreline, at 10 metres equidistance. Vert axis: No. of sites, Hor axis: Metres.



sites. This paves the way for a discussion of new issues concerning the action and dating of these localities. While these observations have generated even more questions, some general conclusions can be drawn about the chronological and spatial pattern of the rock art and the ancient shoreline. Thus, the sea was a very present feature of the rock art sites throughout the BA and even during the PRIA. In general terms, the area may be characterised as a BA seascape (fig. 8.1, 8.36, 8.37). Before discussing

more specific aspects and ideas in connection with these findings, I have tried to summarise some of the most essential observations:

- About 70 percent of all the figurative rock art sites in the Tanum area are located on low-lying land that during the BA constituted shallow bays, estuaries and inlets (fig. 8.1). A majority of the rock art sites seem to have been located between 0 and 100 m from the sea-shore. Moreover, a

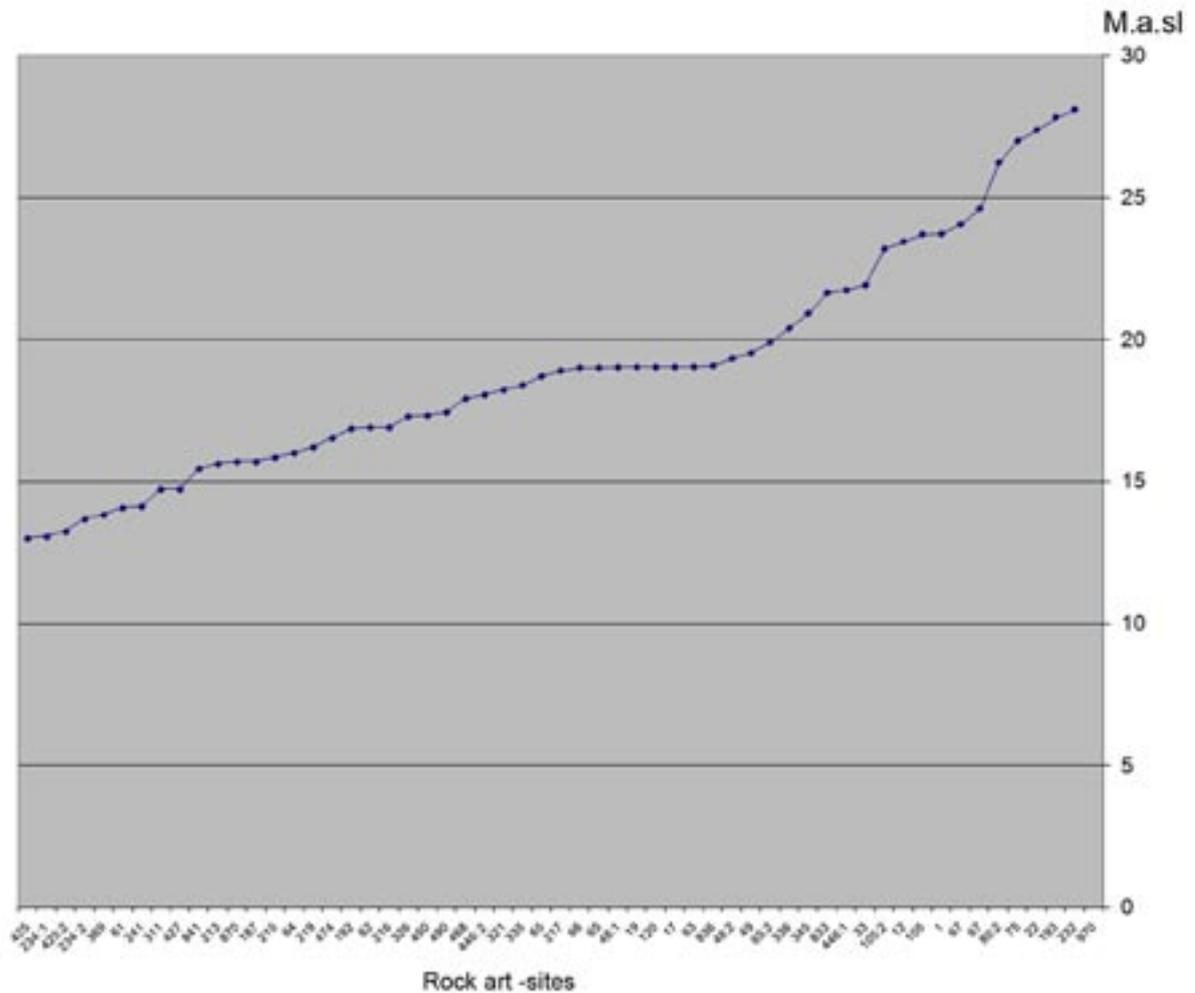


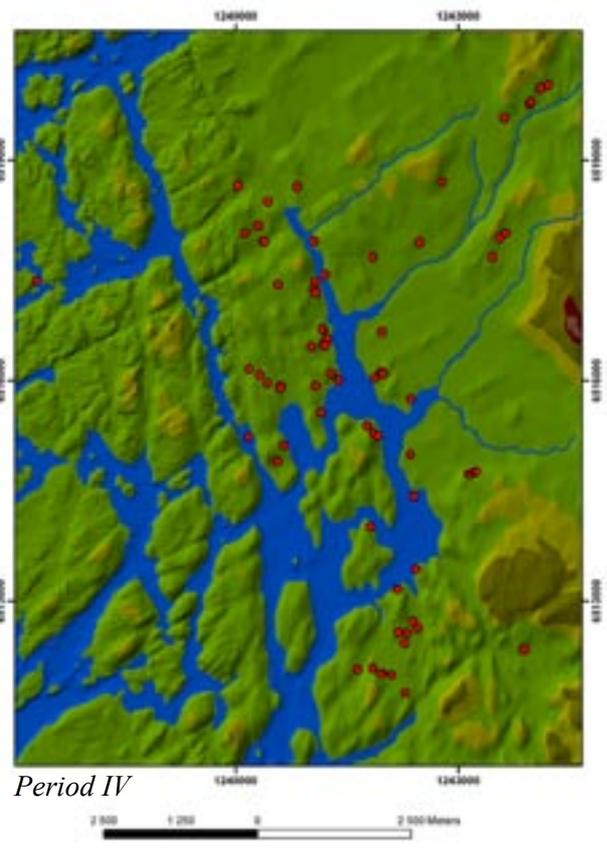
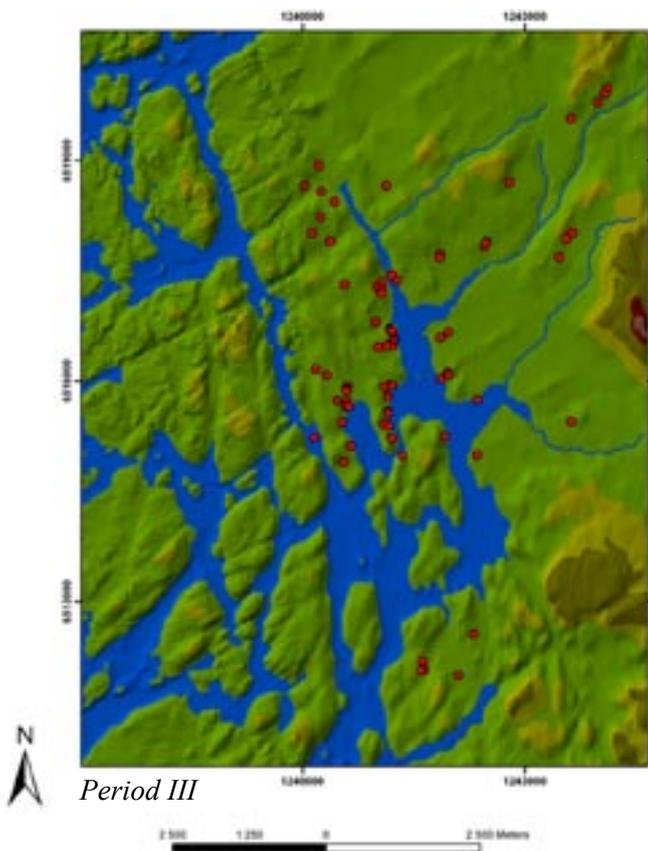
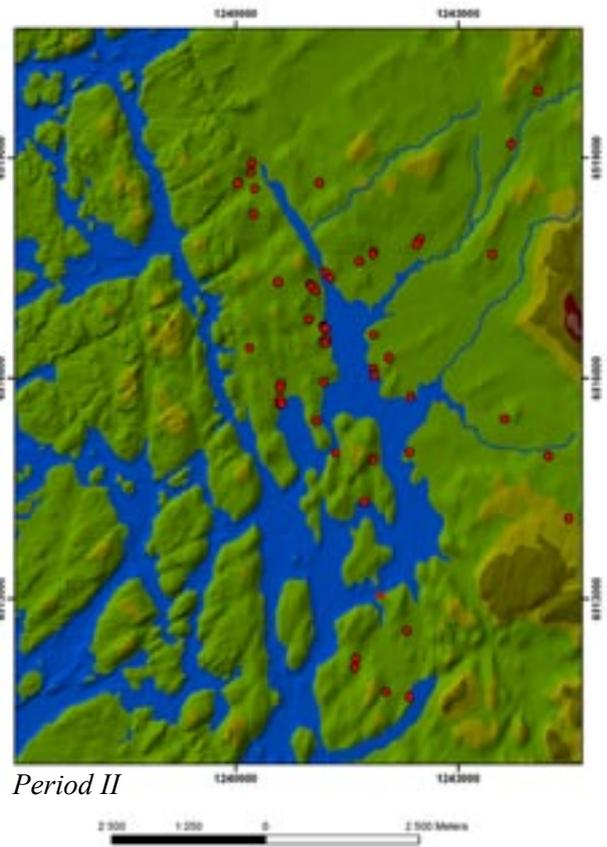
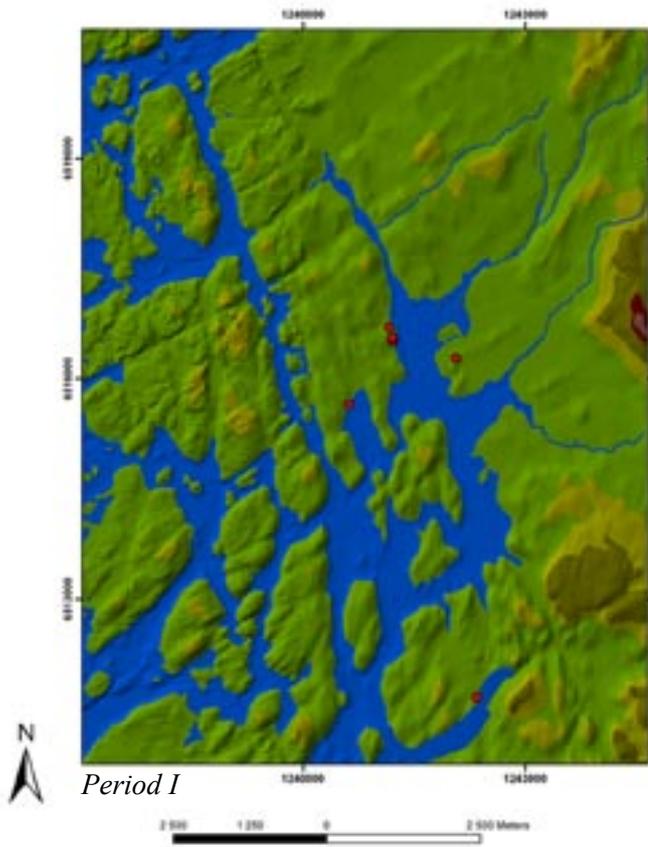
Figure 8.35. Altitudes of each of the GPS-measured rock art sites in Tanum.

major proportion of these sites were between 0 and 20 m from the shore (tab. 8.5). This is also the case in the Kville area (see Appendix 3).

- Only a minority of these rock art sites, about 10 percent, seem to have been located just at the water's edge. Most of the panels appear to have been made on rather elevated outcrops, some meters above the BA shoreline. Even so, the horizontal distance between these rock art sites and the shoreline was short in the BA. This also applies to the rock art in the Kville area (see Appendix 3). However, there are also many rock art sites, about 30 percent, on higher ground at some distance from the sea (fig. 8.1, 8.36, 8.37).
- The BA seascape would have connected and united areas with rock art and made these sites considerably more accessible than today.

- The largest figurative rock art sites dominated by ship images were located close to the BA shore, while rock art sites with large humans, as well as most of those with cup marks only, were placed on higher ground (fig. 8.1, 8.37).

- The strategic maritime setting of the rock art, in a transitional shore zone, may reflect various forms of maritime movement, interaction, position, initiation, ideals and traditions. Some of these panels may also have functioned as strategic meeting points between land-going and sea-going communications. The ship depictions, positions and formations make the greatest impact and dominate the panels not only by their size and frequency but also with their elaborate styles and utterances. The content and situation of the panels may indicate that they were meant



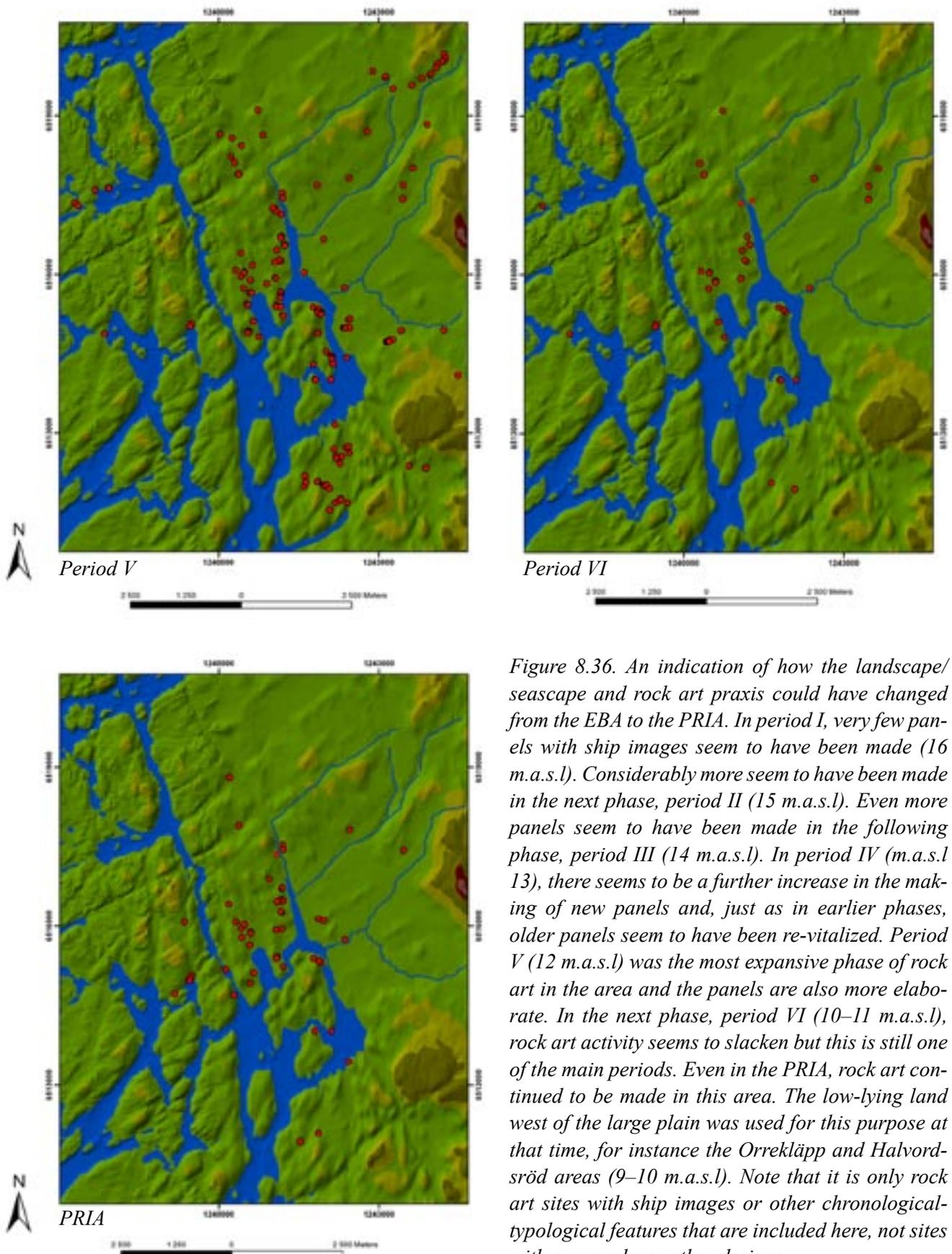
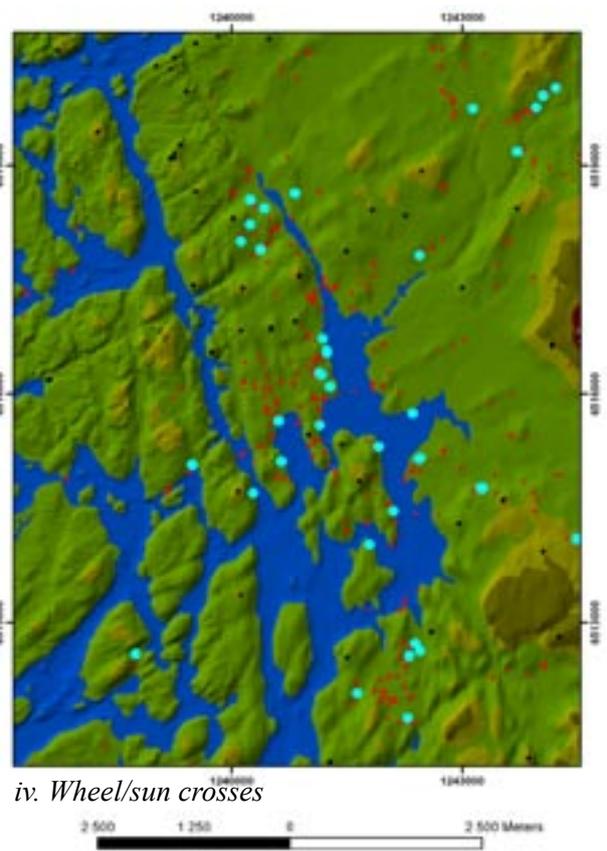
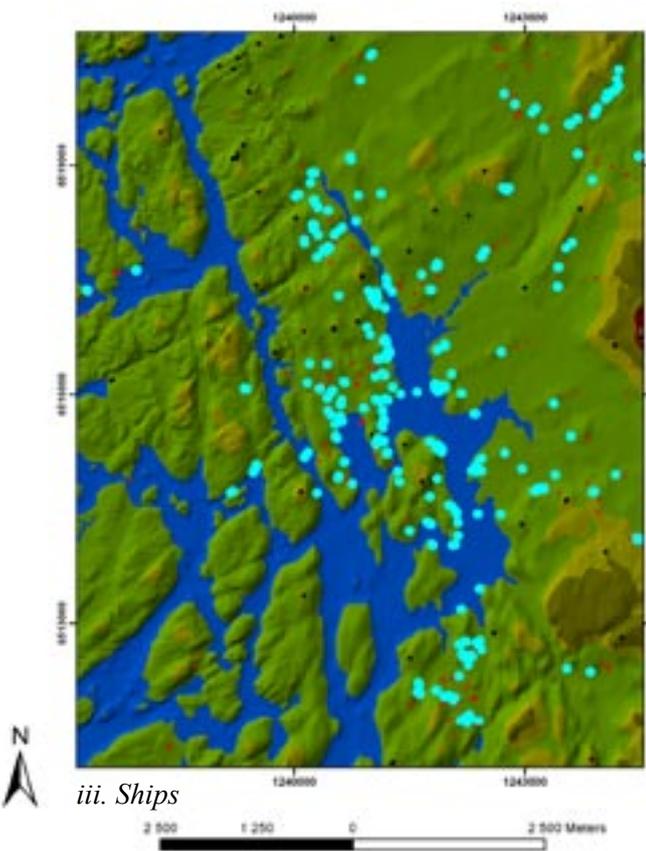
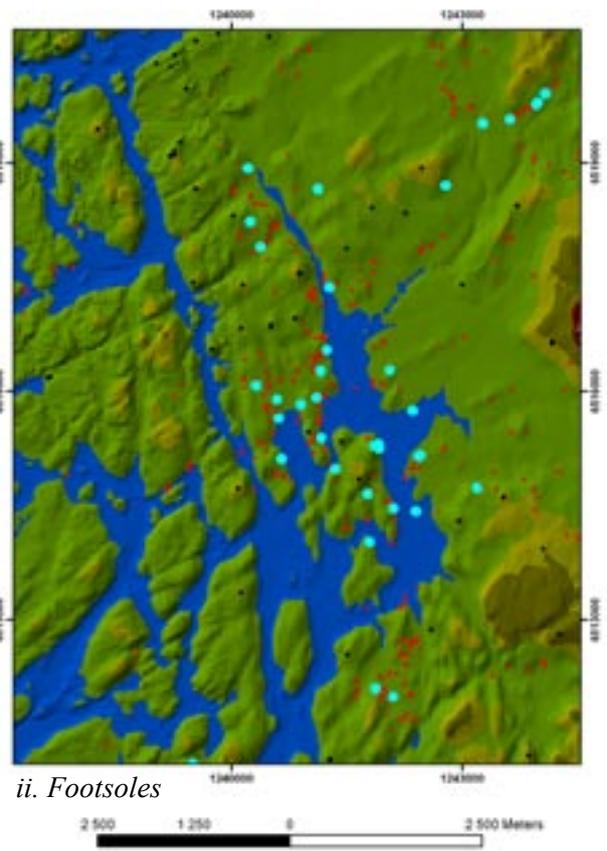
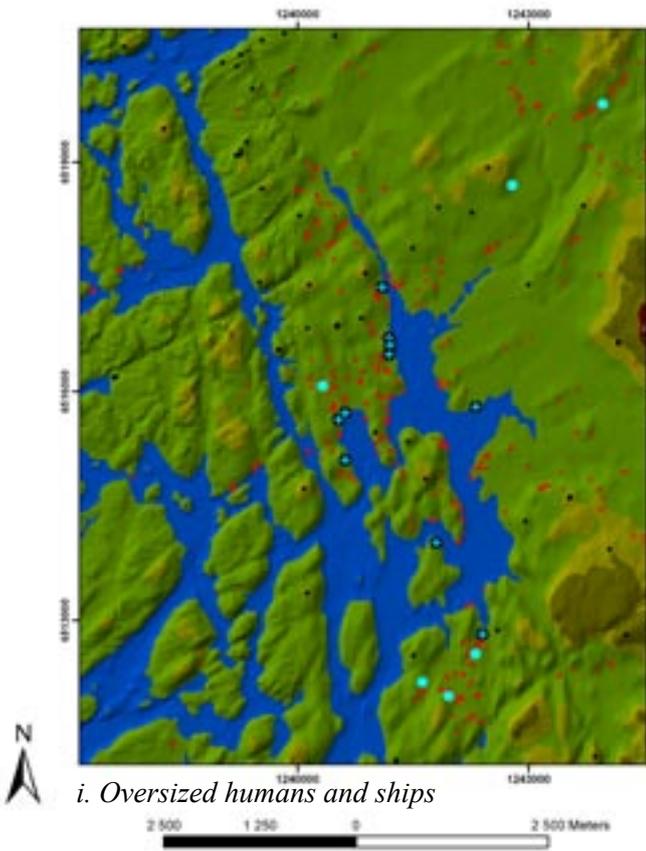


Figure 8.36. An indication of how the landscape/seascape and rock art praxis could have changed from the EBA to the PRIA. In period I, very few panels with ship images seem to have been made (16 m.a.s.l). Considerably more seem to have been made in the next phase, period II (15 m.a.s.l). Even more panels seem to have been made in the following phase, period III (14 m.a.s.l). In period IV (m.a.s.l 13), there seems to be a further increase in the making of new panels and, just as in earlier phases, older panels seem to have been re-vitalized. Period V (12 m.a.s.l) was the most expansive phase of rock art in the area and the panels are also more elaborate. In the next phase, period VI (10–11 m.a.s.l), rock art activity seems to slacken but this is still one of the main periods. Even in the PRIA, rock art continued to be made in this area. The low-lying land west of the large plain was used for this purpose at that time, for instance the Orrekläpp and Halvordsröd areas (9–10 m.a.s.l). Note that it is only rock art sites with ship images or other chronological-typological features that are included here, not sites with cup marks or other designs.



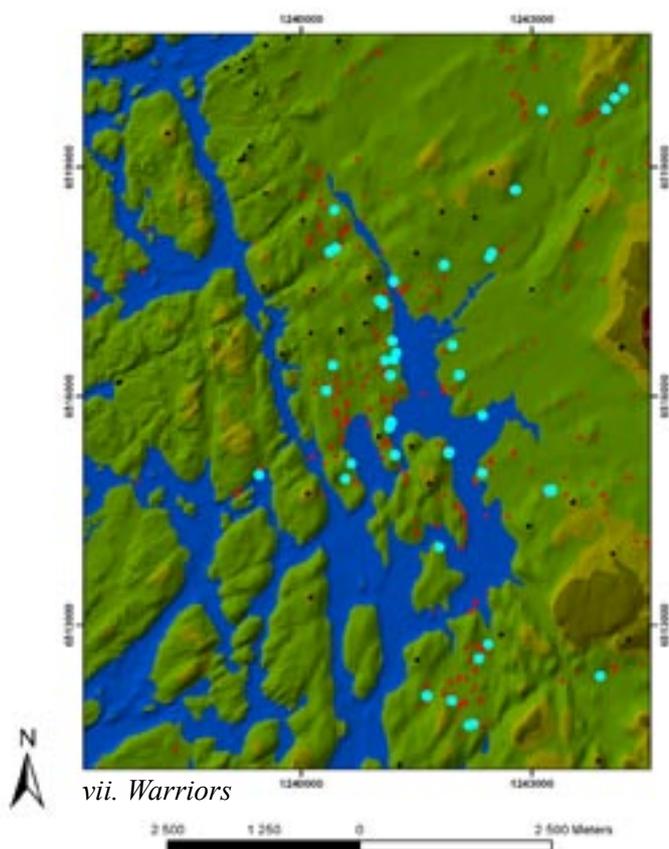
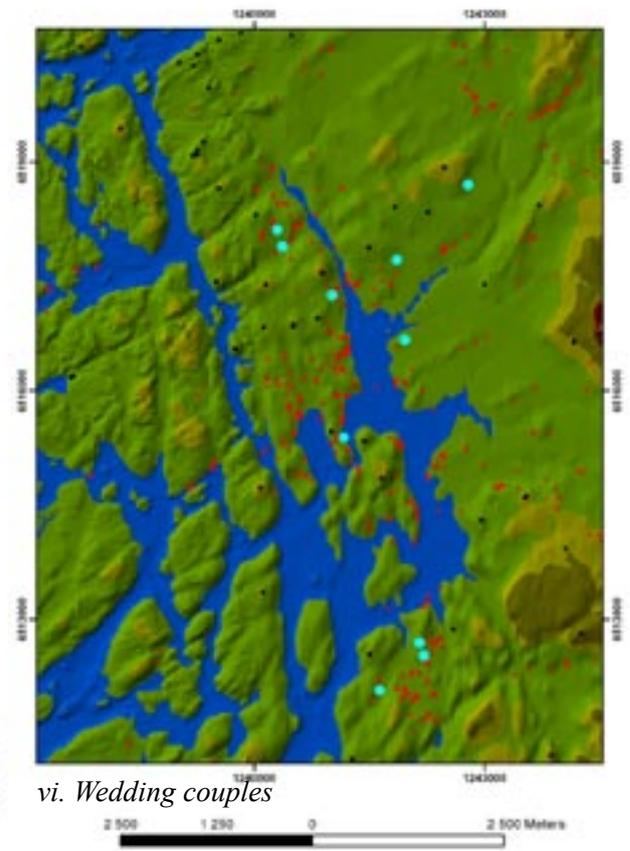
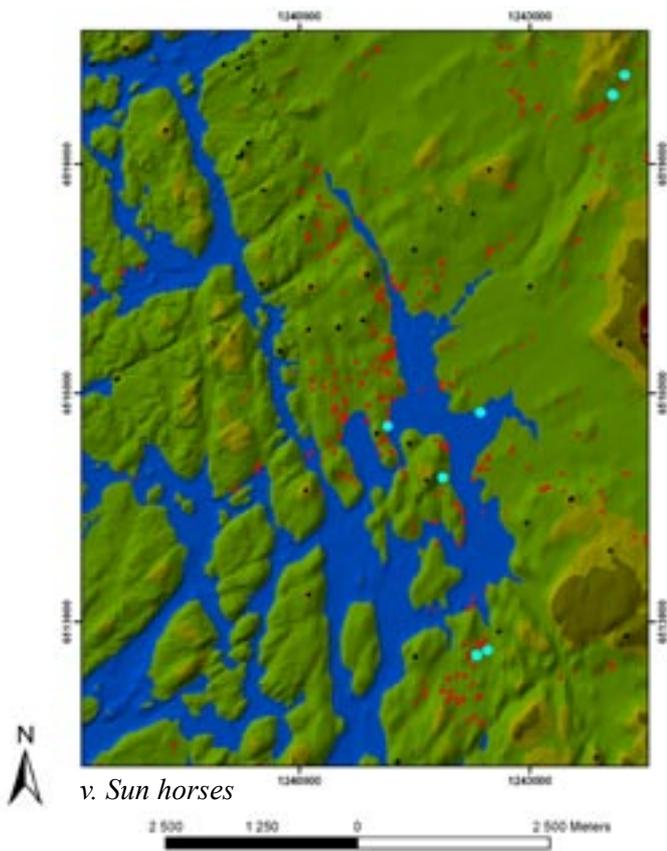


Figure 8.37. The distribution of different motifs within the Tanum area. *i* = Panels with oversized humans located on higher ground (blue dots) and shore-connected panels that include most ship depictions (black dots with cross); *ii* = The distribution of footsoles; *iii* = The distribution of ship depictions; *iv* = The distribution of wheel/sun crosses; *v* = The distribution of sun horses; *vi* = The distribution of wedding couples; *vii* = The distribution of warriors. The BA shoreline runs here at about 13–14 m.a.s.l. (information based on Högberg 1988, 1995, 1998, 2000; Milstreu & Pröhl 1986, 1999, and ATA, GAM, and VM. The information in fig. 8.36 and 8.37 can be found in databases in Appendix 3).

to reflect social actions, conditions or ideals at sea. Some sites were probably meant to be seen from the sea, at least from a short distance.

- The study has shown that the performance of the figurative rock art was limited, regarding both localities, images and expression during the beginning of the EBA towards period II; common features were depictions of ships with anonymous crew, sun wheel/crosses, single weapons, and cup marks. During the next phase, period II–III, the figurative rock art increases in number and in utterance; human gear becomes visible in the material, such as warriors and their gear, lures, and other designs. The ship images become altered during period III with out turned prows that end in animal heads. During the LBA period IV–V, the production of rock art increases dramatically and reaches its peak. At the same time the performance of the images becomes highly innovative and elaborated, especially regarding the depictions of humans in different social positions, bodily performances or scenes: scenes in ships, warriors, plough scenes, scenes with chariots, wedding couples, acrobats and adorants. Ships, animals and other designs are also made in a highly complex manner. During the following phase, period VI and the PRIA, the rock art sites seem to decrease in the area, both in number and in utterances. However, the expression is still highly elaborated but more pragmatic during the PRIA than former phases. During the PRIA the symmetric ship images replace the asymmetric ones from the BA. Horses are more pronounced and horsemen are introduced, four wheeled wagons and warriors with rectangular shields and humans with square bodies appear.

- Grave monuments such as stone settings and barrows are the prehistoric remains with the closest spatial relation to the rock art (fig. 8.38). Bronze Age settlements and settlement finds are generally located at some distance from the areas with frequent figurative rock art sites, usually 400–1000 m (fig. 8.1–8.3). Finds that could indicate a BA settlement, such as bronze items, ceramics or flint daggers, are located northeast and north of the low-lying Tanum plain. Less complex figurative sites and sites with cup marks

only are in general located closer to prehistoric settlements than the complex figurative rock art sites.

Consequently, it seems that, in a broad sense, the spatial and chronological structure behind the making of the rock art tended to follow the regression of the shoreline. Figure 8.36 and 8.37 demonstrate this spatial and chronological conclusion. Thus, the sea was very present in this landscape during the BA and it may have affected and mirrored the rock art activity on different physical, social, ritual and cognitive levels. However, the BA people did not follow the regression of the shoreline; they rather made rock art at specific places in the landscape/seascape that corresponded to their social norms and traditions.

The low-lying localities with ship features from period I–II are in general situated in the northwestern part of the plain at altitudes today that range from about 25 to 17 m.a.s.l. During period III–IV the localities become considerably more frequent and the activity tends to follow the regression of the shore (fig. 8.36). Low-lying localities with ship features from period V–VI are in general situated in the southwest part of the plain at altitudes today that range from about 20 to 13 m.a.s.l. Finally, the low-lying localities with ship motifs from the PRIA are generally to be found in the southwest and western parts of the plain at altitudes that range from about 17 to 13 m.a.s.l (fig. 8.35, 8.36, see also Appendix 3).

However, this praxis seems to be accompanied by a parallel action whereby rock art is made regardless of the shoreline's regression and cannot be explained with reference to the same causes and conditions. At many places, for instance Vitlycke, Aspeberget, Tegneby, Kalleby and Litsleby, it seems that older panels on higher ground were being altered, merged, re-vitalised and upgraded in later periods. Two concepts may be used to describe these actions: *depictions of social landscapes* and *depictions of social memory of a place*. Some of these rock art panels were first made close to the sea, perhaps in order to connect with or meet interactions or ideals at sea. As the seascape turned into a landscape, some of these sites became remembered,

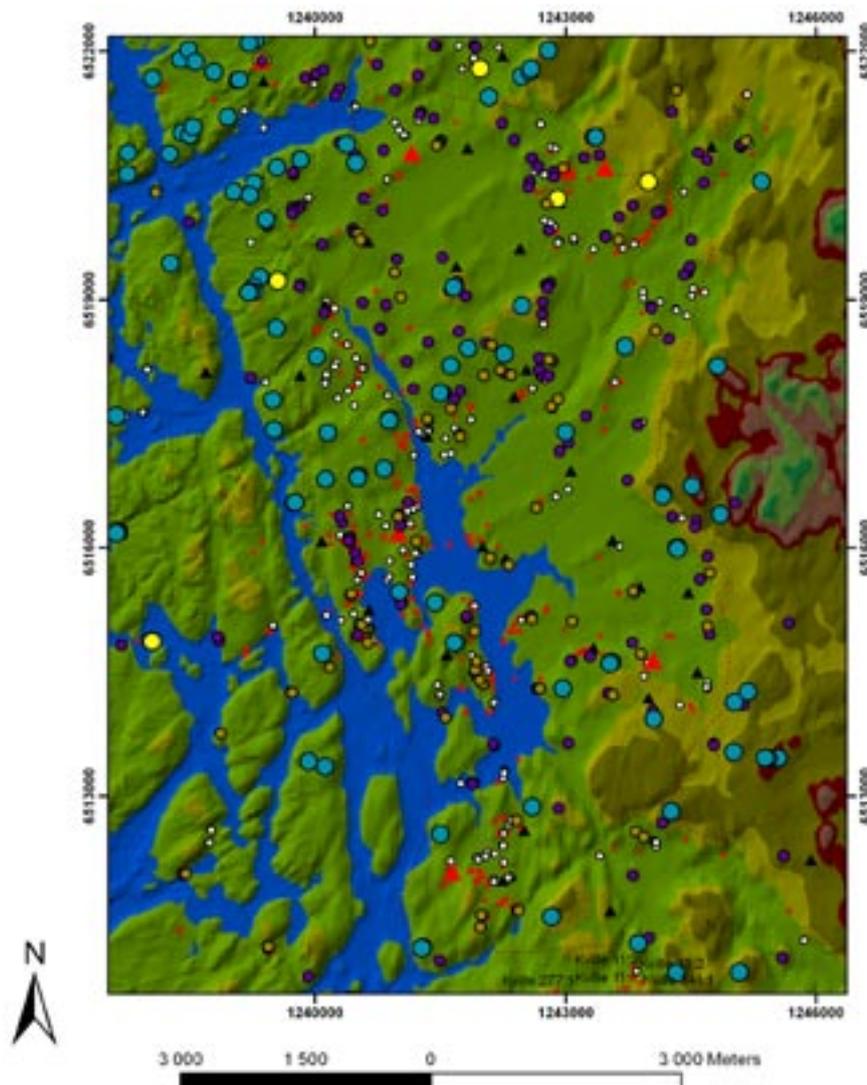


Figure 8.38. Map of the Tanum area showing the spatial relationship between graves, settlements and rock art. Large blue dots = cairns; purple dots = stone settings; brown dots = grave mounds; red triangles = settlement finds (carbon dates, ceramics, or other features) dated to the BA; black triangles = indicative settlement sites from the BA; yellow dots = bronze items.

re-negotiated or revised into upgraded places of memory and tradition.

Moreover, some rock art sites seem implicitly or explicitly to illustrate the landscape or actions connected with the landscape. Most of the ship images, for example, were made close to the shore. Also, human figures, animals and ship images in a broad sense appear to have been represented and adjusted after certain landscape concepts and ideals. Thus, the largest human images were made on higher ground, such as the panels Tanum 248, 255 and 405, and abnormally large in relation to the ship

depictions on the same panel (fig. 8.37). On lower ground, human representations seem more or less to have been adjusted to the size of the ship images. Moreover, the rock art sites from the PRIA appear to represent similar notions about the landscape, with humans made considerably larger than the ship images and sites dominated by horse figures. These sites (Tanum 33, 75, 172) occur on higher ground and panels dominated by ship depictions are on lower ground, such as Tanum 241, 369 and 209 (see Högberg 1995: 99–100; Coles 2005: 143, 146). In a sense, these depictions unambiguously denote the

rather pragmatic conditions for acting and interacting within the immediate landscape/seascape. This could be interpreted as an interchange of new images and ideals in accordance with the changes in the landscape (e.g. Kaul 1998: 104pp, 2003: 192pp).

The study also clearly demonstrates that of all the figurative images on the investigated panels, the ship depictions are the most dominant. It is not unusual for rock art researchers to detach humans from other features such as ship images. This procedure is debateable, especially if the aim is to reconstruct and discuss the social norms that may have governed the production of the images. The frequency of ship images can be taken to indicate that these were the most important features to depict.

However, cup marks are often as frequent as the ship depictions on these panels, if not more so, and there are some sites with cup marks only that have the lowest location of all the rock art. Another general rule is that the localities with cup marks only seem to be most frequent on higher land (fig. 8.3, see also Appendix 3). In a wider south Scandinavian context, cup marks seem to have been sited considerably closer to BA settlements than the figurative images (Goldhahn 2006: 94–98). At the complex BA settlement at Apalle in Uppland, the cup marks are located on small rocks in between the house structures (Ullén 2003); much the same pattern was found adjacent to excavated Iron Age house structures at Svarteborg in Bohuslän (Streffert 2004). Complex figurative rock art sites seem in general to have been deliberately located at some distance from settlements, usually 500–1000 m (see also Wahlgren 2002; Ullén 2003; Ling 2004a, 2004b, 2006; Streiffert 2004; Goldhahn 2007).

It is interesting that this spatial rule or pattern also seems to govern the Tanum area, as demonstrated in figure 8.3 and 8.4. The spatial relationship here between the prehistoric settlement finds and the figurative and non-figurative rock art sites actually seems to be even more concrete and distinct than in the examples above. However, it should be born in mind that only a few extensive settlement surveys have been conducted close to rock art sites and future research may indicate a shorter distance between areas dominated by figurative motives and BA settlements.

Still, the measured altitudes of the low-lying terrain adjacent to the most frequent rock art area in Tanum clearly demonstrate that BA settlements could not possibly have been sited here because at that time this land was under water. These concrete facts severely limit and even refute the notion of prehistoric settlement on the lower plains where a majority of the rock art sites are located (cf. Almgren 1927; Bertilsson 1987). Instead the sea seems to have been the major feature towards which the rock art was deliberately oriented, a relationship that is far more frequent and substantial than agricultural features or settlements.

Thus, the sea was very present in this landscape and this affected the location and making of the rock art as well as its content. In this context it seems that the places with rock art may be traces of different forms of maritime movements, actions, initiations, reflections, rules and norms. The rock art seems to have been made in succession from higher ground down towards the sea during the BA, in keeping with the rock art in areas such as Tisselskog in Dalsland, western Norway and Simris in Scania (Althin 1945; Mandt 1991; Wrigglesworth 2002; Nordenborg Myhre 2004: 116).

Another conclusion of importance is that, in view of their slope and orientation, a majority of the rock art panels could hardly have functioned as communicative signs over a wide area. Only the minority on a 45° slope may have fulfilled this function. And even where this may have been the case, the visibility of the images was probably very limited. If the images were painted, of which there is not yet any concrete evidence, they would still not have been visible beyond 10–30 m. Another factor that limits their visibility is the size of the depictions in relation to the size and colour of the rock face.

Many images are best perceived from a distance of just a couple of metres and at a specific angle. This is particularly true of major compositions but it also applies to a single image, such as the ship on the vertical cliff at Tanum 232, which at a distance of 5–10 m seems to pop out from the rock. Coles has analysed the structure of the images on panels and concluded that a majority are meant to be viewed from below (Coles 2005).

Moreover, the reflection of the sun from the sea onto the panels may originally have contributed a special aesthetic effect.

Another aspect is that the maritime oriented panels in question may have been best seen from a nearby boat that was passing or aiming for the panels as a kind of landmark. The observations above may undermine theories that postulate a secondary long-range communicative function for rock art in the landscape (Nordbladh 1980; Bradley 2000; Nordenborg Myhre 2004). What can be stated, on the other hand, is that this function may have been possible within a range of 0–30 m.

Richard Bradley distinguished between accessible and inaccessible rock art sites on the basis of location and content in a study on British islands (Bradley 1997: 6). Accessible sites are defined by their communicative location in the landscape, by visible vantage points, trails and paths, but also by their complex designs or composition of images. Inaccessible sites are defined on the basis of their inaccessible location in the landscape, close to settlement and away from collective communicative spaces, as well as by their simple composition and content of images (Bradley 1997: 6). I have attempted to apply Bradley's criteria to the area studied here, with the following results. A majority of the rock art sites seem to have been located at rather accessible places in this seascape, while a few sites have a content and location that make them inaccessible.

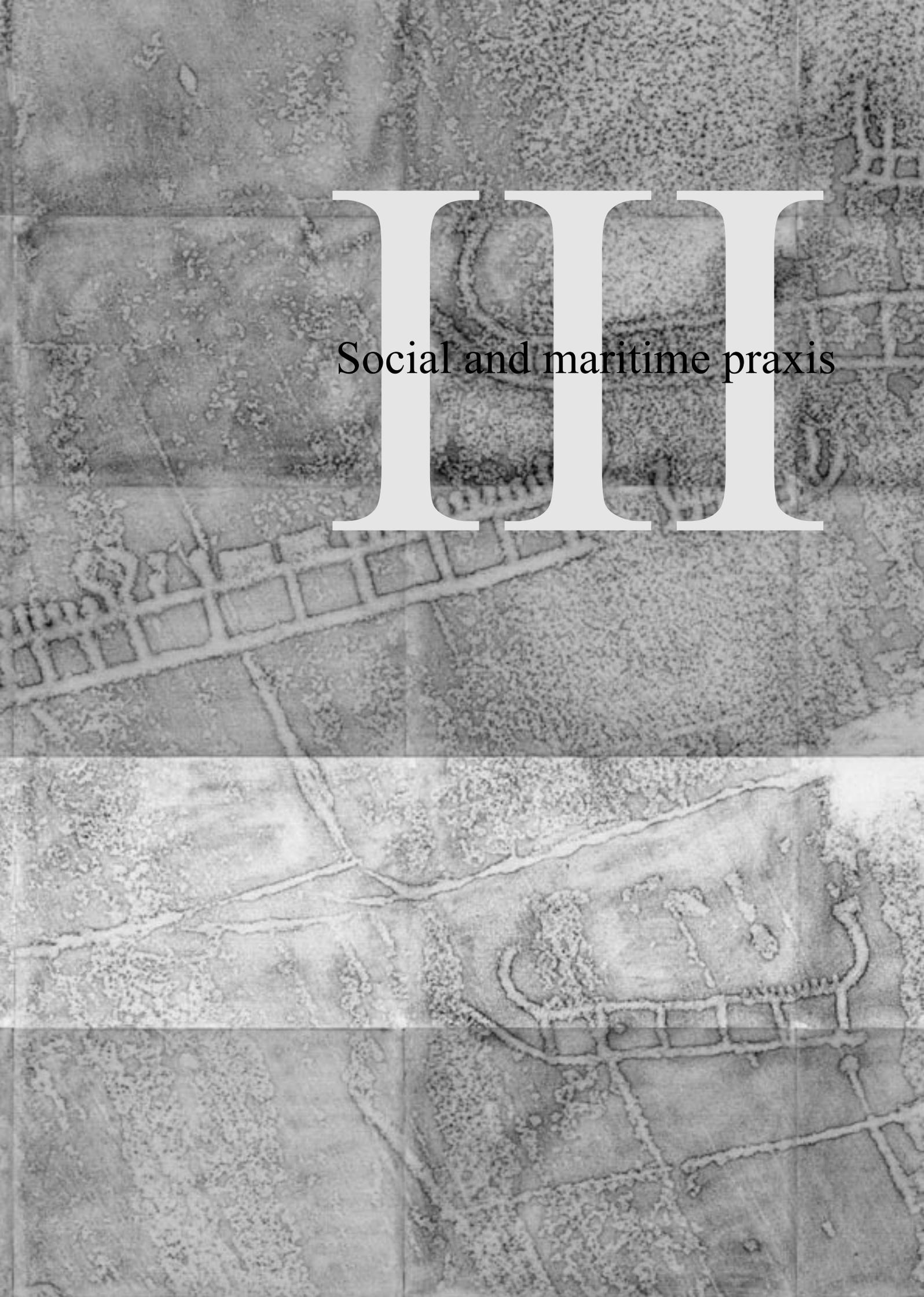
However, there is an important factor that has to be taken into account when applying these criteria to the prehistoric situation in Tanum, namely the sea. The presence of the sea made rock art sites that today are regarded as inaccessible considerably more accessible in prehistoric times. The sea would have connected and united several panels and could have made some panels more accessible. Additionally, some panels on elevated or vertical outcrops, such as Tanum 120, 17, 192, 234 and 311, could have been designed to be seen from the sea. In the light of the existing and dominant seascape in the BA, these criteria must therefore be modified or re-defined as follows:

- Accessible sites are those that have a complex arrangement of images and, of greater importance, are possible to reach from both the sea and the land, besides being visible from both the sea and the land.
- Inaccessible sites could then only have been reached, made and perceived from the sea.

I began this chapter by discussing the difficulties in analysing and understanding areas with rock art that have been greatly transformed by shore displacement. The outcome of this fieldwork has brought me to see more of the potential and possibilities of this rather than all the problems. At different symbolic and pragmatic levels, the seascape may have inspired and affected the making, utterance, position and content of rock art in the area during the BA. However, there are also areas with numerous rock art on higher ground at some distance from the sea. Thus, rock art has been sited in different types of landscape and its prehistoric functions and relations should be regarded as complex and full of nuances (Helskog 1999; Goldhahn 2002, 2007; Nordenborg Myhre 2004).

It is important to try to define and distinguish rock art's different patterns and relationships. For instance, excavations carried out at rock art sites in northern Bohuslän demonstrate that comparatively small rock art sites located on higher ground have yielded a large number of prehistoric finds and features. In contrast, excavations at larger, monumental rock art sites with more communicative locations in the landscape have yielded very sparse finds (Bengtsson 2004). This pattern indicates that complex rock art sites in northern Bohuslän tend to be sited at accessible and communicative locations in the landscape, away from settlements. This trait holds both for the maritime rock art and for the terrestrial rock art on higher ground, while less complex localities tend to be sited closer to settlements and graves (Ling 2006). This study has accordingly yielded some answers but it has also raised more questions. Why was the making of rock art so intense during the BA? What societal stress, action or interaction may have caused the making of these elaborate images and utterances?

These questions have no easy answers but are considered to some extent in the subsequent part of this thesis, where the context and meaning of the rock art in northern Bohuslän is discussed from a maritime perspective.

An aerial photograph of a coastal landscape. The foreground shows a grid-like pattern of fields, likely agricultural. In the middle ground, there is a circular structure, possibly a fort or a large building, surrounded by a wall. The background shows a body of water and a coastline. The overall tone is sepia or aged black and white.

III

Social and maritime praxis



SOCIAL PRACTICE AND ROCK ART

Introduction

The new conditions that have been pointed out regarding northern Bohuslän rock art and its general maritime setting and content prompt a discussion of social issues and interpretations. On the basis of the observations, I will draw attention to and discuss social aspects and theory and how to apply them to the material. I therefore intend to discuss the basic conditions for the production of rock art, before moving on to social theory related to this field and finally to the palpable forms of consumption of rock art. To this end, I will begin with a brief account of the conditions for rock art. This I will do in two steps. The first involves discussing the similarities and differences between rock art ship images in the landscape and those in graves and on bronze items. The second step concerns the act of producing rock art.

Background

The time span between the earlier and later rock art images in northern Bohuslän, from the EBA to the PRIA, is immense and the production and consumption of rock art changed a number of times. For instance, the great differences regarding the performance of rock art between the EBA, the LBA and the PRIA have been stressed by many scholars (Marstrander 1963; Kaul 1998, 2004; Fredell 2003; Bengtsson 2004; Coles 2005; Vogt 2006). Even

so, the rock art does display some general spatial, performative and figurative traits that seem to have been fairly constant throughout these centuries, for example the choice of locations for making the images in the landscape/seascape and some of the content, such as ship images, sun or wheel crosses, etc. The traditional explanation for this has been that the rock art functioned as a conservative “divine”, “cosmological” or “mythological” medium in Bohuslän’s agrarian landscape, with only minor changes during the Bronze Age (Almgren 1927; Fredell 2003). Other scholars have been more reluctant to accept these ideas and have connected the rock art instead to more praxis-oriented social, communicative and ritual acts in the landscape (Nordbladh 1980; Malmer 1981; Bertilsson 1987; Bradley 1997, 2000; Kaul 1998, 2004; Goldhahn 1999a, 2005, 2007; Wahlgren 2002; Bengtsson 2004; Nordenborg Myhre 2004; Coles 2005; Skoglund 2005; Vogt 2006).

For instance, Jarl Nordbladh pioneered a semiotic perspective on rock art, stressing that it was primarily a communicative act between living humans, not between humans and gods (Nordbladh 1980). Malmer argued strongly against mythological interpretations of rock art and claimed that if rock art did primarily depict myths or mythological beings, one would expect that its structure, frequency, amount and images would have been restrictive and norma-

tive instead of innovative, open, numerous and varied in the landscape (Malmer 1981, 1989). David Vogt has recently put forward an even more radical notion that rejects the general assumption of a profound religious function for rock art and argues that religious performances during the BA were executed and displayed at more organised ritual forums than on the rocks (Vogt 2006). Bengtsson reached a different conclusion about this simply by excavating in front of rock art panels and finding archaeological material of a ritual character (Bengtsson 2004). Kaul argues that rock art in Bohuslän depicts real ritual events and actions that took place in this landscape during the BA (Kaul 1998). He states very clearly that the depicted figures and actions are not gods and divinities but real humans displayed in ritual or ceremonial gear (Kaul 2004). His position is midway between the more radical social or communicative interpretations and those that are strictly religious or mythologically oriented.

Lately, however, with reference to the sparse and diverse textual evidence of the so-called Indo-Europeans, some researchers have tried to distinguish specific “ethnic” mythological and cosmological traits in the rock art material (Hultkrantz 1997; Fredell 2003; Odner 2006; Kaliff 2007). These perspectives are intriguing but the approach is beset by many methodological and ideological problems, besides differing greatly from the archaeological method (Renfrew 1987; Arvidsson 2000, 2006; Cornell & Fahlander 2002; Kaul 2004; Bradley 2006).

I prefer the more concrete social, ritual and communicative interpretations of rock art that have been put forward by scholars such as Nordbladh (1980, 1989) Bertilsson (1987), Larsson (1994), Kaul (1998, 2004), Bradley (1997, 2000), Goldhahn (1999a, 2002, 2005, 2007), Helskog (1999, 2004), Kristiansen (1998, 2002, 2004), Sognnes (2001, 2003), Wahlgren (2002), Bengtsson (2004), Nordenborg Myhre (2004), Coles (2005).

In accordance with some of these theories and, above all, on the basis of the presented observations, I will draw attention to and discuss social aspects and theory and how to apply them to the material. To this end, I will begin, as mentioned above, by briefly outlining the conditions for rock art in two steps. The first involves discussing similarities

and differences between rock art ship images in the landscape and those in graves and on bronze items. The second step concerns the act of producing rock art.

Some rock art depictions, such as ships, have traditionally been compared with the images on bronze items and in graves. The aesthetic similarities between them have led scholars to stress religious aspects of the rock art ships (Almgren 1927; Kaul 1998). However, the conditions and context for the production and consumption of these images vary (e.g. Nordbladh 1980) and these differences should be borne in mind.

Ships in rock art, in graves and on bronze items

The traditional view has been that it was the images on bronze items and these items themselves which inspired and triggered the rock art activity in the landscape (Åberg 1839; Hildebrand 1868; Almgren 1927; Almgren 1987; Kaul 1998; Fredell 2003, cf. Nordenborg Myhre 2004; Goldhahn 2007). The rock art medium was therefore determined by a general BA system based on the import of copper and tin and as soon as this system collapsed the rock art vanished more or less from the landscape (Fredell 2003; Kaul 2004; Kristiansen & Larsson 2005). However, some scholars have argued instead that the different materials rather reflect different systems or media of communication (Nordbladh 1980; Wahlgren 2002; Nordenborg Myhre 2004).

Moreover, rock art does not seem to vanish from the landscape after 500 BC. In fact, in the Tanum area rock art from PRIA is, as we have seen, rather common. Furthermore, recent fieldwork and inventories in northern Bohuslän, in parishes such as Tossene and Bro, have shown that rock art from the PRIA is at least as numerous as from the BA (Bengtsson 2004, pers. comm. 2007). This indicates that the rock art worked as an own medium in the landscape, regardless of the import of bronze items. Similar observations and conclusion have been drawn about the rock art material in Norway (Sognnes 2001; Nordenborg Myhre 2004).

Flemming Kaul notes the perceived resemblance between ship images on rocks and those on bronze items and in graves but sees a clear difference in their significance. The former represent real actions

and rituals in the landscape, the latter are of a more normative cosmological nature (Kaul 2004). At the same time, Kaul underlines the biases and interactions between these two socio-material spheres. Even if the rock art primarily illustrates real actions and rituals in the landscape, it seems to have been supported or reinforced by more cosmologically charged celestial representations such as sun crosses, sun wheels, sun horses, cup marks and concentric circles (Kaul 1998, 2004).

Randsborg (1993), Fredell (2003) and Kristiansen and Larsson (2005), on the other hand, do not see a clear difference in the praxis and meaning behind the images in open-air locations and those on bronzes items or in graves. They argue instead that they reflect the same general ideals concerning the transmission of cosmology and ideology during the BA.

While some of the rock art images may certainly be seen as images taken from the BA ideology, the open-air depictions may also be related to a more concrete social and ritual praxis in the landscape. In the areas with numerous rock art ships in the landscape, there is in general a very strong spatial connection with shores or former shores of the sea, lakes or other waterways (Burenhult 1980; Larsson 1994).

As to the rock art ships in graves, they not only display an iconic resemblance to those on open-air sites but have been produced with basically the same technique (Kaul 1998, 2004; Goldhahn 1999a). Rock art images imitating bronze items are rather common but those made on a 1:1 scale are more numerous in some areas than in others (Nordén 1925; Althin 1945; Burenhult 1980; Malmer 1981; Bertilsson 1987; Yates 1993; Wahlgren 2002; Fredell 2003; Skoglund 2005). However, as mentioned above, the aesthetic similarity between the ship depictions on rocks, graves and bronze items is accompanied by clear differences in how they were produced, perceived and consumed in the landscape.

First of all, the open-air rock art sites are both numerous and accessible in the landscape. This contrasts with the enclosed and inaccessible ship images in graves and, to some extent, on bronze items. Due to way in which bronze items were produced and consumed, they may well have been restricted

to more confined and controlled social actions and formations because they are portable and most of them have been found in status graves (Vandkilde 1996; Kaul 1998; Skoglund 2005). Moreover, there are relatively few depictions in graves and on bronze items: no more than about 20 graves with ship depictions and about 420 bronze items (Kaul 1998, 2004; Syvertsen 2002, 2005), as against over 40,000 rock art ships in the landscape.

Some interesting traits regarding the rock art images in the BA graves at Kivik and Sagaholm, both dated to the EBA period II or III, have been pointed out by Randsborg (1993), Goldhahn (1999a, 2005) and Kaul (2004). The images from these two grave contexts differ in their presentation. The rock art in Kivik is very stylistic and most of the slabs with images are framed by a line that imparts a certain structure (Randsborg 1993: 119). No open-air rock art has this kind of structured arrangement (see fig. 7.2); neither do some of the images occur at all on open sites in the landscape. Another difference compared with panels in the landscape is the small number of ship images and the total absence of cup marks (Randsborg 1993: 119; Goldhahn 1999a, 2005: 39pp, 105).

The greatest difference, however, is that the individual images and their spatial arrangement are considerably more static than those in the landscape. It seems likely that the images in Kivik were made before the burial (Goldhahn 2005: 105). The structured arrangement of the slabs and their closed context indicate that these images played a part in a more purposeful “esoteric” narration than the images in the open landscape. The same could apply to the Klinta stone, which apparently was found in a closed grave context, a burial cairn on Öland (Goldhahn 2005: 109), or to the images in BA graves in Rogaland (Syvertsen 2002, 2005; Nordenborg Myhre 2004).

The rock art images from the Sagaholm mound are on slabs at the middle kerb of a large mound (Goldhahn 1999b: 84). They display more or less the same motion and mobile spatial performance as those in open-air contexts. There is another important fact about the Sagaholm images that could throw light on the relationship between the “exoteric” open-air rock art and the “esoteric” rock art

in graves: archaeological investigations of the Sagaholm mound revealed that the inner grave was built in an earlier phase than the kerb with rock art on the border of the grave (Goldhahn 1999b: 86). With reference to van Gennep's tripartite structure of "the rites of passage", Goldhahn convincingly argues that the rock art was made during the "transitional, liminal phase" of the grave ritual, while it was still exposed, before being finally covered with stone and turf (Goldhahn 1999b: 94–95, 2005, 2007).

Thus, the Sagaholm images fall somewhere between those in the open air and those from closed grave contexts; this is evident both from the images and their performance on the slabs and from the fact that, at least for a time, they were public (Goldhahn 1999b: 94–95). In general, the Sagaholm images are more active and mobile than the stylistic images in Kivik. At the same time, there are traits that clearly distinguish the Sagaholm images from their counterparts in the landscape. They were made on slabs that were finally concealed under stone and turf. Moreover, the dominant images at Sagaholm are horses, which occur to only a limited extent in the landscape (Goldhahn 2005: 43pp).

This example illustrates how a more closed, esoteric location or context of rock art tends to be associated with a more abstract performance and style of the images, just as a more open, exoteric location in the landscape may be accompanied by more motion and spaciousness.

The general structure and performance of rock art in the landscape accordingly differ from the depictions in graves and on bronze items. The former was made with an emphasis on motion, action, variety, and innovation, as is evident from the images as such as well as from their positioning and repositioning on the panels (Malmer 1989; Fredell 2003; Coles 2005). Furthermore, the panels in the landscape have a fixed location, whereas bronze items could be moved around; thus they belong to different spheres of communication, the bronze items being portable and rock art immobile (Nordbladh 1980; Bradley 1997). However, even bronze items with ship renderings have ended up in closed, inaccessible contexts, such as graves or hoards, which give them the same inaccessible structure as burial mounds (Randsborg 1993; Kaul 1998, 2004;

Skoglund 2005, 2006; Syvertsen 2005; Goldhahn 2007).

Consequently, the differences between the ship depictions on open-air sites and those in graves or on bronze items could be defined in general terms, as shown in figure 9.1.

At the same time, there are striking similarities between the ship depictions on these different materials and contexts. As a result, the rock art ship has traditionally been regarded as an abstract "agrarian fetish" (Almgren 1927; Ohlmarks 1963). There are, however, other rock art images, such as cup marks, foot soles and certain abstract forms, that has a wider distribution in Scandinavia than the rock art ship (Malmer 1981; Kaul 2004; Skoglund 2006). So if the rock art ship was such a strong religious symbol, why was it not dispersed as frequently in other areas? The same argument could apply to the rock art depictions of warriors, claimed by some scholars to represent gods. If they were meant to represent pan-Scandinavian gods during the BA, why were they not depicted on open-air panels, boulders or rocks in areas with high BA activity such as South Halland, Scania, Västergötland, the Kronoberg area in Småland, and Jutland?

What is clear is that, as mentioned earlier, areas with numerous rock art ships in the landscape are generally characterized by a close spatial connection with the present or former shore of the sea, lakes or other waterways (Burenhult 1980; Larsson 1994). This is very evident in Bohuslän compared with Västergötland. The latter inland area contains many sites with cup marks and bronze hoards, while figurative rock art sites with ship depictions are infrequent and those which have been found are located in the vicinity of one of Sweden's largest lakes, Vänern, or other waterways (Selling 1989; Jankavs 1999). The same applies to Dalsland and the interior of Småland (Rex Svensson 1982; Skoglund 2005, 2006). The general maritime location of rock art ships in Scandinavia is more suggestive of a social and ritual praxis in the landscape.

Thus, rock art cannot solely be explained and understood by broad structural ideas about how the cosmology, mythology, religion or eschatology were constituted during the BA. The rock art must be understood by its own premises. In my view, the

Open-air images

Accessible
Outward
Numerous
Varied and innovative combinations
Non-portable

Images in a closed context or on bronze items

Inaccessible
Inward
Sparse
Limited combinations
Non-portable/Portable

Figure 9.1. A general outline of the differences between rock art made in the open air and the designs on bronze items or in graves (see also Syvertsen 2005: 511; Goldhahn 2007: 245).

ritual aspect of rock art must be regarded as a major feature but more connected to a specific socio-ritual action in the landscape.

Thus, instead of picturing the action behind the rock art in terms of broad cosmological, political, religious or mythological notions, there are some excavation results that may further our understanding of rock art's socio-ritual role in the landscape.

For instance, excavation of the ground adjacent to rock art panels in northern Bohuslän has revealed that complex panels tend to be associated with sparse activity, while there is more activity next to simple panels (Bengtsson 2004). Some of the smaller excavated sites contain numerous deposit finds by the panels, such as burnt clay, clay balls, ceramics, flint and quartz. According to Bengtsson (2004), these observations indicate that ritual activity, such as offering and feasting, mainly took place by the less complex rock art. These social traces are of great importance when considering rock art's social role in the landscape.

Could the socio-ritual actions described by anthropologist as "magic" or "magical rituals" broadly be connected to the action behind rock art? According scholars such as Malinowski (1922), van Gennep (1960), Raphael (1945), and Petrovic (2003), magic is an active social process, mediating between society's ideological "structure" and pragmatic "individual" action in the landscape. Thus, magic, in contrast to religious rituals, is intended to bring about some desired practical result without the interference of supernatural beings (Malinowski 1922: 105; Petrovic 2003: 12-17). Or as Petrovic (2003: 16) puts it: "Magic then denotes the belief in the individual's own powers, while religion shows a belief in beings with super-natural powers".

Another important aspect to discuss is the making of rock art images and how this might throw further light on differences in the production and consumption of the images in the landscape and those in graves or on bronze items. Much rock art analysis focuses on the contemplative observer, and elaborates on these themes. Activities relating more directly to rock art are seldom to the fore. Instead, research has focused on the act of reading rock art and its meaning in the context of rather broad mythological or cosmological theories. I therefore intend to discuss the basic conditions for the production of rock art, before moving on to social theory related to this field and finally to the palpable forms of consumption of rock art.

The production of rock art

Rock art research has suffered from the fact that the act of production is seldom discussed. Althin did once stress that the act of production may have been more important than the act of consumption but very few scholars have elaborated on this idea (Althin 1945, also Burenhult 1980; Goldhahn 1999a, 2007; Wahlgren 2002, 2004; Bengtsson 2004)

There are certain material and technological premises for rock art's production process. A study initiated by Bengtsson and students at Vitlycke museum in Tanum yielded some interesting insights. An ordinary sized rock art image that involved different chopping techniques was chosen to be copied (von Arbin et al. 1995; cf. Bengtsson 2004). The choice fell on the archer from Fossum, which is 44 cm long, 9 cm broad and attributed with a sword and a bow that are approximately 17 cm long. Trials indicated that the most effective stone for working the granite bedrock is amphibolite and this kind of

stone has not only been found by the rock art panels but is also frequent by the sea-shore (Fredsjö 1970; Bengtsson 2004). Considering that most of the rock art sites in the Tanum and Kville area were made adjacent to the BA shoreline, this observation gives the production process another operational dimension.

The time it took to produce a replica of the rock art image, the archer at Fossum, was measured and proved to be around 13 hours (von Arbin et al. 1995: 9). Applying this result to the production of larger rock art images, for instance the ship on the Vitlycke panel which is about 360 cm long and 80 cm wide, indicates that this would have taken about 100 effective working hours to complete, which translates into 10–12 days for a single person working 8–10 hours a day. A cooperative approach to the making of large rock art images would have required less time (5 days for two persons, 2–3 days for three persons). Even if the BA makers of rock art images were probably more adept on account of their experience and/or more rational techniques, the process would nevertheless have represented a large investment in time, skill and, surely, rituals.

The study also resulted in other interesting observations regarding techniques and materials. For instance, direct chopping with a hand-held stone was the most effective method and clearly superior to chopping indirectly by striking a chisel stone with a hammer. Chopping at an angle to the rock was more effective than chopping straight down. Small amounts of water on the surface made chopping easier but too much water was a drawback. Moreover, if the image's contours had been painted or drawn on the rock, as was done in this study, too much water washed them away. There is much in favour of the assumption that some of the most aesthetic and detailed rock art images were first outlined or drawn on the rock (von Arbin et al. 1995).

Another observation was that the work readily took on a specific repetitive rhythm. This social observation may throw light on the prehistoric situation for the making of rock art.

These technological and material prerequisites for the making of the images also indicate a need for certain skills and knowledge about the nature of the rock, such as its composition, hardness, reaction

and reflection. Moreover, the highly elaborate images called for "aesthetic" knowledge and insight regarding perspectives, conduct, space, form, composition and content (see Bengtsson 2004: 101pp; Coles 2005: 9pp). There are clear norms or codes for the images that could be depicted and combined (Nordbladh 1980; Goldhahn 2005: 82–93). These requirements suggest that making was confined to a special "aesthetic" agency, individual or group (Bengtsson 2004: 101; Goldhahn 2007).

I will return to these issues later since there is more to be said about the rock art's social and "aesthetic" side. First, however, some theoretical approaches must be integrated and discussed.

Social practice, analogies and fictions

Little attention has been paid to the social groundings of rock art's production and consumption that significant facts and conditions have been overlooked. Take, for example, Christopher Hawkes' (1954) notion of the ladder of inference, which stresses that most of our information about and understanding of prehistoric material should start from basic aspects of the production of the material itself. The next rung involves theorizing, more speculatively, about the function and praxis of the material and is followed in turn by an even more speculative and less informative discussion of the material's context and function in society (Hawkes 1954: 161, see also Binford 1962). This third rung on the ladder – the most speculative and problematic – leads to assumptions about how the religion was constituted. Lewis Binford partly agreed with Hawkes but saw the archaeological material primarily in the light of his "techno-system", which broadly categorises the archaeological material by its style and function and further distinguishes between three subgroups: technomic, sociotechnic and ideotechnic (Binford 1962: 133pp). In terms of Binford's concepts, rock art would most probably belong to the ideotechnic category, especially with reference to its aesthetic and non-functional character. Even so, there is much to discuss in terms of rock art's sociotechnic side.

Applying Hawkes' ladder to rock art research, one can say that many scholars have proceeded in the opposite direction, starting from the most speculative and less informative top rung of consumption

based on religious notions and bypassing intermediate phases to reach the more concrete level of production (e.g. Almgren 1927; Kaliff 1997, 2007; Kaul 1998; Fredell 2003; Kristiansen & Larsson 2005). The social act of production therefore needs to be considered, not just the “mythological” reading of the images. A relevant notion in this context is the micro-archaeological approach (Fahlander & Cornell 2002). Inspired by the Danish artist Orskov, archaeologists such as William Rathje and philosophers like Sartre and Foucault, Fahlander and Cornell propose less emphasis on “textual” analogies to religion etc. and more of a focus on the archaeological material itself and on aspects of social production and consumption (Cornell & Fahlander 2002).

During several years there has been an intense debate within archaeology about how whether and how analogies should be applied (Binford 1962; Tilley 1999: 1; Reybrouck 2000; Fahlander 2004). I do agree with the micro-archaeological approach’s suggestion that we limit the use of analogies from written text materials, not least ethnographic or ethnoarchaeological studies. Ethnographic data is generally taken from the last 200 years or so, and it is not probable, and should even be absurd to state, that they represent all possible types of social practice. Whether or not the reference cases are taken from remote places, or from the same geographical setting as the archaeological material, is not decisive. The basic problems are the same, independent of geographical distance to the reference example. Archaeology should rather try to use the material traces, the archaeological evidence, more intensively, intending to use its full potential. We must focus on the archaeological material itself and from this base discuss aspects of social production and consumption. Therefore, it is the social praxis in the landscape that should be in focus.

However, it is still necessary to construct archaeological “fictions” or “models”, a concept used in micro-archaeology, in order to put the human back into the picture (Cornell & Fahlander 2002; Fahlander 2004: 186pp). Prehistoric archaeological evidence must be peopled by humans. In doing so, the archaeological evidence and the relations in it give major clues. But it must often be supported by general knowledge of the environment or specific

characteristics of raw materials. Living by the sea, for example, does give certain particular conditions. The use of analogy remains tricky and indeed difficult. It is necessary to be careful and not give it too much emphasis in the research process. If possible, analogies which have not been used previously should be used, if such material can be found. Experiments with materials and simple techniques could also be of some help.

To summarise, I am thus aware of the epistemological and methodological problems associated with analogies or comparisons, and use them only sparsely, but still believe some such comparisons necessary.

Cornell and Fahlander are also critical of structuralist, hermeneutic and even some constructivist assumptions to do with the so-called “linguistic turn”, looking at material objects as a kind of language or written text (Cornell & Fahlander 2002, see Peirce 1934; Bloch 1974, 1998; Barth 1999; Aijmer 2001). Microarchaeology focuses instead on traces of social action, and may serve as a point of departure towards an elaborated social theory, as outlined briefly below. It should also be mentioned that Skoglund has elaborated on the concept praxis with reference to Karel Kosik and others; he suggests that the different locations of cairns and mounds in southwest Scandinavia may be an outcome of different actions, corporate and individual, respectively, in the landscape (Skoglund 2005: 247).

With reference to rock art, it is thus the social praxis in the landscape that is of primary importance.

Ideology and social theory

One of the major aims of this thesis is to discuss more socially oriented aspects and interpretations of rock art. The following brief account of some general social theories starts with Marx’s ideas on material and spiritual production and moves on to later branches of social theory and how they have been applied in rock art research. After that I will focus on aspects of images, symbols and social and ritual actions. For this purpose, some perspectives have been taken from the Palaeolithic rock art researcher Leroi-Gourhan and the anthropologist Göran Aijmer.

The concept of ideology can be of interest for analyzing rock art. It could be used instead of concepts like religion, mythology, cosmology. The term ideology has of course been used in many ways, ranging from an idealistic standpoint (Hegel), a political tool for action (Lenin), to a more general way of perceiving deeds, actions and reality (Habermas, Liedman). As an example of the latter one may mention Slavoj Žižek. Inspired by Lacan's psychoanalytic theory, Žižek speaks of a gap between the imagined and reality and that ideologies tend to fill this gap (Žižek 1989: 230):

Ideologies in Žižek's terms are the collective, imaginary tapestries that obscure the ugly, the cracks and meaningless, which is often too traumatic to be reproduced without subtle alterations/sublimations (Fahlander 2003: 27).

However, I will primarily use Sven Eric Liedman's elaboration on the concept of ideology (1997: 275pp). Liedman bases his conception partly on Marx's and Engel's critique of the so called idealistic German ideology. According to Marx and Engels this "idealistic" conception of ideology resulted in a twisted image of reality (the classic concept of ideology as false consciousness).

Marx's and Engel's critique aimed to compare ideas with a concrete reality and make these intelligible in relation to the environment they once evolved within:

In direct contrast to German philosophy which descends from heaven to earth, here we ascend from earth to heaven. That is to say, we do not set out from what men say, imagine, conceive, nor from men as narrated, thought of, imagined, conceived, in order to arrive at men in the flesh. We set out from real, active men, and on the basis of their real life-process we demonstrate the development of the ideological reflexes and echoes of this life-process (Marx & Engels 1973: 35).

However, Liedman also uses notions about ideology developed by the Frankfurt School and from later philosophical branches such as sociology of knowledge and from later political theory.

Thus Liedman stresses that ideology is intimately bound to the social, political and economical reality in which it exists. "It is manifested in various ways, by written documents – from ambitious theories to causerie – or through other forms of representations" (Liedman 1997: 277, translated here). However, Liedman stresses that its foundation is latent and concealed:

...a network of habits of thinking and illusory truths which are always the starting point for our convictions and which gets its nourishment in the lives we live and the actions we perform. In this latent, not explicit ideology there is a spontaneous image of reality" (Liedman 1997: 277, translated here).

According to Liedman the problem with the concept of ideology is that it tends to make an abstract fusion or bridge between actual facts, values and norms. Thus, it is important to stress that ideology is not merely a question of depicting a pleasant, harmonious world.

For instance, Cornell has argued, elaborating on Žižek, that there is often a rather aggressive, nasty and twisted imagery operating simultaneously with a sort of an ideal, perfect but illusory world image (Cornell et al. 2008). This is, in my view, very obvious in the prehistoric rock art from Bohuslän. The images pecked in the rocks during the BA do not only communicate pleasant, perfect cosmological or mythological ideals.

In line with a long research tradition Flemming Kaul argues convincingly that the BA religious ideology may have been of cosmological and/or celestial nature (Kaul 2004, e.g. Worsaae 1882; Almgren 1927). In general I share his ideas, particularly concerning the imagery and actions connected to the bronze items and burial mounds but also regarding some of the imagery in rock art such as sun crosses, sun horses and other "celestial" images (cf. fig. 9.4–9.5). However, the rock art does not seem to depict any fixed and perfect cosmological order; it displays more innovative and active actions and contradictory normative elements.

The performance of their form and their content clearly reveal discrepancies and double standards

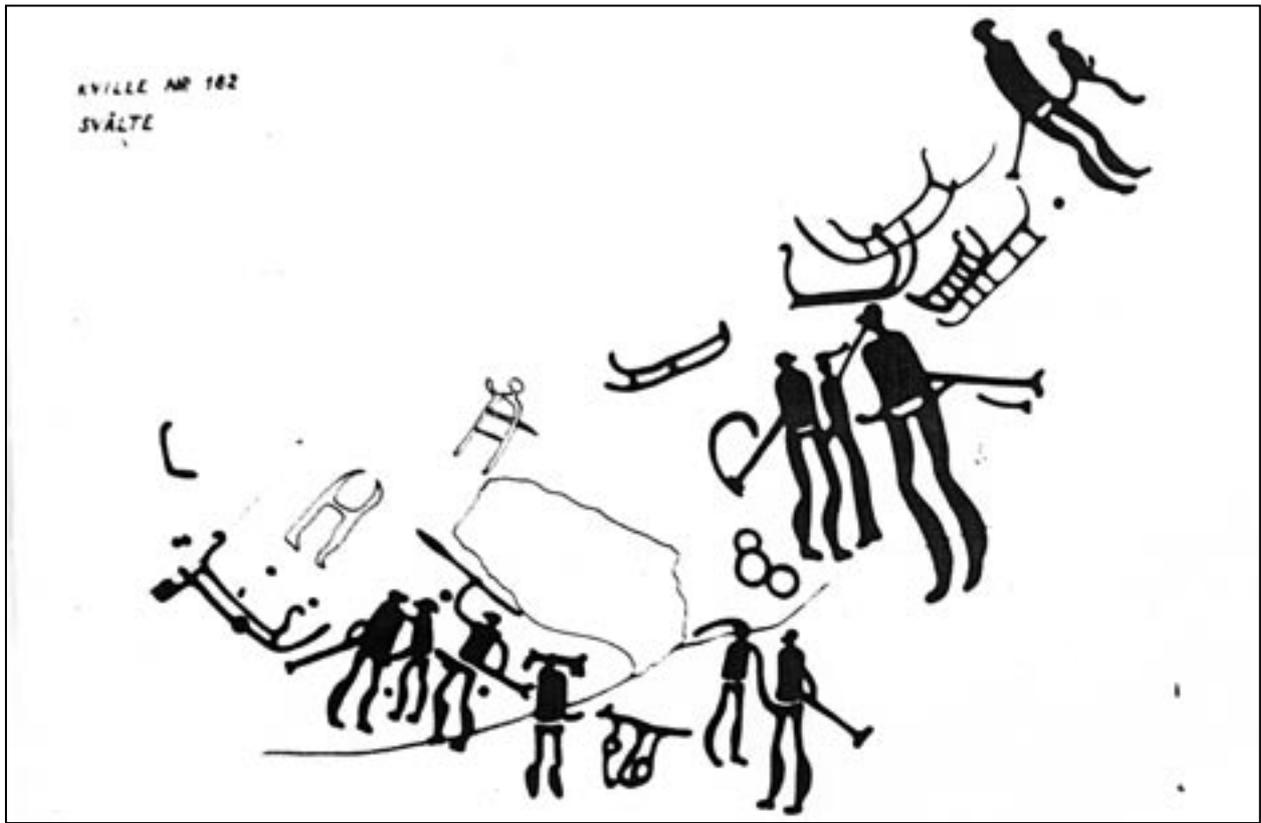


Figure 9.2. The panel Kville 182 illustrates antagonistic scenes mixed with scenes showing sexual positions between men and men (?), men and children (?), and men and women. Thus, not all pictorial scenes depict an “ideal”, peaceful sexual act, such as Tanum 1, between men and women. In a way, this panel, signifying dual standards and discrepancies and not just a perfect world, could help to concretise the discussion of the concept of ideology (after Högberg, now in VM).

(fig. 9.2); a set of images displayed on numerous locations in the landscape but in a highly innovative and open way, in different compositional configurations and utterances. Mobility, stress, antagonisms and conflict occur as often as immobility and harmony. BA “ideology and society” will be discussed in chapter 11. Before that, more social theory needs to be accounted for and I will further this discussion with a brief account of Marxism and related social theory.

Material and spiritual production

Marx’s general ideas about a society’s foundations can be broadly divided into three general spheres: the social and material means and forces of production (humans, animals, wood, pasture, vehicles, etc.); the social relations of production (property and power relations); and the superstructure (political,

juridical, philosophical, religious, literary and artistic means of society). These structures are matched by definite forms and stages of material life, called modes of production. However, a mode of production could be articulated very differently. In Ancient Greece, for instance, oligarchy, democracy and aristocracy were evident as different political forms but they shared a general structure of social relations, namely the slave system. These social factors entailed discrepancies in property and wealth that led in turn to conflicts between the classes (Marx 1973c: 61).

Hence, as long as this discrepancy between the forces of production and the social relations of production persisted, the mode of production remained the same. The changes that occurred in society were caused by a dialectical process in which all the mentioned spheres played a part. True societal progress

must involve changes between the forces of production and the relations of production:

At a certain stage of their development, the material productive forces of society come in conflict with the existing relations of production. [...] From forms of development of the productive forces these relations turn into their fetters. Then begins an epoch of social revolution. With the change of the economic foundation the entire immense superstructure is more or less rapidly transformed (Marx 1973a: 29).

Marx also stressed the discrepancy between the development of art and material production in society. Thus, in certain historical periods, such as Ancient Greece, major achievements were made in art, music and literature, producing artefacts that were still being enjoyed in the capitalist era. This was one of the contradictory elements that Marx and Engels underscored. However, only forms of art that corresponded to the current mode of production were accepted. Thus, the capitalist mode of production was hostile to certain branches of poetry and art because this “opens the way to illusion” (Marx 1973c: 61–62). Regarding the art of Ancient Greece, Marx argued that it was founded primarily in Greek mythology which in turn was shaped and formed on a view of nature and social relations. However, in art and myth these conditions had been worked up into a popular fantasy, into an illusion of the real material and social conditions (Marx 1973c: 61–62).

To understand this social process, it is important to acknowledge Marx’s concept of the “fetishism of commodities”. According to this theory, the value of produced things has less to do with their concrete value and natural form. This is because the social processes involved in the act of production generate an illusion of value that does not correspond to the concrete value; the object becomes a fetish (Marx 1973b: 39):

A commodity is therefore a mysterious thing, simply because in it the social character of men’s labour appears to them as an objective character stamped upon the product of that labour, because the relation of the producers to the sum

total of their own labour is presented to them as social relation, existing not between themselves, but between the products of their labour (Marx 1973b: 40).

Thus the social actions transform the concrete value of the products of work, as soon as they become commodities, into an abstract social value. In this context, Marx used the analogy of religion as the ultimate illusion of social relations and material life. Moreover, Marx argued that if we are to study the connections between spiritual production and material production, it is the latter that should be examined and, moreover, in its particular social historical form. Thus to be able to understand what is specific about a certain form of a spiritual production in a certain epoch, we must conceive the specific social conditions and relations of material life (Marx 1973d: 63). Marx’s social perspective accordingly underscores the notion that, even for rock art, it is social praxis in the landscape that is of importance rather than mythological and cosmological assumptions. Furthermore, Marx’s social notion about fetishism could be useful when considering some of the mythological interpretations of rock art.

It may be appropriate to acknowledge some of the criticism of Marx’s and Engels’s general perspective. The notions of Marx and Engels have been criticised mainly for:

- (i) Their focus on economic factors as a major cause of societal transformations.
- (ii) Their evolutionary, structural depiction of society (see Giddens 1984).

Regarding the first notion, there seems to be a consensus that Marx and Engels stressed that societal transformations were governed by a dialectical process involving the superstructure and the base, but that it was the latter which gave the process its direction. It is also important to acknowledge that Marx criticised the narrow traditional definition of economy and instead stressed the social and political aspect of economy (see Godelier 1975; Cohen 1978; Liedman 2006). A quotation from Engels sums this up:

It is not that economic situation is cause, solely active, while everything else is only passive effect. There is, rather, interaction on the basis of economic necessity, which ultimately always asserts itself. [...] So it is not, as people try here and there conveniently to imagine, that the economic situation produces an automatic effect. No. Men make their history themselves, only they do so in a given environment, which conditions it, and on the basis of actual relations already existing, among which the economic relations, however much they be influenced by the other – the political and ideological – relations, are still ultimately the decisive ones, forming the keynote which runs through them and alone leads to understanding (Engels 1973: 33).

Regarding the second notion some general evolutionary ideas appearing occasionally in Marx's and Engel's texts that are hard to sustain today (e.g. Giddens 1984).

While some of Marx's concepts are applicable to this thesis, his ideas about society, art and social practice are too general for our main topic, BA rock art in Bohuslän. To narrow the concept and throw further light on the social act of depiction, I have therefore integrated Max Raphael's social perspective on Palaeolithic art. Raphael's work has been regarded as one of the most important social contributions to the discourse of Palaeolithic rock art research (Chesney 1991; Lewis-Williams 2002). However, the differences between Palaeolithic rock art and the BA depictions in Bohuslän are so great that only some general ideas from Raphael will be used for a further discussion of social practice and rock art.

Palaeolithic rock art and Marxism

Max Raphael, a Marxist and semiotically-inspired art theoretician, stressed that the most significant features of rock art are its form, shape and structure and that it is these features which determine the content and style, not vice versa. But he also emphasised the structural relationships between all these features. His main contribution, however, was that, in keeping with Marx, he underscored the art's time- and space-specific social traits. Palaeolithic

art reflected innovative transformative social processes, a compulsion to confront, alter and master social and environmental demands (Raphael 1945: 3, see Chesney 1991; Lewis-Williams 2002).

According to Raphael, art was neither just an imitation of natural conditions, nor dependent on external physical conditions or historical circumstances. It rested upon innovative and creative premises that in turn were dependent on specific historical, societal, individual and physical conditions. But the main purpose, force and quest of art were about the creation of values. The act of representation was primarily an active social operation, not a passive religious declaration or a simple illustration of nature (Raphael 1945: 17).

Consequently, art was not primarily a historical act but rather a social act of creating values. Hence, art belonged to two fields: it was rooted in the field of history but its existence and mission followed the field of objective categories and values.

Raphael stressed further that art, including rock art, must in general be seen as "the constitution of a world of more or less autonomous forms, which draws its life from itself and which is adequate to the contents" (Raphael 1945: 17). Moreover, art was a process determined by both the economic substructure and the ideological superstructure of society "but these two factors must first pass through the artist's sensibility, and achieve a personal, spiritual life as aesthetic feeling" (Raphael 1945: 18). According to Raphael, art should therefore be regarded as a social process where the social structure is negotiated by individual praxis. Thus, it is the tensions between the collective societal structure, nature and the individual social praxis that govern the production, transformation and reproduction of art. This notion is not far removed from Giddens' ideas about the theory of structuration (Giddens 1984: 24).

Thus the prehistoric cave paintings illustrated societal, spatial and environmental values about space, mobility, motion, group cohesion, antagonism, sex, conflict and constraints of social force and power. One of Raphael's main enquiries was into whether and how Palaeolithic people represented space in their cave paintings. From the very limited spatial occurrence of rock art in the caves, and the positions, superimpositions, motions and oppositions

of the animals, Raphael concluded that this demonstrated specific norms and values regarding space and motion. The restrictive representation of paintings in the caves was thus a conscious spatial choice. Raphael explains this experience as follows:

The very tendency to eliminate space is only another method of representing space. [...] But even if we deal with varying historical forms of one inescapable category of space, it still can be asked whether certain spatial attributes are present in all artistic representations of space. It seems to me that there are two such attributes: the tension between the two dimensions of the surface and the dimension of the depth. Then the negative representation of space means the approximation of one or both of these attributes to zero, and the positive representation of space the intensification of both attributes (Raphael 1945: 24).

The closed and limited space in the caves and the way of restricting the making and performance of paintings to a few places and panels in the cave were means of representing positive spatial values. These values were in turn a synthesis of the mobile lifestyle and ideology of the Palaeolithics. It follows that mobile groups meditate, consider and relate open space with a negative value and limited, finite or closed space with a positive value (Raphael 1945: 17).

Raphael also demonstrated how motion and mobility are depicted in Palaeolithic rock art. First of all, these compositions never have a firm base line; it is rather as if the animals and other images float or drift on the ceiling. The fixed position of the paintings in the caves in relation to their fluid depictions generates a tension between motion and immobility. This effect is very typical of the cave paintings and enables the spectator to see them untiringly over and over again. The overall impression of these highly mobile compositions is conveyed by the superimpositions, oppositions and general expressions of motion (Raphael 1945: 24). In general, the rock art in Bohuslän displays similar traits regarding structure, motion, form and performance but there are also many differences.

Raphael's notions regarding antagonism and conflict were also rooted in the spatial, formative, asymmetric and mobile conduct of the paintings, for example in the clustering, superimposition, positioning, opposition and utterances of the animals. The way these forms, structures and contents were applied was an implicit way of manifesting the existing social and sexual constraints and conflicts between groups and individuals; sexual drive, struggle and death, propitiation and dissection (fig. 9.2). The act of representation was thus primarily an active social operation.

The concept of "magic" was then used to further demonstrate the manipulative social agency and mentality of the painters in relation to nature and society:

Palaeolithic man knew no magic without action, nor could he imagine action without magic; to him, theory and practice were one (Raphael 1945: 6).

Notwithstanding the tremendous differences between BA rock art sites in Scandinavia and Palaeolithic cave paintings, some of Raphael's general ideas about rock art and social reality, social expression and social action are relevant here. In particular there is his argument, mentioned earlier, that structure, form and shape were the most significant features of rock art and that these features determined content and style, not vice versa. There is also his demonstration of how motion and mobility, conflict and stress could have been represented in the Palaeolithic images. Some scholars have stressed similar notions regarding the South Scandinavian rock art (Bertilsson 1987; Nordbladh 1989; Nordenborg Myhre 2004; Vogt 2006).

Later Marxist approaches

Marx's ideas regarding the dialectical relationship of economic production and "ideological" reproduction were used by the anthropologist Maurice Godelier when discussing social praxis in non-western societies. He also integrated ideas from Claude Lévi-Strauss' anthropological structuralism, stressing that a society's social relations, such as kinship, could shape and control social formations just as

much as economic relations (Lévi-Strauss 1969; Godelier 1975, also Larsson 1986: 10).

Godelier exemplified his ideas with social actions performed by the Mbuti pygmies in Congo and their socio-symbolical and socio-practical relations to the forest. When a person dies, a ritual is executed that lasts for a month. During this period, hunting and other forms of production are stepped up, so the religious praxis stimulates output and results in a surplus (Godelier 1975: 122). Abnormal consumption transforms the common meal into a feast and mundane life into an extravagant social gathering, with dancing and chanting. The Molimo ritual therefore amounts to a symbolic labour whose action and purpose are to eliminate social contradictions that occur when a member of the society dies. The social action temporarily reduces and ameliorates internal social conflicts and contradictions but does not alter them. Thus, the symbolic labour and praxis were a concrete way of handling contradictions in the society's social relations.

However, this symbolic labour should not be separated in an idealistic fashion from the practical, economic relations of production that are its prerequisite. But in special social events and rituals, the social relations become more intense and interactive and are therefore worked up and experienced in a "twisted" fancy shape. Thus, the symbolic practice becomes the invisible join or intersection between social relations. This intersection is both present and concealed by the way it is exposed and performed and this arbitrary condition in turn is what shaped and altered social relations (Godelier 1975: 131).

Structural Marxism has also inspired some scholars in the Scandinavian BA discourse (Kristiansen 1984, 1987b, 1998; Larsson 1986). For instance, Kristiansen used early structural Marxist notions stressing that a new aristocratic, war-oriented, ideology was introduced during the EBA (Kristiansen 1987b, 1991). This new structural change was founded on the control of wealth and ideological means which sanctioned a new stratified social order. Moreover, Thomas B Larsson (1986) has made some interesting social interpretations of the distribution of BA bronze items in southern Sweden using a structural Marxist approach.

However, the importance of the "ideological" as-

pects of society seems to have been overemphasised in the later BA discourse. It became legitimate to focus more on symbolic issues than on socioeconomic material aspects and for a while it was as if scholars were vying with one another in the presentation of increasingly bold symbolic or cosmologic interpretations of the BA remains in the landscape (Gröhn 2004: 98–99, e.g. Larsson 1997, 2002).

Moreover, structural Marxism became mixed up with ideas from Weber, Freud and Durkheim, resulting in rather rigid evolutionary models and assumptions concerning prehistoric societies (Olsen 1997: 150). It is important to note that these concepts have little in common with Marx and the structural Marxism that Godelier stressed (Trigger 1989).

One of the major critiques of Marxism, structuralism and functionalism has come from Anthony Giddens (1984), who argued against the sociological tradition's structural generalisations, governed by the dichotomy between idealistic and structuralist interpretations of society. Either the subject's role or the role of structures in social processes had been favoured at the expense of multiple agencies and social formations. Giddens tried to balance these views with his own structuration theory, i.e. the dualistic tension between individual praxis and societal norms and its effect on social formation.

Some of Giddens' ideas have influenced the rock art discourse (Dowson 1998; Vogt 2006). I will therefore present them here before considering the authors who applied them.

Rock art between practice and structure

Giddens' main theme is the dialectics of power and the mechanisms that govern the action and interaction of power, especially the power that limits actions. He stressed that human praxis is not entirely governed by general social structures or principles; instead, social structures tend to provide both limitations and possibilities. Hence, it is the tension between social structure and social praxis that governs the production, change and reproduction of social formations/institutions. In this context, "social structure is both a medium and outcome of social action" (Giddens 1984: 24).

According to the structuration theory, individual agents have limited knowledge of and impact on

the social structure but this structure governs their actions. By using certain strategies, such as manipulating social, material and symbolic rules (e.g. habits and routines) and recourses (material and ideological), the individual may achieve more access to power and thereby enhance his/her position in social formations/institutions. Fredrik Fahlander puts this as follows:

Social structures in the Giddensian sense consist of recursively organised sets of rules (e.g. habits and routines) and recourses (material and ideological) which are organised in social formations as institutions (Fahlander 2003: 19).

In the context of structuration theory, “ideology” is not something that is created and controlled solely by a society’s upper strata. Because it is constantly subject to the counter-strategies and manipulative strategies of upcoming individuals and their social formations, it is only partly amenable to political strategies and manoeuvres. The paradox with this is that the prevailing structure tends to be reproduced instead of being changed. This explains why individuals are not fully aware of or simply misunderstand the structural elements of their societies, e.g. its rules, resources and institutions (Giddens 1984). Many scholars have seen Giddens’ structuration theory as legitimising individual-oriented actions and notions in society (Fahlander 2003: 18).

Giddens’ ideas have been applied by Thomas A. Dowson (1998) to the social and spatial situation of rock art images in South Africa. Dowson considers that rock art may have been used to articulate social relations among shaman groups. The individuals apparently used rock art actively to manipulate their position within the group. Dowson also shows that the rock art sited in areas with rather stable social and economic conditions displays a rather uniform figurative structure, whereas the rock art in unstable areas, where competitive situations occurred among shaman groups, the figurative images are unequal in size and utterance.

Thus in both cases shamans and groups used rock art images to manipulate and illustrate how real social relations were negotiated via the spirit world (Dowson 1998).

Manipulating the art was therefore not far from manipulating the universe itself. The potent essence of the rock art images imparted a factuality to the social relations and cosmology that they depicted (Dowson 1998: 338). In this context the rock art may be seen as a medium between praxis and structure or, in keeping with Giddens, as one of the material and ideological resources for achieving power.

In a recent thesis about rock art in Bohuslän and Østfold, using some concepts and ideas from Giddens and others, David Vogt argues that the rock art must be seen in the context of constraints and conflicts of power. He stresses that the majority of rock art was produced in period V–VI and represents adaptive regional utterances of the major societal shifts in power that occurred in the continental Hallstatt culture. Periods of instability increased the investment in political techniques, such as different kinds of symbolic monuments and signs (Vogt 2006). Hence, symbolic investment in the public domain was strongly connected with political notions. Inspired by social semiotics, Vogt emphasises that the rock art may be regarded as a kind of “logonomic system”, a communicative system of conventions and rules that defines the relation between producers and recipients of messages in society (Vogt 2006: 181, e.g. Nordbladh 1980).

In the context of a logonomic system, rock art becomes an important social and political tool for elite fractions to achieve or maintain power, political domination and position. However, according to Vogt, elites are constantly exposed to counterstrategies of power that upcoming fractions implement with the same kinds of material and symbolic techniques (Vogt 2006: 185).

Vogt argues that the rock art should accordingly be seen as a political rather than a religious strategy for gaining control of or manipulating the productive grazing land of Bohuslän and Østfold. Vogt does place the rock art in an interesting societal context but I do not agree with his general secularisation of rock art and there is no doubt that certain rock art images were charged with a strong ritual content (see Kaul 2004; Goldhahn 2007). His elitist and secularist assumptions about rock art have further implications. If the rock art was primarily performed and controlled by elites, how was this or-

ganised and achieved? Controlling the panels would have required an apparatus that was far beyond the capacity of BA societies in Bohuslän. Notwithstanding this critique, Vogt highlights some interesting theoretical traits regarding action, society and rock art in Bohuslän and for this reason his attempt must be seen as innovative.

The aspects of rock art and society, art, agency and competition, put forward by Dowson and Vogt underline the importance of social constraints and conflict when dealing with rock art. No other media from any other prehistoric or historic period in Scandinavia displays such explicit, numerous and varied aspects of combat and conflict as the BA rock art (e.g. Bertilsson 1987; Nordbladh 1989; Vandkilde 2006).

Images, symbols and social action

This section presents some selected approaches to images, communication, symbolism and social action with a view to discussing the relationships and differences between cognition, communication, symbolism and social action. These discussions will contribute to the subsequent deliberations concerning the process of making and performing images. The perspective that is most socially oriented and important for my thesis is Aijmer's work on symbolism; this therefore features most prominently here.

Ideas about material objects and things as a kind of language and text have had a considerable influence on material studies in anthropology and archaeology (Hodder 1986; Trigger 1989; Tilley 1991; Andrén 1997; Olsen 1997; Barth 1999; Jensen & Karlsson 1998; Cornell & Fahlander 2002). However, scholars have become more cautious about these constructivist assumptions and point to the interpretative discrepancies between lingual signs and material objects and symbols (Aijmer 2001; also Bloch 1998). These scholars stress that social action with a symbolic or ritual content does not necessarily operate under the same cognitive premises as speech.

For instance, Aijmer acknowledges that many anthropologists have encountered difficulties in obtaining concrete lingual information about symbolic and ritual praxis (Aijmer 2001: 76). It would therefore be inappropriate to use linguistic classi-

fications, theories and concepts with reference to certain social actions.

Moreover, Maurice Bloch argues that most of the information anthropologists study is non-linguistic and that "the knowledge organised for efficiency in day-to-day practice is not only non-linguistic, but also not language-like in that it does not take an essential logical form" (Bloch 1998: 11).

Image, speech, social praxis and social communication

In "Gestures and Speech", Leroi-Gourhan discusses matters to do with cognition, speech, symbolism, mobility, text, technique and gestural behaviour. In the chapter on language and symbols, he points out that figurative art was originally intimately connected with language and should therefore be understood broadly as a kind of writing rather than a work of art. He also states that the spatial spread of certain symbolic graphics over large areas could accordingly be seen as an oral transmission of a certain myth. The scenes represent mythological matters with a missing oral context rather than representations or narrations of reality. Furthermore, in primitive societies there is often a correspondence between mythology and multidimensional graphics. This led Leroi-Gourhan to introduce the terms "mythography" and "mythogram" (Leroi-Gourhan 1993: 199).

His cognitive notions about Palaeolithic art are similar to those of Lévi-Strauss about myth (Lévi-Strauss 1969; Godelier 1999: 25). He also claimed that the invention of the linear writing subordinated graphics to the phonetic realm. However, the orally related "mythograms" had in turn a freedom that linear writing did not require. Leroi-Gourhan described this as follows:

An image possesses a dimension of freedom which writing always must lack. It can trigger the verbal process that culminates in the recital of a myth, but it is not attached to that process; its context disappears with the narrator (Leroi-Gourhan 1993: 195).

According to Leroi-Gourhan, the reason why art is so closely connected with religion is that graphic

expressions restore to language the dimension of the inexpressible; they make it possible to multiply the dimension in a visual form that could be restored and thereby facilitate the lingual understanding of emotion. In this way, Leroi-Gourhan reduced and subordinated the Palaeolithic to the lingual cognitive realm. In general, his ideas are therefore open to the same charge of giving the mental precedence over the social that Godelier aimed at Lévi-Strauss (Godelier 1999: 23–27). This becomes even clearer when Leroi-Gourhan's mythological interpretation of rock art is compared with Raphael's social interpretation, which sees the images as reflecting innovative transformative social operations.

Aspects of pictorial communication have recently been discussed by Åsa Fredell (2003) in relation to rock art images in Bohuslän. She relates the structurally stereotypical setting, the manipulative and repetitive sets of images, to oral transmission and memory and argues that rock art images could be materialisations of oral epics, hymns, lists and catalogues, rhymes and incantations, homage, curses and riddles. She also considers that the pictorial and figurative arrangement of rock art illustrates structures that could be related to Indo-European cosmology and ideology (Fredell 2003: 274). In a sense, Fredell has tested the "oral" hypothesis and presented some interesting notions. There was of course an oral discourse regarding both the production and consumption of rock art. However, as Fredell herself notes, pictorial images played an important role as a support for human memory.

But I would like to go even further. The image can be an active force in itself, generating an oral discourse. I see a risk in reducing rock art to a mere reflection of the oral. Rock art, materialised images in the rock, persistent and stable, has unquestionably functioned far more as a source and producer of social information than the "oral" model suggests. Rock art was a powerful and productive social medium in itself and cannot be reduced to a mere reflection of the oral. In many oral societies the transmission of information, knowledge and ideology is, in fact, often of material or gestural rather than simply oral (Bloch 1998; Ong 1990; Aijmer 2001; Fredell 2003). There is more to say about the discrepancy between pragmatic oral actions and signs on the one

hand and symbolic social actions on the other. For this purpose we can turn to Aijmer's perspective in "The symbological project" (Aijmer 2001).

The symbological project

Aijmer put forward three orders – realist, iconic and discursive – that could be employed in the study of social symbolism. He makes it clear that these concepts have nothing to do with linguistically oriented concepts of symbolism, such as index, icon and symbol (cf. Peirce 1934; Nordbladh 1980; Fredell 2003); instead, his application is directed at interpretations of symbolism's purely social grounds (Aijmer 2001: 70).

The *realistic/operational order*, aims to study the social groundings of symbolism and its relation to basic sociological and environmental conditions. Thus, it explores the general social actions and environmental conditions that make people form and aggregate into different task-oriented groupings or series. This task-oriented perspective strives to understand operational aspects and the causes and meanings which underlie such social actions and materialities. For this, the order may involve the social and environmental conditions of social organisations and aggregations of groups in relation to landscapes/seascapes and the management of environmental utilisation.

The *discursive order* concerns pragmatic social communication and actions such as language and conversation, comments and explanations but it also includes sensory features such as iconography, smells and sounds. This order deals with concrete and intended sociological communicative and performative operations, acts and functions between all social beings. The discursive order is primarily determined by people "using language or language-like types of codes" (Aijmer 2001: 75). The oral aspects of rock art may be connected to this order (Leroi-Gourhan 1993; Fredell 2003).

However, *the iconic order* is the most relevant here. This domain of symbolism operates exteriorly to language and combines strong expression with little descriptive information (Aijmer 2001: 69). The iconic order is a social sphere, deliberately composed and abstracted by humans from everyday life and livelihood, domains of own realities cre-

ated, performed and reproduced “beyond linguistic thinking and reasoning” (Aijmer 2001: 69).

At some point Aijmer speaks of the “iconic order” as a sort of staged theatre. These dynamic messages or constructions mainly appear and operate under social categories such as art, music, ritual or religion. The producers and reproducers of these social actions are therefore fully aware of the symbolic meanings and functions of the iconic codes, but cannot express these linguistically. Thus the images of the iconic order are charged with messages that are suggestive and dramatic rather than concrete linguistic information and narratives.

Aijmer bases this claim on the assumption that in evolutionary terms, symbolism may precede language as a cognitive biological/genetic feature in the mind of the human species (Aijmer 2001). Aijmer argues that symbolism as an iconic order works on a more complex informative level than language:

Icons form universes essentially separated from the world of everyday living in that, as they become composed, they create their own autonomous realities—they are grounded only in themselves and in their construction: symbols will be used to buttress symbols. This sphere of symbolic creation suggests studies of how textures of complex iconology are accomplished by an integration of less inclusive icons into ever more comprehensive symbolic clusters. The grammar of such iconic image-making is one of architecture rather than syntax. What we are dealing with is a sort of ‘concrete’ compositional process, a creation independent of mundane facts (Aijmer 2001: 69).

The iconic order comprises symbolic facts that everyone knows but few can utter. Their complex structure is achieved by merger and integration, classification and association:

Some complex forms could be described as episodic, each being confined to a limited span of time. Others could be described as ‘rhapsodic’, meaning that they are spread over several inter-related occurrences (Aijmer 2001: 74).

The following example from Aijmer illustrates how the iconic order works in ritually charged situations:

It may be, for instance – as in the small Melanesian archipelago of the Duke of York Islands – that in their daily routines, residential preferences and political games, people orientate themselves socially and residentially by way of uterine links of kinship. There is a clear mindfulness of this world. However, once the men living on these islands step into the imaginary realm that is physically demarcated as men’s ground on the beach, they adopt another way of looking at the world, through the lenses of agnatic kinship: fatherhood replaces motherhood as an organizing device. This shift is not linguistically articulated in any kind of exegesis, but made apparent in iconically constructed rituals (Aijmer 2001: 73).

In conclusion, the iconic order works in symbolically charged events and situations and expresses more than it informs about these matters, thus operating outside the language and mundane facts. Aijmer emphasises further that these orders should not be regarded as definitive and that there are interfaces and interactions between them (Aijmer 2001).

Many connections can be drawn between the iconic order and rock art. First of all, the making of rock art seems to be an elaborative process apart from mundane life, manifested by investment in time and aesthetics and by the specific “code” of content, structure and location. Secondly, the reading of these “messages” could also be related to the iconic realm. Aijmer’s perspective may contribute to the social understanding of rock art. In the following section I will try to use some of these perspectives as a theoretical foundation for a discussion of some social traits in the images.

In an earlier section I stressed that for a social understanding of the figurative rock art, it is important to acknowledge its maritime location and content. To further this discussion, I have now tried to integrate some social theory. The following conclusions can be drawn from theoretical aspects of rock art:

- The making of rock art seems to have been an elaborative process set apart from everyday life, as indicated by the investment in time, skill and aesthetics, as well as by the composition, structure and location of the panels.
- The production of rock art was a demanding, forceful process that generated images in stone. The social selection of certain panels in the landscape and the performance of certain images must have been of special significance connected with the social act of making.
- The rock art was a kind of “socio-symbolic media” that grew out of social reality and social praxis.
- The act of depiction was thus primarily an active social operation, not a passive religious declaration or a simple illustration of nature.
- It is therefore the social praxis in the landscape that is of importance when considering rock art, not primarily myth and cosmology, even if these elements played a role in the process of making.
- Thus, rock art was mainly a social articulation, but not a direct description of social matters, values and relations; it is rather a twisted and distorted depiction of a social world.
- The images pecked in the rock do not only communicate pleasant, perfect cosmological or mythological ideals. The performance of their form and their content clearly reveal discrepancies and double standards; mobility, stress, antagonisms and conflict occur as often as immobility and harmony.
- Rock art was not only shaped after oral or linguistic premises; the picture operated on a higher and more complex cognitive level.
- Thus the rock art images were charged with social messages that are suggestive and dramatic concrete linguistic information and narratives.
- Rock art sites were social domains of own realities, created and performed “beyond linguistic thinking and reasoning”.
- The rock art images belong primarily to the iconic order and demonstrate a tendency to autonomous forms, though most of these forms were rooted in reality. The rock art may therefore be considered as a kind of “aesthetic” illusion that grew out of social reality.

- The process or act of depiction was obviously governed by certain societal or traditional norms. However, this does not imply that all the producers of rock art were fully aware of the context, significance and function of the rock art in society; some producers may, in fact, have aimed to illustrate alternative or contrary ideas about the structural elements of society. Some producers may have created alternative or contrary ideas about the structural elements of society (consciously or unconsciously).

The social dimension of rock art images

In order to highlight some general social aspects and information about the rock art images, categories concerning social dimensions of the material will be broadly outlined. There seem to be differences in the degree and intent of the social information in the material. Some panels appear to illustrate more concrete social information, while others present a more suggestive message. I have therefore set up three broad social spheres: depictions of social environments and actions, depictions of social positions and depictions of “iconic” features or elements.

Some images seem to have been preferred to others. For instance, house structures or activities connected with mundane domestic or agrarian life seem to have been more or less ignored in favour of various spatial and social configurations connected with the maritime realm. The general maritime situation and content of the BA rock art are therefore important for an understanding of rock art.

Thus, about 20 scenes of ploughing in the whole of Bohuslän are outnumbered, outsized and out-expressed by more than 10,000 depictions of ships.

I have tried to make a broad distinction between the different kinds of social, ritual, technological and material themes, features, situations and performances that have been depicted on the rocks:

- High-tech mobile wooden contrivances: boats, wagons, ploughs and chariots.
- High-tech portable items: weapons, instruments and other objects made of bronze, wood, stone or textiles.
- Specific anthropomorphised social beings: warriors, acrobats, females, adorants, lure-blow-

ers or anthropomorphised humans or beings with bodily anomalies such as a beaked face, wings or enlarged hands or feet.

- Specific animals: bulls, cattle, horses, aquatic birds, deers, dogs, wolves, goats, sheeps, etc.
- Specific abstract images: cup marks, sun-wheel or crosses, concentric circles, bird-like patterns.
- Specific social actions, positions, performances, scenes or compositions.
- Maritime positions and performances, such as ship scenes, actions or interactions on or connected with ships.
- Scenes that represent ploughing, fishing, herding or hunting.
- Antagonistic, sexual, “ritual” positions, manifestations of conflict and sex, combat scenes, intercourse, heterosexuality, homosexuality and intercourse with animals.
- Animals with specific gear or in specific action: sun horses, bulls and horses attached to circular designs, ships, ploughs, wagons or other vehicles or features.

This brings me to the question of how these images may have been articulated on the panels in the landscape. As mentioned earlier, the following three social approaches are considered here:

1. Depictions of social environments and actions.
2. Depictions of social positions.
3. Depictions of “iconic” features or elements.

There are interfaces and interactions between these approaches that should be noted. All panels contain images with aspects from more or less each of these approaches or demonstrate an interaction or interface between these. However, some panels seem to illustrate more articulated social matters while others seem to have more to do with suggestive, ritual matters. In some cases the suggested approaches may involve the location, context and content of an entire panel. Hence, due to their content, projection, location and utterance, some panels seem to be dominated by one of these approaches.

For instance, panels immediately connected with the shore and dominated by ship depictions, or pan-

els on higher terrestrial ground dominated by human figures or plough scenes. These features may be related to the first, more realistic approach of depicting ideals and actions connected to landscape/seascape. The second order includes depictions of more intended socio-ritual positions and performances and the third order deals with depictions of more abstract “ritual” matters or designs.

1. Depictions of social environments and actions

This dimension or level may be regarded as a rather realistic and operational way of illustrating beings, objects, features or actions associated with social reality or specific social environments. This making of images may be related to practices or activities connected to certain places in the landscape. It could be a panel connected with the shore, dominated by ship images facing the BA seascape. It could also be a panel placed on higher ground, adjacent to settlements or arable land, dominated by human figures, plough scenes, or cup marks (fig. 9.3).

This social approach may also include the making of single scenes on the panels that demonstrate social activities such as ploughing, fishing, herding or hunting, or ship images with crew corresponding to the real boat finds. Specific technological and operational aspects of the ship depictions may also be related to this order, such as steering rods, stabilisers, thwarts, pole- or mast-like features, paddles, fishing rods.

It is possible that the following tentative traits govern these compositions or images in the landscape:

- Connects or reflects social environments or actions in the landscape.
- High motion and activity.
- Continuous chronological action on the panels, initiated during certain period but often re-vitalised during a later phase (synchronic).

Examples of panels depicting social environments and actions are: Tanum 33 (fig. 8.14), 65 (fig. 8.22), 90 (fig. 9.3), 311 (fig. 8.26), and Kville 151 (fig. 10.13).



Figure 9.3. The panel Tanum 90, located on higher terrestrial ground, has figurative features that could be dated primarily to the LBA and the PR1A, when it was already some distance from the sea. The panel is dominated by terrestrial features such as plough scenes, animals and humans. It may broadly be related to the concept “depictions of social environments and realities” (documentation by Fredell 2003).

2. Depictions of certain social positions or social rhetoric

This dimension involves intended and directed social expression, displayed and staged by spectacular social positions and performances, processes, acts and operations, between humans as well as non-human beings. It may be related to what Aijmer calls “a kind of social communication through performative acts” (Aijmer 2001: 63). Or the notions put forward

by Raphael that the rock art was an active medium of creating socio-rhetoric values. These social positions seem to have been made with a certain rhetorical and spatial intent. The most important trait is the social position and corporal performance. It is possible that the following tentative traits govern these compositions or images in the landscape:



Figure 9.4. A major part of the rock art site Tanum 255, already located on higher ground away from the sea in the Bronze Age, has in general figurative features that could be related to the second dimension, “depictions of social positions”, with humans and warriors in various poses and situations. There are also some highly ritualised images and scenes that could be related to “iconic features and elements”, such as the antithetical scenes with humans and animals in the centre of the panel, foot soles and the two “celestial” images top right (after Milstreu & Prøhl 1996).

- Vantage locations in the landscape, adjacent to maritime or terrestrial passageways.
- Relates to or reflects certain social positions in the landscape.
- Regular time specific depictions on the panels (diachronic).
- High socio- rhetoric expression and narration.

Images or compositions depicting certain social positions are (fig. 9.4, see also fig. 1.1):

- Maritime positions and performances of a more staged, rhetorical social nature; for instance, ships with kneeling crew with paddles, staged and directed by one or two larger standing warriors. Social or operational performances on the

ships such as helmsmen, paddlers, fishing scenes, lure-blowers, sitting or kneeling positions.

- Antagonistic or sexual positions, actions, situations and bodily performances, such as combat scenes, acrobats, intercourse, heterosexuality, homosexuality and intercourse with animals.

Examples of panels or compositions depicting certain social positions are: Tanum 255 (fig. 9.4), 192 (fig. 8.24), Tanum 356, 357 (fig. 10.21), Skee 1539 (fig. 1.1).

3. Depictions of “iconic” features or elements

This dimension of depiction involves more articulated “ritual” features, positions, combinations and designs. These depictions are more suggestive,

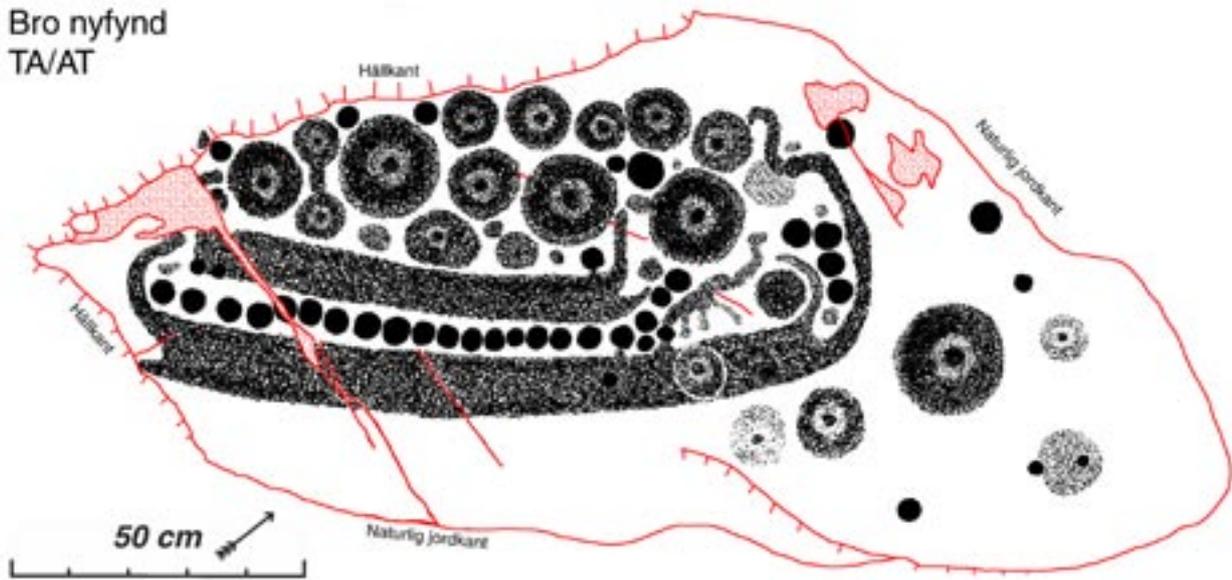


Figure 9.5. Rock art site from Bro parish, Bro 703, showing two highly stylised ship depictions surrounded by deeply pecked circular images. This panel may serve as an illustration of the dimension “depictions of iconic features and elements” (documentation by VM).

stylistic and abstract than the more concrete socio-rhetoric or socio-realistic ones in the landscape (fig. 9.6). Examples of images or compositions depicting “iconic” features or elements are:

- “Celestial” related images and patterns, sun and/or wheel crosses, concentric circles, sun horses, or bird-like patterns, combinations of certain images and patterns similar to those on bronze items or in graves.
- Successions or scenes of specific anthropomorphised images or beings with bodily anomalies such as a beaked face, wings or enlarged hands or feet.
- Animals in a specific position, antithetical or with specific gear: bulls, horses, aquatic birds, deer.

It is possible that the following tentative traits govern these compositions, designs or images in the landscape:

- Suggestive and dramatic expression.
- Successive ritual motion.
- Discontinuous chronological action on the panels (diachronic).

Example of panels or compositions depicting “iconic” features or elements are: Bro 703 (fig. 9.5), Bottna 334, Tanum 105:3 (fig. 8.16), Tanum 255 (fig. 9.4).

Concluding remarks

It is important to stress that there are interfaces and interactions between the mentioned social dimensions and that most rock art panels contain images with aspects from more or less each of these categories. However, some panels seem to be more articulated towards one of the dimensions.

The general theoretical framework I have outlined regarding the social act or process of depiction enables me to move on to a more socially oriented analysis of the rock art ships and anthropomorphic representations in them, with the focus on depictions of social positions and social realities. Several scholars have highlighted the religious and symbolic aspects of the rock art ships and there is no doubt that these images, especially those made with certain iconic elements, should be considered in terms of the “iconic order”. Moreover, the differences between the mythological and the more practical interpretation of the ship images in Bohuslän is a problem not least because they are rooted in a

normative western worldview whereby the ideological is separated from the more social or technological in the interpretation of prehistoric societies (Godelier 1975; Larsson 1986). As I have discussed

above, there seems to be little reason to uphold such a division.

The aim of this study, however, is to highlight the rock art ships' social and maritime aspects.

10

FROM TERRESTRIAL SHIPS TO WAR CANOES

Introduction

The study presented below was inspired by the discussion of whether the rock art ships are representations of real boats or symbols of a more abstract religious nature. The rock art ships' situation, location and chronology in relation to shore displacement have been considered in an earlier section. I have also outlined a general theoretical framework for this analysis, as well as certain concepts to do with the social act or process of depiction. This has paved the way for a more socially oriented analysis of the rock art ships and anthropomorphic representations in them. The religious and symbolic aspects of rock art ships have been studied and highlighted by several scholars and these aspects will be taken into account here, with particular reference to certain iconic elements (Almgren 1927; Kaul 1998, 2004; Fredell 2003; Goldhahn 1999a, 2005; Kristansen & Larsson 2005). However, the theme of this study is the rock art ships' social aspects.

The study deals with more than 1600 ship depictions that present various kinds of human representations. An SQL data base was established for this purpose. About half of the ships (858) are in the parishes of Kville, Bottna and Svenneby and about half (828) in Tanum parish. The chronological framework I have developed and discussed in relation to shore displacement makes it possible to divide the ships into three major chronological phases: the

EBA, the LBA and the PRIA. Observations and aspects of crew strokes, lures, combat scenes, warriors, fishing scenes, fishing rods, helmsmen, steering rods, acrobats and adorants will be perused. How closely do these representations relate to archaeological finds of real boats from the three phases? Are the ships proportional to the human representations or have the latter been enlarged or diminished? How do the human representations act and appear in the ships?

Most of the other objects depicted in rock art, such as weapons, lures, chariots and ploughs, can be related to objects that were in use during the Bronze Age. And even if the rock art ships should not be seen as full-scale documentations of real boats, with all their details and traits, they do in my view convey important social information that calls for more thorough comment. At the same time, I am aware of the methodological problems involved in connecting rock art ships to real boat finds and the discrepancies that obviously exist must not be overlooked.

Background

Scandinavian rock art research has conventionally favoured rather extravagant figurative images at the expense of what is by far the most common motif, namely the ship. Why has so little interest traditionally been paid to issues based on the great variety of rock art scenes connected with real maritime ac-

tions in the landscape? As mentioned earlier, interpretations from the 19th century tended to focus on pragmatic, historical and social perspectives of rock art and landscape, while 20th century approaches have been more oriented to mythological, symbolic and cosmological interpretations. Thus, for the past hundred years or so, the terrestrial paradigm has favoured mythological interpretations of the ship images. Moreover, the articles and dissertations which have been produced in the last two decades display a clear tendency to promote mythological, cosmological and symbolic interpretations of the rock art ships, with hardly any comparisons with or references to existing maritime archaeological finds from the BA or the PRIA (Hedengran 1993; Artelius 1996; Goldhahn 1999a; Wahlgren 2002; Fredell 2003; Bengtsson 2004; Thedeén 2004; Coles 2005).

For instance, Anders Berntsson generally disregards the depicted rock art ships as a source or evidence of how BA boats may have been constructed (Berntsson 2005: 51, 126). There has, however, been some discussion of more practical, social and communicative issues to do with the rock art ships and these perspectives recently seem to have become more topical (Larsson 1994; Kaul 1998, 2004; Kvalø 2000, 2004; Kristiansen & Larsson 2005; Ling 2004, 2006; Coles 2005; Linge 2006; Østmo 2005). There is, in fact, no contradiction between a social and a cosmological view of rock art ships because the making of rock art must primarily be seen as a socio-ritual act involving the depiction of highly staged objects and social and ritual situations.

Some scholars have discussed more specific functional aspects of the rock art ships. For example, Brøgger and Shetelig (1950), Marstrander (1963, 1979) and Strömberg (1983) used rock art ships as an argument for the theory that BA boats originated in a hide construction. Other scholars, such as Dahlgren (1932), Althin (1945) Crumlin-Pedersen (1970, 2003b), Rausing (1984), Kaul (1998, 2003) and Kvalø (2004), have pointed instead to the similarities between the Hjortspring ship and the rock art ships from Tanum, which indicate that BA and PRIA ships were plank-built (Crumlin-Pedersen 1970: 232, 2003b: 228; Rausing 1984: 70, cf. Berntsson 2005: 28pp). Today, most scholars agree that BA boat finds and rock art bear witness to a long

boat-building tradition in northern Europe which may have included multiple constructions: log boats, hide boats and plank-built boats (Kvalø 2000; Crumlin-Pedersen 2003b: 232; Berntsson 2005: 28–33). However, plank-built designs may have been most common for overseas expeditions and also the type that was primarily chosen to be depicted on the rocks (Crumlin-Pedersen 2003b: 232; Kaul 2003: 204; Kvalø 2004; Østmo 2005).

Fredsjö et al. (1956: 115) argued that the famous fishing scene from Kville illustrates a fishing tradition that was common in Bohuslän until the 1950s, where two men went out in a small boat to deep water, where they anchored and angled for pollock, cod and mackerel. Berntsson (2005: 206) suggested more recently that fishing and long-distance sea journeys were made with small extended log boats and that the large rock art ships holding multiple crew represent vessels that may have been used in ceremonial and ritual praxis. In the case of rock art ships with mast-like features, some authors have suggested sailing functions (Dahlgren 1932: 34; Winter 2002).

Noting the varying size of the rock art ships, Jarl Nordbladh pointed out that the smaller ship with fewer crew strokes was the most common and may therefore be more realistic than the larger ships with numerous crew strokes (Nordbladh 1980, 1989):

Sometimes the size of the crew indicated must exceed what was possible in reality at the time, as there are ships with more than 135 crew members. 10–20 persons per ship seems to be a more probable figure (Nordbladh 1989: 327).

Another interesting study is Detlev Ellmers' "Crew structures on board Scandinavian vessels" (Ellmers 1995: 231). The point of departure is the ship depictions on the BA sword from Rørby, dated to period Ib, and Ellmers notes that the crew are arranged in 16 pairs, with each man represented by a single line with a dot at the top representing the head (fig. 7.1, no.1). In addition, there are depictions of a single crew member in the stern and another in the prow. Using various kinds of prehistoric and historic pictorial evidence and late historical sources of norms and actions onboard, Ellmers convincingly dem-

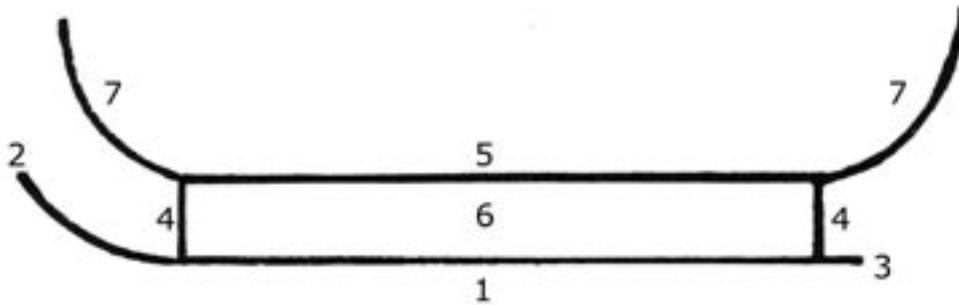


Figure 10.1. Definitions of the parts of a rock art ship (after Strömberg & Strömberg 1983).

onstrates how the positions – the single man in the stern, the helmsman, and the man in the prow/stem, the stemsman – reflect a similar function of steering or propelling. This structure seems to have governed the prehistoric and historic way of manoeuvring and propelling boats for over 3500 years (Ellmers 1995). Although the attempts mentioned above are highly interesting, the studies are either too brief, reserved or too general and seem to have been more or less dictated by single or random observations (cf. Fredsjö 1948).

The study includes more than 1600 ship depictions in the parishes of Tanum (828), Kville, Bottna and Svenneby (858) with crew strokes or visual representations of humans (based on Fredsjö 1971, 1975, 1981; Högberg 1988, 1995, 1998, 2000; Milstreu & Prørhl 1986, 1999, and the VM and GAM archives). For this purpose an SQL data base has been constructed. Each ship image can be related to one of three major chronological phases, the EBA, the LBA and the PRIA. There is also a more precise division of the BA chronology of ship images, based on Montelius' periods. Each item in the data base includes information regarding crew strokes/human representations, dimensions, paddlers, helmsmen, warriors, adorants, acrobats, etc., as well as features in the ships such as lures, weapons, steering rods, or specific scenes of combat or fishing.

Of the 858 ship images with crew from the parishes of Kville, Bottna and Svenneby, 415 relate to the EBA, 437 to the LBA and 64 to the PRIA. Of the 828 ship images with crew from Tanum parish, 273 relate to the EBA, 501 to the LBA and 49 to the PRIA.

General features of the rock art ships

Before discussing the relationship between real boat finds and the rock art ships, there are some facts and concepts that need to be presented. Note that the term ship will be used here for the rock art depictions and boat for the archaeological finds of real boats. Most of the features have already been mentioned above. The construction traits displayed by the rock art ships are limited compared to those of a real boat (fig. 10.1). The lowest part of the rock art ship is constituted by the keel line (1). The extension of the keel line in the fore is called the keel extension (2) and the extension in the aft, the stabiliser (3). The fore and aft stems (4) connect the keel line and the gunwale (5). The hull is the bulk of the ship (6) and the prows (7) extend from the stems and the hull (fig. 10.1).

There is only one boat find from prehistoric times in Scandinavia that displays these general traits, namely the one from Hjortspring in Denmark. I will therefore confine this study to a comparison of the rock art ships with the Hjortspring boat.

The Hjortspring boat was found in the early 20th century in a bog on the island of Als. The find was thoroughly investigated by S. Rosenberg (Crumlin-Pedersen 2003a). Furthermore, recent analyses and a reconstruction of the Hjortspring boat have yielded important new observations and results. The boat is estimated to have been about 18–19 meters long overall and its interior (the cockpit) about 13–14 m long (fig. 10.2). The 10 thwarts were set about one metre apart, making room aboard for about 20–28 persons. The basic material is lime and it has been carbon dated to about 300–400 BC (Crumlin-Pedersen 2003a).

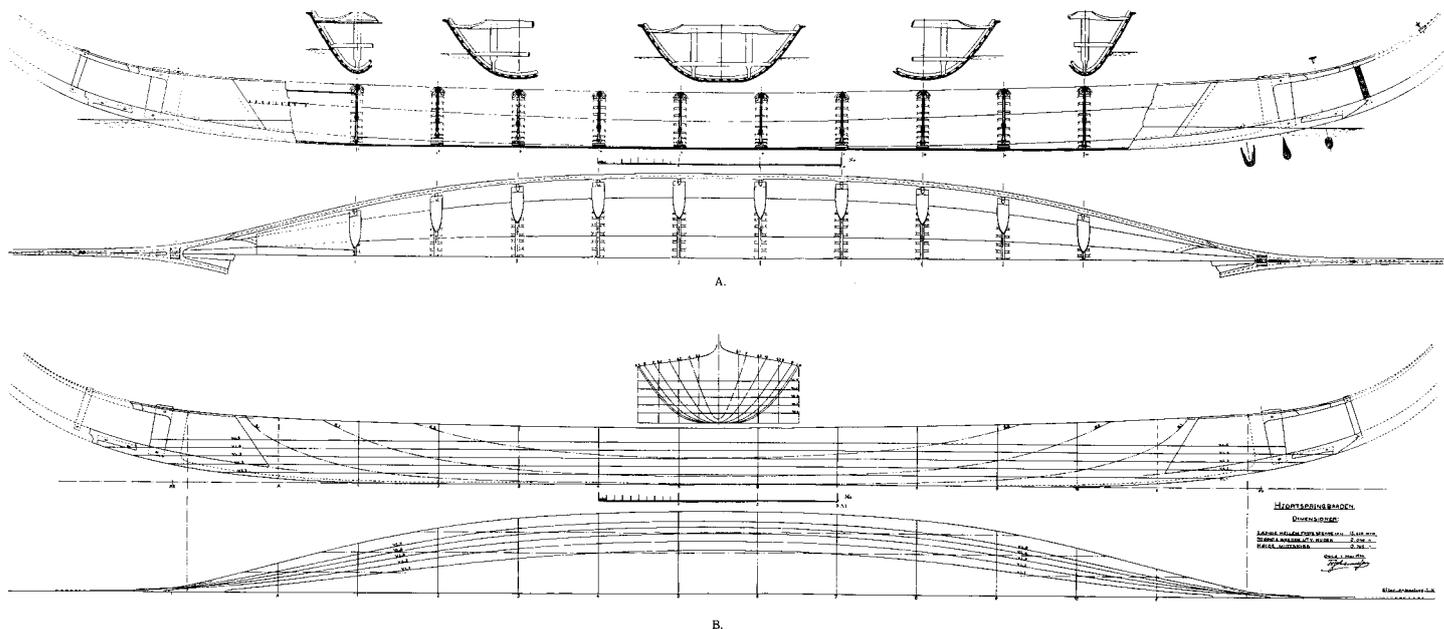


Figure 10.2. Johannessen's drawing of the Hjortspring boat (after Crumlin-Pedersen 2003).

The following quotation contains some of the most essential facts about this vessel:

According to Johannessen's drawing, the interior length of the reconstructed vessel was 13.61 m (measured between the stems excluding the oak locking boards). If the beaks, assumed by Rosenberg to be 2.5–3.0 m long, are included, the total original length is approximately 18.6–19.6 m. The maximum external breadth is 2.04 m and the height amidships 0.705 [...] Johannessen calculated the weight of the boat, with rudders and paddles, to be 530 kg. He assumed a crew would consist of 24 men, each weighing 72 kg with 16 kg weapons and equipment, giving a total weight of 2,640 kilo (Crumlin-Pedersen 2003a: 36).

The same author has also described the basic construction:

The boat had been constructed as a delicate shell around one central bottom strake with two broad strakes on each side, fastened to each other by means of sewing along the overlaps of the planks [...] Inside the boat were found remains of ten rows of cleats for fastening lashings around the elegantly-shaped frames, each consisting of a

thwart with carved seats for two men, [...] The central bottom strake extended from both ends of the boat proper, forming sturdy, upwards-turning horns with oval cross-sections. At each end of the boat, a large winged stem rested on top of the bottom plank and the ends of the side strakes were attached to this (Crumlin-Pedersen 2003c: 234).

As mentioned earlier, a comparison of rock art ships with the Hjortspring boat clearly has to be limited to some general proportional and technological features, related to the technical, aesthetic and social constraints and aims in the production of rock art. There are, however, some social features such as the number and positions of the crew, and the helmsman and stemsman, that can also be considered. These social settings may, indeed, reveal some interesting information about social norms connected to the boat in prehistoric times. For instance, the distance between each of the 10 thwarts in the cockpit of the 19 m long Hjortspring boat was about one metre, making room aboard for about 20 paddlers, seated pair-wise, and two helmsmen (Crumlin-Pedersen 2003a: 36).

How do these features, the proportions between ship and crew, appear in the rock art ships in relation



Figure 10.3. *Tilia*, a reconstruction of the Hjortspring boat, at sea (after Crumlin-Pedersen 2003).

to what is known or assumed about the Hjortspring boat? Is it reasonable to discuss proportions and settings like this? Or do the rock art ships display different social and constructional features?

First it has to be stressed that the hull of rock art ships should not be equated with the cockpit. When the Hjortspring boat is seen in profile, the cockpit is not visible, only the hull, and there therefore seems to be room for more paddlers. The same applies to many rock art ships. The hull of the Hjortspring boat includes the stem and prow features in addition to the extent of the cockpit (fig. 10.2, 10.3). So the length of the hull is greater than the length of the cockpit and it may then be supposed that the number of crew represented in a rock art ship could have been adjusted accordingly. In fact, many rock art ships seem to have room for more paddlers.

In that rock art ships are depicted in profile, the number of crew should perhaps be twice what one sees, assuming that they sat in pairs. However, there are some ship images that clearly display paired crew strokes with a space in between. Moreover, some ship images contain fully formed anthropomorphic representations.

The next section presents some general results, after which we can move on to discuss more specific proportional, chronological and social traits of the rock art images. The general statements of results can be further checked in the more specific chronological account of the study that follows.

General outcome of the proportional study; codes of dimension

The rock art ships from the study area clearly follow a strict dimensional code, for instance as regards the internal length of the hull between the stems. In general, the hull was made so that it accounted for 80 percent of the ship's total length and the prows and keel extensions in the fore and aft accordingly made up 20 percent of the total length. These proportions tend to apply to the rock art ships regardless of their size and more or less regardless of their period. For instance, both EBA and PRIA ship images generally follow these proportions (fig. 10.4).

However, what seems to be the major trait that chronologically distinguishes BA from PRIA ship images is their degree of symmetry. This has been stressed by a number of researchers (Fett & Fett 1941; Marstrander 1963; Glob 1969; Malmer 1981; Kaul 1998; Sognnes 2001; Ling 2005). The asymmetric tendency becomes less pronounced during the LBA, when keel extensions in the aft become longer and are curved towards a vertical position. There are, however, some ship types from the EBA that are generally symmetric (fig. 7.1, 7.35).

Nevertheless, the general visual proportions of the rock art ships correspond very well to the proportions of the Hjortspring boat. The latter's hull constitutes about 80 percent of its total length and the exteriors – prows and keel extension – about 20 percent (Crumlin-Pedersen 2003a: 36). This general proportion is to be found in about 90 percent

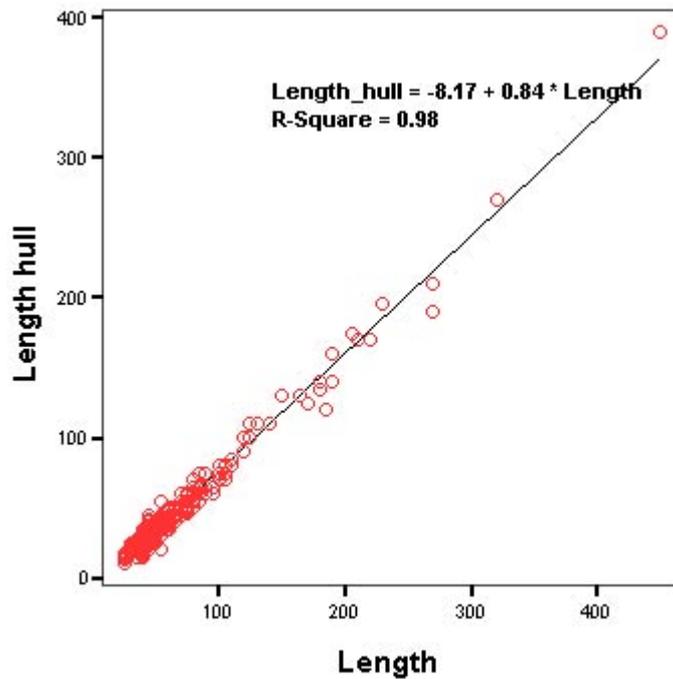


Table 10.4. Correlation between total length and hull length for all ship images in the study area from the EBA to the PRIA. A majority of the ships have a hull that is about 70–80 percent of the vessel’s total length.

of the rock art ships with crew display, regardless of their location and chronological period (fig. 10.4). Even if the PRIA rock art ships can be distinguished by their general symmetry and most BA ships are asymmetric, the general proportions of hull and prows are very consistent. The characteristics that generally distinguish PRIA from BA ships are the length and shape of the keel extension fore and aft and the shape of the prows. Thus it is the PRIA ships that bear the strongest proportional and figurative resemblance to the Hjortspring boat in profile, especially the longer and slender examples of rock art ships from sites like Tanum 75, 208, 241, 325:3 (fig. 10.5).

Thus the similarity between the Hjortspring boat and the ship depictions on the rocks favours the hypothesis of a continuous boat-building tradition in Scandinavia from the EBA to the PRIA (Kaul 1998, 2003; Crumlin-Pedersen 2003b: 228pp; Kvalø 2004; Østmo 2005). Further support for this is provided by recent radiocarbon datings of a plank-built boat from Haugvik in Norway. However, the Haugvik boat is made of pine instead of the Hjortspring’s lime, which points to it having been made in northern Norway (Sylvester 2006: 99). Two separate C14 datings show that the boat was made during the end of the LBA (Sylvester 2006: 93–99):

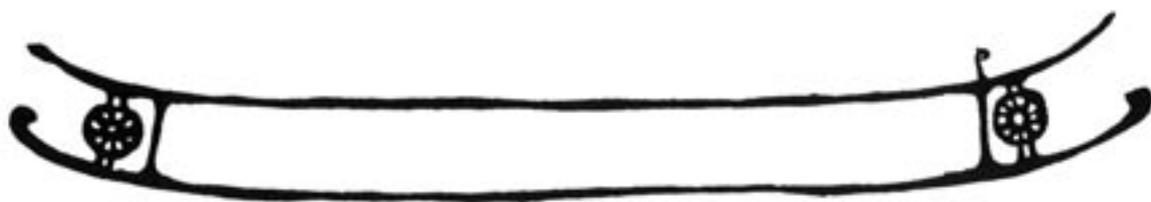


Figure 10.5. PRIA ship from the rock art site Tanum 75 (after Kaul 1998).

In connection with the new investigation of the Haugvik find, two samples were taken for 14C testing, resulting in two datings of 840–540 cal BC and 780–420 cal BC. With the recent datings of the Haugvik find, the existence of planked-built ships in The Late Bronze Age is no longer a hypothesis (Sylvester 2006: 99).

Thus the rock art ships and the prehistoric boats considered here bear witness to a long boat-building tradition in northern Europe.

Another notable fact is that the Hjortspring boat has been interpreted primarily as a highly effective war craft rather than a “functional” craft (Randsborg 1995; Crumlin-Pedersen 2003b; Kaul 2003). For instance, one of Scandinavia’s largest finds of prehistoric weapons, comprising 169 spearheads, 11 swords, remains of several chain-mail coats and parts of more than 50 shields, was discovered in the same context as the Hjortspring boat. Taken together, these facts point in the same direction, namely that the Hjortspring boat was intended for military purposes (Kaul 2003: 141pp).

Regarding the rock art ships, there are indications that some of them represent a similar military function. One is the mentioned correspondence between the proportions of the rock art ships and the Hjortspring boat. Another is the depiction of large craft with numerous crew. A third is the combat scenes with armed warriors in and adjacent to the ships. The representation of conflict, power and mobility is a very obvious trait of many rock art sites from the LBA–PRIA. However, it is also logical to assume that other rock art ships represented more standard ship prototypes (e.g. Crumlin-Pedersen 2003b: 232). The vast majority of ship images, regardless of period or location, do in fact display a rather small number of crew strokes. Moreover, most ships lack scenes with warriors. At the same time, the ships depicted on the rocks are no doubt very special. Crumlin-Pedersen stresses this and claims that they were determined by traditions of prestige and performance rather than technological or functional characteristics:

The desire to follow ancient traditions in order to indicate a special status for certain ships by

displaying stem decorations has found its expressions in countless ways through the millennia, down to the present. In this way, the shape of the stems of the rock-carved ships is not explained primarily on the basis of technological prerequisites but is to be considered as a stylistic feature of symbolic significance (Crumlin-Pedersen 2003b: 230).

The next section presents a more explicit account, broadly divided into three chronological phases, of crew strokes, sizes, proportions, chronology and other features of the ships.

The Early Bronze Age ship images

Among the total of 418 studied ship depictions from the EBA in the parishes of Kville, Svenneby and Bottna, a large proportion have 6–13 crew strokes, with 7 as by far the most common number; 51 ships have no crew strokes at all. The results for the Tanum area are remarkably similar: a total of 276 ship depictions with crew strokes and 47 with no crew strokes; the number of crew strokes ranges from 6–14 and 7 is by far the most common number (fig. 10.6). These figures may indicate that in these areas there was a similar way of building, dimensioning and crewing real ships during the EBA.

Moreover, the length of the ship depictions is generally 30–35 cm and the hull is 15–25 cm (fig. 10.7, 10.8). The height of the crew strokes is generally 2–5 cm. Logically but interestingly, these dimensions grow with the number of crew strokes. For instance, ships with 13–15 crew are in general 45–55 cm long and their hulls 30–40 cm.

The largest ship in all these areas is in Torsbo, Kville 157. It measures about 4.5 m overall, the hull measures 3.9 m and it holds 125 crew strokes, each about 5 cm tall (fig. 10.9). However, the number of crew seems to be disproportionate to the size of this ship. Half the number of crew, about 60, might be more in keeping with the ship’s proportions. The most common large ships from the EBA do, in fact, have 30–60 crew. Still, this particular ship may have been made to illustrate a specific social event and for this purpose it may have been “loaded” with more people than would usually be the case for transports or sea ventures. It can be mentioned that,

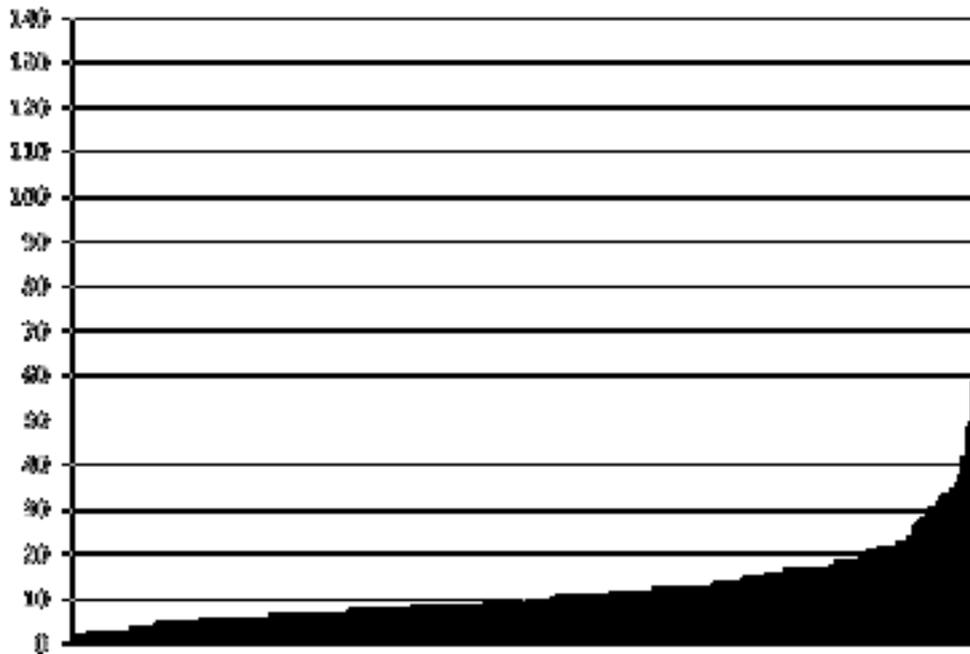
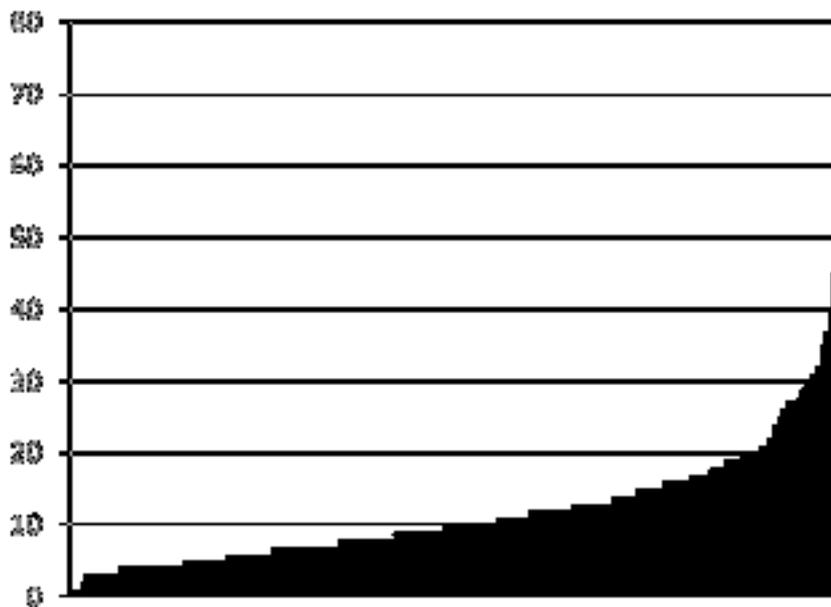


Figure 10.6. Number of crew in all ship images from the EBA in Kville parish (above) and Tanum parish (below).



for instance, the church boats which were used on the lakes in Dalarna in northern Sweden in historical times were constructed in a similar way to the Hjortspring boat and were occasionally overloaded with people on the way to church or other social events (Ellmers 1995: 232).

A traditional claim among scholars has been that some ships represented on rock would have been

far too large, with too many crew, for it to have been technically possible to build them in prehistoric times (Almgren 1927: 7–85; Nordbladh 1989; Berntsson 2005: 51). Instead, the large ships are interpreted as mythological vessels unconnected with real maritime situations (Almgren 1927). These somewhat evolutionary assumptions tend to overlook analogies between archaeological finds and

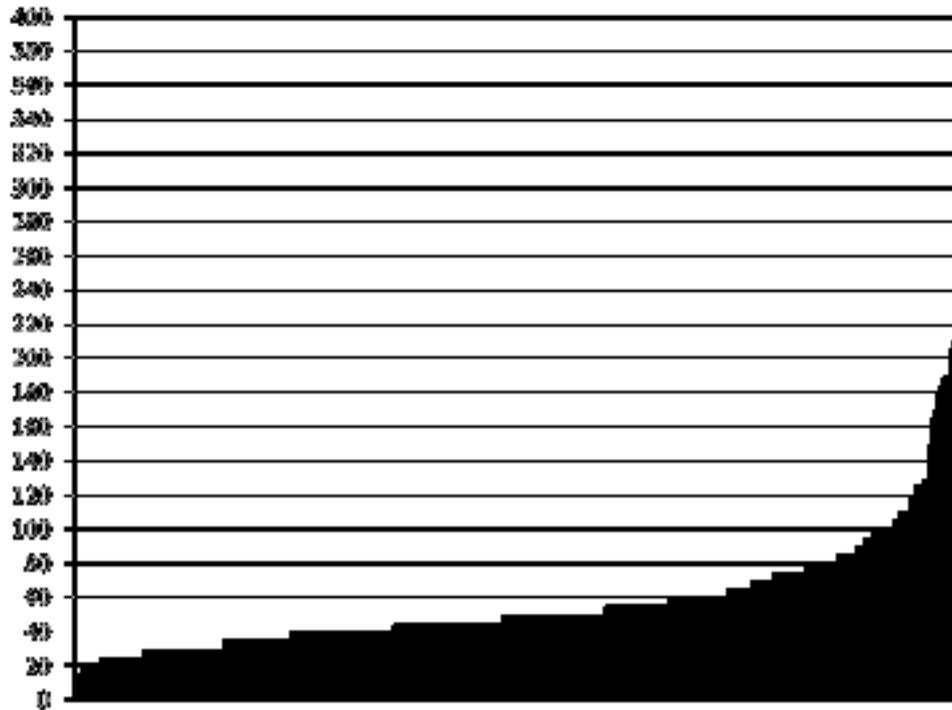


Figure 10.7. Total length in centimetres of all ship images from the EBA in Kville parish.

non-western ethnographic traditions of maritime craft-building. This is a pity because there are interesting instances of such craft that basically share the Hjortspring boat’s sewed and plank-built technology.

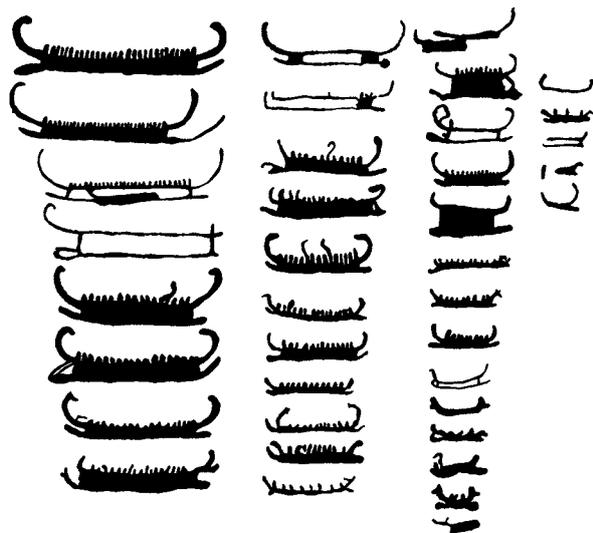


Figure 10.8. Some of the most common ship depictions from the EBA in Kville parish (after Nordbladh 1980).

One example is the “Tomoko” war canoes from the Solomon Islands which, just like the Hjortspring boat, have a bottom plank to which two side strakes are attached on either side of the hull. These canoes are more slender than the Hjortspring boat but the largest can still hold 60 crew and are primarily designed for military action or manifestations of power and prestige (fig. 10.10, Clausen 1993). It is worth mentioning that the most common large rock art ships from the EBA hold 30–60 crew, which more or less agrees with the large war canoes in Melanesia (Clausen 1993: 21). Moreover, the elaborate prows of the Melanesian craft are reminiscent of the prows of the rock art images in Bohuslän, especially those from the LBA. This is not indicative of maritime interactions between these highly remote areas during the BA but it does tell us that it was possible to build large boats of great technical and aesthetic complexity, boats that in general share the technological premises of the Scandinavian boat finds from the LBA–PRIA. Even if the proportions of the large ship at Torsbo in Kville are most probably exaggerated, the Melanesian war canoes demonstrate that the large EBA ship images could have represented

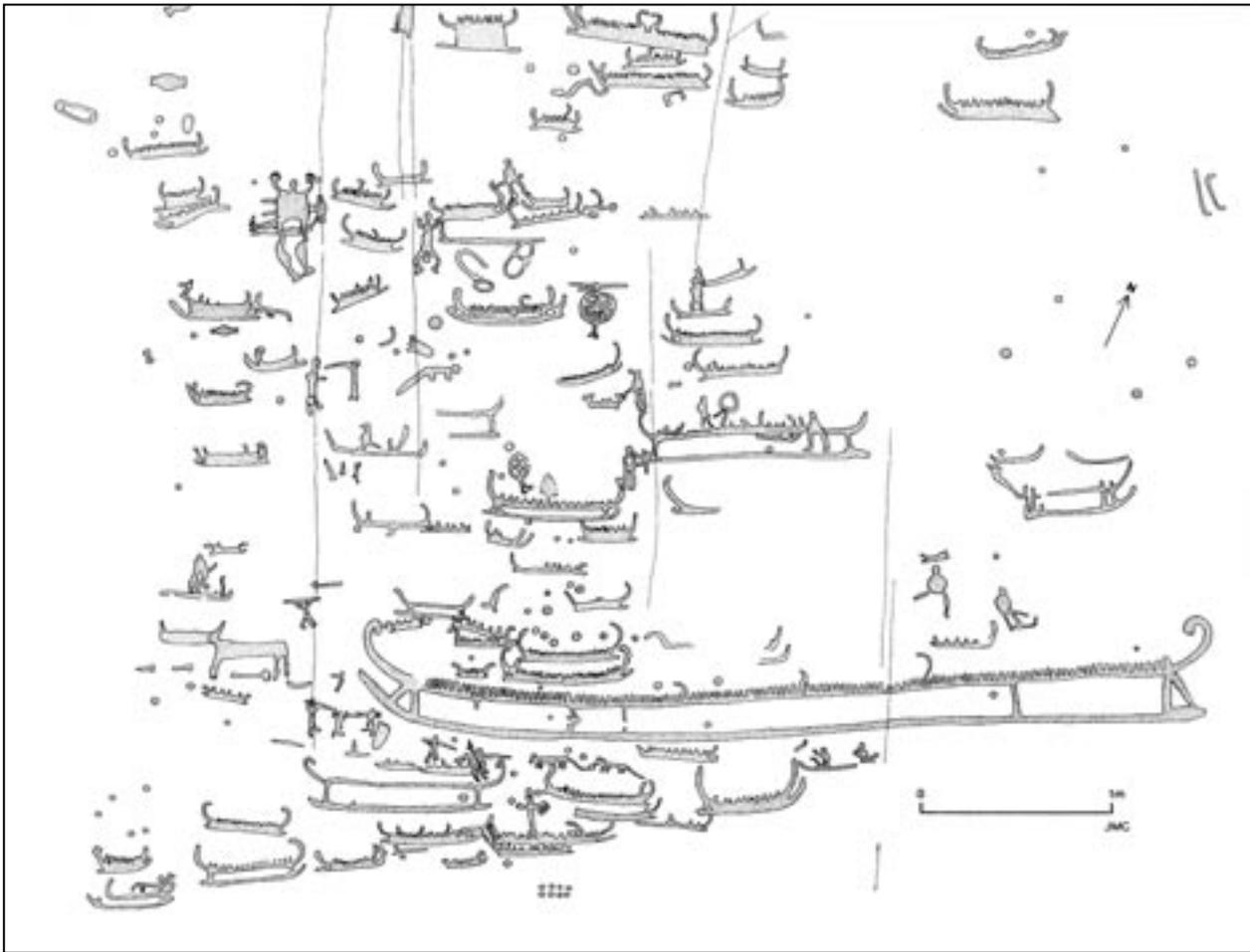


Figure 10.9. The panel Kville 157 in Torsbo with a ship image that measures 4.5 m (after Coles 2005).

existing craft. This may have implications for the religiously oriented interpretations that primarily see the rock art ships as fictional representations with no reference to a maritime reality.

Thus, the large ship representations on rock have much the same proportions as the Hjortspring boat, which indicates that there were norms in Scandinavia which apparently governed conceptions of maritime craft during the BA–PRIA (Crumlin-Pedersen 2003a: 36). We may then assume that the representations of the large rock art ships were based on real boats. Or as Crumlin-Pedersen puts it:

...it is tempting to consider the Hjortspring boat, and with it the boats depicted in the rock carvings and on bronze objects, as a product of a local building tradition (Crumlin-Pedersen 2003b: 230).

The Late Bronze Age ship images

A total of 433 ship images with crew strokes classified to the LBA derive from the parishes of Kville, Svenneby and Bottna. The number of crew is mostly in the range 6–11, with 7 as by far the most common number. Another 134 ship images from the LBA in these parishes have no crew strokes at all. There are two sites with ship images that have 38 crew strokes (Kville 149: 1–2).

The 503 LBA ship images from Tanum parish with human representations (143 without) that were studied are generally similar to the above in terms of size and crew numbers (fig. 10.11). The number of crew mostly ranges from 5–12, again with 7 as by far the most common number. However, the LBA ship images from Tanum generally represent larger craft with more crew strokes than those from the other parishes. One of the largest ships, from Kalleyby (Tanum 249), has 75 crew strokes.



Figure 10.10. Sewn and plank-built “war canoe” from Tomoko island with elaborate and markedly raised prows; it seats 17 paddlers (after Clausen 1993: 26).

The most common LBA ship depictions with crew from all the studied parishes are 35–45 cm long overall, with a hull 20–25 cm long (fig. 10.12). As in the case of the EBA ships, the proportions

of the LBA images – overall, hull and prow height – grow with the scale of the representation and the number of crew. This may favour the hypothesis that we are dealing with rather realistic representa-

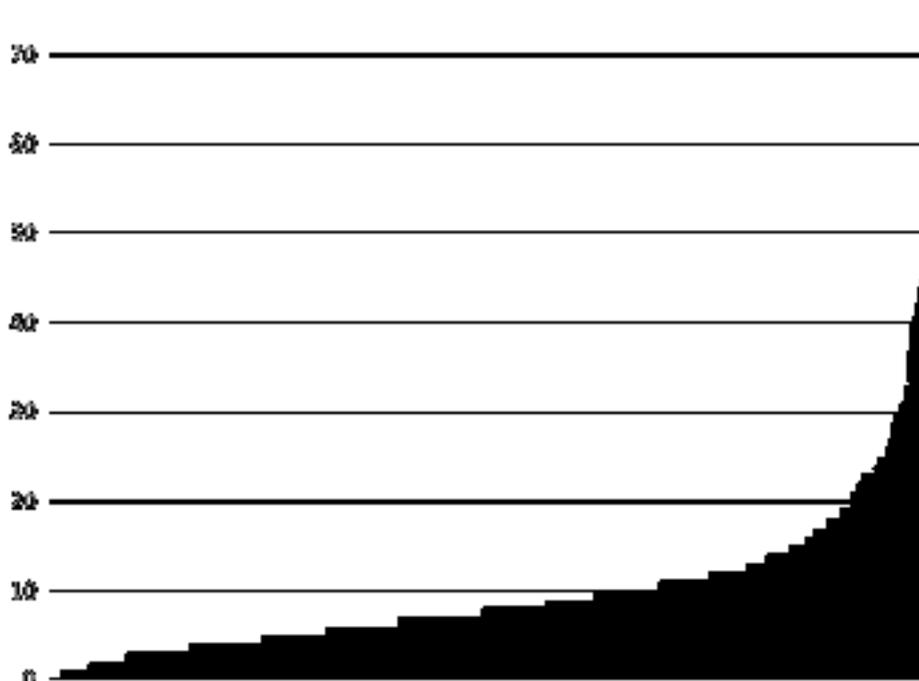


Figure 10.11. Number of crew in all ship images from the LBA in Tanum.



Fig. 24. Kville (Kville s 72).



Fig. 25. Allestorp (Kville s 78).

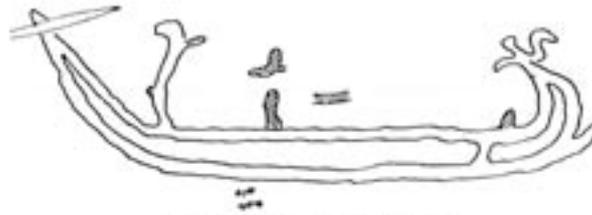


Fig. 26. Bottna (Bottna s 148).

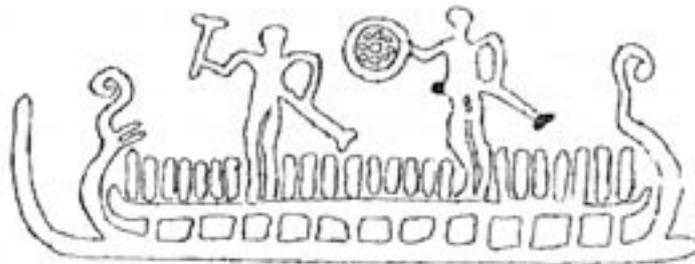


Fig. 27. Svenneby (Svenneby s 103).

Figure 10.12. LBA ship images from Kville, Bottna and Svenneby (after Strömberg & Strömberg 1983).

tions of boats. The most common ship images from the LBA have 7–10 crew strokes, are double lined and about 35–45 cm long (fig. 10.11).

The Pre Roman Iron Age ship images

The ship images from the PRIA generally have fewer crew than those from the EBA and the LBA. However, their general proportions are similar to those from the BA, with the interior making up about 80 percent of the overall length and the exterior features 20 percent. Thus there are striking similarities between the PRIA rock art ships from Tanum, such as Tanum 75, 208, 241 and 325:3 (fig. 10.5), and the Hjortspring boat. A total of 130 ship images classified to the PRIA derive from Tanum parish; 49 have human representations, 81 do not. The number of crew is mostly in the range 1–7 and here by far the most common is 4. The ship with most crew has 17. This is considerably fewer than the BA ships, especially those from the EBA. A total of 72 ships classified to the PRIA derive from the parishes of

Kville, Svenneby and Bottna, 63 with crew strokes, 9 without. Just as in Tanum, ship representations with 4 crew are most common but here the number of crew is generally higher than in Tanum: the common range is 4–14 and the ship with most crew has 36. However, Tanum has most of the PRIA ships (130) and most of them lack crew. In the other three parishes, Bottna has almost half of the PRIA ships, 37 out of 72, and contrary to Tanum, a larger proportion have crew.

To sum up, the most frequent ship types from the EBA to the PRIA seem to have some general traits in common. The ship images are in general 30–40 cm long, with a hull of 20–30 cm. The crew strokes are in general 3–5 cm high but become higher as the ships become larger. Ship depictions from the EBA generally have more crew strokes than those from the LBA. The PRIA ships in turn have fewer crew than those from the LBA. Moreover, the EBA ships are generally longer than those from the PRIA, while the average LBA ship seems to be longer than

the average EBA ship. Ship images without crew strokes are more frequent in the LBA and PRIA than they are in the EBA. In the case of EBA and LBA ship images, the most common number of crew is in the range 7–13.

It is possible, however, that a single crew stroke represents a pair of paddlers. In that case, the numbers of crew, excluding the helmsman and stemsman fore and aft, might be twice the above. On the other hand, ship images that include fully shaped anthropomorphic crew representations have between 6–11 crew. This argues against a doubling of the crew strokes to arrive at the total number of crew.

Another observation is that the most common ship depictions lack warriors and combat scenes. This may indicate that these depictions refer to more “ordinary” craft, used for more quotidian maritime actions during the BA. They may then have represented prevailing norms and ideals among local social units concerning the building and crewing of ships for more everyday maritime missions such as short and medium distance transport, trading, deep-water fishing and communication. The large ship images with numerous crew or crew in clearly defined positions in the ships, as well as elevated or enlarged individuals with warrior attributes, may be



Figure 10.13. The renowned fishing scene from the panel Kville 151 (after Fredsjö 1956).

regarded as military or ceremonial craft, such as war canoes, staged and used for special maritime events. From the same chronological period there is also a number of interesting panels displaying depictions that include larger craft of a “fighting or ceremonial” nature as well as normal-sized and crewed ships. The smaller ship images are positioned around the larger as if they were supporting or connected to them. Examples are Tanum 1, 65 and 161, and Kville 165 and 163 (Coles 2005). It is tempting to relate these maritime compositions to social events such as launchings, meetings or departures.

Finally, another trait that is common to all sites, regardless of period or geography, is that all the ships on a particular rock art panel have the same number of crew strokes; examples are Kville 8, 53, 54, 55, 62, 82 and 157, and Tanum 15, 18, 65, 89, 254, 255, 311 and 409.

Depictions of social realities

A few of the ship images display more functional actions such as fishing scenes. They are clearly exceptions, outnumbered by the vast majority of more anonymous or socially loaded ship representations. There is, in fact, only one site in these parishes with explicit fishing scenes and there are actually more sites, about 20, with ploughing scenes. However, there are about 900 sites in these parishes with more common ships and I will try to show that some of them could also relate to fishing.

The most illustrative are the well-known scenes from southern Ödsmå in Kville parish, Kville 151, with ships that display typical traits of the LBA period V, such as out-turned prows ending up in animal heads and a hooked upward-turned keel extension (fig. 10.13). The type of fishing rods attached to the two humans in the ships and the length of the rods, the hooks and the anchor have been related to the traditional form of deep-water fishing in Bohuslän. Fredsjö et al. (1956) argues that this particular fishing scene may illustrate a fishing tradition that remained in use in Bohuslän until the 1950s: men went out in pairs in small boats to deep water and anchored there to angle for pollack, cod or mackerel (Fredsjö 1956: 115; Berntsson 2005). Bengtsson in turn relates this scene to Thor’s and Loki’s fishing venture (Bengtsson 1999).

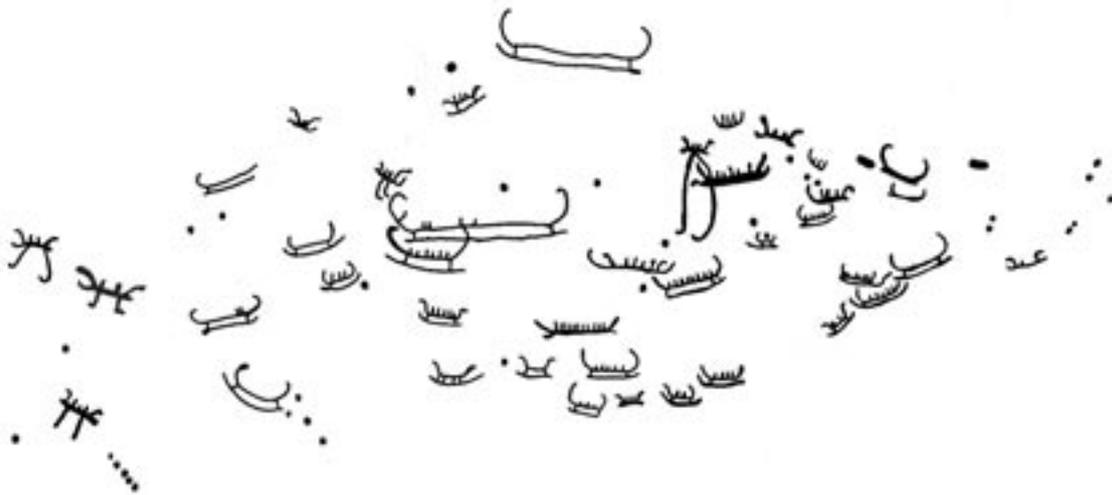


Figure 10.14. The rock art site Askum 687, with six fishing scenes (documentation by VM).

There are two sites in Tanum, Tanum 330 and 311, that display similar ships with human representations in a similar pose holding what could be rods, but no lines or fishing hooks are visible. Elsewhere, however, there are clearer examples of fish-

ing scenes, for instance further south in the parish of Askum at Sotenäset (fig. 11.2). The site Askum 687 has 6 fishing scenes and the ships are of much the same LBA types as those in Kville and also hold two crew (fig. 10.14). The site also includes additional ships that look just the same but lack lines and hooks. It is notable that all the ships from the mentioned sites have not only the same proportions but also the same general appearance with out-turned prows and hooked upward-turned keel extension (fig. 10.13, 10.14). Perhaps what we have here is a ship or a boat type representing a rather small fishing vessel used during the BA in northern Bohuslän.

This type of ship also occurs on other sites in Tanum and Kville but without lines and hooks (Tanum 25, Kville 82, 149, 157, 172, 209, 228 and 242). Then there are ships that have lines leading down to the keel line that may represent some kind of fishing rod or anchor (Kville 157, 204, 228 and 209, Bottna 241).

There are also ships attached or adjacent to net figures, some of them, such as Tanum 280 (fig. 10.15), of the same type as those from Kville, others not, such as Tanum 361 and 306 (fig. 10.16).

Do these images represent fishing scenes or something of a more symbolic, complex nature? Marstrander, for instance, interpreted them as representations of Celtic fields or tenure system. That does seem rather far-fetched but it follows Almgren's general idea that the ships on rock signified



Figure 10.16. The rock art site Tanum 361 with two ship images entangled in a net figure (after Högberg 2000).

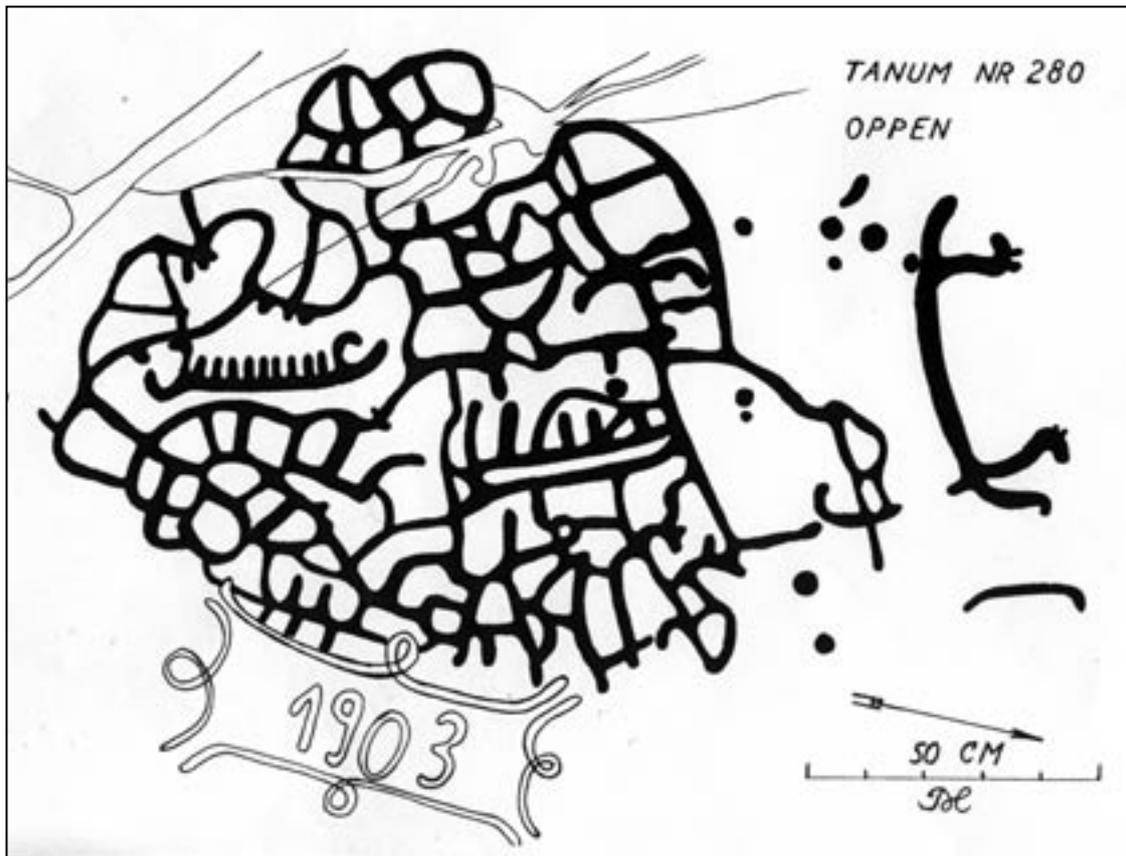


Figure 10.15. The rock art site Tanum 280, from Oppen, seems to display two ship images entangled in a net figure (after Högberg 1981).

“agrarian cult ships” rather than real boats (Almgren 1927: 145).

To me, however, the fishing interpretation seems more likely than Almgren’s and Marstrand’s rather abstract notions. It is possible, on the other hand, that these images symbolize another maritime feature. There are several maritime societies that have depicted sea routes in a similar way, either drawn in the sand or made of sticks or branches. This interpretation was, in fact, suggested by Holmberg as long ago as 1848 (Holmberg 1848: 107).

Helmsmen and steering rods

Some kind of steering rod or apparatus seems to be represented on a number of panels (fig. 10.17). There are ship images from the EBA that have a stroke or line leading from the last crew stroke in the aft downwards to the so-called stabiliser. In these cases the last crew stroke has been made at some distance from the others, towards the aft prow

in a more elevated position (e.g. Kville 157 and 162, Tanum 311), representing the helmsman (e.g. Ellmers 1995). The entire feature could be interpreted as the helmsman holding the steering rod. Ship images from the LBA support this interpretation, which is further illustrated by two ship images from the site Kville 49 (fig. 10.18).

Thus there are some very clear examples of anthropomorphic figures in ships that could be related to a steering function, for instance Bottna 374, Kville 49 and 171, Tanum 326, 356 and 357, all of them from the LBA. There are also several ships with anthropomorphic representations in a position or pose that points to this kind of functional and social position in the ship (fig. 10.19, Kville 149 and 169, Svenneby 240, Tanum 356 and 357).

From the EBA there are examples of two single crew strokes in elevated positions in the fore and aft, respectively, possibly signifying the helmsman and the stemsman (e.g. Tanum 311), and in the LBA



Figure 10.17. The aft of the 4.5 m long ship image on the panel Kville 157, showing a possible helmsman attached to a steering rod (after Strömberg & Strömberg 1983).



Figure 10.18. The LBA ship image from the panel Kville 49, showing a helmsman holding a steering rod (after Fredsjö 1981).

there are pronounced figurative differences, such as enlarged, horned warriors fore and aft. This way of signifying social differentiation may relate to ancient maritime norms connected with the shape, size and structure of the ship (Randsborg 1995; Varenius 1998).

Depictions of humans holding paddles are evi-

dent in some of the ships (fig. 10.19). But it does not seem to be the act of propelling the boat that is depicted; it is more as if different poses and performances are illustrated. These positions and performances are strongly reminiscent of rituals that Kwakiutl Indians, on the northwest coast of America, performed in their war canoes, which were used

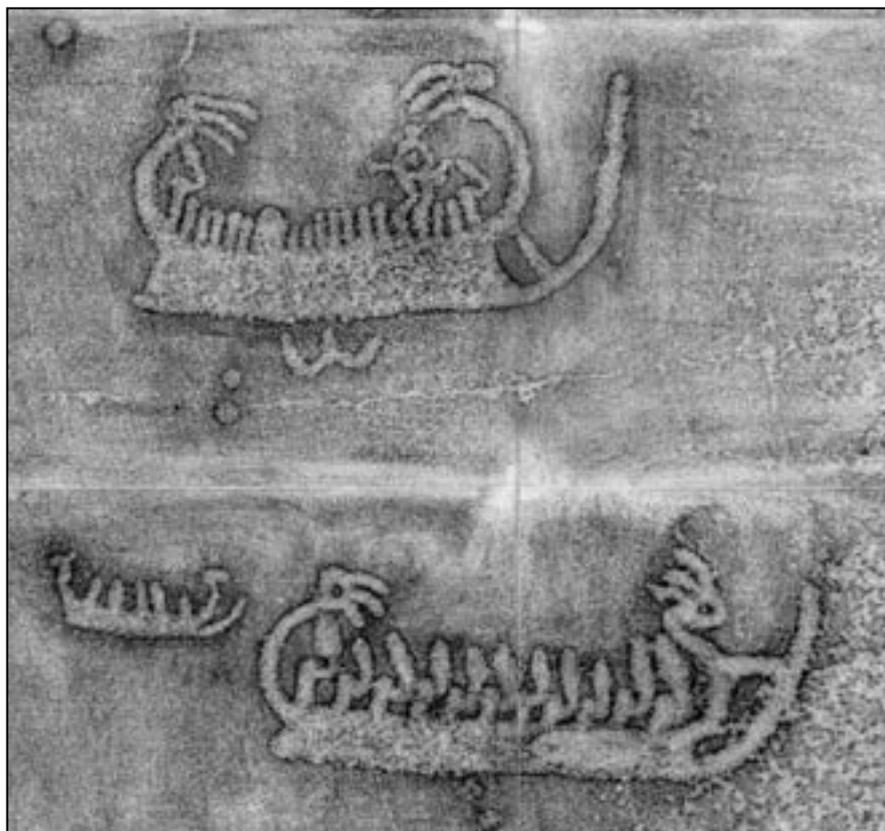


Figure 10.19. Ship with crew holding paddles, from Tanum 192:1 (documentation by RockCare).

for military and ceremonial events (Boas & Codere 1966).

The number of crew in the rock art ships with clearly depicted humans – kneeling, sitting, raising paddles, blowing lures, raising weapons, etc. – ranges in general between 7–11 (e.g. Tanum 89, 192, 322, 325–327, cf. Skee 636 and Askum 697). These ships are generally relatively small, 50–70 cm long, with a hull of 35–55 cm. Thus these ships are similar in size and number of crew to the ships with crew only. This supports the theory of a common local mode or tradition of crewing ships in the

Tanum and Kville area during the BA.

Two ship depictions include a mast or pole feature. Some scholars see this as evidence of ships being furnished with a sail (Winter 2000; Bengtsson 2003). These two representations are on adjacent panels and can be typed to period V. Although there are a couple of other examples of poles or mast-like features from southern Scandinavia (Winter 2000), these must be regarded as exceptions. So far there are no indications of prehistoric boat finds in Scandinavia or northern Europe that could support the sailing theory (Crumlin-Pedersen 2003b).

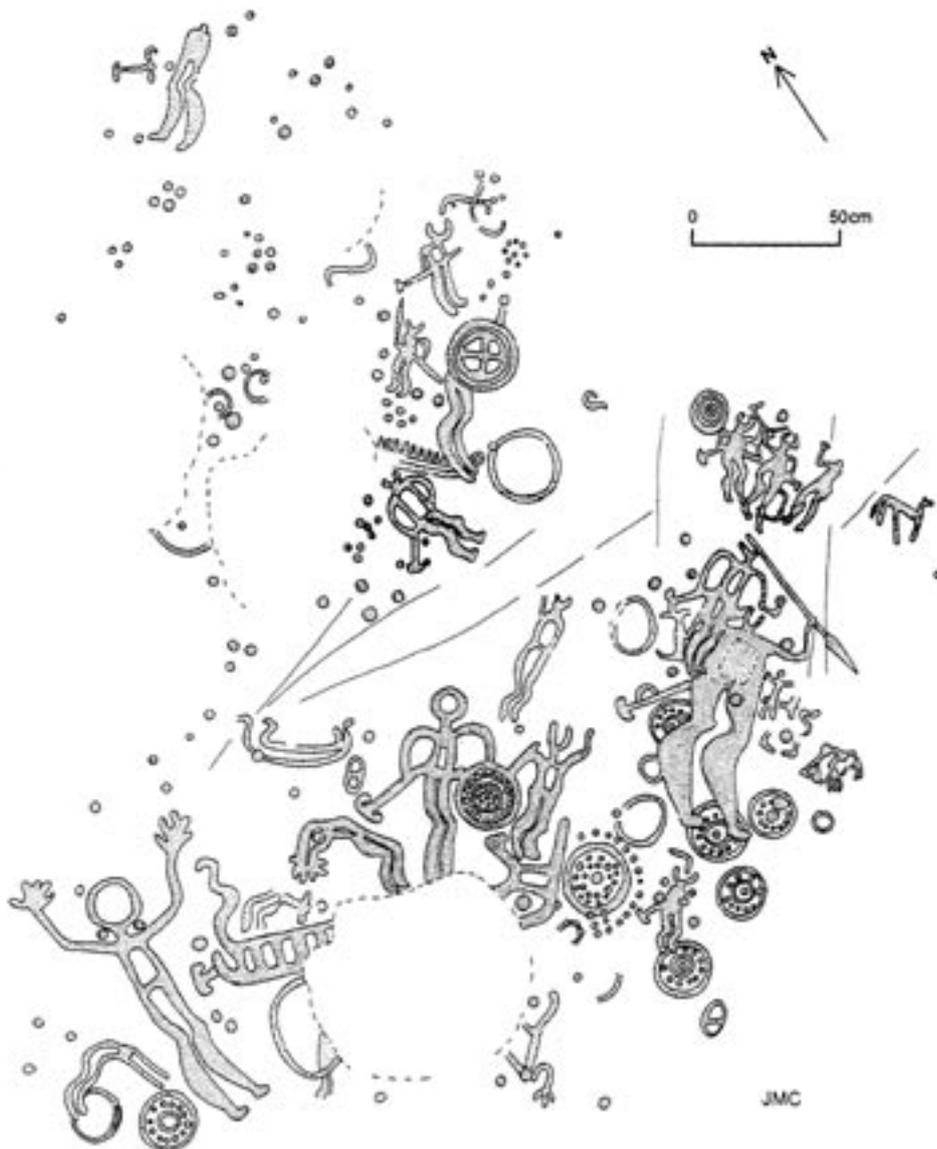


Figure 10.20. Social positions combined with strong “iconic” images. The rock art site Kville 124, displaying warriors, and acrobats on, attached or adjacent to a ship (after Coles 2005).

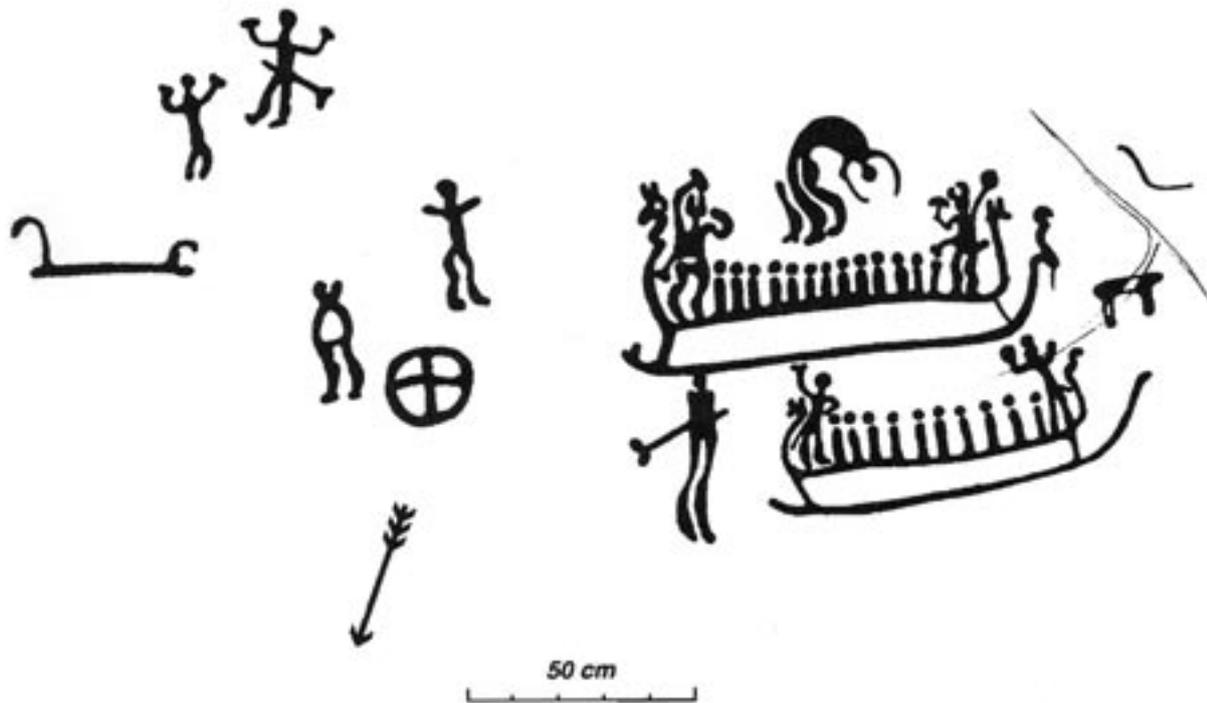


Figure 10.21. The rock art sites Tanum 356 (above) and 357 (below), with scenes of social inequality aboard the ships and acrobats jumping above the ships (after Högberg 2000).



Depictions of social positions

The ship constitutes the axis, the infrastructure, of various social scenes in and outside it. Thus, every human scene of warriors, adorants or acrobats seems to be attached to or connected, directly or indirectly, with the ship (fig. 10.20, 10.21, see also Kville 124). There are instances of two enlarged warriors being depicted in the same ship as an anonymous set of crew, sometimes holding paddles (e.g. Svenneby 240, Bottna 374, Tanum 335 and 192).

Furthermore, there are ship depictions with individuals placed fore and aft in what seem to be commanding positions, often with weapons or other items aimed, pointed or directed at an anonymous bunch of crew strokes in the mid-section of the ship (Kville 149 and 169, Svenneby 240 and Tanum 325, 356 and 357). This again implies a need to stress scenes and codes of social inequality in the ship. Indeed, social norms could hardly be represented more explicitly than this (fig. 10.22).

These scenes suggest that the ship could have functioned, at least metaphorically, as an impor-

tant arena for the display and performance of social norms and inequalities (e.g. Varenius 1998). There are several examples of similar “social” representations in the rock art of Tanum (e.g. Tanum 1, 192, 255 and 325).

The general difference between EBA and LBA compositions of rock art ships lies in the figurative representation of humans, which is much more concrete and pronounced during the LBA. During the EBA periods I–II, human representations seem to have been restricted primarily to crew strokes. The first known representations of warriors are from period III (Kville 98 and 170, Tanum 6, 12, 15 and 18). These military representations become more accentuated in the following period and reach a peak during period V. Warriors are also represented during the PRIA (Kville 98 and 170, Tanum: 6, 15, 33, 208 and 369), at least up to 300 BC (e.g. Kaul 2003; Coles 2005). However, the social representation of conflict seems to have been stressed far more often during the LBA than during the EBA and the PRIA (Bertilsson 1987; Coles 2005; Vogt 2006).

Thus the chronological differences between the figurative utterances in the rock art may reflect societal changes. Individual traits are more pronounced during the LBA than during the EBA, which suggests a shift away from collective social norms. This can be seen in relation to some general societal interpretations of the south Scandinavian BA, which envisage a more collectively oriented society during the EBA and a more individual one in the subsequent periods (Vandkilde 1996; Kristiansen 1998;



Figure 10.22. A ship depiction illustrating social positions and inequalities, Tanum 325, with an enlarged warrior in a commanding position in the aft of the ship and crew in kneeling position.

Artursson & Björk 2006). Bronze finds in Bohuslän from the LBA are considerably more numerous than those from earlier periods, whereas elsewhere in southern Sweden their number decreases (Larsson 1986; Kindgren 1999; Vogt 2006). This is in line with the incidence of rock art in Bohuslän: what seems to be a limited occurrence of panels from period I is followed by increasing action in periods II–III and then a sharp rise to the peak during periods IV–V.

Warriors, acrobats, adorants, and lure blowers

Most of the depicted warriors and combat scenes have been made close or adjacent to a contemporary ship depiction and in some way appear to be attached to the ship. This is actually the case with 98 percent of the warriors. This repetitive maritime pattern is too evident to be ignored, though many scholars have detached the warriors from this context (Bertilsson 1987; Nordbladh 1989). Instead, the warriors should be discussed against this maritime background and perhaps be broadly described as maritime warriors.

A case in point is a panel in Hede, Kville 124, displaying a ship on which two warriors are attached to a Hallstatt shield together with an acrobat (Fredsjö 1981: 95). Here as elsewhere, the ship seems to be the basic requisite, an infrastructure or arena for performances of social agency and position. The choice of weapons for these depictions is also interesting. Spears and axes are the most common attributes in these actions, followed by a few archers (e.g. Nordbladh 1989: 327). Swords are very rarely depicted in an active way in these scenes; they generally hang passively by the warrior (Nordbladh 1989: 328). There are, in fact, only two indistinct examples that may illustrate a sword in an active position (Kville 50, 51). This could indicate that the sword was not regarded as an effective weapon in these situations or performances.

However, the fact that a majority of the warriors with swords are depicted with this weapon hanging passively by their hip does point to the sword possessing a high social and ritual value. In this context it is relevant to consider an analysis by Kristiansen (1978, 1984) of BA swords in Denmark, showing that some had been used frequently, others less so.

Kristiansen sees this as an indication of two social groups: warriors who used their swords in combat and political leaders who used swords for symbolic reasons. How should this be applied to the rock art?

The lack of raised swords could indicate that all these human representations were either chiefs with passive symbolic swords at their hips or warriors who were not associated with a raised sword. I find the latter alternative more likely; otherwise there would be “too many chiefs and not enough Indians”.

While there are not many combat scenes on the ships, they frequently occur just outside the ships and are more or less restricted to the LBA. The general characteristics can be further distinguished as regards scenes of conflict and loyalty, respectively. Scenes of loyalty are more frequent than scenes of conflict but the latter are more striking, such as on the panels Tanum, 1, 12, 192 and 255, Kville 216 and Svenneby 270.

All depicted acrobats from the parishes of Kville, Svenneby and Bottna (3) and Tanum (6) seem to be attached or related to ships (fig. 10.21). Most of the jumps or volts are executed over ships. Adorants are mostly inside ships in Kville, Svenneby and Bottna (12 of 16 sites) but in Tanum more of them occur just outside ships (28 of 44 sites). The adorant pose has generally been interpreted as a worshipping pose towards supernatural features (Almgren 1927; Hygen & Bengtsson 1999). Ingrid Fuglestedt (1999) has a more innovative and pragmatic interpretation, inspired by the phenomenology of the body; she suggests that this pose reveals states or modes of victorious behaviour. Thus, uplifted hands and arms



Figure 10.23. Lure blowers in a ship from the panel Tanum 158 (after Milstreu & Prøhl 1999).

may be a trait that represents more of a cognitive condition to do with achievement, triumph and happiness than with religious adoration of divinity.

All the lures and lure blowers are depicted in or just beside the ships but their representation varies (fig. 10.23). In the parishes of Kville, Svenneby and Bottna there are about 35 ship representations from the EBA with lures and 33 from the LBA, while in Tanum the number is the same, 22, in these two periods. The difference is that all the lure blowers from the EBA are seated in the ships, while during the LBA some are depicted in a more individualistic manner just outside the ship, sometimes enlarged and horned; well-known examples are those from Kalleby and Fossum (Tanum 248, 255 and 405). In both the EBA and the LBA, however, the majority of lure blowers occur on ships. Although LBA ship representations are more numerous in these areas, lures seem to be a more common trait in the EBA. It is noteworthy that no lure blower has been related to the PRIA.

Spatial and social aspects of the ship

The highest frequency of large ships with many crew strokes from the EBA is to be found at Torsbo in the parish of Kville. This is hardly surprising in that this is one of the richest rock art areas in Bohuslän. No other area displays so many rock art ships. Moreover, the fact that the majority of these ship images are from the EBA indicates that the area was an early centre of rock art activity. Torsbo contains a high frequency of some specific ship types that also occur on other sites in the same parish as well as in the neighbouring parishes of Svenneby and Bottna. Thus, three ship types from the EBA appear in fre-



Figure 10.24. The Truehøjgård ship from Torsbo, Kville parish (after Glob 1969, cf. fig. 7.1, No 15).

quent numbers at Torsbo. One is the large “Rørby”-like ship and modifications of this theme. Another is a smaller and more slender type from the EBA (fig. 10.9). This ship type is also widely represented in all of the areas considered here but not in such frequent numbers as in Torsbo. Finally, there is the short “Truehøjgård” ship with a hull that is wide and large in relation to the prows and keel features (fig. 10.24). This ship type is remarkably similar to the ship from the grave context at Truehøjgård in Denmark, broadly dated to periods II–III (Kaul 1998, see fig. 7.1, No 15).

In view of all the ship images from the EBA, it is tempting to see the Torsbo area as an initial and innovative centre of social and ritual maritime representations. It is also interesting that the typical Torsbo ships occur in the other parishes but not as frequently. Does this indicate that people from a wider area came to Torsbo to make rock art and that this rock art area functioned as an arena for larger aggregations and meetings during the EBA? In that case, could the rock art be regarded as manifestations of smaller social units’ participation in such meetings? Were the meetings connected with various kinds of maritime venture, such as departures, arrivals and the building or launching of “real” ships?

The Torsbo area’s location, strategically close to shores for maritime passage during the EBA, may support this theory (fig. 10.26a-e). However, during the LBA it seems that what had been the most innovative centre of rock art ships gave way to other centres. One of these may be related to Gisslegårde in the adjacent parish of Bottna, as indicated by the very large numbers of a particular ship depiction from the LBA (Strömberg 1983; Kaul 1998, fig. 10.25). Features of the depiction include a spiral-shaped prow in the aft, the shape of its outline and a rather accentuated hull. Kaul stresses the strong resemblance between these ship depictions and the spiral shape on bronze items from period V. The same ship type as in Gisslegårde in Bottna occurs in scattered locations in adjacent areas (fig. 10.25). Moreover, there is a high frequency of elaborate ship types, presumably from period V, in Kalleby, Ryk and Bro in the southern parts of Tanum (e.g. Ch. 8). But while Bottna may have become a centre

for rock art, the predominance of specifically LBA ships in Tanum clearly indicates that it was this area which became the main new centre. This domination seems to have lasted some way into the PRIA (fig. 10.26).

This apparent geographical/chronological relocation of rock art making is intriguing. Could the pattern mean that different areas were used at different times for major social meetings, aggregations and rituals, such as Torsbo during the EBA, Tanum and Bottna during the LBA and Tanum during the PRIA? Or should the geographical and chronological relocation of rock art be related to societal changes in these areas? Was the Torsbo area in Kville the main centre of power during the EBA, only to be superseded by Bottna during LBA and then by Tanum during the PIRA? Or do these patterns simply represent a relocation of rock art’s production?

Could the geographical and chronological relocation of rock art be related to societal maritime changes in these areas? Changes in the maritime forces of production, and in relations of production, such as boat-building units, fishing units, transport, trading or military units and organisations, which in turn strengthened or weakened the production of rock art in these areas?

Conclusion

The aim of the study presented in this chapter has been to account for and discuss social and proportional aspects of the rock art ship. A material totalling more than 1600 ship depictions that include various kinds of human representations has been studied and the results have been compared and discussed in relation to archaeological boat finds from the BA–PRIA. Regardless of the area or the chronological period to which they belong, about 90 percent of these rock art ships have the same general proportions of the hull, prows and stems. Thus they are clearly governed by a strict dimensional code, for instance as regards the length of the hull measured between the stems. In general, the hull makes up 80 percent of the total length of the craft, while the prows and keel extensions fore and aft account for the remaining 20 percent. The ship images are generally 30–40 cm long overall, and the hull is 20–30 cm. The crew strokes are generally 3–5 cm high

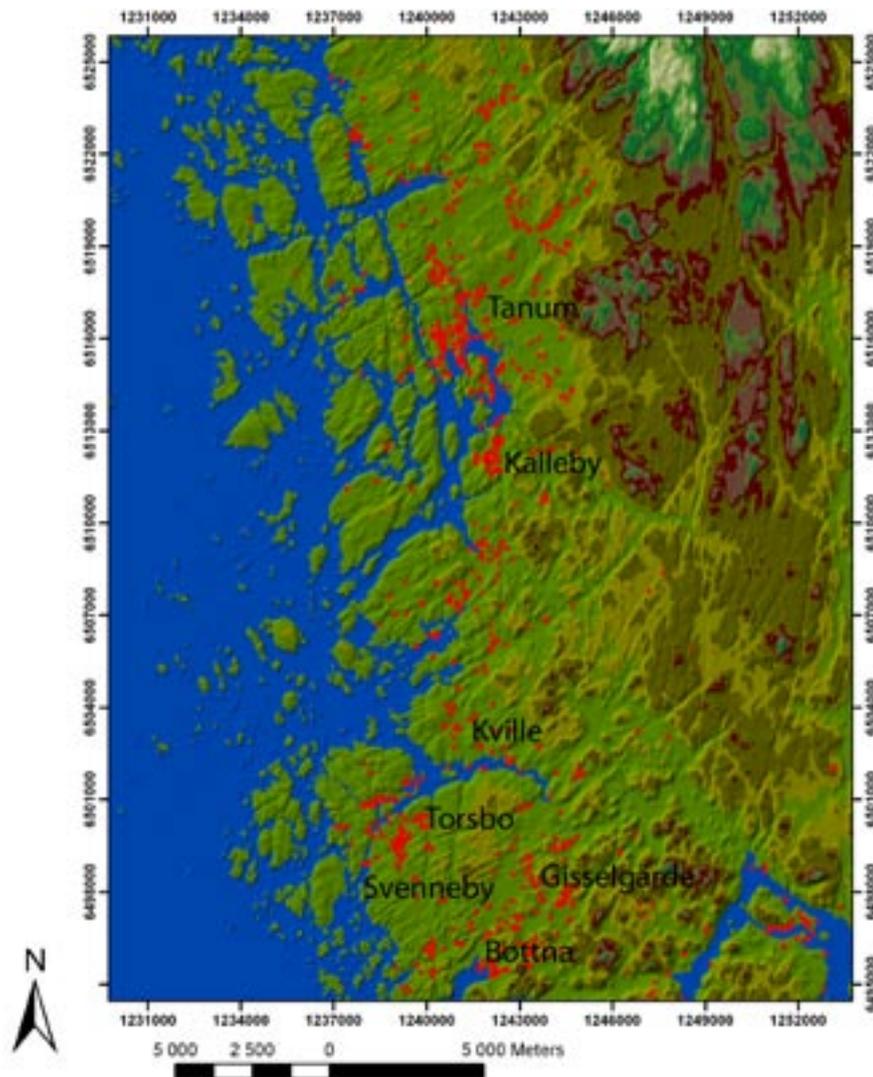


Figure 10.25. Reconstruction map of the study area with rock art from the Bronze Age (shoreline corresponding to an altitude of about 13–14 m.a.s.l.

but their height increases with the size of the ship. Moreover, ship depictions from the EBA tend to have more crew strokes than those from the LBA and the PRIA but LBA ship images are generally larger than those from the EBA and PRIA. These, then, are the most common features of the ship types with human depictions, crew strokes, from the EBA–PRIA. Furthermore, the proportions of the hull, stem and prows on the rock art ships correspond very well with those of the Hjörspring boat, which may indicate that the rock art ships could have been based on a similar plank-built tradition.

The fact that the ship depictions on the rocks have so much in common favours the hypothesis

of a continuous ship-building tradition in Bohuslän from the EBA to the PRIA. Moreover, the study shows that the average BA ship is depicted with a crew of 7–11. This may be indicative of a common mode or tradition behind the size and construction of local ships in the Tanum and Kville areas during the EBA–LBA. These craft may have represented prevailing norms and ideals among the local social units as regards the building and crewing of ships for everyday maritime missions: short and medium-distance transport, trading, deep-water fishing or communication. The large ship images in turn, with numerous crew or crew with clearly defined positions in the ships, elevated or enlarged individuals

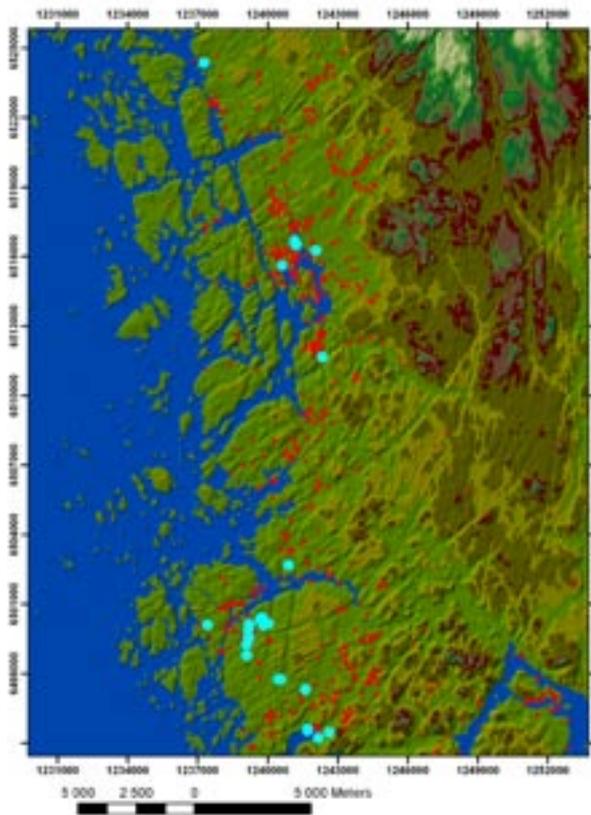


Figure 10.26. Rock art from period I.

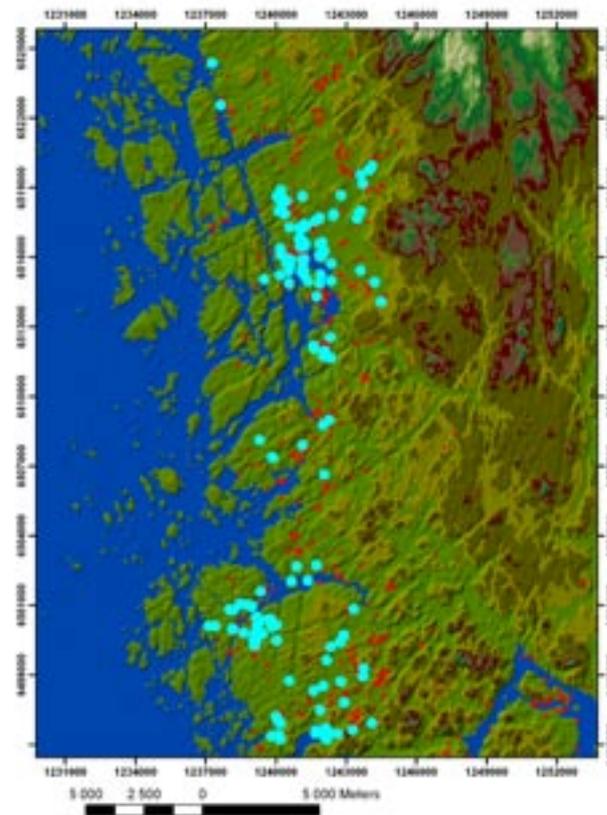


Figure 10.26. Rock art from period II-III.

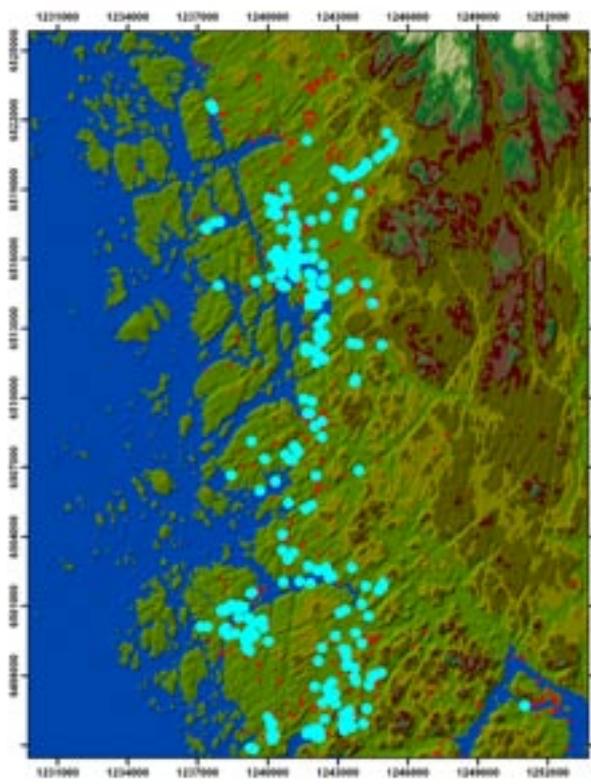


Figure 10.26. Rock art from period IV-V.

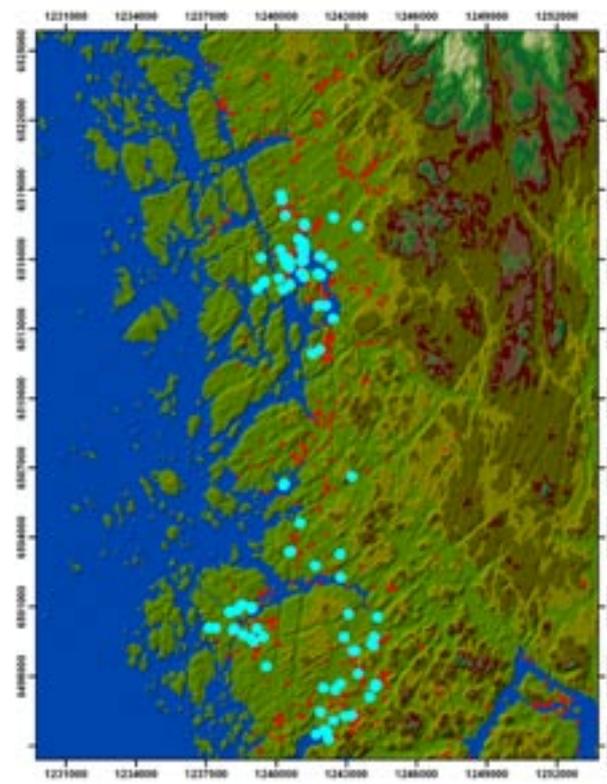


Figure 10.26. Rock art from period VI-PRIA.

with warrior attributes, may be regarded as military or ceremonial craft, such as war canoes, staged and used for special maritime events. Thus, comparisons between archaeological and ethnographic data indicate that the large BA ship images with many crew strokes could have been based on real boats. This seems to contradict the religiously oriented interpretations that see rock art ships primarily as fictional representations with no reference to any maritime reality.

The general difference between EBA and LBA illustrations of humans in the ships is that the former tend to be anonymous and collective, while LBA depictions are more socially stratified or staged representations of warriors and crew. These differences may be related to changing perceptions of society and the individual. There are several ship scenes from the LBA which may indicate that norms of social inequality were formulated and performed in the ships. The clearest examples depict enlarged warriors together with numerous smaller anonymous "collective" crew strokes. The articulated differentiations in the size, attributes, poses, gestures and utterances of the anthropomorphic representations in the ships may serve as a starting-point for a further discussion of rock art's manifestation of social differentiation.

On the whole, it seems to have been more important to depict social and ritual aspects than functional or technical characteristics. Still, there are a few fishing scenes that may be interpreted in more functional terms. There are also cases where social functions and positions such as steering and manoeuvring seem to be represented. During the EBA this is done with two single crew strokes in elevated positions fore and aft, possibly signifying the helmsman and the stemsman, respectively; during the LBA there are pronounced figurative differences, such as enlarged and horned warriors fore and aft. Depictions of humans holding paddles occur in

some of the ships but what is represented seems to be not so much the act of propelling as various kinds of social performance and position.

The hypothesis that the main theme of rock art representations was the social or ritual collective agency or motion may broadly be related to maritime group behaviour. For instance, many maritime actions, such as rowing, paddling and winching, require accurate timing, orchestrated by oral, bodily or rhythmic performances. Consequently, rock art ships with crew in kneeling, sitting or other poses, raising paddles or weapons or blowing lures, may be related to social and ritual concepts of group behaviour or group cohesion. In this context the ship is the centre and infrastructure of various social utterances on the rock art panels. As we have seen, the majority of the human scenes with warriors, adorants or acrobats appear to be attached or connected, directly or indirectly, to the ship. So it seems that these maritime codes, conceptions and symbols were organised, manifested and ordered in relation to the ship. This indicates that these societies were oriented towards the maritime realm, which may have both formed and influenced social relations.

Finally, it seems that the making of rock art and certain rock art ships was particularly intensive in certain areas during specific periods. This pattern could indicate that different areas were used at different times for major social meetings, aggregations and rituals, for instance Torsbo during the EBA, Tanum and Bottna during the LBA and Tanum during the PRIA. Or should the geographical and chronological relocation of rock art be related to societal maritime changes in these areas? Changes in the maritime means of production, fishing grounds or timber for boat-building, or demographic changes that affected units of production for purposes such as boat-building, fishing, transport, trading and warfare, which led in turn to more, or less, rock art activity in these areas.

11

ROCK ART AND SOCIETY

Introduction

Archaeological material from Bronze Age Bohuslän, such as graves, bronze items and rock art, indicates that the communities were of a hierarchic nature or socially stratified (fig. 11.1, 11.2). Some scholars have argued that the rock art may reflect a medium or resource of competitive persons or groups and that this medium was used to achieve more favourable positions in the social arena. It has also been suggested, explicitly or implicitly, that rock art as a medium served the elites, e.g. chiefs (Larsson 1997, 2002; Kristiansen 2002, 2004; Bengtsson 2004; Kristiansen & Larsson 2005; Vogt 2006). These assumptions have been questioned, especially regarding the use and role of rock art, for which other actions, situations, individuals and genders have been proposed (Sognnes 2001; Wahlgren 2002; Nordenborg Myhre 2004; Thedeén 2004; Coles 2005; Goldhahn 2005; Skoglund 2005). It is nonetheless relevant to consider some variants and nuances of chiefdom. For instance, Edmund Leach (1982) lists over fifty types of chiefdom, which points to this societal phenomenon being multifaceted. In “Pathways to power”, Brian Hayden (1995) elucidates this from an archaeological perspective that will be discussed further on.

So what is chiefdom? Are there other concepts which are more applicable to the societal situations and social formations in BA Bohuslän? What

were the material conditions at that time? Should the action and consumption of rock art be regarded primarily as an elitist concern or is it more likely that other social formations or groups could have exploited this medium?

Before considering these matters, it may be relevant to outline some of the current discussions about social formations that may have existed during the Scandinavian BA. Different perspectives on the concept of chiefdom will be considered to see what they have in common with respect to BA remains in Bohuslän.

The concept of chiefdom and the Bronze Age

The traditional view of BA forms of society has been that they were or resembled a chiefdom (Randsborg 1974, 1993; Welinder 1977; Jensen 1982; Larsson 1986, 1997, 2002; Kristiansen 1984, 1998; Vandkilde 1996; Earle 1997, 2002; Apel 2001; Lekberg 2002; Gröhn 2004: 99–114; Kristiansen & Larsson 2005). In a discussion between Brøndsted and Broholm, however, the former favoured a hierarchic chiefdom-like system but the latter argued for a more or less egalitarian social structure (Moberg 1956; Thedeén 2005; Artursson & Björk 2007: 336).

Scholars such as Kristian Kristiansen (1987, 1998), Helle Vandkilde (1996) and Timothy Earle (1997, 2002) have proposed that in southern Scandinavia a less complex chiefdom evolved from

approximately 1600 BC. The basis for this is the growing material and monumental affluence during the EBA, as reflected in the abundance of highly elaborate bronze items and grave monuments, house structures, rock art and wood technologies.

Moreover, a comparison of the archaeological conditions with ethnographic data on non-western societies has led to the hypothesis of less complex, decentralised chiefdoms in southern Scandinavia during the BA (Kristiansen 1998; Vandkilde 1996; Earle 1997, 2002; Kristiansen & Larsson 2005). A closer look at the concept of chiefdom is needed in order to clarify this discussion.

An important factor in this debate has been E. R. Service's traditional model of chiefdom, which includes a centralised direction and large-scale arrangements for storage. Chiefdoms are complex arrangements of hereditary hierarchic status, with no formal legal apparatus of forceful repression. The leadership has a theocratic, priestly structure and production is primarily agricultural. Moreover, Service favours a consensus perspective of chiefdom and rejects the notion of a repressive bureaucracy, which belongs to later state formations (Service 1962, 1978).

The Scandinavian discussion of BA chiefdoms has also been influenced by Morton Fried (1967), Jonathan Friedman and Mike Rowlands (1977) and Allen Johnson and Timothy Earle (1987, see Welinder 1977; Jensen 1982; Stjernquist 1983; Kristiansen 1991, 1998).

In contrast to Service, Fried and Friedman & Rowlands consider that in no way does the empirical BA evidence from southern Scandinavia support the idea of complex chiefdoms. Scholars such as Timothy Earle (1997, 2002) and Kristiansen (1991, 1998) have argued for the existence of less complex, unstable and less centralized forms of chiefdom at that time. Moreover, these chiefdoms may have been dependent on controlling wealth, such as bronze items, rather than agrarian production, as is

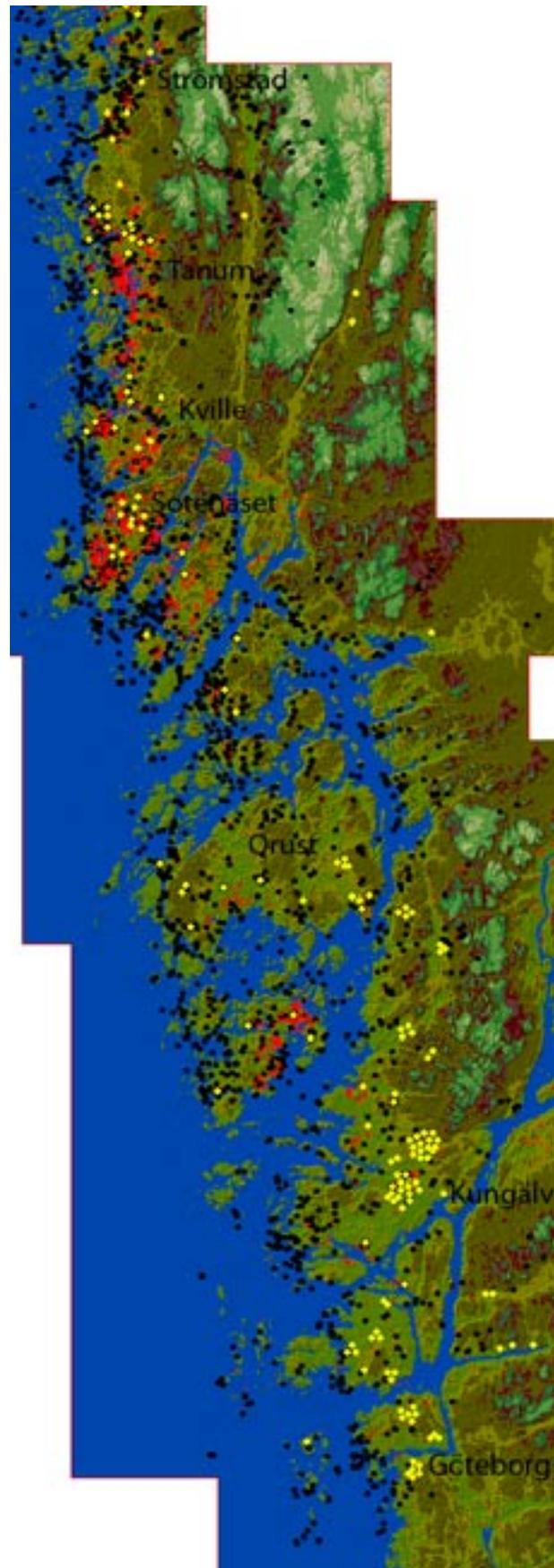


Figure 11.1. Right, the Bohuslän coastline in about 1200–1000 BC, reconstructed on the basis of shore displacement data for each area. The distribution of rock art (red dots), cairns (black dots) and bronze finds (yellow dots) is also illustrated.

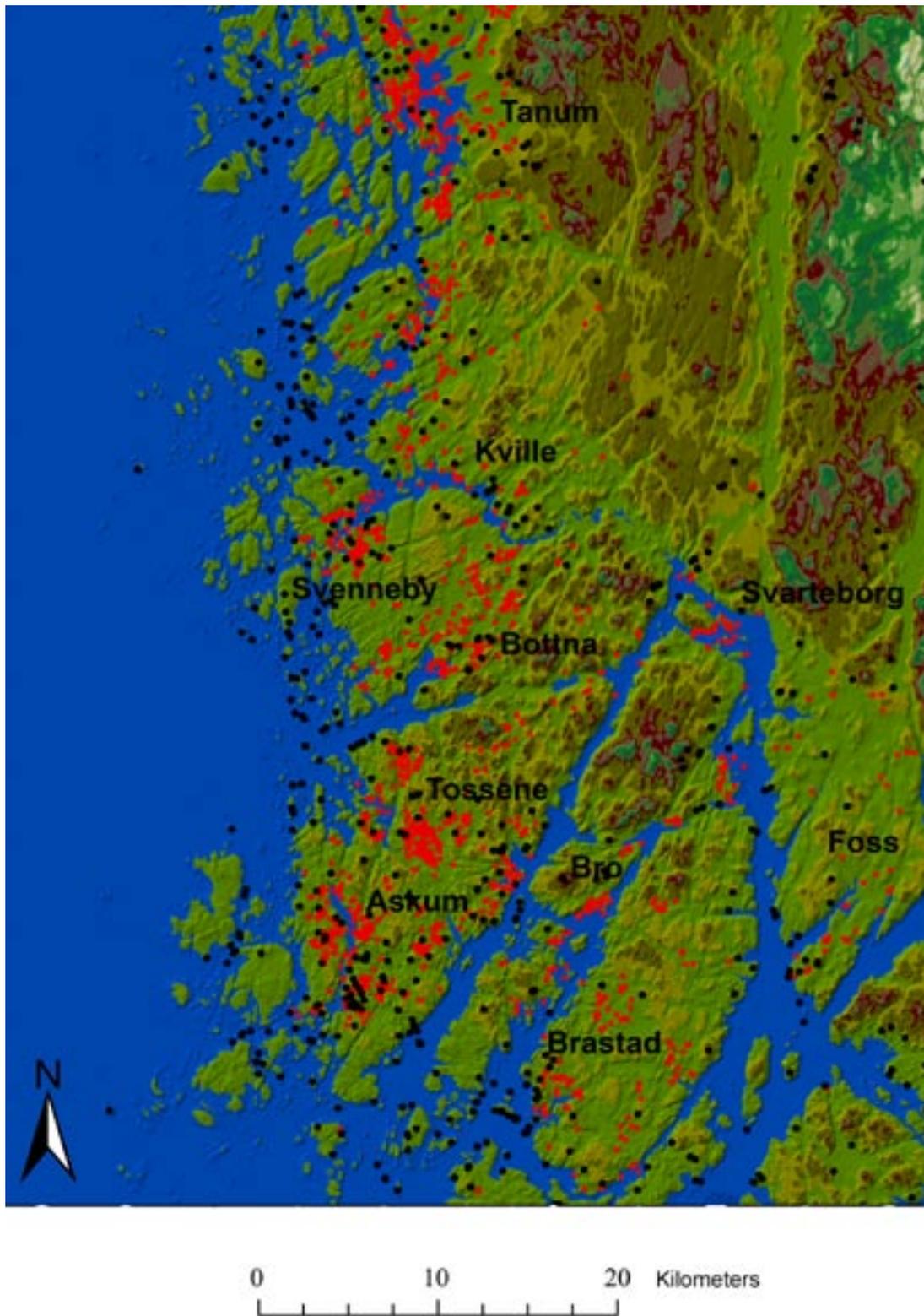


Figure 11.2. Map showing the geographical distance between the main rock art areas in Bohuslän during the Bronze Age. Black dots = cairns, red dots = rock art. Judging from the speed and maneuverability of the replica of the early Iron Age boat from Hjortspring, Denmark, the map suggests that it took less than half a day to travel by sea between the major rock art areas in Bohuslän.

the case in the traditional models of chiefdoms.

Using cross-cultural and cross-temporal case studies, Earle (1997) has, for instance, tried to identify chiefdom's general and specific foundations. He is particularly interested in the way chiefs came to power and argues that chiefs endeavoured to control not only all kinds of production but also the military and ideological apparatus. According to Earle (1997: 31), a less complex chiefdom was briefly established in period II–III at Thy in Denmark; this transformation or expansion was evident in both the archaeological and the archaeobotanic data, manifested by differences in the scale of grave investments and house structures. This chiefdom was accordingly founded on the control and export of wealth, such as bronzes and flint daggers.

Kristiansen (1998) in turn distinguishes between two modes of chiefdom in BA Europe: centralised/collective and decentralised/individualising. The former mode is partly based on Marx' notion of an "Asian mode of production" and the latter on Engel's "Germanic mode of production" (Kristiansen 1998: 23). According to Kristiansen (1998) it is the decentralised/individualising chiefdom that may have arisen on the Danish peninsula during the BA. This mode is based on control of the production of wealth, such as bronze items. Kristiansen summarises this as follows:

Leadership during the Bronze Age was ritualised. Chiefs acted as both war leaders and ritual leaders, chiefly women also had ritual or priestly functions. [...] The ritual chiefs had a following of high-ranking warriors, although the nature of this following cannot be specified. War parties seem to have been small, and no major territorial conquest is documented; no defence works existed. Chiefdoms, or rather clusters of chiefdoms, are reflected in localised style variations and in metalwork [...] These stylistic regions are approximately 500–1,000 km², 20–40 km across, normally with one or a few central places. [...] Within this region, local settlement units (individual chiefdoms) are defined by clusters of barrows typically only a few kilometres across. Paramount chiefs were in control of long-distance elite exchange in metals, prestige goods, and

related to exotic knowledge (Kristiansen 1991: 27).

The amount of bronze items and the investment in graves and ritual gear clearly change from the LN to the EBA Ib onwards (Vandkilde 1996). It has been suggested that these material changes reflect two major societal transformations: the introduction of a new religion and the introduction of inherited or institutionalized chiefdom (Kristiansen 1991, 1998; Kaul 2004; Kristiansen & Larsson 2005). These "new" social institutions evolved and were dependent on the control and monopolization of import and exchange of bronze items. Kristiansen (1987b: 33) summarizes the arguments for this as follows:

- *Specialization becomes more differentiated and eventually linked to new status positions.*
- *Exchange systems become more differentiated and more far-reaching.*
- *Warfare becomes more efficient and organized.*
- *New social positions are reflected in burials.*
- *Ritual and religious organization becomes more complex.*
- *Settlement structure is differentiated.*

The advocates of this viewpoint consider that there is no evidence of these social conditions during the LN (Larsson 1986; Randsborg 1993; Vandkilde 1996; Kristiansen 1987b, 1998; Kristiansen & Larsson 2005).

"Too many chiefs and not enough Indians"

These viewpoints have been challenged by several scholars, who have broadly proceeded in two directions. One trend, more or less shaped by Broholm, sees the affluent EBA barrows and bronze items in Denmark as an indication of an egalitarian agrarian society at that time and argues that the prosperity could not have been the preserve of an upper stratum because that would imply a situation which Broadbent later described as "too many chiefs and not enough Indians" (e.g. Broadbent 1983, also Broholm 1943; Lambert et al. 2004; Skoglund 2005; Thedén 2005).

The other main school favours the theory of chiefdoms during the EBA but argues that inherited or institutionalized chiefdoms may have emerged somewhat earlier, during the Late Neolithic (Apel 2001; Lekberg 2002; Varberg 2005; Artursson & Björk 2007). According to this school, the major difference between the LN and the EBA is more chronological and ritual than social and is reflected only in the amount of bronze items in burials and hoards. All other material evidence, such as burials, hoarding, housing, exchange production and consumption, rather suggests that these social institutions were introduced and established during the LN I–II.

For instance, the production, exchange and consumption of the highly advanced flint daggers, the marked inequalities in the size and type of graves, such as those equipped with typical warrior equipment, or the growing size of house structures, must all have required rather complex social institutions, not far removed from what has been proposed for the EBA (Apel 2001; Lekberg 2002; Varberg 2005; Artursson 2005, 2007). Control of the import, exchange and consumption of bronze items may have actually increased and rendered the existing social positions and institutions more complex and evident. Briefly, then, the latter school considers that new, complex social institutions were introduced during the transition between the LN I and the LN II, established and articulated during the LN II and accentuated and consolidated during the EBA Ib onwards.

Artursson and Björk (2007: 328) have recently proposed that the barrows in Scania may reflect a system with 15 different chiefdoms, each with a population of about 3000 and accordingly rather fragile constellations (e.g. Welinder 1977; Håkansson 1985; Larsson 1986). About 20 percent of the population would then have been buried in barrows or cairns. They also argue that the chief and the chiefly kin were buried in the largest barrows and cairns, while smaller barrows and cairns may have mostly represented followers such as warriors and their kin. Commoners and slaves would then have been buried in simpler grave forms (Artursson & Björk 2007: 330). This is an interesting conception but the burials of the “lower” social classes need to

be identified empirically and discussed more thoroughly to make the model satisfactory. Artursson and Björk (2007) have made an admirable description of the material and societal features that characterise the BA in south Scandinavia and the following account is mainly based on their presentation.

Ideas of social transformation during the Early Bronze Age

I will now discuss the above-mentioned arguments about social transformations during the EBA and LBA. The social transformations that occurred around 1600–1500 BC are often discussed as representing the introduction of a new religion and new social institutions (Kristiansen 1998; Vandkilde 1996; Kaul 2004; Kristiansen & Larsson 2005). The following features have been taken as indications of this new order:

- The increased number of bronze items, some made for ritual use, others for more practical or political purposes.
- Burial praxis and house architecture become more complex, stratification in graves becomes more evident and the cremation praxis is introduced (e.g. Randsborg 1974, 1993; Kristiansen 1998; Goldhahn 1999a; Kaul 2004).
- New house structures, the three-aisled house and stratification between households are evident (Earle 1997; Kristiansen 1998, 2006; Artursson 2005; Artursson & Björk 2007).
- New forms of cult buildings, rock art and elaborate woodwork and amber are also included in this general frame (Kristiansen 1987, 1998; Kaul 1998, 2004; Goldhahn 1999a; Victor 2002).
- Economic changes are evident in several regions from the extension of grazing land and deforestation (Tesch 1993; Earle 1997; Kristiansen 1998, 2006; Ekman 2004; Nordenborg Myhre 2004; Skoglund 2005; Artursson & Björk 2007).

Scholars such as Kristiansen (1998, 2006), Vandkilde (1996), Kaul (2004), and Kristiansen and Larsson (2005), argue that the new social order which evolved during the EBA may be characterized as a theocracy, involving the introduction of a new ide-

ology/religion with clear elitist features. Some of these elitist features and symbols were accordingly depicted in rock art, such as ships, lures, weapons, war chariots, sun horses and sun crosses (Kaul 2004: 341; Kristiansen & Larsson 2005: 342pp).

Thus, the new ideology/religion may have served the upper order or rather the “chiefly” ideology and supported the new stratified social order. It should be noted, however, that Kaul (2004: 241pp) differs from Kristiansen and Larsson (2005: 25pp) when it comes to the influences, form and content of the BA religion. The new aristocratic institutions would accordingly have been introduced rather quickly during the EBA, by a few dominant kin or families with strong connections to “metal-dependent” aristocratic networks, such as Unetice on the Continent or Wessex in the British Isles (Kristiansen 1998, 2006; Kaul 2004: 390; Kristiansen & Larsson 2005: 309). This development has been pictured in terms of the control and knowledge of raw material imports, casting processes and metal exchange.

In this context, Kristiansen and Larsson (2005: 30pp) have argued that the “new” BA order cannot be explained by traditional diffusionistic models alone; it should rather be understood in terms of the transmission of new “social institutions” that introduced, monopolized, transmitted, explained and executed the new power and knowledge:

First, we propose that institutions should be the focus of research, as they are the building blocks of society. The formation and transmission of institutions in time and space is seen to be a major area of research in interaction studies. Second, we have designed an interpretative methodology to identify institutions in material culture. Tracing central symbols and their context in time and space, delineating a symbolic field of meaning, does it. If it can be demonstrated that such a structural field of meaning corresponds to an institution, its history can be traced by tracing the symbolic package or structure, which defines it in time and space. It involves the employment of textual evidence when available, even if written down at a later period. Such a structural approach makes it possible to identify the symbolic transmission of institutions irrespective of cul-

tural affiliations and periodisations (Kristiansen & Larsson 2005: 30).

This approach led Kristiansen and Larsson to conclude that travel, interaction and transmission between local elites in the Near East, Mediterranean and Europe generated new forms of aristocratic alliances and networks. These interactions provided the aristocratic institutions with the material and the ideological instruments and knowledge to legitimate and promote their power. This innovative perspective seems to offer a productive way of approaching the complex and diverse traces of the BA in Scandinavia but it does pose some problems (e.g. Thedéen 2004; Skoglund 2005).

For instance, the focus on elite symbols and materials tends to downplay ordinary action, praxis and ordinary groups (Gröhn 2004; Thedéen 2004; Goldhahn 2005, 2007; Skoglund 2005). Peter Skoglund (2005) and Susanne Thedéen (2004) argue instead that the differences between the BA regions in Scandinavia are evidence of regional and local praxis rather than geographic power relationships. Skoglund (2005: 247) also points out that Kristiansen and Larsson do not consider the conflicts that may have occurred with the introduction of the BA institutions or that the regional differences in praxis may indicate conflict and disagreement.

Still, in “Cosmology, economy and long term exchange in the Bronze Age of Northern Europe”, Kristiansen (2006) does present some interesting new facts, models and ideas about the BA in northern Europe. His discussion of results from excavations and pollen studies in different parts of Scandinavia in relation to various models suggests that the economy and cosmology were the two dominant features of action in BA society. To be able to understand these mechanisms, Kristiansen uses “a long term perspective of the household in the BA, to see how changes at the micro level of life articulate with ecological and economic changes at a wider regional level” (Kristiansen 2006: 173).

Traditional explanations of the monumental and material regional differences during the EBA in Scandinavia have used broad models of centres and peripheries, the central areas being agricultural areas of accumulation, with concentrations of barrows,

bronze hoards and bronze items, and the peripheries “pastoral production areas” with fewer bronzes and barrows but more cairns and rock art (Larsson 1986; Bertilsson 1987; Kristiansen 1987a, 1998; Vogt 2006). In an interesting discussion of these authors’ results, Kristiansen looks at the regional differences in social, ritual and economic praxis during the BA and takes the ideas one step further, raising the following questions about the BA political economy in Scandinavia:

...did there exist a geographical division of labor that was politically controlled and secured so that central areas [...] received tribute in a system of unequal exchange due to their superior social and cosmological position? Or were the two ecological zones part of a single economic system where cattle and herders moved between the coastal and inland areas during summer time? [...] Did the farming economies control the maritime economy at the coast? Or should we rather see these different economies as representing independent polities (chiefdoms) that interacted with each other, but employed different ritual strategies (rock art versus metal depositions) as suggested by Skoglund? (Kristiansen 2006: 182).

These questions touch on some important issues that will be discussed later. First, however, I will give a brief account of ideas about the LBA.

Chiefdoms during the Late Bronze Age

The LBA has been characterized as an expansive period, due to population pressure as well as new settlement structures and praxis (Thrane 1975; Kristiansen 1978; Jensen 1982; Tesch 1993). Several scholars have suggested that these changes reflect an ecological crisis that affected the agricultural economy (Kristiansen 1978; Burenhult 1983; Jensen 1982). Today, however, researchers downplay these general assumptions and argue that settlement praxis was more extensive during the LBA and therefore less restricted by the landscape than EBA settlement (Gröhn 2004: 114; Artursson & Björk 2007: 340). There is a general consensus, based on both archaeological and archaeobotanic material, that

settlement patterns seem to expand during the LBA (Tesch 1993; Borna Ahlqvist 2002; Ullén 2003; Andersson & Ragnestern 2005; Streiffert 2005; Vogt 2006; Artursson & Björk 2007: 340).

Even if the general settlement pattern seems to expand, house structures become smaller, decreasing from about 10–50 m during the EBA to about 10–30 m during the LBA (Artursson 2005, 2007). Grave patterns become more complex, with several new grave and burial categories and phenomena, such as cult houses (Victor 2002; Svanberg 2005; Goldhahn 2007). Bronze items become less frequent than in the EBA in most regions in Sweden but in some regions, such as Bohuslän, Västergötland and Mälardalen, their number increases during the LBA (Larsson 1986: 53; Kindgren 1999).

Kristiansen (2006: 19) argues that in most regions in southern Scandinavia the “chiefly” aristocratic becomes even more pronounced and consolidated during the LBA, as manifested by new networks for the supply of bronze items. During the transition from the EBA to the LBA, when Scandinavia experienced a crisis in the supply of bronze items, the EBA networks, such as Unetece, Tumulus and Wessex, were replaced by new networks and systems of trade with the Urnefelder and Hallstatt regions (Kristiansen 1991, 1998, 2006). In keeping with Kristiansen, the traditional line has been that the inherited and institutional form of chiefdom arose during the EBA period II (Brøndsted 1964; Vandlkilde 1996; Kristiansen 1998), though some favour an earlier introduction (Lekberg 2002; Varberg 2005; Artursson 2007). There are, however, other perspectives that see a more or less egalitarian system in the EBA, at least in Denmark and Skåne, rather than a strictly stratified social system (Broholm 1943; Lambert et al. 2004). Lambert et al. (2004) also consider that in southern Scandinavia the more elaborate burials, as well as a regional accumulation of wealth and cleared central places, suggest that a truly stratified chiefdom may have arisen during the LBA.

This theory is of interest in relation to Bohuslän rock art. The EBA ship images, for example, tend to have anonymous crew and no clear social positions are depicted. This changed during periods III–IV and from the LBA period V there are numerous scenes

where social inequality seems to be expressed by warriors on or beside the ship images.

To summarize, there is, in my opinion, an urgent need to develop models that can accommodate the evident regional variations in the empirical records. Recent studies have, indeed, drawn attention to the regional differences in southern Scandinavia during the BA (Skoglund 2005; Thedéen 2005; Kristiansen 2006; Artursson & Björk 2007; Bergerbrant 2007, but cf. also Welinder 1977; Håkansson 1985; Larsson 1986). For this period, a general model of less complex chieftdom is both too superficial and inappropriate for many areas in southern Scandinavia.

I have now briefly outlined some of the current ideas about the EBA and the LBA and will recapitulate the questions regarding stratified societies that were spelled out at the beginning of this chapter: What is chieftdom? Are there other concepts which are more applicable to the societal situations and social formations in BA Bohuslän? What were the material conditions at that time? Should the action and consumption of rock art be regarded primarily as an elitist concern or is it more likely that other social formations or groups could have exploited this medium?

Brian Hayden has elaborated some concepts and ideas about social formations and social agents that may be interesting to consider in this context, not least regarding the BA in Bohuslän. The following discussion will therefore deal with these issues.

Rock images of chiefs, aggrandizers, commoners or girots?

Hayden saw the limitations in projecting general evolutionary anthropological schemes upon pre-historic societies and he detected nuances in North American archaeological material that did not seem to fit these models. He therefore conducted a new, archaeological analysis of ethnographic accounts of transegalitarian societies and focused on specific social and economic causes of social and individual action and power, rather than on general ideological or economic speculations of a structural nature.

Some of Hayden's concepts and notions have been applied by Jan Apel to the production, exchange and consumption of flint daggers in Scandi-

navia during the LN. Apel (2001) stresses that flint daggers may have been produced in an apprenticeship system where knowledge was transmitted by exclusive initiation rites geared by "aggrandizers", who also controlled the local and long-distance production and consumption of daggers. Hayden's concepts of "aggrandizer" and "entrepreneur society" (e.g. Big Man society, Hayden 1995: 18) help to qualify the concepts of chief and chieftdom (Hayden 1995: 18). In entrepreneur societies, the societal level that precedes chieftdom, a heredity of skill, knowledge and power exists among the elite fractions (Hayden 1995: 52). This is close to chieftdom but whereas heredity is an institutionalised feature in chieftdom, it is less so in entrepreneur societies (Hayden 1995: 63).



Figure 11.3. Aggrandizer? Warrior with beaked nose from the panel Tossene 58:4 (documentation by VM).

Entrepreneur	Chiefdom
Competitive feast involving the entire community	elites only
Pubertal rites involving youths of the community	elites only
Initiation rites (into esoteric societies or into knowledge and skills)	elites only
Marital rites involving the entire community	elites only
Ancestral rites involving the entire community	elites only

Figure 11.4. A simplification of Hayden's (1995) accounts of the general differences between entrepreneur and chiefdom societies.

Thus, while some entrepreneur societies display very complex stratified and societal forms, not far from those traditionally assigned to chiefdoms, they are not as stable and predictable as chiefdoms but more fragile and open to competition (Hayden 1995: 53, 58). The general mechanism behind the social inequality in this two societal forms is considered to be manipulative strategies and actions performed by the “aggrandizer” (fig. 11.3), an archetypical figure with an aggressive and acquisitive character who is engaged in surplus production of self-interest in order to attain more influence and power in society (Hayden 1995: 18).

Aggrandizers were also engaged in the acquisition of knowledge and information about craft specialisation. Moreover, investments in ancestor cult were devised and executed by aggrandizers and manifested by elaborate grave monuments or cult houses as tokens of the descendents' power. This trait became even more pronounced in chiefdom societies, where the aggrandizer or chief claims a “divine” right and position in society with reference to ancestors, animals and distant others (Hayden 1995: 63, cf. Larsson 2002).

Investments in communal pubertal and marital initiation rites, in the form of bride-wealth and child-growth payments, were also promoted by entrepreneur aggrandizers. In chiefdom societies, however, these matters were restricted to elites such as chiefly families and their kin (Hayden 1995; Earle 1997). Large community-based competitive feasts, such as “potlatch”, are also seen as a typical trait of entrepreneur societies as a means of attracting supporters and uniting and organising society. In chiefdoms,

the competitive feast is removed from the communal arena and restricted to elites. According to Hayden (1995: 15), however, competitive feasting may also have included lower-level elites in chiefdoms, which is interesting in the light of rock art and will therefore be considered later.

Finally, small raids, the exploitation of slaves and territorial conquest are primarily a feature of chiefdom, though Hayden (1995: 52) notes that elites among coastal corporate fishing groups (Kwakiutl and Haida) on the northwest coast of North America had slaves and conducted recurrent raids for more slaves to maintain and increase production, profit and prestige. While this trait tends to be typical of chiefdoms, it is noteworthy that the corporate coastal groups were using the typical entrepreneur forms of strategies to generate surpluses, such as marriage-wealth exchanges and competitive or reciprocal feasting.

Let us now take the major traits of these two societal systems, entrepreneur and chiefdom, and discuss which of them could have prevailed in Bohuslän during the BA (fig. 11.4). As mentioned earlier, the rock art and burials both indicate that BA societies in Bohuslän were stratified but not to what degree or form. However, the archaeological material definitely does not indicate that either an inherited institutionalised chiefdom or the “entrepreneur” form of society prevailed at that time in northern Bohuslän. Considerably more archaeological data from graves and settlements would be needed to support either of these forms. Still, in my opinion, elites, aggrandizers and complex stratified societies did exist but these formations were fragile and var-

ied, not formally or officially based or structured on a system with a hereditary principle. Neither does this seem to have been the case during the Viking epoch (Lönnroth 1963; Varienius 1998).

In any event, the burials suggest that society was stratified and the pertinent question here is not which specific form existed but rather whether the rock art medium was utilised primarily by society's elite fractions. It has been argued that the rock art seems to display norms of social inequality and this has traditionally been taken to indicate that the rock art was a symbolic tool of the elites (Kristiansen 1998; Fredell 2003; Bengtsson 2004; Kristiansen & Larsson 2005). On the other hand, there is much which contradicts this view. If we take the notions of elites, aggrandizers and chiefs as accounted for above and try to integrate rock art in an elitist structure, one would expect the rock art to have been a strictly controlled, private, closed, spatially limited, socio-material phenomenon. The opposite seems to have been the case.

Most of Bohuslän's rock art has an open, communicative, coastal location. Moreover, the general, innovative and mobile conduct of the rock art does not agree with the normative ideologies connected with BA elites (cf. Kristiansen & Larsson 2005). In this respect the rock art panels do not seem to provide the spatial, expressive or social conduct or criteria of control or privacy that chiefly agency demands. They seem to reflect public rather than private affairs. There are other monuments or items, such as cairns, stone settings, barrows and bronze items, that seem to come closer to "chiefly" demands of closeness, control, and privacy, so perhaps it would be appropriate to relate them to chiefdom agencies. It is notable that Timothy Earle (pers. comm. 2005), one of the most quoted authorities in discussions of chiefdom, clearly disregards rock art as a chiefly medium, preferring to associate it with lower social formations. Bearing this in mind, it is tempting to relate rock art to more communal affairs, such as competitive feasting and marital, pubertal and initiation rites. Such a hypothesis is supported by both spatial and expressive social traits of the rock art, such as the panels' openness and general innovative and mobile conduct. I have already presented

a broader argument for this and used the concept maritime "aggregation" to picture the interactions behind the production and consumption of rock art in these areas (Ling 2004a, 2005, 2006).

There are, however, other rules of conduct that favour a more confined agency regarding the production and consumption of rock art, such as the general maritime location and content and the dominant masculine representations, with warrior attributes related or connected to the ship images (see Ch. 10). About 90–95 percent of the human images demonstrate masculine traits (cf. Nordbladh 1989: 325pp; Yates 1993; Bengtsson 1999: 311).

In the light of this, Tim Yates (1993) suggests that the rock art may demonstrate male pubertal rites: the stylistic awareness of the male body and typical male warrior equipment point to the production of the rock art being closely connected with agencies and interactions regarding masculine matters. These observations are interesting but Yates does not integrate other crucial facts regarding location, structure and content.

On the basis of measurements of some specific images in Askum, Bengtsson (2004: 101) argues that rock art was made by specific privileged persons with knowledge of certain ritual codes and costumes, such as druids or the runic carvers in the Viking era. Coles (2005) favours a similar idea and that "girots", old and experienced wise men/women, could have made rock art. According to Wahlgren (2002) and Thedéen (2004), the images may be related to family or kin and have to do with initiation rites, while Goldhahn link some of the rock art to ritual specialists, e.g. the "smith" (Goldhahn 2007).

Thus, the rock art also has traits that may reveal the agency of a special task-oriented group. In terms of Bohuslän rock art's location, structure and content, the following characteristics are most prominent:

- Dominance of panels with a coastal or maritime location.
- Dominance of ships.
- Dominance of performances in or connected to the ships.
- Dominance of figures with male equipment.

Frode Kvalø (2000) has argued, for instance, that rock art may be a medium which displays how BA chiefs built, crewed and launched ships for sea ventures. Kvalø also considers that during the BA the ship was a social institution and social formations were shaped after its premises. Thus leaders exercising control of prestige goods were dependent on this social and technological institution for achieving long-distance exchange. In this way the ship became a concrete icon of power (Kvalø 2004).

This does not mean, as suggested by Kristiansen (2002, 2004), that rock art was made by the chiefs. Once again, the open maritime location and numerous sites of rock art favour the notion that this medium was not restricted to the elite fractions of society. However, the retinues of these maritime ventures may have been linked to kin of a local aggrandizer and in this respect the structure may be appropriate for “chieftdom” or chieftdom-like initiation rites.

A tempting assumption in this context is that rock art may have been produced in accordance with maritime “pubertal” or “initiation” rites (into esoteric societies or into knowledge and skills), that is, rites for maritime tasks such as sea ventures, involving maritime skills combined with marshal arts. In that case, ship images with crew that are kneeling, sitting or performing actions or poses such as raising paddles or weapons or blowing lures, may represent social relationships, staged in special social forms (fig. 10.19, 10.22).

Could rock art reflect one of the resources that maritime groups or individuals may have used to reproduce ideals about their actions and positions in society? A maritime medium that was only partly open to alteration and control in relation to the social order and to certain strategies because it was constantly subject to the counter-strategies and manipulations of upcoming individuals?

Material and ecological conditions of Bohuslän Bronze Age social formations

I have broadly argued that rock art should not automatically be connected to the elite fractions of society. I have also mentioned the hypothesis that rock art may reflect more communal maritime social and ritual affairs, such as aggregation or initiation rites. My aim now is to develop these ideas in rela-

tion to earlier notions concerning social, ritual and economic praxis in Bohuslän during the BA (Almgren 1927; Nordbladh 1980; Larsson 1986; Bertilsson 1987; Hygen & Bengtsson 1999, Kristiansen 1998, 2004, 2006; Fredell 2003; Bengtsson 2004; Coles 2005; Kristiansen & Larsson 2005; Ling 2005, 2006; Skoglund 2005; Vogt 2006). I will also present some new conditions and theories about the making of rock art in Bohuslän at that time.

First, however, some archaeological conditions need to be considered. Some of the material and ecological conditions for discussing social formations in Bohuslän are presented in chapter 2 and the following is a summary of the key issues:

- A majority of the rock art localities in Bohuslän are close to the contemporary shore and it is ship images that dominate the panels from the BA but also from the PRIA.
- Investigations of burials, cairns, barrows, gallery graves and stone settings in the Bohuslän region support the idea that the BA societies there were socially stratified. Only a few of the burials contain prestige goods such as bronzes, gold or elaborate constructions of stone (Hallström 1917; Andersson 1982; Gerdin 1999; Claesson & Munkenberg 2004b; Andersson 2005; Munkenberg & Gerdin 2005).
- From a low average consumption of bronze items during the EBA (51), Bohuslän advanced to become one of the major regions of bronze consumption in Sweden during the LBA (163) (cf. Larsson 1986; Kindgren 1999; Vogt 2006). In this context it is interesting that the production of rock art in Bohuslän peaked during the LBA. Moreover, a considerable number of flint daggers (c. 450) and sickles dated to the LN–EBA have been found in this region, imported from Jutland in Denmark (Apel 2001).
- Not many concrete BA settlement structures from northern Bohuslän have been investigated and those that have suggest comparatively small household structures rather than larger hamlets. The location of settlements and settlement finds indicates that individual households were scattered across the landscape, with a concentration to the coastal zone (Bertilsson 1987; Lindman

& Ortman 1997; Streiffert 2004). Furthermore, the rock art seems to have been situated away from the settlement areas, generally at a distance of 500–1000 m (Bertilsson 1987; Ling 2004a, 2005, 2006).

- Archaeobotanical remains from the settlement sites reveal the use of cereals such as barley, corn, naked corn and emmer, mainly dated 1500–500 BC (Gerdin 1999; Streiffert 2004; Bengtsson et al. 2005; Munkenberg & Gerdin 2005). The BA economy in Bohuslän has been seen up to now as mainly pastoral or agrarian. However, the overall osteological record presents a more complex pattern. In terms of the overall faunal record in northern Bohuslän, fish bones dated to the BA outnumber bones from domestic or wild mammals (e.g. Nordqvist 2005; Jonsson 2005, pers. comm. 2006).

Praxis, production and ideology

Earlier attempts to describe BA social patterns in southern Scandinavia have been discussed earlier in this thesis and the following summary is intended to indicate the picture as regards Bohuslän.

Almgren (1927) saw rock art in Bohuslän as an expression of an agrarian society's cultic action in the landscape. Malmer (1981) suggested that it was a substitute for the bronze items that were more common in southern Scandinavia, where rock art in turn was less frequent. Thomas B Larsson (1986) argued that rock art regions, such as Bohuslän, which have fewer bronze items and barrows, may have constituted "pastoral production areas" in relation to the rich agricultural accumulation areas with bronze items and barrows in southern Scandinavia. Skoglund (2005) recently saw these differences as having more to do with "cultures" and "praxis". Bertilsson (1987) and Vogt (2005) argue that rock art may have reflected competition for the "new", low-lying pasture land that resulted from land uplift.

Kristiansen (1991, 1999), Kristiansen and Larsson (2005) and Kaul (1998, 2004) have proposed that the rock art areas in Bohuslän may have functioned as ritual centres or arenas. Kaul (2004: 98pp) claims that the bronze items depicted on the rocks, such as lures and weapons, may show that people

from bronze-rich areas visited Bohuslän with their bronzes and then, after ceremonies or social events, took them back to the accumulation areas further south. As mentioned earlier, Kristiansen (2006) has proposed that "maritime" areas with rock art may have been either controlled or independent communities in relation to the "agricultural accumulation areas" in southern Scandinavia.

While I find most of these suggestions attractive, what bothers me is that since Oscar Almgren there has been a tendency to picture the groups in Bohuslän as passive. Either as passive sedentary agriculturalists that performed seasonal cults by the rocks, as passive cattle-breeders that provided the "agricultural accumulation areas" with meat and hide, as passive imitators of visitors with bronze items or as a passive transit zone for traveling chiefs.

In the following I will point to BA groups in Bohuslän that seem to have been highly active and mobile, at least to judge from the number of flint daggers and sickles, bronze items and, perhaps even more importantly, the high frequency of maritime images on rocks adjacent to the shoreline.

In keeping with Skoglund's and Kristiansen's notion of regional differences in socio-economic and socio-ritual praxis, I propose that production and general social praxis in Bohuslän were oriented slightly more towards a maritime realm, not mainly to arable land and cattle-breeding, as is the case in parts of Jutland, Scania and even southern Halland.

My argument for this maritime scenario involves developing a hypothesis in two steps. The first focuses mainly on the general economic and social conditions, aspects of the forces or relations of production, for this maritime praxis in the rock art areas. The second step is more oriented towards the rock art and deals with its social, ideological and ritual aspects in relation to maritime praxis. This maritime praxis may have included various labours, such as fishing, transport, trade, communications and maybe boat-building, but also maritime social or ritual forms of meeting, ceremony, warfare and interaction.

It must be stressed that the following discussion is highly tentative and speculative, though based as far as possible on the archeological, ecological and environmental evidence and discussions and less on

historical and ethnographic analogies. I have singled out five major spheres of action or labour and will discuss each of them in turn:

1. Fishing.
2. Maritime barter, trade and communication.
3. Maritime warfare.
4. Maritime rituals and ceremonies.
5. Boat-building.

1. Fishing

There is little evidence of fishing activity from BA Bohuslän but there are some interesting indications. The evidence that does exist is of different kinds, such as osteology, artefacts and rock art. The osteological remains of fish from those days are actually more abundant than finds from domestic animals (Jonsson pers. comm. 2006). For instance, at Huseby Klev, on the island of Orust, a culture layer from the BA was found to contain ceramics and a bronze hook for fishing (Nordqvist 2005: 48–53); the size of the hook indicates that it was meant for catching large fish in rather deep water (e.g. Berntsson 2005: 75). The same layer also included numerous bones that came predominantly from fish. The fish bones in turn mostly consisted of large fragments of pollack but also some bone fragments from cod, herring and mackerel. The bones from terrestrial domestic mammals included cattle, sheep, and pig (Jonsson 2005: 103). Radiocarbon dating of the layer, based on the remains of ceramics, indicated a date to period V (830–600 BC; 2660 ± 55 BP, Nordqvist 2005: 53).

This site is very important for a general understanding of the BA economy in Bohuslän. It bears witness to deep-water fishing for resident species. Furthermore, a couple of LBA rock art sites display scenes that are suggestive of deep-water fishing after large species. The well-known fishing scene from Kville, for instance, strongly resembles the way in which large species such as pollack, cod and mackerel were fished in historical times. Olof Hasslöf (1949: 30) and Åke Fredsjö (1956: 115) argue that this particular fishing scene may illustrate a fishing tradition that persisted in Bohuslän from the BA up to the 1950s: two men in a small boat would venture out to deep water, anchor there and angle

for pollack, cod, and mackerel (fig. 10.13).

Berntsson (2005) has studied maritime aspects of the BA in Denmark and Scania and notes that finds of large bone fragments from cod indicate that fishing was a targeted activity there, conducted in permanent deep-water areas. Other rock art sites depict net figures connected to ship images, which suggests that fishing with a net could have been practiced here during the BA. As to the artefacts, finds of small stone artefacts adjacent to rock art sites in Bohuslän (Bengtsson et al. 2005) are seen by some scholars as an indication that they were used as weights for fishing nets (Indreko 1956: 17). This material evidence indicates that during the BA, fishing was not just a supplement to agriculture or cattle-breeding in Bohuslän but a targeted activity conducted on more or less permanent fishing grounds.

Another fact to consider is that some of the major rock art areas in Scandinavia are located where fishing, at least in historical times, has been one of the major forms of production. This is true, for instance, of coastal fishing in Bohuslän and Østfold (Hasslöf 1949), Simrishamn in Scania (Althin 1945), Torshamn in Blekinge, around the island of Bornholm (Kaul 2006), and in the rock art areas of western Norway (Mandt 1991), Stavanger (Nordenborg Myhre 2004), Trøndelag (Sognnes 2001) and Alta in Norway (Helskog 1999). River fishing for salmon has also been important, for instance in Motala ström in Östergötland (Nilsson 2005) and Nämforsen in the far north of Sweden (Hallström 1960; Goldhahn 2002).

In the southern tradition of rock art, however, there are very few fishing scenes, perhaps because people preferred to depict highly valued social and ritual actions and situations rather than the act of production. It can be noted that the maritime rock art in Bohuslän that derive from historical times were made by sailors or fishermen waiting for the weather or the fishing to improve (Lundin 1999: 44). These rock art do not depict scenes, images or situations connected with production, such as trading or fishing; instead they display large representations of contemporary compass roses, “aristocratic” shields and emblems, initials and years, and sometimes ships. In other words, highly valued objects,

norms, identities and symbols rather than social or economic relations of production (Lundin 1999). It may also be relevant that among fishermen in Scandinavia there have been taboos and prohibitions on uttering or picturing the word fish in connection with the act of fishing or the fishing season (Hultkrantz 1993; Westerdahl 2005). Could the absence of fish on rock art panels be connected with such perceptions?

To return to the topic of BA fishing in Bohuslän, it is clear that this activity may have been an important economic resource. Furthermore, in historical times fishing has been a major reason for some of the great sea ventures and conflicts, just as some societies have been directly dependent and founded on marine products (Kurlansky 2001). It is therefore interesting to consider the herring cycles that have been a feature of life on Sweden's west coast in historical times (Hasslöf 1949; Nilsson 1991; Pettersson 2001). Early historical accounts indicate that herring cycles occurred in Bohuslän from the 11th century onwards (Hasslöf 1949: 118pp).

However, the best documented great herring periods are from the 17th and 19th centuries (Hasslöf 1949: 169; Pettersson 2001: 56). They quickly made the coast of Bohuslän attractive and people came from as far away as eastern Bohuslän, Jutland, Norway, Halland and Scania to interact and participate in this form of surplus production, generating new complex social and economic constellations (Hasslöf 1949: 163, 172; Pettersson 2001: 56).

The herring led to an economic upswing and stability but in the longer run the fluctuations in supply rendered this income both fragile and unpredictable. The social formations based on herring collapsed with the fishing (Hasslöf 1949: 172; Pettersson 2001: 101). Those who could rely on their permanent occupations, such as farming and permanent fishing grounds, were in a more stable position (Hasslöf 1949: 172).

Let us suppose that during the BA, marine products such as herring and pollack temporarily became abundant off the coast of Bohuslän. Such a marine surplus might then have shaped and altered social formations, besides making them more complex but at the same time more open to social change, competition and conflict. This situation could have

broadly resembled what happened during the historical herring periods in Bohuslän. Or what has been described concerning the Haida and Kwakiutl Indians of the northwest coast of North America who relied on salmon fishing (Hayden 1995: 37). Their social formations, described as entrepreneur, were directly dependent on this kind of surplus production and varied in power, complexity and structure more or less with the amount of fish they caught (Hayden 1995: 37). It was the fish surplus that lay behind their community-based competitive feasting or "potlatch" (Hayden 1995: 52).

So does the increase in the number of rock art panels and bronze items in Bohuslän during the LBA indicate a glut of fish at that time? This is a tempting scenario and one that might have attracted people from further afield and thereby generated new social constellations, benefits, constraints and conflicts – people from eastern Bohuslän but also groups from more distant places such as Jutland and western Norway. Moreover, the numerous unexcavated prehistoric dwelling sites located on BA shores in the rock art areas could indicate a seasonal praxis there (fig. 11.1, 11.2). These sites have been dated in general to the Stone Age on account of the finds of flint. However, contract archaeology in Halland has demonstrated that many of the reputed "Stone Age sites" are actually from the BA (Knarrström 2001: 87pp; Andersson 2005: 127pp). Perhaps the same applies to the settlement areas adjacent to rock art in northern Bohuslän.

Still, the empirical evidence of BA fishing in Bohuslän is sparse. However, the available archaeological remains of fishing and the fishing scenes on the rock art do suggest that the local inhabitants gained a regular livelihood from fishing, not just from farming and cattle-breeding.

2. Maritime trade, barter, communication

The archaeological record for BA Bohuslän includes several categories of imported objects. The rock art rich areas in northern Bohuslän actually have one of West Sweden's highest concentrations of flint daggers and flint sickles dated from the LN–EBA. Most of the flint daggers had been imported from a couple of production areas in Jutland and there are many indications that the sickles also came from this area

(Apel 2001). Besides numerous flint daggers and sickles, the Tanum area has the highest concentration of bronze items dated from the LN II–EBA II (Herner 1999; Vogt 2006, e.g. Vandkilde 1996). During the LBA, Bohuslän became one of Sweden's major regions of bronze consumption and it has been argued that most of the bronze items were imported from Denmark (Kristiansen 1999).

A relevant observation in this context concerns the general maritime location of cairns and rock art in Bohuslän and the fact that the distance by sea between the major rock art areas in central Bohuslän, such as Kville–Tanum, Sotenäset–Bro and Tjörn, seems to have represented a voyage of about half a day, based on the speed and capacity of the replica of the Early Iron Age boat found at Hjortspring in Denmark (Crumlin-Pedersen 2003b, see fig. 11.1, 11.2). Several scholars have seen Bohuslän as a communicative transit area for the north-south sea routes during the BA (Marstrander 1979; Burenhult 1981; Kaul 1998; Kristiansen 2002, 2004; Kvalø 2000, 2004; Crumlin-Pedersen 2003b; Østmo 2005). The archaeological material likewise suggests that traffic between Bohuslän and Jutland must have been intense. Johan Pettersson points out, for instance, that the shortest sea passage from Bohuslän to Jutland starts from the rock art rich island of Tjörn, which is where Bohuslän's figurative rock art becomes more frequent as one moves north (Pettersson 1982). The more northern rock art areas may also have been used for sea expeditions to and from Jutland.

Thus, maritime expeditions were probably organized along established maritime routes, possibly initiated during the LN, primarily for the exchange of flint for domestic goods (Apel 2001; Ling 2004; Østmo 2005). Bronze Age boats seem to have been propelled by paddling and their construction suggests that seafarers most probably used the more sheltered waterways among the inner skerries (Kvalø 2000; Crumlin-Pedersen 2003b). These journeys, short or long, would have involved temporary stops for rest, food and water. Another important factor would have been the weather (Marstrander 1979; Burenhult 1980; Kvalø 2000; Crumlin-Pedersen 2003b).

Besides being dependent on social and economic conditions, the seafarers would have needed

knowledge of local waterways, currents and shoals. Many scholars consider that the maritime location of cairns may represent important nodes for nautical navigation (Dahlgren 1941; Krantz 1940; Selinge 1969; Kvalø 2000, cf. Gerdin 1999). But even if ships were shallow and easy to navigate, how did those from foreign parts manage to navigate in the complex archipelago of Bohuslän? Were local people employed for this, just as in historical times, or did foreign mariners simply rely on experience?

Finally, this region has the highest frequency of elaborate rock art images located adjacent to natural BA maritime ports or passages. In general, the rock art shares several figurative elements with south Scandinavian bronze items but the images on the rocks are more innovative, mobile and vital.

In this context Kaul (1998) has suggested that the elaborate rock art scenes in Tanum may be traces after Danish visitors who interacted and participated with the local people in rituals and meetings; for these occasions they brought with them treasured bronze items, such as weapons, sun stands, lures and chariots, and then took them back. Kaul sees this as a possible explanation both for the dearth of bronzes in Bohuslän and for the elaborate rock art scenes depicting bronze items (Kaul 2004: 98pp).

This is an attractive hypothesis but the reverse could be equally likely, that is, groups from Bohuslän could have visited Jutland for trading and barter and during these events interacted and participated in local rituals. That actually seems more logical than the seasonal flashing of bronzes by Danish visitors. However, maritime interaction should not be seen as a one-way process; the material evidence in Bohuslän probably represents a combination of local and foreign maritime interactions.

To summarize, the archaeological material is evidence that maritime interactions, such as barter, trade, transport and communication, were important elements of BA life in Bohuslän. However, BA people in Bohuslän have traditionally been seen as passive receivers of material and ideas, not as active or innovative maritime deliverers, communicators or inventors. I have argued that mobile maritime groups from Bohuslän and elsewhere, such as Jutland, may have interacted in various parts of the Skagerrak-Kattegatt region. Still, the BA mariners

of Bohuslän were presumably more familiar with local maritime conditions, such as waterways, currents and shoals.

3. Maritime warfare

Besides trade and communication as such, there is material evidence of antagonism and warfare in Bohuslän. Both the EBA and the LBA bronze material is, in fact, dominated by swords, spears and axes, while combat scenes are a recurrent theme on the rocks (Nordbladh 1989: 324; Kindgren 1999: 73, 91pp).

Prehistoric warfare has often been downplayed in traditional post-war Scandinavian BA research in favour of society's functional and ritual aspects. Moreover, rock art research has traditionally favoured interpretations involving fertility or other myths in relation to the warriors and scenes of conflict on the rocks (Almgren 1927; Hultkrantz 1993; Fredell 2003). This prehistoric period, however, is actually associated with numerous weapons, notably an increased number of highly efficient weapons (not only ritual), as well as frequent images of conflict (Kristiansen 1984: 195pp; Bertilsson 1987; Nordbladh 1989: 324; Thrane 2006: 492pp; Vandkilde 2006: 59pp; Vogt 2006).

Moreover, some of the weapons show clear traces of wear (Kristiansen 1984: 195pp). There is also more direct evidence of violent death in BA Scandinavia, for instance the findings at Sund, central Norway (dated to approximately 1300 BC), which witness to the harsh killing of several individuals (Fyllingen 2006: 319pp). The extent and character of warfare are difficult to ascertain exactly, not to mention its causes. Some antagonistic actions may have fulfilled a communicative and symbolic function, perhaps related to social and economic exchange and/or encounters. Small-scale raiding and armed clashes involving bloodshed and death were probably common (Thrane 2006: 501pp).

The next question concerns the kind of warfare, its intensity and frequency, and its instruments. Most of the warriors depicted in rock art scenes are in some way related to a contemporary ship depiction. This repetitive maritime pattern indicates a key condition and context that should not be ignored. Small-scale warfare or raiding could have been both

a local phenomenon in Bohuslän and a practice in connection with overseas expeditions. The local conflicts might have been about competition between social or geographical units or constellations of various sizes, for different social and economic reasons. The same general setting could apply to overseas expeditions, though these may have been slightly more organised and extensive. In short, the causes may have been varied and complex. Just to illustrate one possible scenario, we know that during the Viking Age misfortune often turned mercantile overseas expeditions into small-scale warfare or raiding (Hedeager 1994).

A closer look at the BA rock art images reveals that some ships display signs of being war machines. Some of the large ship images have a differentiated crew, with certain individuals in an elevated or enlarged position and attributed with weapons. These craft may be regarded as military or ceremonial boats, such as war canoes, staged and used for special maritime events. The similarity between the Danish war craft from Hjortspring and the ship depictions on the rocks favours this hypothesis (Kaul 1998, 2003; Crumlin-Pedersen 2003b).

It is difficult to detail the practice and social organisation of the maritime war canoe. There is little direct evidence in the available BA archaeological record from Scandinavia. The ship depictions can be used to count the number of crew members, as discussed above. The average BA ship in the present case study has a crew of 7–11, which might represent a common local mode or tradition for the size and construction of ships for more ordinary BA maritime practice and communication in the Tanum and Kville area. There are, however, images representing larger “war canoes” with crews ranging from 20 to 60. But if these images correspond to actual craft, how were these larger craft crewed and organised? At present this must remain a matter for speculation.

In the general discussion of maritime warfare in the Bronze and Iron Ages, some researchers argue for a general principle in early Scandinavian troop formation, consisting of 18 commoners and two commanders (Randsborg 1995: 39, 50). This argument is largely based on evidence from the Hjortspring boat and textual evidence in Tacitus con-

cerning the “Svions”. Thus, the ship is conceived as organised with a steersman and a stemsman in command of a crew of paddlers, equivalent to the commanders and commoners in the troop formation (Randsborg 1995). As discussed above, some rock art ships displays a similar social setting, with two enlarged or armed “leaders” fore and aft directing an anonymous crew.

Some scholars have also discussed prehistoric maritime warfare in terms of an analogy with the Scandinavian medieval period. The medieval maritime *levy* in Scandinavia was understood as very ancient (Nerman 1925; Hafström 1949). However, both historians and archaeologists are sceptical about such a simple analogy (Lönnroth 1963: 103; Varenius 1998: 36; Berntsson 2005). Even in the historical period, the levy organisation was probably never as uniform as the texts suggest (Varenius 1998). But a brief comment on the levy system may still be of interest.

While most coastal provinces in Scandinavia had this kind of system in the medieval period (Lönnroth 1963: 103; Varenius 1998: 36), the maritime military systems varied between provinces and states. In the 12th century, for instance, King Sverre divided Bohuslän into 16 *skipreidor* (ship levies), corresponding in general with the later administrative levy or *häräd* (hundred). This early form of taxation outraged the local inhabitants. Each skipreidor was further divided into forty *lid*, a retinue unit that corresponded to four farmsteads. Each lid was to provide arms and finance one maritime warrior. It was up to each lid to select warriors to crew the longships. Thus, the system required each skipreida to provide 40 maritime warriors.

The medieval maritime system in Bohuslän cannot serve as a blueprint for the BA. Still, during the BA there must have been some sort of means for mobilizing and crewing ships (Randsborg 1995; Kvalø 2000, 2004).

To return to the BA ship images on the rocks, some display signs of being war machines and may broadly be regarded as military or ceremonial craft, such as war canoes, staged and used for special maritime events. We must remember that a substantial number of skilled and trained personnel was needed to crew a war canoe and in most cases local set-

tlements were probably incapable of supporting a crew of, say, 20–30 skilled boatsmen and warriors. So crewing a war canoe may have involved several local aggregates in northern Bohuslän, collaborating to crew a particular craft. This raises the question of how frequent such enterprises were during the BA and how recruitment took place?

4. Maritime rituals and ceremonies

The strong maritime concentration of BA rock art and graves in Bohuslän points to the region being of special ritual significance. There is much to say about this and here I will only touch on some topics because these issues are considered more fully in a subsequent chapter.

Many scholars have discussed aspects of rituals connected with the maritime realm and its rock art and burials (Krantz 1940; Nordbladh 1980; Randsborg 1995; Artelius 1996; Kaul 1998; Gerdin 1999; Goldhahn 1999a, 2005, 2007; Helskog 1999; Kvalø 2000; Nordenborg Myhre 2004, Thedeén 2004; Bradley 2006). For instance, in Bohuslän there seems to have been a continuous practice, from the Neolithic onwards, of erecting grave monuments towards the maritime realm (Gerdin 1999; Sjögren 2003). Different eschatological, cosmological and ritual aspects have therefore been applied to the maritime realm, such as mortal rituals, rites de passage and initiation rites (Krantz 1940; Nordbladh 1980; Artelius 1996; Gerdin 1999; Helskog 1999; Kvalø 2000; Nordenborg Myhre 2004; Thedeén 2004). For instance, Tore Artelius (1996) and Dag Widholm (1998, 2006, 2007) discuss eschatological aspects of the maritime located and shaped graves, such as stone ships, ship settings and rock art images and argue that they may have shared similar eschatological conceptions of the maritime realm.

Nordenborg Myhre (2004) proposes a similar perspective regarding the BA rock art and graves in Rogaland but acknowledges that shells and sand from the sea have been deposited in the graves. She also points out that the ship images on the rocks may intentionally have been made to illustrate different notions of real and eschatological or ecological journeys between life and death. Moreover, scholars such as Nordbladh (1989), Helskog (1999), Gerdin (1999) and Bradley (2000) argue for a vertical cos-

mological structure behind the placing of rock art and cairns and that the shores or former shores are central elements of transitions between life/land and water/death.

Another theme put forward by many scholars is that cairns may have marked contemporary sailing routes (Almgren 1934: 54; Krantz 1940: 44pp; Selinge 1969; Kvalø 2000; cf. Gerdin 1999). There are several historical accounts of the cairns being used for nautical navigation by sailors and fishermen (Krantz 1940: 24pp). Many scholars have therefore suggested, in keeping with the *Odyssey*, a twofold function of the cairns: Bronze Age mariners were buried along the maritime routes and the monuments helped other seafarers to navigate along the coast (Kvalø 2000; Kristiansen & Larsson 2005).

Maritime encounters, meetings and manifestations are frequently represented on the rocks and the general maritime location of the rock art could indicate that the shore zone functioned as an arena for various kinds of social performance and interaction. The actions depicted on the rock art seem literally to represent maritime performances and ideals, with social manifestations of clearly depicted humans kneeling, sitting, raising paddles, blowing lures, raising weapons, combating, adoring, or tumbling. It is thus tempting to connect these representations with communal feasting, competitions or encounters that took place in the shore zone of the rock art areas during the BA.

In this context it is alluring to assume that rock art may have been produced in accordance with maritime aggregations, transitions or initiations, in connection with overseas expeditions or the launching of a newly produced maritime craft.

5. Boat-building

In this thesis I propose that the ships depicted on rocks in Bohuslän show a clear correspondence with an actual social BA praxis of producing real boats in the area. If this argument is correct, an important question is how and where the boats were produced. Could Bohuslän's rock art areas also have been centres for this kind of production? A specialised activity in a larger system of production and exchange with, for instance, bronze items and flint daggers produced in other areas (Kristiansen 1998;

Apel 2001)? Or is it just Danish or North German boats that are depicted on the rocks in Bohuslän? Some support can be found for these theories:

1. The close resemblance between real boat finds such as Hjortspring and the ship images on the rocks.
2. Several finds of log-boats from the area, dated from the Mesolithic to the PRIA, bear witness to a long boat-building tradition. Two finds of log-boats from the Gothenburg area have been C-14 dated to the transition between the LBA and the PRIA (Andersson 2005). Some of the rock art ships may be related to log-boats but the majority seem to represent plank-built boats such as the Hjortspring craft.
3. The deforestation that occurred in the rock art areas during the BA (Swedhage 1997; Ekman 2002, 2004; Påsse 2003). This could indicate that timber was needed for boat building, not just for household activities and metallurgy. The overall archaeological record demonstrates intense maritime interactions during the BA. It is therefore logical to assume that boats were produced on a local basis.
4. In historical times, the Bohuslän region was regarded as one of Scandinavia's foremost boat-building centres (Haslöf 1949, 1970).

The resemblance between ship images on the rocks and the Hjortspring boat has been stressed by many scholars. There is no archaeological evidence of such boat types in Bohuslän but the frequent number of similar rock art ship images indicates that these boats may have been produced on a local basis. The rock art ships also display some clear functional traits, such as steering rods, stems and keel extensions, as well as proportions, crew and social positions, that generally correspond to the Hjortspring boat. In the whole of Scandinavia there are only two secure finds (Hjortspring, dated to the PRIA, and Haugvik from Norway, dated to the LBA V–PRIA) of plank-built and sewn craft (Crumlin-Pedersen 2003b; Sylvester 2006).

Still we may assume that the representations of the large rock art ships were based on existing boats and on a tradition of maritime boat-building that

may go back to the LN (Kaul 1998, 2004; Kvalø 2004; Østmo 2005).

On the basis of all the ship depictions on the rocks that correspond to real boat finds, the general strategic “maritime” location and content of the rock art and the fact that Bohuslän in historical times was regarded as one of Scandinavia’s foremost boat-building centres, it seems logical to assume that real boats could have been produced in the rock art areas during the BA.

Discussion

The maritime actions that have been considered above – fishing, barter, transport, meetings, ceremonies, warfare and boat-building – should not be seen in opposition to or as a substitute for ordinary “terrestrial” life and work. On the contrary, these actions may have accompanied and complemented each other. The archaeological evidence from BA Bohuslän does, in fact, indicate that the economy was not “purely” maritime but still less was it “purely” agricultural or pastoral. The sparse evidence points to a more complex pattern of utilisation and social praxis that could have been dependent on various maritime, agrarian and pastoral labours. For example, some settlement sites from BA Bohuslän demonstrate high quantities of cereals, indicating that agriculture was important (Gerdin 1999; Sandin 2001; Bengtsson et al. 2005; Munkenberg & Gerdin 2005).

Up to now, it is the pastoral or agrarian economy that has attracted most attention at the expense of facts and theories about maritime production (Ljunger 1939; Bertilsson 1987; Gerdin 1999; Munkenberg & Gerdin 2005). For instance, Ljunger (1939) and later Bertilsson (1987) and Vogt (2006) have suggested that the increasing number of rock art sites during the LBA may be an outcome of an expansion of cattle-breeding as shore displacement resulted in additional land for grazing (also Gerdin 1999; Munkenberg & Gerdin 2005).

There may be something to this theory but it needs to be scrutinised. First of all, shore displacement did not alter the landscape much between the EBA and the LBA, neither did the amount of pastureland increase substantially in the rock art areas at that time. It is true that recent studies of pollen in northern and

central Bohuslän point to increases in deforestation and grazing land during the BA (Svedhage 1997; Påsse 2003; Ekman 2004) but some of the species that are regarded as indicative of extending pasture, such as *Poaceae* or *Plantago*, are also generated by regressive shore displacement and occur on newly exposed shores (Påsse 2003: 63). Moreover, there is no archaeological or rather osteological evidence to support an expansion of cattle-breeding during the LBA in Bohuslän (Jonsson pers. comm. 2006). This is generally explained by the poor conditions for conservation in Bohuslän. However, that would also apply to bones from wild mammals and fish, so in that sense it is not a convincing argument.

Thus the more stable form of income in BA Bohuslän was probably a mixture of cattle-breeding, agriculture and fishing. It is remarkable that it is the few plough scenes and the few depictions of domestic animals that have caused researchers to favour the idea of a terrestrial economy in BA Bohuslän despite the existence of more than 10.000 ship depictions on the rocks. Moreover, the absence of houses in the rock art imagery may not be a mere coincidence.

From my perspective, these circumstances must reflect or be rooted in some kind of reality and cannot solely be explained in broad and obscure mythological or cosmological terms. It seems rather as if the rock art reflects certain norms taken from an ideology that was based in turn on real maritime and terrestrial material forces of production and relations of production in the area. In a sense, then, we may speak of a dual social and economic praxis, rather than a general “system”.

Due to various factors, determined in part by seasonal changes and long-term changes in the natural environment, the relative importance of these two spheres may have varied. Still, it can be argued that each sphere had a certain autonomy and that their social forms differed considerably. At the same time, the numerous configurations of ship images on the rocks could indicate a general transition or drive towards the maritime realm. Thus the maritime realm may have attracted groups and individuals both for its intensive and demanding collective seasonal social labours and actions and for its income and liberating, mobile livelihood.

Several historical accounts from the 12th to the 20th century describe similar transitions and a strong relation to the sea among farmers in Bohuslän (Hasslöf 1970: 74–75). Norwegian and Danish rulers complained several times of a loss of tax revenue because people neglected their agrarian units, houses, and arable land. Arable land fell into disuse as farmers focused instead on building as large boats as possible in order to take their sons and daughters on trading or fishing ventures (Hasslöf 1970: 74–75). These accounts refer to a state-organized system of tribute and taxation that is by no means comparable to the situation in the BA but they may still bear witness to a more ancient praxis and mentality.

Bearing this in mind, it is interesting to consider the large number of BA ship images and ship scenes on the rocks, the absence of depicted house structures or house-related activities and the few scenes of domestic agricultural activity.

Could this indicate a correspondingly strong relation to and conception of the maritime realm in the BA, a realm of great expectations and liberations but also of great demands and dangers? And could it be the outcomes of these maritime transitions and actions – the artistic, legal, ideological and ritual ideals – that were depicted on the rocks rather than “real forces and relations of production”? Or were the social and ritual ideals on the rocks merely an outcome of an agrarian ideology and praxis in the landscape?

In the following I will argue for the existence of several spheres of maritime, agricultural and pastoral praxis, between which there was a continuous flow of people, artefacts and knowledge.

Dual social praxis, positions and transitions in Bronze Age Bohuslän

It seems reasonable to assume that groups and individuals may have alternated between the maritime and terrestrial spheres. In general, however, heavy maritime labour, such as overseas expeditions, deep-sea fishing, trade, transport, boat-building, burials, ceremonies, warfare and other encounters would have represented a major investment in people and materials. For these purposes or occasions, some groups and individuals may have suspended their terrestrial livelihood to take up a seasonal or

occasional maritime livelihood, while others may have had more permanent positions in this sphere. It may have been important to mark or manifest such transitions in some way and it is tempting to picture some of the BA remains in this light.

For instance, all the investigated BA barrows in Bohuslän had an inland location with favorable conditions for prehistoric agriculture (Andersson 2005; Selling 2007). Sites with cup marks only are also more frequent in these areas, whereas most of the figurative rock art and cairns had a location nearer the maritime realm (Ling 2004a, 2006). Moreover, the majority of rock art ships were made on what was maritime land and here the human representations seem to be more or less proportional to the ship images, whereas on higher ground some of the human figures are abnormally large in relation to the ship images (fig. 8.37i).

Perhaps these representations illustrate social conceptions such as collective versus more individual social spheres of action and transition in the landscape: the lower maritime land for collective maritime aggregations and interactions, represented by the “collective” ship depictions, and the higher ground for more individual actions and positions, represented by abnormally large humans in relation to the ships. The latter form of representation may even illustrate that certain individuals were related or connected to the actions in the maritime sphere. Some of the heavy maritime labours that were mentioned earlier must have been dependent on many small social units and households.

In that sense the boat may have been regarded as a collective emancipator and unifying feature but also as a demanding and alienating feature. Thus, there may have been certain dynamics, expectations and conflicts between the individuals and groups positioned in or transferring between the terrestrial and maritime spheres and these dynamics may have included certain social conceptions and actions about gender, groups or individuals.

Here it is relevant to stress the absence of houses or house imagery in the rock art. Rather than being just a coincidence, this could possibly reflect the two spheres’ different social actions and concepts. Another possibility is that the house unit was socially regarded as an incorporated or subordinated feature

of the ship. However, the house sphere probably had its own premises, manifested and communicated by its visible and permanent location and construction, as well as by other visible and invisible features and entities such as smoke and certain smells, humans and animals. Depicting this sphere on a rock art site would, in fact, have been hard on account of all the visible features, constructions and actions.

This may be one reason why complex figurative rock art sites have not been found close to house structures in Scandinavia. The full explanation is probably more complex and more connected to social ritual conceptions and praxis rather than just aesthetic or functional aspects. The large number of ship depictions at various points in the landscape may, in itself, have served to enhance the importance of the maritime sphere. In a sense, rock art could have had certain political aims and dimensions. As discussed above, rock art is not a mere depiction of a social world, nor a mere religious declaration, but also a vehicle for projections and conceptions arising from tensions in the real social world. Thus the rock art could have served to accentuate the maritime social world and even, to some extent, make it more dominant. This could have been one reason why it is ship images that were depicted most frequently in the landscape, even on higher ground away from the sea together with other valued rock art images.

The different forms of maritime action that have been accounted for, such as deep-water fishing, transport and trade, boat-building and warfare, burials, ceremonies and aggregations at sea, required a great deal of labour and may have generated more intensive social relations. This may have led to an increase in “symbolic production”, in this case the production of rock art, both as an outcome of more intensive social relations and as an articulation of forthcoming actions and events. Hence, people’s spiritual ties with the maritime realm may have become stronger as an effect of the intensive social relations at sea (Godelier 1975: 122). Articulating and manifesting these transitions at different locations in the landscape may have been important. Rock art may have been one of the recourses, messages or media used for these purposes, communicating strong norms and narratives taken from the socially

sanctioned ideology.

Thus like many rituals, the rock art may be regarded as an outcome of a symbolic labour whose purpose was to articulate certain social and ritual transitions and positions in the landscape. However, this medium or action neither aimed at nor was capable of altering social formations. It rather seems to have been the case that the rock art reproduced certain norms of social relations.

In the rock art medium, social relations were worked up and experienced in a fantastic shape and this materialised ideology was confined to only some social values and relations. Thus, the rock art was both present and concealed by the way it was performed and this arbitrary condition may reveal alienated social relations that in a way restored society’s prevailing norms.

The rock art was most certainly produced for special purposes and may broadly be seen as a materialized social or ritual medium, made before, in connection with or after certain actions, manifestations or events in the landscape. The process and production of rock art should not be disregarded and the investment it represented in time and effort indicates a consistency in time and place that cannot simply be ignored. In general, it must relate to some form of local conditions of production.

Thus rock art’s general maritime location and content could indicate that the underlying general forces and relations of production may have been oriented towards a maritime realm. It also seems that certain areas were favoured for the making of rock art in specific periods. Could this be an indication that different areas were used at different times for larger maritime meetings, aggregations, transitions and rituals, such as Torsbo during the EBA, Tanum and Bottna during the LBA and Tanum during the PRIA? And could this geographical/chronological relocation of rock art be related to societal maritime changes in these areas, for example changes in the maritime forces of production, such as fish or fishing grounds and timber for boat-building, changes in populations or in maritime relations of production, such as trading and barter units, fishing units, ceremonial units, military units or boat-building units, which in turned led to less or more rock art in these areas?

Conclusions

It seems that Bohuslän, just like several other regions, does not comply with the traditional BA societal matrix and the prevailing idea of Bohuslän as either an agricultural or a pastoral production area in relation to the “agrarian accumulation areas”. The sparse evidence is more indicative of a more complex pattern of utilisation and social praxis that could have depended on a mixture of maritime, agrarian and pastoral labours. However, the general location and content of the BA remains do slightly favour a maritime realm that seems to have included both socio-ritual and social-economic matters of production and consumption. The burial material and rock art in Bohuslän indicate that the societies were socially stratified but the notion of a stable form of chiefdoms here at that time is harder to accept. The institution or form of stratification may have resembled “less complex chiefdoms” but it seems doubtful that the very specific inherited chiefly/priestly theocratic form existed here during the BA.

Temporary stabilizations most certainly occurred and may have led to more complex social stratifications. The increase in the number of bronze items and rock art during the LBA in Bohuslän may indicate this. This form of accumulation or stabilization must be understood in the light of internal forces and relations of production, not external control, tribute or colonization. It is thus tempting to perceive the rock art utterances as expressions of constraints, competition and conflicts between stabilizations and destabilizations of the societal forms in this area (Raphael 1945; Bertilsson 1987; Dowson 1998; Vogt 2006), due to changes in the maritime and terrestrial forces and relations of production.

In this context it is interesting to consider the traditional “agricultural areas”, such as Jutland, Scania, Västergötland and southern Halland, that have less figurative rock art in the landscape but more bronze hoards, barrows and complex house structures; this could have been an outcome of a more stable agrarian economy that was predictable and controllable in a different way (Tesch 1993; Kristiansen 2006; Artursson 2007).

In keeping with scholars such as Gröhn (2004), Nordenborg Myhre (2004), Artursson (2005) Skoglund (2005), and Bergenbrant (2007), it seems more interesting to highlight specific local or regional traits and thereby discuss the differences, nuances and articulations between these regions than to state a few general systems. The same goes for discussing aspects of rituals, religions and cosmology (cf. Kaul 2004; Kristiansen & Larsson 2005). Certain elements and aspects from these actions seem to have been common to the whole of southern Scandinavia, albeit articulated and performed with different material, monumental or figurative content and structure.

Finally I suggest that in general, rock art in Bohuslän could reflect traces of seasonal maritime transitions and aggregations in the landscape. These transitions may have occurred in connection with heavy maritime labour, resulting in more intensive social relations, and during this phase the symbolic production of rock art may have increased. The rock art could be regarded as an outcome of a symbolic labour whose action and purpose aimed to articulate social and ritual transitions and positions in the landscape. This medium or action had neither the aim nor the power to alter social formations because rock art was both present and concealed by the way it was performed and this arbitrary condition may actually have tended to restore society’s prevailing norms.

Finally, the strategic and communicative maritime zones with BA rock art in Bohuslän could have served as important ports or transits for local and regional sea-going communications. Such sea journeys, whether short or long, required temporary stops for rest, food and water. The weather must also have exerted a strong influence on these voyages and the daily trips must have been organized accordingly.

In this context, it is also relevant to discuss the making of rock art in Bohuslän. Both local and regional praxis may have been manifested in the rock art to illustrate both the importance of consensus and independence regarding ideology, socio-ritual and political praxis.

12

MARITIME TRANSITIONS

Introduction

This chapter presents an integrated discussion of the theoretical approaches and observations that have been considered earlier in the thesis. It opens with a brief outline of the physical conditions that seem to govern rock art activity in a maritime landscape. This is followed by perspectives from archaeology, anthropology, ethnography, or historical sources, that envisage situations and actions that, in a sense, may concretise social interpretations of rock art in Bohuslän. It is easy to be seduced by well-articulated ethnographic and anthropological analogies, which can only inspire, never tell how actions were constituted in prehistoric Bohuslän. But it would also be wrong not to quote or compare these accounts and theories because there are, indeed, some very specific spatial, social, economic, technologic and environmental conditions that broadly shape man's premises and ability to act and interact with the sea. At the same time, just as modern man shares some general cognitive conditions that in general make people act in similar ways, there are also specific articulations that generate differences and nuances.

For instance, there are clearly some spatial and technological features that limit and shape the actions on a boat, especially if one considers the prehistoric boats that have been found in Scandinavia, log boats or sewed plank-boats such as the Hjortspring boat. There are additionally many ethnographic ex-

amples of similar boat types in the world (Clausen 1993; Crumlin-Pedersen 2003). These boats constitute a kind of social space; actions and operations are more or less dependent on this premise (e.g. Weibust 1958; Nordenborg Myhre 2004).

Considering the possibilities and limitations for acting under such social and spatial premises, the social operations are likely to have been rather similar, though not doubt modified by some specific geographical and nautical conditions regarding the sea. Or as Bronislaw Malinowski puts it:

For a craft, whether of bark or wood, iron or steel, lives in the life of its sailor than a mere bit of shaped matter. To the native, not less than to the white seaman, a craft is surrounded by an atmosphere of romance, built up of a tradition and of personal experience. It is an object of cult and admiration, a living thing, possessing its own individuality (Malinowski 1922: 105).

In any case, the sea is both a dangerous feature that has to be attended to and a crucial "infrastructure" and source of income. Similar general aspects could apply action towards the shore. To summarise, I am aware of the epistemological and methodological problems associated with analogies or comparisons, and use them only sparsely, but still believe some such comparisons necessary.

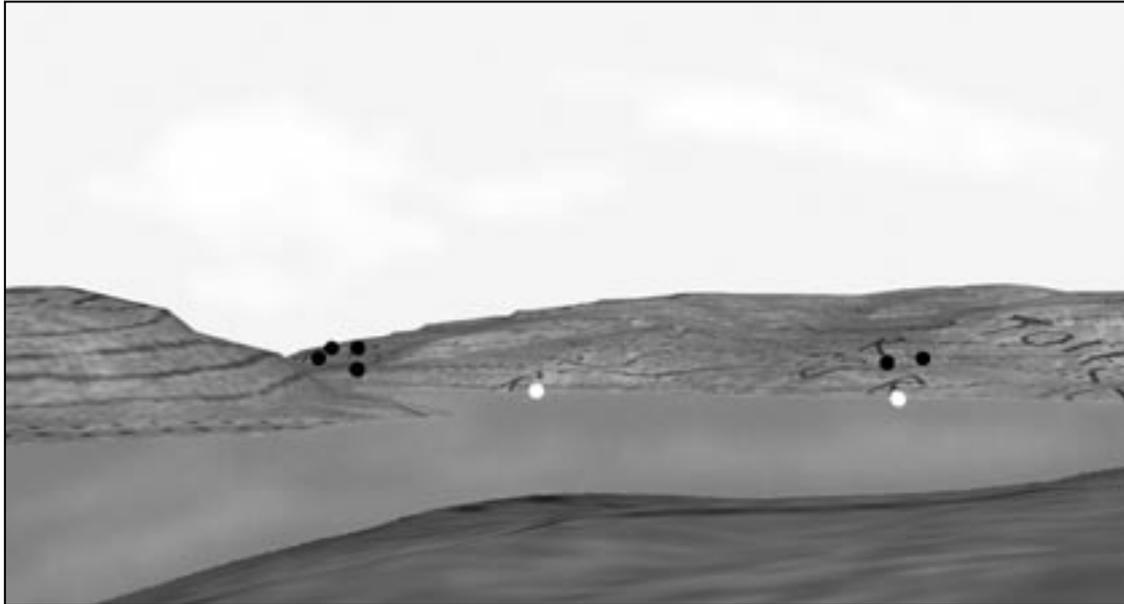


Figure 12.1. The shore as a ritual landscape. A 3D-reconstruction of the rock art in the S. Ödsmål area, Kville parish (shoreline at the beginning of the Late Bronze Age, corresponding to an altitude of about 12–13 m.a.s.l). Black dots = rock art sites from Early Bronze Age, white dots = rock art sites from Late Bronze Age (after Ling 2005).

Rock art in a maritime zone

It has been stressed that about 60–70 percent of the known rock art sites in northern Bohuslän were made at or adjacent to the shore (see fig. 11.1, 11.2). In this context it is notable that the rock art in general seems to have been sited on the perimeter of the inner skerries in rather sheltered places, close to or at the shore of rather large inlets, bays, lagoons or natural harbours, or at strikes, isthmuses, peninsulas and small islands. Rock art rarely seems to have been placed in exposed locations in the outer archipelago with immediate contact with the open sea. Moreover, a majority of the rock art representations in areas such as Tanum, Kville, Bottna, Svarteborg and Bro were made on panels oriented towards the seascape. This observation is relevant for an understanding of the action behind the rock art. Furthermore, the making of rock art in sheltered bays, lagoons and so on seems to have been more frequent in some areas than in others, which resulted in clusters of rock art sites. The prehistoric location of rock art close to or at the shore calls for further examination (fig. 12.1). It will therefore be well to present some facts and notions concerning this matter.

First of all, the coastal strip or shore may be regarded as a special place with special environmental conditions for social action. The shore zone can be seen as a dynamic boundary, a physical edge or “third space” between three dominant spatial formations: sky, sea and land (e.g. Helskog 1999). The shore is associated with some specific perceptive and receptive features, dependent on the seasons and movements of the sea, such as certain sounds, smells, winds, lighting, and reflections. The interaction between certain spatial, temporal and climatologic conditions at the shore is of special significance. The shore is an active transformative arena that displays seasonal and climatologic modes in a concrete way. Stormy, calm, windy, sunny, cloudy, icy or warm days each have a characteristic appearance at the shore that may be manifested or understood as beautiful, dramatic, etc. Changes in sea level due to the season, the climate, the wind or weather may more or less transform the coastal landscape, especially its low-lying areas. For instance, sea levels are generally lower in the spring than during the summer and autumn, while cyclones and storms can generate high sea levels in the autumn and winter

(Rydberg 2000). Thus the shore could be regarded both as a confined, safe space and as a dramatic, hazardous space. Knut Helskog has drawn attention to other properties of the shore:

The shore is where land meets the water. It is a zone that stretches from the dry land immediately above the high-tide mark and into the ocean at the lowest tide mark. It is the area that is last covered with snow when winter returns. In the spring the shore is the first area where the snow disappears and where life associated with land first re-appears. As such, the shore (associated with a body of water) connects not only land and water but also life therein (Helskog 1999: 76).

According to Helskog, the shore may be regarded as a physical mediator where the three natural elements or dimensions sky, land and sea congregate but also where sounds of elements interact in a special way (Helskog 1999: 75–80). These conditions definitely have an impact on human perception and mentality. It is telling that different maritime-oriented societies have chosen to perform certain actions, rituals, meetings, communications and contemplations by the shore (see Solheim 1940; Weibust 1958; Malinowski 1922; van Ginkel 1987; Hultkrantz 1992; Helskog 1999; Westerdahl 2003, 2005; Bradley 2000).

Thus there are environmental, spatial, climatology and temporal aspects of the shore that may have both shaped and determined the kinds of social actions or events that are located on the coast. These actions may be relatively permanent or more affected by seasonal or temporal conditions. The following are some general actions that may be related to the shore as an arena for:

- Exploitation and operation: fishing, grazing, hunting-gathering.
- Arrival, departure and transit: from or to the sea.
- Ceremonies and rituals: transitional rites, seasonal rites, initiation rites.
- Meetings and contacts; aggregation.
- Performance and interaction.
- Negotiation and transaction.

- Communication and reflection.

Maritime transitions and rituals by the sea

Both historic and prehistoric evidence suggests that maritime activities have been of great importance in Bohuslän and played an important social and economic role for other household activities, such as farming and cattle breeding (Hasslöf 1949; Nordqvist 2006).

Dual livelihoods have been a natural form of existence in Bohuslän in historical times (Hasslöf 1949) and the concentration of Bronze Age remains to Bohuslän's coastal zone indicates that human occupation and activity were also oriented towards the sea in prehistoric times (Bertilsson 1987; Hygen & Bengtsson 1999; Coles 2005).

Seasonal occupations at sea must have contrasted strongly with life and work on the land. Sea-going men would have confronted a totally different world, full of dangerous natural forces such as harsh weather, waves, rocks and shoals. But it was also a world of great possibilities, utilities, hopes and desires. In this context it is logical that extraordinary disciplines, skills, norms and taboos fulfilled a special need to cope with the hazardous conditions at sea. Several anthropologists, ethnologists and archaeologists have used concepts such as "rite de passage" and "taboo" to describe this sociological behaviour at sea. The anthropologist van Ginkel put this as follows:

It is my hypothesis that most of the taboos in maritime communities are part and parcel of rites of territorial passage. During their transitional stage fishermen have to observe ritual avoidances. Prohibitions while preparing to sail are particularly widespread and strictly observed. Rites of separation, therefore, appear to be especially important (van Ginkel 1987:66).

This is not the place for a full account of the numerous and complex interpretations and concepts concerning rite de passage and taboo. Various attempts have been made to define behaviour at sea, with different aims and outcomes (Malinowski 1922; Solheim 1940; Weibust 1958; van Ginkel 1987; Hultkrantz 1992; Westerdahl 2003, 2005). Some

general sociological phenomena may also be worth noting, such as special initiation rites, particular social and cognitive forms and norms of perceiving, acting, articulating and communicating with different corporal and lingual means. In this context, the work of Boris Malinowski on the Melanesian maritime culture has been regarded as a milestone (Malinowski 1922).

Malinowski distinguished two main driving forces behind the symbolic and magical behaviour connected with different stages and forms of maritime action. They are both of a rather rationalistic cognitive nature, namely the economic risk and the personal risk (Malinowski 1922: 115, 125, cf. van Ginkel 1987: 57–59; Hultkrantz 1992: 36–40). They also share the cognitive purpose of eliminating untoward acts at sea and stimulating individual and group action in connection with various forms and stages of maritime action.

However, when fishermen, such as the Trobrianders, fished in safe shallow water they never resorted to ritual, magic or taboo, which were used only for missions in the open sea.

Thus, several anthropologists, ethnologists and archaeologists have stressed different transitional aspects and notions of the coast and the shore. In this context the shore is regarded as a natural boundary, hence charged with special values and forces. Taboo, magic and rituals are therefore recurrent practices associated with the shore and there are several historical and ethnographic accounts of rituals performed at the shore in connection with sea missions such as fishing, transport, communication, warfare and travel (Malinowski 1922; Solheim 1940; Weibust 1958; van Ginkel 1987; Hultkrantz 1992; Westerdahl 2005). Anthropologists such as Arnold van Gennep, Boris Malinowski and Rob van Ginkel emphasize concepts such as anxiety, ambiguity and liminality to describe socio-ritual or socio-structural behaviour at sea (Malinowski 1922; van Gennep 1960: 11, 23; van Ginkel 1987).

For instance, in his classic essay “Rite de passage”, van Gennep stresses that transitions from one physical and cognitive domain to another constitute important elements in the rites de passages (van Gennep 1960: 11, 23), and many scholars have therefore regarded the shore as one of those bound-

ary elements where rites of passage could have been executed (van Ginkel 1987; also Helskog 1999; Bradley 2000). For example, the maritime rites of embarking and disembarking are typical rites of separation that may be performed at the shore (van Gennep 1960: 11, 23; also van Ginkel 1987: 62).

Thus, rituals connected with a sea journey and the making of rock art may have been executed at the shore at three stages:

- Before a journey: pre-liminal rites, rites of separation.
- During a journey: liminal rites, rites of transitions.
- After a journey: post-liminal rites, rites of incorporation.

The shore meant salvation and rest, while the open sea meant unrest, hardship and danger (van Ginkel 1987: 62; also Weibust 1958).

There is yet another perspective regarding rite de passage and rock art at the sea shore. Helskog sees ritual behaviour behind the placing of rock art by the shore in the most northern parts of Scandinavia. According to him, the rock art settings in these areas may well mirror fundamental aspects of a specific



Figure 12.2. The landscape divided in accordance with a vertical cosmology. At the top, cairns representing mortal ground; in the middle, a house structure representing the human sphere, at the bottom, rock art by the aquatic sphere (after Ling 2004, drawing: J. Neminen).

world view that invested the shore with a symbolic meaning (cf. fig. 12.2):

The location of the rock carvings at specific places in the transitional shore zone indicates that the shore itself could be a ritual landscape, where specific locations were considered more meaningful than others for making rock carvings, practising ritual and communicating with the spirits of the cosmological system. The shore being where the three main dimensions – sky, land and water – meet might indicate that this is also where spirits of these dimensions meet, given that there is some structural similarity between the cosmological world and the physical world of the people (Helskog 1999: 81).

Moreover, in the light of van Gennep's notions, Helskog notes that the rock art could have been made in accordance with seasonal rites de passage.

Richard Bradley argues for a similar perspective regarding the meaning and function of both the northern and the southern traditions of Scandinavian rock art. He emphasizes a vertical cosmological structure behind the placing of the rock art and cairns, where the shore or former shore is a central element of transitions between life/land and water/death (Bradley 2000). The placing of rock art ships in Bohuslän may have been intended to convey the idea of water in areas from which the sea had retreated.



Figure 12.3. Maritime rock art from the 19th century from the harbour in Göteborg (photo: Johan Ling).

Thus, the rock art ships were made to illustrate artificial shorelines, at the foot of certain hills with BA graves, and this action may subsequently have transformed them into realms of death, i.e. islands of death (Bradley 2000, 2006).

Rock art and maritime mobility

In this context it is interesting to consider the general maritime location of rock art and cairns in Bohuslän and the fact that it took about half a day to travel by sea between major rock art areas in northern Bohuslän during the BA. It has been suggested that the general location of the cairns indicates sea routes (see fig. 11.1) and during the historical era sailors and fishermen are known to have used these landmarks for navigation in the Bohuslän archipelago (Krantz 1940). Thus, during the BA maritime groups may have regulated and communicated their geographical, temporal and social positions by means of rock art in the seascape.

Let us try to imagine the predicament of a group of BA mariners forced by bad weather to interrupt a sea voyage and disembark on the nearest shore. They might have to wait for days for the weather to improve, scanning the seascape from vantage points and safeguarding their boat by the shore. In the meantime they could perhaps have produced rock art that combined images of memorable events with representations of their expectations. There are both historical and archaeological accounts in Bohuslän of sailors and fishermen who turned to rock art in circumstances like this. These “maritime rock art”, as they are known, date from the 16th to the 20th century. Situated rather high up on shores, islands, strikes and isthmuses that overlooked the sea routes along the outer Bohuslän coast, the rock art display images of compasses, shields, ship features, initials, dates and years (fig. 12.3, see Lundin 1999). The prehistoric rock art lie further east and seem to follow sheltered routes in what were then the inner skerries.

I have already discussed rock art's notably maritime location and the distance between rock art centres. Another point worth mentioning is that some of the main rock art localities in central Bohuslän have a close spatial connection to old roads that seem to have ended by the sea. It is as if the rock art and

pathways combined to form a pattern of movement, similar to the rock art in Tisselskog, Dalsland, with a succession of rock art panels from the former shore up towards higher ground or vice versa.

Could this pattern indicate that some of these places with rock art were used as markers or points for both concrete social and ritual transitions between land and sea? Roads, paths and trails may theoretically be seen as prehistoric infrastructure where the topography ruled out other alternatives, especially if they pass by or lead to prehistoric remains (Bradley 1997: 82). Thus, complex rock art sites in Bohuslän on lower, former maritime ground, tend to be situated at accessible places in the seascape, while those on higher ground are sited close to old roads, trails or natural passages in the landscape (Nordbladh 1980; Ling 2004a). The transitional elements, such as shores, roads and water, seem to be connected with rock art, whether on higher ground or in a maritime situation (Ling 2005, 2006). Could the making of rock art at these transitional places be related to van Gennep's ideas about demarcations and prohibitions in connection with territorial passages at communicative locations in the landscape? Could the rock art localities that display warriors in active aggressive positions at maritime or terrestrial vantage points indicate that these places were important boundaries? Localities with this content do in general have a communicative location in the landscape.

Bradley has stressed the connections between rock art and vantage points, paths and old roads in the landscape of Atlantic Europe (Bradley 1997). He argues that this pattern could represent a mobile praxis and mentality, only to be replaced by a more fixed agrarian system. The earlier tenure system, based on roads, paths and vantage points, was expressed in the location of complex rock art sites in the landscape.

Moreover, Bradley and Ingold argue that mobile or semi-mobile groups have a certain urge to communicate their positions in the landscape by the use of fixed natural features such as rocks or stones (Bradley 1997: 9). Their "messages" are inscribed, performed or made on vantage points or passages in the landscape (Ingold 2002: 233).

This perspective is applicable, with some modifications, to the maritime prehistoric rock art in Bohuslän. Moreover, many other rock art sites are to be found here on higher ground away from the sea, at natural vantage points, passages and old roads.

Rock art as a traveler's picture

Malinowski provides the following description of actions that were held before the departure of an oversea expedition among the Melanesians:

As is usual in such cases, months before the approximate date of sailing, plans and forecasts were made, stories of previous voyages were recounted, old men dwelt on their own reminiscences and reported what they had been told by their elders of the days when iron was unknown and everyone had to sail to the East in order to get the green stone quarried in Suloga on Woodlark island (Malinowski 1922: 148).

In keeping with this, it could be relevant to consider the mobile figurative applications of rock art, with numerous ship depictions, as a kind of traveller's picture, a maritime image, where representations of real events became mixed with myths, magic and brag. For instance, John Coles suggests that rock art may be traces of old men (women?) who communicated their experience of travels or journeys (Coles 2005). Kristiansen and Larsson argue that the Odyssey may have served as a general matrix for BA conceptions of travels and journeys (Kristiansen & Larsson 2005).

The sea in the rock and the rock in the sea

Another perspective to consider in the context of the shore is the interplay between the depicted rock and the sea. In this context the rock may have served as a "maritime canvas" that represented the sea and the location of the ship images may have been adjusted to features on the rock, such as prominent wavy veins of quartz (e.g. Pettersson 1982; Nordenborg Myhre 2004; Coles 2005; Goldhahn 2005, 2007: 163). This interplay would have been even more evident in localities that faced the sea, so that the latter's movements would be reflected onto the ship images and impart a sense of motion. Thus, the

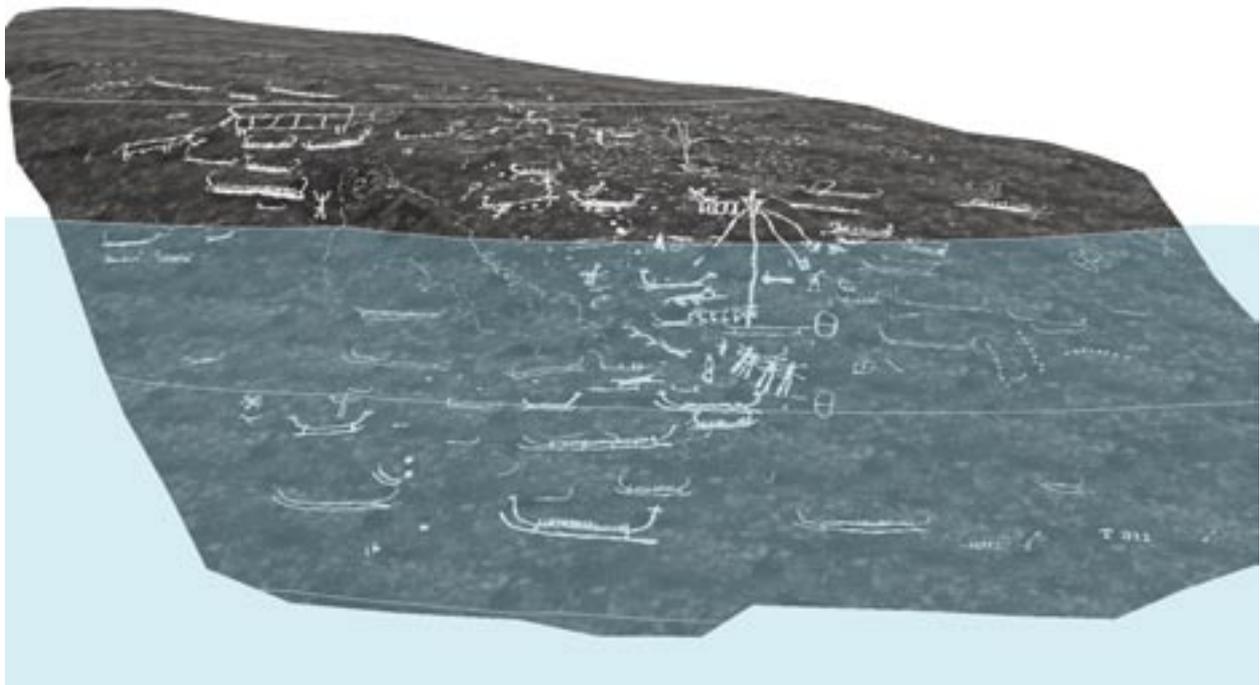


Figure 12.4. The sea in the rock, the rock in the sea, represented by the 3D-reconstruction by Chris Sevara of Tanum 311.

interplay between rock and sea, the sight of the sea, with its light, smells and sounds, could have provided an inspiration that affected both the process of making the rock art and of reading it (fig. 12.4).

The ship images are often arranged in relation to a regular flow of water. A clear instance of this is the vertical arrangement of ships at Aspeberget, Tanum 12, or entire compositions such as at Backa in Brastad and the large site at Torsbo in Kville (Coles 2005: 85–87). At some sites, which vary in the size, slope and altitude of the panel, it is only ship images that are placed where the water flows. This position seems to have been chosen to achieve a certain effect – the flow of the water and the reflections in it set the ship images in motion.

This interplay between rock, water, light and ship images creates an illusion that may have been intended to convey a picture of actions and interactions at sea. It can, for example, be interpreted as a kind of symbolic launching of the ships, particularly in the case of sites located on higher ground away from the sea. Water as an element seems to be con-

nected with rock art in general, both for localities on higher ground and for those in lower, maritime settings (Coles 2005; Ling & Bengtsson 2006). The rock art on higher ground seems to have a close spatial relationship to springs, streams, bogs, creeks, and rivers (Bengtsson 2004). Water symbolism and rock art seems to be a recurrent theme.

The ships on the rocks

The frequent ship representations on rocks, bronze items and graves, as well as the boat-shaped stone settings, suggest that human action and mentality were preoccupied with and oriented towards the sea (Artelius 1996; Kaul 1998; Kvalø 2000; Nordenborg Myhre 2004; Coles 2005; Kristiansen & Larsson 2005). The clearest indications of this are the location and content of the numerous exposed rock art panels dominated by ship depictions and situated on former shores. The interplay between the shore, the rock and the ship images seems to have been a significant feature of both the making and the reading of rock art.



Figure 12.5. Photo from the arrival of Götheborg (photo: Ivan Hagstig, cf. fig. 8.6, 8.22, 10.9).

The predominance of ship images is significant here. The ship images are the axis, infrastructure and prerequisite for almost any spatial, perceptual or pictorial form of utterance or action on the panels. At some localities, these spatial and pictorial performances are modified as ship images are altered, merged or superimposed. Every human scene with warriors, adorants or acrobats seems to be attached or connected, directly or indirectly, to a ship.

The most common arrangement of ships images on the rock is horizontal. However, this horizontal scheme is often spatially distributed in clusters and mixed with vertical or semi-vertical arrangements (Bradley 1999, 2000; Fredell 2003: 180; Nordenberg Myhre 2004; Coles 2005). This structure can be likened to a disorganised fleet, in some cases distributed over an entire panel, in others clustered or crowded at its centre. Ship scenes that are superimposed give the display an additional effect. This pattern calls to mind the intense maritime interactions between ships that occur in confined spaces, such as harbours, in connection with events such as a launching, a meeting or a celebration. A recent example is the launching, embarking and disembark-

ing of the *Götheborg* (fig. 12.5), a reconstruction of a 18th century merchant ship, when boats of all kinds and sizes swarmed and interacted in the approaches to the port of Gothenburg.

Imagine, for instance, the experience and expectations of a boat being launched in prehistoric times. The modern copy of the Hjortspring boat, for example, took about 6500 man-hours to produce (Valbjørn 2003: 235p), which is equivalent to one person working 8 hours every single day for 2 years. Whether the original boat took less or more time to build, the project would have been a huge investment in social, material and technological organisation, in wood technology and certain tools, in know-how and in time. The creation of a ship would also be associated with ceremonies, rituals and taboos. For instance, the Solomon Islands war canoes, which represent much the same technology as the Hjortspring boat (though with considerably more elaborate prows that are reminiscent of those represented on rock art), took 3 or 4 years to complete, so that may be a more reasonable time span for the construction of large BA craft.



Figure 12.6. A possible representation of the builder and the owner of a war canoe? (Kville 12, documentation by Högberg, now in VM).

Another social aspect connected with the construction of war canoes in the Solomon Islands is that stages of the building of a boat were marked by rituals that had to be performed (Clausen 1993). Malinowski observed that Melanesian craft builders considered work and magic to be an interwoven praxis that followed the technological, social and spatial stages of canoe-building:

Magical rites must be performed over the sea-going canoe when it is built, in order to make it swift and steady and safe; also magic is done over a canoe to make it lucky in the Kula. Another system of magical rites is done in order to avert the dangers of sailing. The third system of magic connected with overseas expeditions is the mwasila or the Kula magic proper (Malinowski 1922: 102).

Such actions have also been recorded from historical times in Scandinavia (Weibust 1958). In this context it is tempting to interpret the spatial distribution of rock art in relation to the spatial, social and ritual stages of building or launching a maritime craft.

This interpretation could also, to some extent, explain the location of ship images on higher ground away from the shore (fig. 12.6). Thus, the enlarged warriors, the ship lifter or the adorants adjacent to ship depictions could then have been made in connection with the building or launching of maritime craft, thereby manifesting the builder or the leader of the vessel:

The belief that the magician is a man endowed with special powers, controlling the canoe, makes him a natural leader whose command is obeyed,

who can fix dates, apportion work and keep the worker up the mark (Malinowski 1922: 116).

In this context the rock art may have functioned as the “magical” or ritual counterpart of the pragmatic and technological stages of such enterprises or events. In terms of this interpretation, rock art could have been made on higher ground while cutting trees for the proposed craft, adjacent to the settlement, or near the shore during the communal work of building the craft and finally on the shore in connection with performances and rituals of launching or embarkation and disembarkation.

To return to the topic of launching a craft, such a major social and material investment must have been of special significance. There would presumably have been numerous social, spatial, technological and material interactions that directly or indirectly involved households, kin and other social and “professional” relationships. Moreover, such a social event would no doubt have mobilised a cohesive, synchronised interaction and meeting of individuals and groups from different social and geographical arenas, close to or more remote from the launching area in question. Some of the complex rock art sites may have been related to the diverse ceremonies, rituals and events of boat-building, launching, embarking and disembarking.

However, no evidence of such actions has yet been found. We only have the rock art and it is easy to be side-tracked and seduced by ethnographic accounts and fictions, especially those that are so well articulated as Malinowski’s. These analogies can be a source of inspiration but cannot tell us about prehistoric interactions in Bohuslän. At the same time, it would be wrong not to quote these accounts because they may bear witness to a specific temporal and spatial praxis that is of some general significance.

Maritime performances

The actions depicted on the rock art seem to represent maritime performances and ideals that are expressed and articulated in connection with maritime praxis. Some of the ship images include depictions of humans holding paddles in particular poses that do not seem to articulate the act of propelling so

much as social status and maritime rituals. Once again, social position or socio-ritual codes seem to be more evident than more functionally oriented actions. Thus, common features are the social display of clearly depicted humans: kneeling, sitting, raising paddles, blowing lures, raising weapons, fighting, adoring, or tumbling.

There are striking similarities between these performances on the rock art and those displayed and recorded by the maritime Indians of the northwest coast of America from the beginning of the 20th century (Boas & Codere 1966; Holm & Quimby 1980). Their craft are dugouts made of pine, some of them 20 m long and 2 m wide. It is also interesting to compare the decorated prows and the steering rod, as well as the elevated position of the steersman and the severe “shaman performer” in the fore of the canoe who recalls the enlarged warrior in the fore of some rock art ships in northern Bohuslän. What is perhaps most interesting, however, is the action in the ships and their performance and appearance by the shore.

In Curtis’ film “In the land of the war canoes”, the maritime performances are made very suggestive and dynamic by the interplay with the maritime environment. The paddlers in these performances are in a similar position to those displayed on the rock art (fig. 12.6, cf. 10.19, 10.22). These communicative performances were executed in specific, charged social events such as competitive feasts, meetings, initiations and warfare (Boas & Codere 1966; Holm & Quimby 1980; Hayden 1995).

At some rock art panels in Bohuslän, an enlarged, often horned, warrior is depicted in connection with the same ship as seated figures with paddles. As mentioned earlier, this suggests a need to stress scenes and codes of social inequality. It is, indeed, hard to imagine a more explicit representation of a social code. On the subject of social positions and social codes as depicted on rock art, it can be mentioned that the professional paddlers who propelled the Hjortspring replica had similar codes of communication and performance. Collectively raised paddles are a gesture of respect that is evident in many maritime cultures, regardless of time or space (Kaul 2003). Kaul describes the cohesive actions and motions performed by the professional paddlers of the



Figure 12.7. Maritime performances by Kwakiutl Indians on the northwest coast of North America (stills from C. Curtis' film "In the Land of the War Canoes", from 1914).

Hjortspring replica as a very special experience, as their synchronised movements drove the boat faster and faster, accompanied by the rhythm of the drums (Kaul pers. comm. 2004).

A straight interpretation of the maritime actions depicted on the rock suggests that they represent actions such as competitive feasting, meetings and initiations. These actions could accordingly have been performed in connection with specific temporal, social or spatial aggregations or events, such as rites de passage, journeys, transference of power, launching boats, or death.

Consequently, the rock art in northern Bohuslän might be interpreted as traces of a “social geography” placed in “a third space” (Hood 1994; Helskog 1999; Nordenborg Myhre 2004; Ling 2005, e.g. Bhabha 1994); a maritime space for different social, economic and ritual interactions, transactions and initiations, used by both a domestic and a non-domestic public, preferably on a seasonal basis.

Coda

The practice of prehistoric rock art in the Bohuslän landscape had and has numerous dimensions. Only some of them have been discussed in this thesis. My intention was not to advocate a general model or law for the interpretation of rock art in Bohuslän. For my purpose it was highly important to apply specific data on shore displacement in northern Bohuslän. Using this data, I demonstrated that in the BA the majority of rock art sites dominated by ship depictions in Bohuslän had a very close spatial connection to the sea.

The perception and use of the landscape has not previously been a main target of analysis. Instead, more attention has been paid to various mythological, cosmological, ideological, ritual, eschatological or religious configurations in the rock art images,

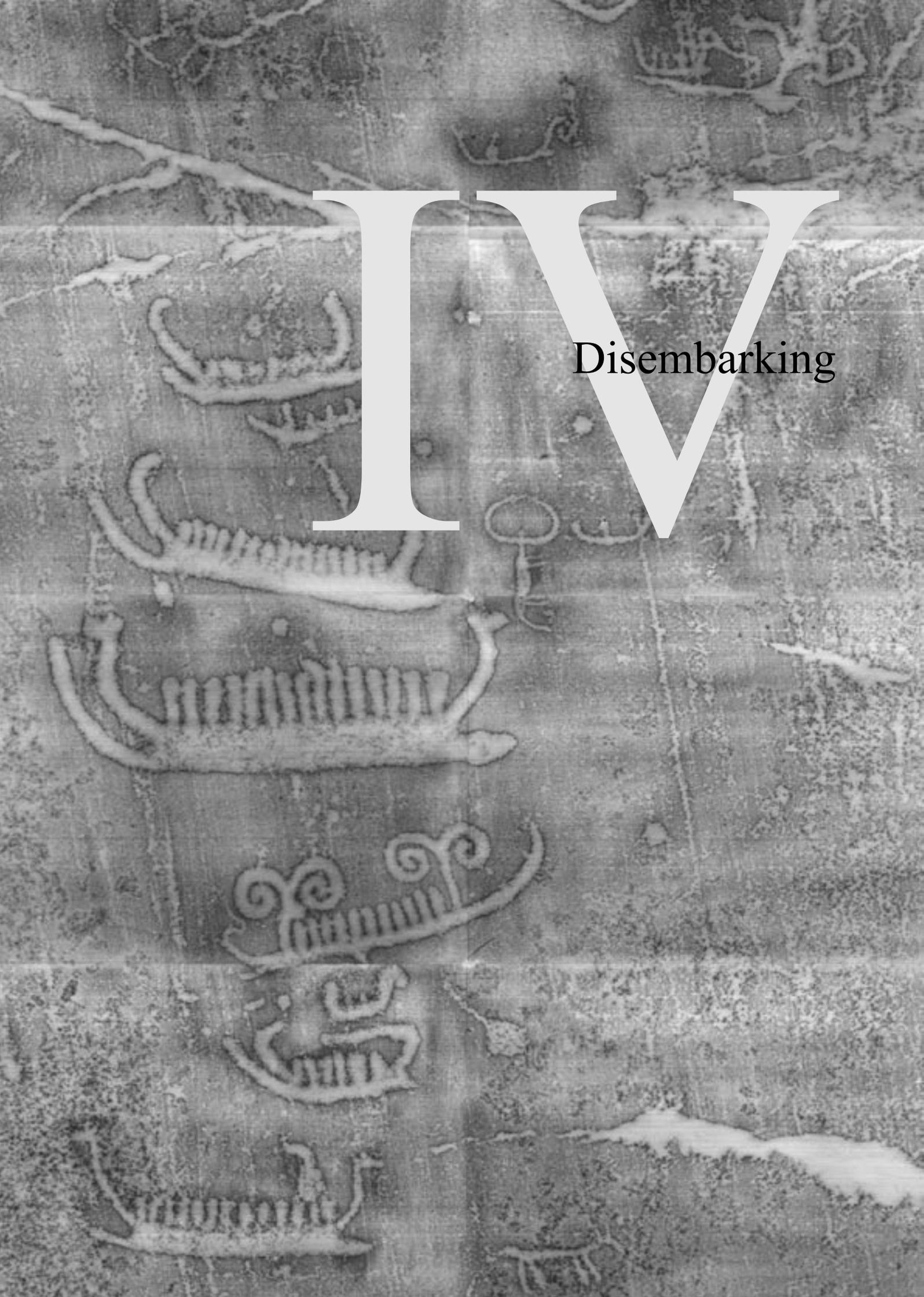
with less reference to a concrete social world or a particular landscape. That this has been the case is hardly surprising because the images are so evocative. The rock art certainly operated in a variety of dimensions, as a highly ritualized medium, made in or for special social or ritual settings.

I began this thesis by discussing the difficulties in analysing and understanding rock art areas that have been greatly transformed by shore displacement. The outcome of the fieldwork led me to appreciate the potential and possibilities of this rather than all the problems. At various symbolic and pragmatic levels, the seascape may have inspired and influenced the making, utterance, position and content of rock art in the area during the BA. But there are also numerous rock art images on higher ground at some distance from the sea. Thus, rock art was located in different types of landscape and its prehistoric functions and relations should be regarded as complex and full of nuances.

Thus, rock art’s different patterns and relationships need to be distinguished and defined. For instance, in excavations at rock art sites in northern Bohuslän, comparatively small sites located on higher ground have yielded a large number of prehistoric finds and features, whereas the finds at larger, monumental sites with more communicative locations in the landscape have been very sparse. This pattern indicated that complex rock art sites in northern Bohuslän tended to be sited at accessible and communicative locations in the landscape, away from settlements. This thesis has provided some answers but it has also raised further questions. Why was the making of rock art so intense during prehistoric times in Bohuslän? What societal stress, action or interaction may have generated the making of these elaborate images and utterances?

IV

Disembarking



13

SUMMARY

Towards a maritime understanding of rock art in northern Bohuslän

In this thesis I have tried to argue for an alternative social and maritime approach to the rock art in Bohuslän. The approach relies on various empirical, historical, chronological and theoretical means, methods, and understandings. Here I attempt to summarize the results of the arguments put forward in the preceding chapters.

Chapter 2. The Bronze Age in northern Bohuslän

Some general conditions for the Bronze Age in northern Bohuslän were presented in this chapter, which gave a broad account of some of the archaeological, geological, botanical and osteological evidence of Bronze Age activity in that region. This general account served as a frame of reference for relating the facts to the subsequent discussion of society and rock art.

New shore displacement studies have shown that in the BA about 30% of today's arable land in northern Bohuslän was covered by the sea and that at the end of the BA the shoreline was roughly 6 m lower than at the beginning. Pollen studies from this region's coastland have shown a generally similar chronological pattern, which may indicate that this development applied throughout the region. The first phase of deforestation and expansion of heathland

began around 2000 BC and lasted until about 500 BC. The most likely cause of this transformation is the human impact. It is notable that this change in the landscape correlates with the archaeological record of bronze items, flint daggers and sickles from the LN to the EBA. Pollen records from all areas in northern Bohuslän suggest that agricultural activity made its first general impact from about 0 BC onwards. Another point worth noting is that the making of figurative rock art in this area seems to have ceased at about that time.

A number of excavations at rock art sites in northern Bohuslän have been carried out in connection with the Tanum project. The general outcome was that comparatively small rock art sites located on higher ground yielded a large number of prehistoric finds and features that correspond to the typological dating of the rock art images. In contrast, excavations at larger, monumental rock art sites with more communicative locations in the landscape yielded very sparse finds and no concrete prehistoric features.

The general spatial distribution of house structures and settlement finds indicated that individual households were scattered across the landscape and mainly located in the coastal zone. The house structures are mainly erected on well-drained sandy soil, in some cases with parts placed directly on the bedrock. This practice seems to be specific to pre-

historic house structures in northern Bohuslän and this building tradition is also characteristic of house structures built in the area in historical times.

Up to now it is a pastoral or agrarian economy that has been highlighted with regard to the BA in Bohuslän but the overall osteological record suggested a more complex pattern. In this region, osteological remains after fish are, in fact, more common than finds from domestic animals. There is also evidence of bronze casting and metallurgic activity in Bohuslän. Moreover, several mounds containing fire-cracked stones and traces of melting have been excavated in both the Gothenburg and the Tanum area.

It is noteworthy that excavations of BA graves in Bohuslän have uncovered just a few cases of graves equipped with bronze items, gold or elaborate stone cists. This may indicate that burial praxis in this region reflected social inequality or stratification.

The bronze items in Bohuslän include 51 from the EBA and 163 from the LBA. Thus, from a low consumption of bronze during the EBA, Bohuslän advances to become one of the major regions of bronze consumption during the LBA. In this context it was of interest that the rock art in Bohuslän is mainly from the LBA. Bohuslän also has a considerable number of flint daggers and sickles. There are approximately 450 daggers, imported from Jutland in Denmark, and they are particularly frequent in the Tanum area, which has a quarter of all the daggers in the region.

Chapter 3. Social landscapes

This chapter presented various works and theories regarding the social perception of the landscape. The primary focus was on perspectives that have influenced my work.

A vital point for my thesis was how changes in the landscape could be perceived and understood. This matter has a clear social and philosophical dimension. From my point of view, it was not the subjective or the pure ideographic “being” perspective that was of interest but rather more socially orientated theory that considers different social and cognitive aspects of the landscape, related to social and ritual praxis. Thus, more concrete social theories about praxis and changes in the landscape that could

be related to archaeological, geological or botanical facts have doubtless exerted most influence on my work, rather than economic or mythological models or generalisations.

Chapter 4. The terrestrial paradigm

This chapter on the history of research dealt with social and historical perceptions of the relationship between rock art and landscape in northern Bohuslän. The aim was not to capture all the trends and interpretations of rock art, but to focus on how social and epistemological facts, theories and features, within archaeology and geology, have shaped and biased the perception of rock art and landscape in northern Bohuslän.

One of the main issues was why rock art research in Bohuslän traditionally either disregarded or only briefly discussed the correlation between the location of rock art and the BA shoreline. I argued that this “thought style” was established in connection with the introduction of “bebyggelsearkeologi” (settlement archaeology) in Uppsala, Sweden, in the early 20th century. At the same time, influenced by Oscar Almgren, rock art research progressed in the same direction.

Rock art research in northern Bohuslän, traditionally but even today, has clearly been governed by this terrestrial thought style, due to a complex mixture of socio-historical, socio-scientific and methodological constraints. Thus, over the years, two major trends have characterised rock art research in this area. An earlier school, a maritime thought style, stressed the close relation between rock art and the sea, claiming this to be a reflection of a marine identity, activity, interactions of bronzes and long-distance contacts and trade. A later school, the terrestrial paradigm, has had the greatest impact on contemporary research, which accentuates the close correlation of rock art with agriculture and settlements through features in the contemporary landscape. The major forces behind this thought style have been the theory of land uplift and the evolutionary conception of the BA sedentary farmer.

Consequently, BA formations in Bohuslän have been treated as sea-absent, agrarian fractions. The dominant ship motif has been perceived primarily as an icon for ancient Germanic agrarian religion,

not as a symbol of real or ritual maritime actions in the landscape. Only rarely has the discussion stressed the aspects of coastal activity, mobility and identity.

Chapter 5. Rock art and seascapes in South Scandinavia

A major hazard when working with rock art in the landscape of northern Bohuslän is the tug-of-war between shore displacement and the power and impact of today's landscape. It is difficult to grasp the transformations which this landscape has undergone over more than 3000 years and to recognize that in the BA major parts of this landscape were a seascape, with its strikes, islands, isthmuses, bays and lagoons. There is the absence today of certain perceptual and sensory features associated with a seascape, such as sounds, smells, light and specific animals and vegetation, accompanied by the presence of typical agricultural features. All this seems to contradict a perception of the BA rock art that assumes a maritime environment.

My argument, based on the new shore displacement data in Bohuslän, was that during the BA many rock art sites were in fact located in a seascape. In order to understand the implications of this and the changes which the landscape of northern Bohuslän has undergone since the BA, I made analogies with other rock art areas in South Scandinavia, such as western Norway, Dalsland in western Sweden and Scania in southern Sweden, where shore displacement has not transformed the landscape/seascape as dramatically as in Bohuslän. The rock art in these areas seems to have been made in succession, from higher ground down towards the sea or lakes. The water's presence here is very powerful and its appearance, light and motion tend to distract the viewer from the rock art images. The combination of rock art and an expanse of water seems to be a common Scandinavian theme. Indeed, the element of water appears to be common to rock art in general, both on higher ground and in a maritime setting. Water symbolism and rock art are accordingly a recurrent theme.

Chapter 6. Shore displacement, tides and altitude

The main purpose with the studies of shore dis-

placement for this thesis was to be able to discuss more specific issues about how shore displacement affected the landscape and rock art, spatially and chronologically, during the BA. In this way, shore displacement may contribute to a deeper understanding of the changes in the landscape and also help to determine the maximum age of the rock art in the Tanum and Kville area in northern Bohuslän.

Thus, new studies have indicated that today's altitude of the BA shoreline is slightly (about 1.8 m) higher than Tore Pässe suggested for Tanum; the difference probably has to do with improvements in the methodology. This suggested that the shoreline around 1800–1700 BC has an altitude today that is closer to 17 m.a.s.l and around 600–500 BC to about 9–10 m.a.s.l. This "hypothetical" curve was highly interesting because it supported the hypothesis based on the measured altitude and estimated age of rock art in Kville and Tanum. The new curve fitted well inside the interval of about 1–2 m for errors that Pässe stresses for his study in Strömstad. This made it possible to use Pässe's model and work with a slightly (about 1.2–2.3 m) higher shoreline altitude for the northern and central parts of Bohuslän. The most interesting point, however, was that much the same altitude for the BA shoreline was indicated by the measured rock art ships. This implied that the archaeological approach to comparative dating is a quite reliable relative dating method. Moreover, when these two independent methods correspond, they may be combined into a tool for determining rock art's maximum age.

Finally a brief account was presented of data on altitudes in the area, as well as on accumulations of sediment and tides. The findings suggested that altitudinal studies of prehistoric sites in the area cannot rely on the economic maps. Instead, it is necessary to use specific GIS measurements of the rock art sites and terrain. The GPS measurements showed that the altitude of both the land and the rock art localities diverges considerably from data on the economic maps; in general there was a discrepancy of 1–3 m, sometimes even more. Secondly, the lower plain areas have been intensively cultivated for at least two centuries, some parts since medieval times. Recent archaeological surveys in these areas have shown that at least 1–1.5 m of agricultural sediment has ac-

cumulated and shifted from higher to lower ground. This implied that the altitude of this lower land must have been at least 1 m lower in prehistoric times. It followed that during the BA the sea was considerably more present and closer to these rock art sites.

Chapter 7. Rock art chronology and seascape in Bohuslän

An essential aim of this thesis was to present new and alternative chronological aspects of Bohuslän rock art. Unlike other attempts, this study was based on rock art images from the local landscape, not on images from distant bronze items or graves. The following analysis used measurements of low-lying rock art localities with ship depictions from different parts of Bohuslän.

More than 104 rock art panels were sampled that together contain 686 ship depictions, including panels from the Gothenburg area in the south to Tanum in the north. Two independent approaches to dating – shore displacement and comparative chronology – were applied to the same rock art material. Finally, I discussed how this alternative chronology could contribute to a wider understanding of the rock art's social and spatial traits in the landscape. In the final section of this chapter, the most significant ship depictions in the study were considered in relation to shore displacement simply by placing them in the new shore displacement schema for the Tanum area.

The shore displacement data showed that the lowest ship images with outward turned stems that end in an animal head could not have been made before period IV. The lowest measured ships have some very specific characteristics. They are symmetrical and have a bifurcated stem fore and aft. These characteristics have been seen as typical chronological features of the PRIA. However, shore displacement would have made it possible to peck these ship images as early as the transition between LBA period IV and V, so these observations did not automatically justify dating these ships to the PIRA. Another observation concerned localities with ship images that display traits which are typical of the earliest phase of the EBA, period I, traits similar to the ship depiction on the Rørby sword, dated to period Ib. Another noteworthy fact was that some of

the ships located at high altitudes in the landscape are very similar to some of the Norwegian ship images that have been connected to the LN.

So why were all these early ship images located at such high altitudes? Why were none of these typical ships placed closer to the seashore, like the later ship images from period II to the PRIA. Might it be logical to assume that open-air rock art, such as ship images, was first made and articulated in the landscape and was then acknowledged as functional social and ritual symbols which later ended up on bronze items and graves?

The outline chronology was primarily based on the altitude of the ship types in relation to shore displacement. The final ship scheme, however, was based on the agreement between, or a synthesis of, two chronological methods that seemed to harmonize very well, namely shore displacement and comparative chronology.

This generalisation may be of some chronological relevance for rock art in Bohuslän but one should be cautious about removing or abstracting ship features from their landscape context. It is preferable to study the context of motifs on these panels and the setting of the specific panels in relation to shore displacement.

Chapter 8. Modeling landscapes and seascapes in the Tanum area

This chapter presented the fieldwork, the measuring of rock art and the surrounding terrain in Tanum. About 70 percent of all the rock art in the World Heritage area of Tanum have low locations, near what in the BA were shallow bays, estuaries and inlets. However, this statement needed to be qualified. The questions addressed in this case study were as follows. In which specific ways did shore displacement during the BA affect these rock art sites? For how long were these panels in use? How close was the sea to the rock art sites? Was the sea a major factor behind the choice of sites and if so, would these observations throw more light on rock art as a means of social and ritual communication during the BA?

Most of the rock art sites seemed to have been located between 0 and 100 m from the sea-shore, a large proportion of them between 0 and 20 m from

the shore. This was also the case in the Kville area. However, only a minority, about 10 percent, seemed to have been located just at the water's edge. Most of the panels appeared to have been made on rather elevated outcrops, some metres above the BA shoreline. Even so, the horizontal distance between these rock art sites and the shoreline was short in the BA. This also applied to the rock art in the Kville area. However, there were also many rock art sites, about 30 percent, on higher ground at some distance from the sea. The BA seascape would have connected and united areas with rock art and made these sites considerably more accessible than today.

The largest figurative rock art sites dominated by ship images were located close to the BA shore, while sites with large humans, as well as most of those with cup marks only, were placed on higher ground. The strategic maritime setting of the rock art, in a transitional shore zone, may reflect various forms of maritime movement, interaction, positions, initiation, ideals and traditions. Some of these panels may also have functioned as strategic meeting points between land-going and sea-going communications. The ship depictions, positions and formations make the greatest impact and dominate the panels not only by their size and frequency but also with their elaborate styles and utterances. The content and situation of the panels may indicate that they were meant to reflect social actions, conditions or ideals at sea. Some sites were probably meant to be seen from the sea, at least from a short distance.

The study showed that the performance of figurative rock art was limited, as regards localities, images and expression, from the beginning of the EBA towards period II; common features were depictions of ships with anonymous crew, sun/wheel crosses, single weapons and cup marks. During the next phase, period II-III, the figurative rock art increases in number and utterance; human gear becomes visible, such as warriors and their equipment, lures, and other designs. The ship images are altered to out-turned prows that end in animal heads. During period IV-V, the production of rock art increases dramatically and peaks. At the same time, the performance of the images becomes highly innovative and elaborate, especially the depictions of humans in different social positions, bodily performances

or scenes; scenes in ships, warriors, plough scenes, scenes with chariots, wedding couples, acrobats and adorants. Ships, animals and other designs also become highly complex. During the subsequent phases, period VI and the PRIA, both the number and the utterance of rock art sites in the area seem to decline. However, in the PRIA the expression is still highly elaborate, though more pragmatic than in earlier periods. During the PRIA, symmetric ship images replace the asymmetric from the BA. Horses are more pronounced and horsemen are introduced; four-wheeled wagons and warriors with rectangular shields and humans with square bodies appear.

The study showed that the prehistoric remains with the closest spatial relation to the rock art are grave monuments such as stone settings and barrows. Bronze Age settlements and settlement finds are generally located at some distance from the areas with frequent figurative rock art sites, usually 400–1000 m. Finds that could indicate more permanent BA activity or settlement, such as bronze items, ceramics or flint daggers, are mainly located northeast and north of the low-lying Tanum plain. Less complex figurative sites and sites with cup marks only are in general located closer to prehistoric settlements than the complex figurative rock art sites.

However, it should be born in mind that only a few extensive settlement surveys have been conducted close to rock art sites. Still, the measured altitudes of the low-lying terrain adjacent to the most frequent rock art area in Tanum clearly demonstrated that BA settlements could not possibly have been sited here because at that time this land was under water. These facts severely limited and even refuted the notion of prehistoric settlement on the lower plains where a majority of the rock art sites are located. Thus the sea seems to have been the major feature towards which the rock art was deliberately oriented, a relationship that is far more frequent and substantial than agricultural features or settlements. The rock art seems to have been made in succession from higher ground down towards the sea during the BA, in a similar way to the rock art today in areas such as Tisselskog in Dalsland, West and Southwest Norway and Simris in Scania.

Thus, the sea was very present in this landscape during the BA and it may have affected and mir-

rored the rock art activity on different physical, social, ritual and cognitive levels. However, the BA people did not follow the regression of the shoreline; they rather made rock art at specific places in the landscape/seascape that corresponded to their social norms and traditions. This praxis seems to be accompanied by a parallel action whereby rock art is made regardless of the shoreline's regression and cannot be explained with reference to the same causes and conditions.

At many places, for instance Vitlycke, Aspeberget, Tengenby, Kalleby and Litsleby, it seems that older panels on higher ground were being altered, merged, re-vitalised and upgraded in later periods. Two concepts may be used to describe these actions: depictions of social landscapes and depictions of social memory of a place. Some of these rock art sites were first made close to the sea, perhaps in order to connect with or meet interactions or ideals at sea. As the seascape turned into a landscape, some of these sites became remembered, re-negotiated or revised into upgraded places of memory and tradition.

Moreover, some rock art sites seem implicitly or explicitly to illustrate the landscape or actions connected with the landscape. Most of the ship images, for example, were made close to the shore. Also, human figures, animals and ship images in a broad sense appear to have been represented and adjusted after certain landscape concepts and ideals. Thus, the largest human images were made on higher ground and abnormally large in relation to the ship depictions on the same panel. On lower ground, human representations seem more or less to have been adjusted to the size of the ship images. Moreover, the rock art sites from the PRIA appear to represent similar notions about the landscape, with humans made considerably larger than the ship images and sites dominated by horse figures. In a sense, these images unambiguously denote the conditions for acting and interacting within the immediate landscape/seascape. This could be interpreted as an interchange of new images and ideals in accordance with changes in the landscape. Other figurative rock art images or scenes such as foot soles, warriors, sun/wheel crosses and wedding couples, seem to have a rather even distribution in the landscape and no specific spatial pattern could be observed.

The study also clearly demonstrated that of all the figurative images on the investigated panels, ship depictions clearly predominate. It is not unusual for rock art researchers to detach humans from other features such as ship images. This procedure is debateable, especially if the aim is to reconstruct and discuss the social norms that may have governed the production of the images. The frequency of ship images can be taken to indicate that these were the most important features to depict. However, cup marks are often as frequent as the ship depictions on these panels, if not more so, and there are some sites with cup marks only that have the lowest location of all the rock art. But the general rule is that panels which only contain cup marks seem to be most frequent on higher land.

Richard Bradley distinguished between accessible and inaccessible rock art sites on the basis of location and content in a study on British islands. I attempted to apply Bradley's criteria to the area studied here, with the following results. A majority of the rock art sites seem to have been located at rather accessible places in this seascape, while a few sites have a content and location that make them inaccessible. However, there is an important factor that has to be taken into account when applying these criteria to the prehistoric situation in Tanum, namely the sea. The presence of the sea made rock art sites that today are regarded as inaccessible considerably more accessible in prehistoric times. Moreover, a majority of the panels could hardly have functioned as communicative signs over a wide area. Only the minority on a 45° slope may have fulfilled this function. And even where this may have been the case, the visibility of the images was probably very limited. Even if the images were painted, of which there is not yet any concrete evidence, they would still not have been visible beyond 10–30 m.

The sea would have connected and united several panels and could have made some panels more accessible. In the light of the existing and dominant seascape in the BA, these criteria must therefore be modified or redefined as follows: Accessible sites are those that have a complex arrangement of images and, of greater importance, are possible to reach from both the sea and the land, besides being visible from both the sea and the land. Inaccessible sites are

then those that could have been reached, made and perceived only from the sea.

Thus, the conclusions drawn from the measured altitudes of the rock art and terrain generated some general ideas about the placing and making of rock art during the BA in this particular area.

Chapter 9. Social practice and rock art

The new conditions that have been stressed regarding the rock art, its general maritime setting and content, made it possible to discuss new social issues and interpretations of rock art in Bohuslän. The discussion was divided into two steps. In the first I discussed the similarities and differences between rock art ships in the landscape and those in graves and on bronze items. The second step focused on the act of producing rock art and then moved on to social theory related to this field and finally to the palpable forms of consumption of rock art. The concepts ideology, fetishism, material and spiritual production, social praxis and social action were related here to ideas articulated by scholars such as Karl Marx, Max Raphael, Maurice Godelier, Sven Eric Liedman, Anthony Giddens, Christopher Hawkes, Lewis Binford, Per Cornell and Fredrik Fahlander, and Peter Skoglund.

Thus, some rock art images, such as the ship, have traditionally been compared with the images made on bronze items and in graves. However, there are great differences regarding the conditions and the context in which these images were produced or consumed. These differences needed to be stressed. As the social groundings of the production and consumption of rock art have seldom been discussed, important facts and conditions have been disregarded. It was therefore important to consider the social act of production, not merely the mythological reading of the images. It is thus the social praxis in the landscape that is of importance when considering rock art, not primarily myth and cosmology. Much rock art analysis has focused on the contemplative observer, and elaborated these themes. Activities related more immediately to rock art have seldom been focussed directly.

One of the major aims of this thesis was to discuss more socially oriented aspects of rock art. To be able to move forward in this discussion, some gen-

eral social theory had to be considered. The account started with a short description of the philosopher Marx's and the anthropologist Godelier's ideas and concepts regarding material and spiritual production and moved on to a brief account of ideas about Palaeolithic rock art put forward by Raphael, a Marxist and Semiotic inspired art historian and art theoretician. This was followed by a resumé of views on social practice from Giddens, some of whose ideas have influenced the rock art discourse.

Raphael stressed that form, shape and structure are the most significant features of rock art and determined its content and style, not vice versa. According to Raphael, rock art was not merely an imitation of natural conditions, nor dependent on external physical conditions or historical circumstances. It rested upon innovative and creative premises that in turn were dependent on specific historical, societal, individual and physical conditions. The act of representation was thus primarily an active social operation, not a passive religious declaration or a simple illustration of nature. Raphael further stressed that art, including rock art, must in general be seen as "the constitution of a world of more or less autonomous forms, which draws its life from itself and which is adequate to the contents".

Social and cognitive aspects of depiction and symbolism

This section presented a selection of approaches to image, communication, symbolism and social action. The selected perspectives, which were taken from the Palaeolithic rock art researcher André Leroi-Gourhan, the anthropologists Maurice Bloch and Göran Aijmer and rock art researcher Åsa Fredell, discussed the relations and differences between cognition, communication, symbolism and social action. These perspectives were important for the final discussion in this section of the thesis concerning the process of making and performing images.

Ideas about material objects and things as a kind of language and text have had a considerable influence on material studies in anthropology and archaeology. However, scholars have become more cautious about these constructivist assumptions and pointed to the interpretative discrepancies between lingual signs and material objects and symbols. For

instance, Aijmer acknowledged that many anthropologists have encountered difficulties in obtaining concrete lingual information about symbolic and ritual praxis. They have stressed that social action with a symbolic or ritual aspect may not belong to the same cognitive realm as speech. It would then be inappropriate to use linguistic classifications, theories and concepts with reference to certain social actions.

The perspective that is most socially oriented and most important for my thesis was Aijmer's work on symbolism. Therefore more space and emphasis was given to Aijmer's work, especially his ideas about "iconic orders", that is, dynamic messages or constructions that mainly appear and operate under social categories such as art, music, ritual or religion. The producers and reproducers of these social actions are often fully aware of the symbolic meanings and functions and of the "iconic codes", but cannot express them linguistically. Thus the images of "iconic orders" are charged with suggestive and dramatic messages rather than textual informative messages or narratives. Their complex structure is gained by merger and integration, classification and association. In conclusion, the iconic orders work in symbolically charged events and situations, express rather than inform, and operate outside language and mundane facts.

There are many connections that could be drawn between iconic orders and rock art. First of all, the making of rock art seems to be an elaborate process set aside from mundane life, as manifested by the investment in time and aesthetics and by the specific "code" of content, structure and location. Secondly, the reading of these "messages" could also be related to the iconic realm. The following conclusions could be drawn from the theoretical aspects of rock art:

- The rock art is a kind of "socio-symbolic medium" that stemmed from social reality and social praxis.
- The act of depiction was thus primarily an active social operation, not a passive religious declaration or a simple illustration of nature.
- It is therefore the social praxis in the landscape that is of importance when considering rock art,

not primarily myth and cosmology, even if these elements played a role in the process of making. Thus, rock art was mainly a social articulation, but not a direct description of social matters, values and relations; it was rather a twisted and distorted depiction of a social world.

- The images pecked in the rocks did not only communicate pleasant, perfect cosmological or mythological ideals. The performance of their form and content clearly reveals discrepancies and double standards; mobility, stress, antagonisms and conflict occur as often as immobility and harmony.
- Rock art was not only shaped after oral or linguistic premises; the picture operated on a higher, more complex cognitive level. Thus, the rock art images were charged with social messages that are suggestive and dramatic rather than with concrete linguistic information and narratives.
- Rock art sites were social domains of own realities, created and performed "beyond linguistic thinking and reasoning".

The social dimensions of rock art

This section presented an attempt to apply some of the theoretical perspectives so as to be able to discuss some social traits in the images. It included a broad outline of categories with regard to social dimensions of the material.

It should be noted that the material seemed to represent different degrees of social information and intent. Some panels appeared to illustrate more concrete social information, while others seemed to have a suggestive message. This led me to a division into three broad social spheres:

1. Depictions of social environments and actions.
2. Depictions of social positions.
3. Depictions of "iconic" features or elements.

These spheres are not discrete entities. All panels contain images with aspects from at least two of them, often all three, or demonstrate an interaction or interface between them. However, some panels seemed to illustrate more articulated social matters, while others had more to do with suggestive, ritual

matters. In some cases, the suggested spheres may involve the location, context and content of an entire panel. Hence, due to their content, projection, location and utterance, some panels seemed to be dominated by one of the spheres.

For instance, panels immediately connected with the shore and dominated by ship depictions have human figures that are proportional to the ships, while panels located away from the shore have human figures that are abnormally large. These features may be related to the first, more realistic sphere, which seems to recount real actions in the landscape.

Chapter 10. From terrestrial ships to war canoes

The general theoretical framework I outlined regarding the social act or process of depiction made it possible to move on to a more socially oriented analysis of the rock art ships and anthropomorphic representations in them. Several scholars have already studied and stressed the religious and symbolic aspects of the rock art ships, and there is no doubt that these images should be considered in terms of the “iconic orders”, especially those made with certain iconic elements. The aim of this study, however, was to highlight social aspects of the rock art ship.

The studied rock art ships are clearly governed by a strict dimensional code, for instance the proportions of the hull measured between the stems. The proportions of hull, stem and prows on the rock art ships closely correspond to the Hjortspring ship’s proportions in these respects. This may indicate that the rock art ships could have been based on a similar plank-built tradition.

The strong similarity between ship depictions on the rocks favoured the hypothesis of a continuous boat-building tradition in Bohuslän from the EBA to the PRIA. Moreover, the study showed that the average BA ship is attributed with a crew of 7–11, which may support the theory of a local mode or tradition of building boat of a certain size in the Tanum and Kville area during the EBA–LBA. These vessels may then have represented prevailing norms and ideals among the local social units when it came to building and crewing boats for regular maritime missions such as short and middle-distance transport, trading, deep-water fishing and communica-

tion. The large ship images with numerous crew or crew with clearly defined positions in the ships, elevated or enlarged individuals with warrior attributes, may be regarded instead as military or ceremonial vessels such as war canoes, staged and used for special maritime events. Thus comparisons between archaeological and ethnographic data indicated that the large BA ship images with many crew strokes could have been based on real ships. This may modify the religiously oriented interpretations that see the rock art ships primarily as “agrarian fetishes” or cult ships with no reference to any existent maritime reality.

Chapter 11. Rock art and society

The archaeological material from BA Bohuslän, such as graves, bronzes items and rock art, indicated that the societies were hierarchic or socially stratified. Some scholars have argued that the rock art may reflect a medium or resource which competitive persons or groups used to achieve a more favourable position in the social formations. In this context, some scholars have explicitly or implicitly suggested that rock art primarily served elite groups, e.g. chiefs. However, these assumptions have been questioned, especially regarding the use and role of rock art, for which other actions, situations, individuals and genders have been suggested. This raised the question: what is a chiefdom? Are there other concepts which are more applicable to societal situations and social formations in BA Bohuslän? What material conditions do we have? Moreover, should the action and consumption of rock art be seen primarily as an elitist preserve or is it more likely that other social formations or groups also exploited this medium?

The BA burial material and rock art in Bohuslän indicated that societies were socially stratified. However, it was more difficult to find firm evidence of a stable form of chiefdom in BA Bohuslän. The institution or form of stratification may have resembled a “less complex chiefdom” but it was questionable whether a very specific theocratic form of inherited chiefdom/priesthood existed here in the BA. Still, periods of temporary stabilization most certainly occurred and may have led to more complex social stratifications. The increased number of

bronze items and rock art panels during the LBA in Bohuslän may indicate this. But the rock art panels did not appear to meet the spatial or social criteria of control or privacy that are inherent in a chiefdom. In this respect they seemed to reflect public rather than private matters. There are other monuments or items, such as cairns, stone settings, barrows and bronze items, that seemed to meet the “chiefly” demands of closeness, control, and privacy more than rock art does. Bearing this in mind, it was tempting to relate rock art to more communal rites, such as seasonal maritime transitions and aggregations in the landscape.

Another matter was that, since Oscar Almgren, there has been a tendency to picture the groups in Bohuslän as passive; either passive sedentary agriculturalists who performed seasonal cults by the rocks, passive cattle breeders who supplied meat and hide to the “agricultural accumulation areas”, passive imitators of visitors with bronze items, or a passive transit zone for travelling chiefs. Instead, I emphasised that groups in BA Bohuslän were highly active and mobile, as is evident from both the number of flint daggers, sickles and bronze items and, perhaps even more importantly, from the high frequency of maritime images on rocks adjacent to the BA shore. It seemed that Bohuslän, just like several other areas, does not fit the traditional interpretation of the BA societal matrix or the prevailing idea of Bohuslän as either an agricultural or a pastoral production area in relation to the “agrarian accumulation areas”. The sparse evidence indicated a more complex pattern of utilisation and social praxis that could have been dependent on a mixture of maritime, agrarian and pastoral labours.

The general location and content of BA remains do in fact indicate a slight preponderance of the maritime realm, which seems to have included both socio-ritual and socio-economic elements of production and consumption. At the same time, it can be argued that each sphere had a certain autonomy, and that their social forms differed considerably. Nevertheless, the numerous configurations of ship images on rock could indicate a general transition or drift towards the maritime realm. Thus, the maritime realm may have attracted different groups and individuals, both on account of its intense and de-

manding seasonal collective social labours and actions and for its income and liberating, exhilarating livelihood. For these purposes or occasions, some groups and individuals may have alternated between a terrestrial livelihood and a seasonal or temporary maritime livelihood, while others may have had a more permanent position in either sphere. Marking or manifesting such transitions in some way may have been important and it was tempting to picture some of the BA remains as traces or manifestations after such transitions or positions in the landscape.

Furthermore, the strategic and communicative maritime zones with rock art in BA Bohuslän could have served as important ports or transits for local and regional sea-going communications. Whether they were short or long, these sea journeys involved temporary stops for rest and for food and water. It seemed relevant to discuss the making of rock art in this context. The rock art may have manifested both local and regional praxis and identity to illustrate the importance of consensus and independence. Consequently, the rock art in this area might be interpreted as traces of a “social geography” located in “a third space”: a BA maritime space for social, economic and ritual actions, used by a domestic as well as a non-domestic public, preferably on a seasonal basis.

Chapter 12. Maritime praxis

This chapter presented an integrated discussion of the theoretical approaches and observations that were considered earlier in the thesis. It opened with a brief outline of the physical conditions that seem to govern rock art activity in a maritime landscape. This was followed by perspectives from archaeological, anthropological, ethnographic and historical sources that envisage situations and actions which, in a sense, may concretise social and spatial aspects of rock art. However, it is easy to be seduced by well-articulated ethnographic and anthropological analogies, which can only provide inspiration, never actually tell how actions were constituted in prehistoric Bohuslän. Still, it would be wrong not to quote or compare these accounts and theories because there are, indeed, some very specific spatial, social, economic, technologic and environmental conditions that broadly shape man’s premises and

ability to act and interact with the sea.

For instance, there are some spatial and technological features that limit and shape actions on a boat, especially the prehistoric boats that have been found in Scandinavia. These vessels constitute a kind of social space and the related actions and operations are more or less dependent on this premise. So if one takes the spatial and social possibilities and limitations into account, the operations may come to seem rather similar, even if some specific geographical and nautical conditions regarding the sea also have to be considered and allowed for. Similar general aspects can be applied to action on the shore.

Dual livelihoods have been a natural form of existence in Bohuslän in historical times and the concentration of BA remains to Bohuslän's coastal zone indicates that human occupation and activity were also oriented towards the sea in prehistoric times.

The shore offered salvation and rest, while the open sea meant unrest, hardship and danger. In this context it was interesting to consider the general BA maritime location of cairns and rock art in Bohuslän and the fact that the time it took to travel by sea between major rock art areas in central Bohuslän, such as Kville, Tanum, Sotenäset, Bro and Tjörn, seems likely to have been about half a day. The most rational form of transport and communication in Bohuslän in historical as well as prehistoric times was by sea. It has been suggested that the general location of the cairns indicates sea routes.

Seasonal occupations at sea must have contrasted strongly with life and work on the land. Sea-going men would have confronted a totally different world, full of dangerous natural forces such as harsh weather, waves, rocks and shoals. But it was also a world of great possibilities, utilities, hopes and desires. In this context it is logical that extraordinary disciplines, skills, norms and taboos served a special need to cope with the hazardous conditions at sea. Several anthropologists, ethnologists and archaeologists have used concepts such as "rite de passage" and "taboo" to describe this sociological behaviour at sea. Some general sociological phenomena may also be worth noting, such as special initiation rites, particular social and cognitive forms and norms of perceiving, acting, articulating and communicating

with different corporal and lingual means.

Malinowski distinguished two main driving forces behind the symbolic and magical behaviour connected with different stages and forms of maritime action. They are both of a rather rationalistic cognitive nature, namely the economic risk and the personal risk. They also share the cognitive purpose of eliminating untoward acts at sea and stimulating individual and group action in connection with various forms and stages of maritime action.

Thus, rituals connected with a sea journey or event may have been executed by the shore at three stages: before a journey: pre-liminal rites, rites of separation; during a journey: liminal rites, rites of transitions; after a journey: post-liminal rites, rites of incorporation.

There was yet another perspective regarding "rite de passage" and rock art at the sea shore. Knut Helsingog has seen ritual behaviour behind the placing of rock art by the shore in the most northern parts of Scandinavia. According to him, the rock art settings in these areas may well mirror fundamental aspects of a specific world view that invested the shore with a symbolic meaning.

The sea in the rock

Another perspective to consider in the context of the shore was the interplay between the depicted rock and the sea. In this context the rock may have served as a kind of "maritime canvas" that represented the sea, while the location of the ships may have been adjusted to features on the rocks, such as prominent wavy veins of quartz. This interplay would have been even more evident in localities that faced the sea, so that the latter's movements would be reflected onto the ship images and impart a sense of motion. Thus, the interplay between rock and sea, the sight of the sea, with its light, smells and sounds, could have provided an inspiration that affected the process of making the rock art as well as the reading of it.

The ships on the rocks

The most common arrangement of ships images on the rock is horizontal. However, this horizontal scheme is often spatially distributed in clusters and mixed with vertical or semi-vertical arrange-

ments. This structure can be likened to a disorganised fleet, in some cases distributed over an entire panel, in others clustered or crowded at its centre. Ship scenes that are superimposed give the display an additional effect. This pattern called to mind the intense maritime interactions between ships that occur in confined spaces, such as harbours, in connection with events such as a launching, a meeting or a celebration. A recent example is the launching and departure of the *Götheborg*, a reconstruction of a 18th century merchant ship, when boats of all kinds and sizes swarmed and interacted in the approaches to the port of that name.

Malinowski observed that Melanesian craft builders considered work and magic to be an interwoven praxis that followed the technological, social and spatial stages of canoe-building. Such actions have also been recorded from historical times in Scandinavia. In this context it was tempting to interpret the spatial distribution of rock art in relation to the spatial, social and ritual stages of building or launching maritime craft. This interpretation could also, to some extent, explain the location of ship images on higher ground away from the shore. The enlarged warriors, the ship lifter or the adorants that are connected with rock art ships could then be interpreted as social conceptions or relations in connection with the building or launching of maritime craft.

In this context the rock art may have functioned as the ritual counterpart of the pragmatic and technological stages of such enterprises or events. The actions depicted on the rock art seem to represent

maritime performances and ideals that are expressed and articulated in connection with maritime praxis. Some of the ship images include depictions of humans holding paddles in particular poses that do not seem to articulate the act of propelling so much as social status. Social position or socio-ritual codes seem to be more evident than more functionally oriented actions. Thus, common features are the social display of clearly depicted humans: kneeling, sitting, raising paddles, blowing lures, raising weapons, fighting, adoring, or tumbling.

There are striking similarities between these performances on the rock art and those displayed and recorded by the maritime Indians of the northwest coast of America from the beginning of the 20th century. Their craft are dugouts made of pine, some of them 20 m long and 2 m wide. It was also interesting to compare the decorated prows and the steering rod, as well as the elevated position of the steersman and the severe “shaman performer” in the fore of the canoe who recalls the enlarged warrior in the fore of some rock art ships. What was perhaps most interesting, however, was the action in the ships and their performance and appearance by the shore. In Curtis’ film “In the land of the war canoes”, the maritime performances are made very suggestive and dynamic by the interplay with the maritime environment. The paddlers in these performances are in a similar position to those displayed on the rock art. These communicative performances were executed in specific, charged social events such as competitive feasts, meetings, initiations and warfare.

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REFERENCES

- Aijmer, G. 2001. The Symbological Project. *Cultural Dynamics* 2001: 13-66.
- Algotsson, Å. & Swedberg, S. 1997. *Specialundersökning av Världsområdet Tanum. Delrapport 1*. Bohusläns Museum 1997. Uddevalla.
- Almgren, B. 1962. Den osynliga gudomen. *Proxima Thule. Sverige och Europa under forntid och medeltid. Hyllningsskrift till H. M. Konungen den 11 november 1962*: 53-71. Svenska Arkeologiska Samfundet. Stockholm.
- Almgren, B. 1987. *Die Datierung bronzezeitlicher Felszeichnungen in Westschweden*. Acta Musei Antiquitatum Septentrionalium Regiae Universitatis Upsalensis 6. Uppsala.
- Almgren, O. 1912. Tanums Härads fasta fornlämningar från bronsåldern. *Bidrag till kännedom om Göteborgs och Bohusläns fornminnen och historia* 6: 473-572. Göteborg.
- Almgren, O. 1927. *Hällristningar och kultbruk. Bidrag till belysning av de nordiska bronsåldersristningarnas innebörd*. Kungl. Vitterhets Historie och Antikvitets Akademien, Handlingar 35. Stockholm.
- Almgren, O. 1933. Hällristningsguden med dom stora händerna. *Göteborgs och Bohusläns Fornminnesförenings Tidskrift* 1932/1933: 57-61.
- Almgren, O. 1934. *Sveriges fasta fornlämningar från hednatiden*. Lindblad. Uppsala
- Althin, C-A. 1945. *Studien zu den Felszeichnungen von Skåne I-II*. C. W. K. Gleerup. Lund.
- Andersson, S. 1982. Rösen och Stensättningar i Göteborg. *Undersökta 1960-1970. Fyndrapporter* 1980/1981: 163-186.
- Andersson, S., Nancke-Krogh, S. & Wigforss, J. 1988. *Fångstfolk för 8000 år sedan: om en grupp stenåldersboplatser i Göteborg*. Göteborgs arkeologiska Museum. Göteborg
- Andersson, S. 2005. Bronsåldern. Bronsgjutare och bönder. *Fångstfolk och bönder. Om forntiden i Göteborg* (Andersson, S. & Ragnesten, U. red): 115-149. Göteborgs StadsMuseum. Göteborg.
- Andersson, S. & Ragnesten, U. (red) 2005. *Fångstfolk och bönder. Om forntiden i Göteborg*. Göteborgs StadsMuseum. Göteborg.
- Andersson, T. 1992. Magiska stenar: ett debattinlägg. *Hembygden* 1993: 184-188.
- Andersson, T. 1994. *Skurna figurer på hällristningarna i Högsbyn. En studie i ristningsteknik*. Ask och Emblas Skriftserie 11. Bengtsfors.
- Andersson, T. 2000. *Hällristningar från Högsbyn. Del 1. Trädgården, fornlämning nr. 11 i Tisselskog s:n, Dalsland*. Ask & Embla, Hällristningsrapport 1. Allingsås.
- Andersson, T. 2001. En vårprocession från bronsåldern på en hällristning i Högsbyn. *Hembygden* 2001: 11-21.
- Andrén, A. 1997. *Mellan ting och text. En introduktion till de historiska arkeologierna*. Brutus Östlings Bokförlag Symposion. Stockholm/Stehag.
- Apel, J. 2001. *Daggers, knowledge & power. The social aspects of flint dagger technology in Scandinavia 2350-1500 cal BC*. Coast to Coast-Books 3. Uppsala.
- von Arbin, S., Dahnberg, J., Hellervik, K., Mellquist, F. & Molander, L. 1995. Knacka hällristning med forntida teknik - ett arkeologiskt experiment. Opubl. Arbetsrapport. Experimentell Arkeologi. Arkeologiska institutionen Göteborgs Universitet. Göteborg.
- Artelius, T. 1996. *Långfärd och återkomst - skeppet i bronsålderns gravar*. Riksantikvarieämbetet, Skrifter 17. Kungsbacka.
- Artursson, M. 2005. Byggnadstradition, bebyggelse och samhällsstruktur i Sydskandinavien under senneolitikum och äldre bronsålder. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet*.

- Göteborg 2003-10-09/12 (Goldhahn, J. red): 39-66. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Artursson, M. & Björk, T. 2007. Vätland – ett vattenrike. *Vägar till Vätland : en bronsåldersbygd i nordöstra Skåne 2300-500 f. Kr* (Artursson, M. red): 295-359. Riksantikvarieämbetet. Stockholm.
- Arvidsson, S. 2000. *Ariska idoler: den indoeuropeiska mytologin som ideologi och vetenskap*. Östlings bokförlag Symposion. Lund.
- Arvidsson, S. 2006. *Aryan idols: Indo-European mythology as ideology and science*. University of Chicago Press. Chicago.
- Aulin, A. & Gustafsson, A. 2002. *Tanums projektet, Genomförda delprojekt 1997-1998*. Gotarc Serie D. Arkeologiska Rapporter 46. Göteborg.
- Bakka, E. 1976. *Arktisk og nordisk i bronsealderen i Nordskandinavia*. Det Kgl. Norske Videnskabers Selskab Museet Miscellanea 25. Trondheim.
- Baltzer, L. 1911. *Några af de viktigaste Hällristningarna samt en del af de fasta fornminnena i Bohuslän*. Göteborg.
- Barnekow, L., Possnert, G. & Sandgren, P., 1998. AMS 14C chronologies of Holocene lake sediments in the Abisko area, northern Sweden – a comparison between dated bulk sediment and macrofossil samples. *GFF* 120: 59-67.
- Barth, F. 1987. *Cosmologies in the making. A generative approach to cultural variation in inner New Guinea*. Cambridge University Press. Cambridge.
- Barth, T. 1999. *A critique of structuralism: towards a generative analysis of disordered systems*. Arena. Oslo.
- Baudou, E. 1960. *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im Nordischen Kreis*. Studies in North-European Archaeology 1. Stockholm.
- Baudou, E. 1997. *Gustaf Hallström: Arkeologi i världskrigens epok*. Natur och Kultur. Stockholm.
- Baudou, E. 2004. *Den nordiska arkeologin - historia och tolkningar*. Almqvist & Wiksell. International. Stockholm.
- Bengtsson, B. 2003. The Southern Scandinavian rock-carvings. A synthesis of past interpretations and the introduction of a maritime perspective. Opubl. M.A. thesis at Faculty of arts Department of Archaeology. University of Southampton. Southampton.
- Bengtsson, L. (red) 1998. *Hällristningar från Askums socken, del 2*. Arkeologisk Rapport 4 från Vitlyckemuseet. Tanumshede.
- Bengtsson, L. 1999. Kring dolda strukturer på hällristningar i Bohuslän. *Tjugo artiklar kring aktuell bronsåldersforskning* (Olausson, M. red): 309-321. Riksantikvarieämbetet, Skrifter 25. Stockholm.
- Bengtsson, L. 2000. Om hällristningar och strandforskjutningen i Tanum. *In Situ* 1999: 94-100
- Bengtsson, L. 2004. *Bilder vid vatten. Kring hällristningar i Askum sn, Bohuslän*. Gotarc Serie C. Arkeologiska Skrifter 51. Göteborg.
- Bengtsson, L. 2005. Arkeologiska undersökningar vid Raå 446:2 och Raå 446:3 i Tossene socken 2002-2003. *Tanumsprojektet. Arkeologiska undersökningar 1998-2004* (Bengtsson, L., Gustafsson, A. & Strid, L. red): 6-56. Gotarc Serie D. Arkeologiska Rapporter 57. Göteborg.
- Bengtsson, L., Gustafsson, A. & Strid, L. (red) 2005. *Tanumsprojektet. Arkeologiska undersökningar 1998-2004*. Gotarc Serie D. Arkeologiska Rapporter 57. Göteborg.
- Bergerbrant, S. 2007. *Bronze Age identities. Costume, conflict and contact in Northern Europe 1600-1300 BC*. Stockholm Studies in Archaeology 43. Stockholm.
- Berntsson, A. 2005. *Två män i en båt – om människans relation till havet under bronsåldern*. University of Lund Institute of Archaeology, Report Series 93. Lund.
- Berntsson, A. 2006. The isolation of Lake Raftötångstjärnet and its implications for the dating of rock art in Tanum, Bohuslän, Sweden. Opubl. Examensarbete K-10 2006 vid Institutionen för Naturgeografi och Kvartärgeologi, Stockholms universitet. Stockholm.
- Bertilsson, U. 1987. *The rock carvings of Northern Bohuslän. Spatial structures and social symbols*. Stockholm Studies in Archaeology 7. Stockholm.
- Bhabha, H. K. 1994. *The location of culture*. Routledge. London.
- Binford, L. R. 1962. Archaeology as anthropology. *American Antiquity* 28: 217-225.
- Bing, J. 1937. *Fra trolldom til gudetrol: studier over nordiske helleristninger fra bronsealderen*. Dybwad. Oslo.
- Björck, S. & Svensson, N.-O., 1998. Östersjöns och västerhavets utveckling. *Berg och Jord, Sveriges Nationalatlas* (Fredén, C. red): 141-178. Metria. Kiruna.
- Björck, S. & Wohlfarth, B. 2002. 14C-Chronostratigraphic techniques in paleolimnology. *Tracking Environmental Change Using Lake Sediments* (Last, W. M. & Smol, J. P. ed): 205-245. Kluwer Academic Publishers. Hingham, MA.
- Bloch, M. 1974. Symbol, song, dance and features of articulation: is religion an extreme form of traditional authority? *Archives européennes de sociologie: European Journal of Sociology* 15: 55-81.
- Bloch, M. 1998. *How we think they think: anthropological approaches to cognition, memory, and literacy*. Westview Boulder. Colorado.
- Boas, F. & Codere, H. (eds) 1966. *Kwakiutl ethnography*. University of Chicago Press. Chicago
- Borna-Ahlkvist, H. 2002. *Hällristarnas hem. Gårdsbebyggelse och struktur i Pryssgården under bronsåldern*. Riksantikvarieämbetet Skrifter 42. Lund.
- Bradley, R. 1997. *Rock art and the prehistory of Atlantic Europe. Signing the land*. Routledge. London and New York.
- Bradley, R. 1998. *The passage of arms. An archaeological analysis of prehistoric hoard and votive deposits*. Oxbow Books. Oxford.
- Bradley, R. 1999. Dead soles. *Glyfer och arkeologiska rum – en vänbok till Jarl Nordbladh* (Gustafsson, A. & Karlsson, H. red): 661-666. Gotarc Serie A3. Göteborg.

- Bradley, R. 2000. *An archaeology of natural places*. Routledge. London and New York.
- Bradley, R. 2002. *The past in prehistoric societies*. Routledge. London and New York.
- Bradley, R. 2006. Danish razors and Swedish rocks: cosmology and the Bronze Age landscape. *Antiquity* 80: 372-389.
- Broadbent, N. 1983. Too many Chiefs but not enough Indians. A Peripheral View of Nordic Bronze Age Society. *Struktur och förändring i bronsålderns samhälle. Rapport från det tredje nordiska symposiet för bronsåldersforskning* (Stjernquist, B. red): 7-22. University of Lund Institute of Archaeology, Report Series 17. Lund.
- Broholm, H. C. 1943. *Danmarks Bronzealder. Bd I. Samlede fund fra den Ældre Bronzealder*. Nyt Nordisk Forlag. Arnold Busk. København.
- Brunius, C. G. 1839. *Antiqvarisk och arkitektonisk resa genom Halland, Bohuslän, Dalsland, Wermland och Westergötland år 1838*. Lund.
- Brunius, C. G. 1868. *Försök till förklaringar öfver hällristningar med femton plancher*. Berlingska Boktryckeriet. Lund.
- Brøndsted, J. 1939. *Danmarks Oldtid II. Bronzealderen*. Nordisk Forlag. København.
- Brøgger, A. W. & Shetelig, H. 1950. *Vikingskipene: deres forgjengere og etterfølgere*. Dreyer. Oslo.
- Burenhult, G. 1980. *Götalands hällristningar. Del I*. Theses and Papers in North European Archaeology 10. Stockholm.
- Burenhult, G. 1983. *Arkeologi i Sverige 2. Bänder och bronsgjutare*. Förlags AB Wiken. Höganäs.
- Burenhult, G. 1988. *Länkar till vår forntid – en introduktion i Sveriges arkeologi*. Utbildningsradion i samarbete med Bra Böcker. Stockholm.
- Chesney, S. 1991. Max Raphael's contribution to the study of prehistoric symbol systems. *Rock Art and Prehistory: papers presented to symposium G of the AURA congress, Darwin 1988* (Bahn, P. G. & Rosenfeld, A. eds): 14-23. Oxbow books. Oxford.
- Childe, V. G. 1930. *The Bronze Age*. Cambridge University Press. Cambridge.
- Christensson, J. 2001. Sven Nilsson och Skandinaviens urinvånare. *Kulturanatomiska studier* (Broberg, G. red): 29-52. Avdelningen för Idé- och lärdoms historia. Lunds universitet. Lund
- Christensson, J. 2005. Om Sven Nilsson som arkeolog. *Från Worm till Welinder. Åtta essäer om arkeologins disciplinhistoriska praxis* (Goldhahn, J. red): 63-97. Gotarc Serie C. Arkeologiska Skrifter 60. Göteborg.
- Claesson, P. & Munkenberg, B. (red) 2004a. *Landskap och bebyggelse*. Bohusläns museum, Kulturhistoriska dokumentationer 14. Uddevalla.
- Claesson, P. & Munkenberg, B. (red) 2004b. *Gravar och ritualer*. Bohusläns museum, Kulturhistoriska dokumentationer 14. Uddevalla.
- Clausen, B. L. 1993. *Tomoko. En krigskano fra Salomonøerne*. Viking Ship Museum. Roskilde.
- Clemensen, L.B., Richardt, N., & Andersen, C. 2001. Holocene sea-level variation and spit development: data from Skagen Odde, Denmark. *The Holocene* 11: 323-331.
- Cohen, G. A. 1978. *Karl Marx's theory of history: a defence*. Princeton University Press. Princeton.
- Coles, J. 1990. *Bilder från forntiden. En guide till hällristningar och andra fornminnen i norra Bohuslän*. Skrifter utgivna av Bohusläns museum och Bohusläns hembygdsförbund 34. Uddevalla.
- Coles, J. 1999. The dancer on the rock: record and analysis at Järrestad, Sweden. *Proceedings of the Prehistoric Society* 65: 167-187.
- Coles, J. 2000. *Patterns in a rocky land. Rock carvings in South-West Uppland, Sweden 1-2*. Aun 27. Uppsala.
- Coles, J. 2004. Bridge to the Outer World. Rock Carvings at Bro Utmark, Bohuslän, Sweden. *Proceedings of the Prehistoric Society* 70: 173-206.
- Coles, J. 2005. *Shadows of a northern past. Rock carvings of Bohuslän and Østfold*. Oxbow Books. Oxford.
- Coles, J. 2006. Beacon on the Ridge: rock carvings at Kasen Lövåsen, Bohuslän, Sweden. *Proceedings of the Prehistoric Society* 2006: 319-339.
- Conkey, M. 1991. Contexts of action, contexts for power. Material culture and gender in the Magdalenian. *Engendering archaeology. Women in prehistory* (Gero, J. M. & Conkey, M. W. eds): 57-92. Blackwell. Oxford & Cambridge MA.
- Cornell, P., Ekelund, A., Borelius, U., Kresa, D., Backlund, T. (in press) 2008. Kossina, the Nordische Gedanke, and Swedish archaeology. Discourse and politics in German and Swedish archaeology 1900-1950. *Current Swedish Archaeology* 2007.
- Cornell, P. & Fahlander, F. 2002. *Social praktik och stumma monument. Introduktion till mikroarkeologi*. Gotarc Serie C. Arkeologiska Skrifter 46. Göteborg.
- Cornell, P. & Fahlander, F. (eds) 2007. *Encounters, materialities, confrontations. Archaeologies of social space and interaction*. Cambridge Scholars Press. Newcastle.
- Crumlin-Pedersen, O. 1970. Skind eller træ? En studie i den nordiske plankebåds konstruktive oprindelse. *Sømand, fisker, skib og værft. Introduktion til maritim etnolog* (Hasslöf, O. red): 213-240. Rosenkilde og Bagger. København.
- Crumlin-Pedersen, O. 2003a. The boat, its state of preservation, conservation and display. *Hjortspring. A Pre-Roman Iron-Age warship in context* (Crumlin-Pedersen, O. & Trakadas, A. eds): 23-36. Ships and Boats of the North 5. Roskilde.
- Crumlin-Pedersen, O. 2003b. The Hjortspring boat in a ship-archaeological context. *Hjortspring. A Pre-Roman Iron-Age warship in context* (Crumlin-Pedersen, O. & Trakadas, A. eds): 209-232. Ships and Boats of the North 5. Roskilde.
- Crumlin-Pedersen, O. 2003c. Rosenberg's analysis of the boat. *Hjortspring. A Pre-Roman Iron-Age warship in context* (Crumlin-Pedersen, O. & Trakadas, A. eds): 234. Ships and Boats of the North 5. Roskilde.
- Dahlgren, P. 1932. *Primitiva skepp. Vad hällristningarna vittna om bronsålderns sjökultur*. Natur och Kultur. Stockholm.

- Dowson, Th. A. 1998. Like people in prehistory. *World Archaeology* 29 (3): 333-343.
- Earle, T. 1997. *How chiefs come to power. The political economy in prehistory*. Stanford University Press. Stanford.
- Earle, T. 2002. *Bronze Age economics. The beginnings of political economies*. Westview Press. Cambridge MA.
- Eckhoff, E. 1881-1890. *Bohusläns fasta fornlemningar från hednatiden*. Göteborg.
- Ekholm, G. 1915. *Studier i Upplands bebyggelsehistoria. I. Stenåldern*. Uppsala Universitets Årsskrift 1916. Uppsala.
- Ekholm, G. 1916. De skandinaviska hällristningarna och deras betydelse. *Ymer* 1916: 275-308.
- Ekholm, G. 1921. *Studier i Upplands bebyggelsehistoria. II. Bronsåldern*. Uppsala Universitets Årsskrift 1921. Uppsala.
- Eklund, L. 1999. *Geografisk informationsbehandling. Metoder och tillämpningar*. Byggnadsförskningsrådet. Stockholm.
- Ekman, S. 2002. Hällristningar under vatten? Kommentarer till en studie över landskapsutveckling och strandförskjutningsförlopp i Tanum. *In Situ* 2000/2001: 81-95.
- Ekman, S. 2004. Bohusländsk kulturmarksutveckling från stenålder till historisk tid. *Metod- och materialanalys* (Claesson, P. & Munkenberg, B. red): 113-144. Bohusläns museum. Uddevalla.
- Ellmers, D. 1995. Crew structures on board Scandinavian vessels. *Shipshape: essays for Ole Crumlin-Pedersen* (Skamby Madsen, J., Rieck, F., Crumlin-Pedersen, O. & Olsen, O. red): 231 -241. Viking Ship Museum. Roskilde.
- Engelmark, J., Olofsson, J. & Wallin, J. E. 2004. Miljöarkeologisk undersökning av hällristningslokaler i Askum och Rished, Sotenäset, Bohuslän. Rapport nr. 2004-028. *Tanumsprojektet. Arkeologiska undersökningar 1998-2004* (Bengtsson, L., Gustafsson, A. & Strid, L. red): 132-159. Gotarc Serie D. Arkeologiska Rapporter 57. Göteborg.
- Engels, F. 1973. Base and superstructure. From letter to W. Borgius. *Marxism and art: essays classics and contemporary* (Solomon, M. ed): 33. Vintage Books. New York.
- Engberg, L. 1998. Geodetisk verksamhet. Sveriges kartläggning. En översikt. 1988-1997. *Kartografiska sällskapet* 1998: 33-46. Gävle.
- Ericsson, A. 2002. Liv, död och jordbruk i ett bronsålderslandskap. *Kulturell mångfald i Södermanland. Del 1* (Åkerlund, A. red): 58-66. Länsstyrelsen i Södermanlands län. Nyköping.
- Eriksson, L. & Henkel, H. 1998. Geofysik. *Berg och Jord, Sveriges Nationalatlas* (Fredén, C. red): 76-101. Metria. Kiruna.
- von Essen, U. (1996). *Paradigm eller tankestil? En jämförelse av Ludwik Flecks och Thomas S Kuhns kunskaps- och vetenskapsteorier*. Avdelningen för Idéhistoria, Stockholms universitet. Stockholm
- Fahlander, F. 2003. *The materiality of serial practice : a microarchaeology of burial*. Gotarc Serie B. Gothenburg Archaeological Thesis 23. Göteborg.
- Fahlander, F. 2004. Archaeology and anthropology: brother in arms? – on analogies in 21st century archaeology. *Material culture and other things Post-disciplinary studies in the 21st century* (Fahlander, F. & Oestigaard, T. eds): 185-212. Gotarc Serie C. Arkeologiska Skrifter 61. Göteborg.
- Fett, E. & Fett, P. 1941. *Sydvestnorske helleristninger. Rogaland og Lista*. Stavanger Museum. Stavanger.
- Fleck, L. 1997. *Uppkomsten av ett vetenskapligt faktum. Inledning till läran om tankestil och tankekollektiv*. Brutus Östlings Bokförlag Symposion. Stockholm/Stehag.
- Foucault, M. 1972. *Vetandets arkeologi*. Cavefors. Staffanstorps.
- Fredell, Å. 2003. *Bildbroar. Figurativ bildkommunikation av ideologi och kosmologi under sydkandinavisk bronsålder och föromersk järnålder*. Gotarc Serie B. Gothenburg Archaeological Thesis 25. Göteborg.
- Fredsjö, Å. 1948. Två hällristningsdetaljer: 1. »Bemanningsstrecken». 2. Svärd eller svans? *Göteborg och Bohusläns Fornminnesförenings Tidskrift* 1946-47: 72-86.
- Fredsjö, Å. 1969. Hällristningar i Kville (IV). *Bohusläns Hembygdsförbunds Årsskrift* 1969: 39-80.
- Fredsjö, Å. 1970. Hällristningar i Kville V. *Bohusläns Hembygdsförbunds Årsbok* 1970: 39-81.
- Fredsjö, J. 1971. *Hällristningar. Kville härad, Svenneby socken* (Nordbladh, J. & Rosvall, J. red). Studier i Nordisk Akreologi 7. Göteborg.
- Fredsjö, J. 1975. *Hällristningar. Kville härad, Bottna socken* (Nordbladh, J. & Rosvall, J. red). Studier i Nordisk Akreologi 13. Göteborg.
- Fredsjö, J. 1981. *Hällristningar. Kville härad, Kville socken* (Nordbladh, J. & Rosvall, J. red). Studier i Nordisk Akreologi 14/15. Göteborg.
- Fredsjö, Å., Janson, S. & Moberg, C-A. (red) 1956. *Hällristningar i Sverige*. Forum. Stockholm.
- Fried, M. H. 1967. *The evolution of political society. An essay in political anthropology*. Random House Studies in Anthropology 7. New York.
- Friedman, J. & Rowlands, M. J. (eds) 1977. Notes towards an epigenetic model of the evolution of 'civilisation'. *The evolution of social systems London University* (Friedman, J. & Rowlands, M. eds): 201-276. London University. Pittsburgh.
- Fries, M. 1951. Pollenanalytiska vittnesbörd om senkvarter vegetationsutveckling. *Acta Phytogeographica Suecia* 29: 14-25.
- Fuglestedt, Ingrid. 1999. Adorants, vultigeurs and other mortals - an essay on rock art and the human body. *Rock art as social representation* (Goldhahn, J. red): 25-40. BAR International Series 794. Oxford.
- Fyllingen, H. 2006. Society and the structure of the violence: A Story told by middle Bronze Age human remains from central Norway. *Warfare and society : archaeological and social anthropological perspectives* (Otto, T., Thrane, H. & Vandkilde, H. eds):319-331. Aarhus University Press. Aarhus.

- Gansum, T., Jerpåsen, G. B. & Keller, C. 1997. *Arkeologisk landskapsanalys med visuella metoder*. Arkeologisk museum i Stavanger. Stavanger.
- Gedda, B. 2007. Landskapsrummets fysiska möjligheter. *Vägar till Vætländ. En bronsåldersbygd i nordöstra Skåne 2300-500 f. Kr* (Artursson, M. red.): 17-25. Riksantikvarieämbetet. Stockholm.
- van Gennep, A. 1960. *The rites de passage*. The University of Chicago Press. Chicago.
- Gerdin, A-L. 1999. Rösen – uttryck för makt eller platser där himmel och jord möts i det kosmiska rummet. *Spiralens öga. Tjugo artiklar kring aktuell bronsåldersforskning* (Olausson, M. red): 47-74. Riksantikvarieämbetet Skrifter 25. Stockholm.
- Gerdin, A-L. & Munkenberg, B-A. 2005. *Från mesolitisk tid till järnålder – Tanum inte bara hällristningar*. Riksantikvarieämbetet UV Väst Rapport 2007:7. Göteborg.
- Giddens, A. 1984. *The constitution of society. Outline of the theory of structuration*. University of California Press. Berkeley.
- van Ginkel, R. 1987. Pigs, priests and other puzzles. Fishermen's taboos in anthropological perspective. *Ethnologia Europaea : Revue internationale d'ethnologie européenne : A world review of European ethnology* 1987 (XVII): 57-68.
- Gjerde, J. M. 2002. Lokalisering av helleristningar i landskapet. *Bilder av bronsålder – ett seminarium om förhistorisk kommunikation. Rapport från ett seminarium på Vitlycke Museum 19.e-22.e oktober 2000* (Goldhahn, J. red): 23-51. Acta Archaeologica Lundensia, Series in 8° 37. Lund.
- Gjessing, G. 1936. *Nordenfjelske ristninger og malinger av den arktiske gruppe*. Instituttet for Sammenlignende Kulturforskning Serie B XXX. Oslo.
- Gjessing, G. 1939. *Østfolds jordbruksristninger. Idd, Berg og delvis Skjeberg*. Instituttet for Sammenlignende Kulturforskning Serie B LIII. Oslo.
- Glob, P. V. 1969. *Helleristninger i Danmark*. Jysk Arkæologisk Selskabs Skrifter Bd VII. Odense.
- Godelier, M. 1975. *Bas och överbyggnad. Studier i marxistisk antropologi*. PAN/Norstedt. Stockholm.
- Godelier, M. 1999. *The enigma of the gift*. The University of Chicago Press. Chicago.
- Goldhahn, J. 1999a. *Sagaholm – hällristningar och gravritual*. Studia Archaeologica Universitatis Umensis 11. Umeå.
- Goldhahn, J. 1999b. Rock art and the materialisation of a cosmology – the case of the Sagaholm barrow. *Rock art as social representation* (Goldhahn, J. red): 76-100. BAR International Series 794. Oxford.
- Goldhahn, J. 2002. Roaring rocks. An audio-visual approach on hunter-gatherers engravings in Northern Sweden and Scandinavia. *Norwegian Archaeological Review* 35 (1): 29-61.
- Goldhahn, J. 2005. *Från Sagaholm till Bredarör – hällbildsstudier 2000-2004*. Gotarc Serie C. Arkeologiska Skrifter 62. Göteborg.
- Goldhahn, J. 2006. *Hällbildsstudier i norra Europa – trender och tradition under det nya millenniet*. Gotarc Serie C. Arkeologiska Skrifter 64. Göteborg.
- Goldhahn, J. 2007. *Dödens hand – en essä om brons- och hällsmed*. Gotarc Serie C. Arkeologiska Skrifter 65. Göteborg.
- Gräslund, B. 1974. *Relativ datering. Om kronologisk metod i nordisk arkeologi*. TOR XVI. Uppsala.
- Gräslund, B. 1987. *The birth of prehistoric chronology. Dating methods and dating systems in nineteenth-century Scandinavian archaeology*. Cambridge University Press. Cambridge.
- Gröhn, A. 2004. *Positioning the Bronze Age in social theory and research contexts*. Acta Archaeologica Lundensia, Series in 8° 47. Lund.
- Gustafsson, A. 2001. *Arkeologihistoria som historia och som arkeologi. Studier i arkeologins egenhistorier*. Gotarc Serie B. Gothenburg Archaeological Thesis 17. Göteborg.
- Hafström, G. 1949. *Ledung och marklandsindelning*. Stockholms Högskola. Stockholm.
- Hall, S., Morley, D. & Chen, K. (eds) 1996. *Critical dialogues in cultural studies*. Routledge. London.
- Hallbäck, S. A. 1944. De bohusslänska hällristningarnas höjd över havet och något om deras ålder. *Fornvännen* 1944: 54-59.
- Hallström, G. 1917. Bohusläns fasta fornlämningar från hednatiden 7. Tanums härad. Bronsåldern 2. Gravar. *Göteborgs och Bohusläns Fornminnesförenings Tidsskrift* 1917: 1-75.
- Hasslöf, O. 1949. *Svenska västkustfiskarna. Studier i en yrkesgrupps näringsliv och sociala kultur*. Sockholm.
- Hasslöf, O. 1970. *Sømand, fisker, skib og værft. Introduktion til maritim etnologi*. Rosenkilde og Bagger. København.
- Hawkes, C. F. 1954. Archaeology theory and method: some suggestions from the Old World. *American Anthropologist* 56: 155-168.
- Hayden, B. 1995. Pathways to Power. Principles for creating socioeconomic inequalities. *Foundations of social inequality* (Pirce, T. D. & Feinman, G. M. eds): 15-86. Plenum publishing. New York.
- Hedeager, L. 1994. Warrior economy and trading economy in Viking-Age Scandinavia. *Journal of European Archaeology* 2.1: 130-148.
- Hedengran, E. 1993. Att synliggöra människor, figurer eller gestalter? Kring hällristningsforskningens förutsättningar. *Ekonomi och näringsformer i nordisk bronsålder* (Forsberg, L. & Larsson, Th. B. red): 177-193. Studia Archaeologica Universitatis Umensis 3. Umeå.
- Hedenström, A. 2001. *Early Holocene shore displacement in eastern Svealand, Sweden, based on diatom stratigraphy, radiocarbon chronology and geochemical parameters*. Stockholms Universitet. Stockholm.
- Heimann, C. 2004. *Förflutna rum. Landskapets neolitiseri i sydvästra Värmland*. Gotarc Serie B. Gothenburg Archaeological Thesis 25. Göteborg.
- Helskog, K. 1993. Fra tvangstrøjer til 90-års pluralisme i helleristningsforskning. *Nordic Tag. Report from the third Nordic Tag conference 1990* (Prescott, Ch. &

- Solberg, B. eds): 70-75. Historisk Museum/Universitetet i Bergen. Bergen.
- Helskog, K. 1999. The shore connection. Cognitive landscape and communication with rock carvings in Northernmost Europe. *Norwegian Archaeological Review* 32 (2): 73-94.
- Helskog, K. 2004. Landscapes in rock-art: rock-carvings and ritual in the old European North. *The figured landscape of rock art. Looking at pictures in place* (Chippindale, C. & Nash, G. eds): 265-288. Cambridge University Press. Cambridge.
- Herner, E. 1999. Föremålskatalog. *Bronser. Bronsfynd i Göteborgs och Bohus län* (Kindgren, H. red): 9-69. Bohusläns Museum Kulturhistoriska Dokumentationer 8. Uddevalla.
- Hildebrand, B. E. 1869. Till hvilken tid och hvilket folk böra de Svenska Hällristningarne hänföras? *Antiquarisk Tidskrift för Sverige* 2: 417-432.
- Hodder, I. 1982. *Symbols in action*. Cambridge University Press. Cambridge.
- Hodder, I. 1986. *Reading the past*. Cambridge University Press. Cambridge.
- Holm, B. & Quimby, G. I. 1980. *Edward S. Curtis in the land of the war canoes. A pioneer cinematographer in the Pacific Northwest*. University of Washington Press. Seattle.
- Holmberg, A. E. 1848. *Skandinaviens hällristningar, arkeologisk afhandling*. P. G. Berg. Stockholm.
- Hood, B. C. 1994. Sacred pictures, sacred rocks: Ideological and social space in the north Norwegian Stone Age. *Norwegian Archaeological Review* 27 (2): 65-87.
- Hultkrantz, Å. 1989. Hällristningsreligion. *Hällristningar och hällmålningar i Sverige* (Janson, S., Lundberg, E. B. & Bertilsson, U. red): 43-58. Forum. Stockholm.
- Hultkrantz, Å. 1992. Tabueringsföreställningar kring fisket. *Tabu, verklighet, språk. Tio uppsatser om folkliga tabueringsföreställningar och taxonomi* (Edlund, L. red): 35-53. Carlsson. Stockholm.
- Hygen, A-S. & Bengtsson, L. 1999. *Hällristningar i gränsbygd. Bohuslän och Østfold*. Warne Förlag. Sävedalen.
- Håkansson, I. 1985. *Skånes gravfynd från äldre bronsålder som källa till studiet av social struktur*. Acta Archaeologica Lundensia, Series in 8° 14. Lund.
- Högberg, T. 1995. *Hällristningar från Litsleby, Tegneby & Bro i Tanums socken*. Arkeologisk Rapport 5 från Vitlycke Museum. Tanumshede.
- Högberg, T. 1998a. *Hällbilder på Aspeberget*. Strömstads tidnings tryckeri. Strömstad.
- Högberg, T. 1998b. *Hällbilder på Kalleby*. Gamla kvarnens tryckeri. Strömstad.
- Högberg, T. 2000. *Världsarvsområdets centrala del och Grebbestad*. Arkeologisk Rapport 1 från Vitlyckemuseet. Tanumshede.
- Indreko, R. 1956. *Steingeräte mit Rille*. Kungl. Vitterhets Historie och Antikvitets Akademien, Antikvariska Serien 4. Stockholm.
- Ingold, T. 2002. *The perception of the environment essays on livelihood, dwelling and skill*. Routledge. London.
- Jankavs, P. 1999. Rapsodi över hällbilder i Skaraborg – med impromptu för skålgropar och fotsulor. *Glyfer och arkeologiska rum – en vänbok till Jarl Nordbladh* (Gustafsson, A. & Karlsson, H. red): 411-439. Gotarc Serie A 3. Göteborg.
- Jensen, J. 1982. *The prehistory of Denmark*. Methuen. London.
- Jensen, J. 1997. *Fra Bronze- till Jernalderen – en kronologisk undersøgelse*. Nordiske Fortidsminder Serie B 15. København.
- Jensen, O. 2002. *Forntid i historien. En arkeologisk studie av synen på forntida lämningar från medeltiden till och med förupplysningen*. Gotarc Serie B. Gothenburg Archaeological Thesis 19. Göteborg.
- Jensen, O. W. & Karlsson, H. 1998. *Aktuell samhällsteori och arkeologi. Introduktion till processuellt och post-processuellt tänkande*. Gotarc Serie C. Arkeologiska Skrifter 20. Göteborg.
- Johnson, A. W. & Earle, T. K. 1987. *The evolution of human societies. From foraging group to agrarian state*. Stanford University Press. Stanford, California.
- Jones, A. 2002. *Archaeological theory and scientific practice*. Cambridge University Press. Cambridge.
- Jonsson, L. 2005. Bilaga 11. Rapport över inledande osteologisk undersökning, Bo, Morlanda socken, RAÄ 89. *Husby klev: en kustboplatz med bevarat organiskt material från äldsta mesolitikum till järnålder* (Nordqvist, B. red): 96-104. Riksantikvarieämbetet. UV Väst, Avdelningen för arkeologiska undersökningar. Möndal.
- Kaislahti, P. 2004. Shore displacement in relation to local rock art in Bohuslän: what can diatoms tell us about early "art movement" on the Swedish west coast? Opubl. Examensarbete K-7 2004 vid Institutionen för Naturgeografi och Kvärtärgeologi, Stockholms universitet. Stockholm.
- Kaliff, A. 1997. *Grav och kultplats. Eskatologiska föreställningar under yngre bronsålder och äldre järnålder i Östergötland*. Aun 24. Uppsala.
- Kaliff, A. 2007. *Fire, water, heaven and earth. Ritual practice and cosmology in ancient Scandinavia : an Indo-European perspective*. Riksantikvarieämbetet. Stockholm.
- Karlenby, L. 1987. Gruppering av hällristningar. Definition av grupper och en preliminär studie. *TOR* 21: 79-101.
- Karlsson, H. 1998. *Re-thinking archaeology*. Gotarc Serie B. Gothenburg Archaeological Thesis 8. Göteborg.
- Kaul, F. 1998. *Ship on bronzes. A study in Bronze Age religion and iconography*. PNM Studies in Archaeology and History 3:1/2. København.
- Kaul, F. 2003. The Hjortspring boat and ship iconography of the Bronze and Early Pre-Roman Iron Age. *Hjortspring. A Pre-Roman Iron-Age warship in context* (Crumlin-Pedersen, O. & Trakadas, A. eds): 187-208. Ships and Boats of the North 5. Roskilde.
- Kaul, F. 2004. *Bronzealderens religion*. Nordiske Fortidsminder Serie B 22. København.
- Kaul, F. 2006. Nyt om skibsristninger på Bornholm. *His-*

- torien i forhistorien. *Festskrift til Einar Østmo på 60-årsdagen* (Glørstad, H., Skar, B. & Skre, D. red): 161-172. Kulturhistoriskt Museum, Universitetet i Oslo, Skrifter 4. Oslo.
- Kindgren, H. (red) 1999. *Bronser. Bronsfynd i Göteborgs och Bohus län*. Bohusläns Museum Kulturhistoriska Dokumentationer 8. Uddevalla.
- Kjellén, E. & Hyenstrand, Å. 1977. *Hällristningar och bronsålderssamhälle i sydvästra Uppland*. Upplands Fornminnesförenings Tidskrift 49. Uppsala.
- Knarrström, B. 2001. *Flint a Scanian hardware*. Riksantikvarieämbetet. UV Syd, Avd. för arkeologiska undersökningar. Lund.
- Kossinna, G. 1911. *Die Herkunft der Germanen. Zur Methode der Siedlungsarchäologie*. Mannus-Bibliothek 6. Würzburg.
- Krantz, C. 1940. Bronsåldersrösenena som sjömärken. Ett stycke nautisk arkeologi. *Göteborg och Bohusläns Fornminnesförenings Tidskrift* 1940: 1-29.
- Kristiansen, K. 1978. The consumption of wealth in Bronze Age Denmark. A study of the dynamics of economic process in tribal societies. *New Directions in Scandinavian Archaeology* (Kristiansen, K. & Paludan-Müller, C. eds): 158-190. Studies in Scandinavian Prehistory and Early History 1. Copenhagen.
- Kristiansen, K. 1984. Krieger und Häuptlinge in der Bronzezeit. *Jahrbuch des Römisch-Germanisches Zentralmuseums Mainz* 31: 187-208.
- Kristiansen, K. 1987a. Centre and periphery in Bronze Age Scandinavia. *Centre and Periphery in the ancient world* (Rowlands, M., Larsen, M. & Kristiansen, K. eds): 74-85. Cambridge University Press. Cambridge.
- Kristiansen, K. 1987b. From stone to bronze – the evolution of social complexity in Northern Europe, 2300–1200 BC. *Specialization, exchange and complex societies* (Brumfield, E. & Earle, T. eds): 30-51. Cambridge University Press. Cambridge.
- Kristiansen, K. 1991. Chiefdoms, states, and systems of social evolution. *Chiefdoms: power, economy, and ideology* (Earle, T. ed): 16-43. Cambridge University Press. Cambridge.
- Kristiansen, K. 1998. *Europe before history*. Cambridge University Press. Cambridge.
- Kristiansen, K. 1999. Mellem centrum og periferi. Bohuslän i bronsäldern. *Bronser. Bronsfynd i Göteborgs och Bohus län* (Kindgren, H. red): 85-96. Bohusläns Museum, Kulturhistoriska Dokumentationer 8. Uddevalla.
- Kristiansen, K. 2002. Langfærder og helleristninger. *In Situ* 2000/2001: 67-80.
- Kristiansen, K. 2004. Sea faring voyages and rock art ships. *The Dover boat in context. Society and water transport in prehistoric Europe* (Clark, P. ed): 111-121. Oxbow Books. Oxford.
- Kristiansen, K. 2005. Cosmology and consumption in the Bronze Age. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet, Göteborg 2003-10-09/12* (Goldhahn, J. red): 135-149. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Kristiansen, K. 2006. Cosmology, economy and long-term change in the Bronze Age of Northern Europe. *Ecology and economy in Stone Age and Bronze Age Scania* (Sjögren, K. ed): 170-193. Archaeological Excavations Department, National Heritage Board. Lund.
- Kristiansen, K. & Larsson, Th. B. 2005. *The rise of Bronze Age society. Travels, transmissions and transformations*. Cambridge University Press. Cambridge.
- Kristiansen, K. & Rowlands, M. J. 1998. *Social transformations in archaeology : global and local perspectives*. Routledge. London
- Kuhn, Th. 1970. *The structure of scientific revolutions*. University of Chicago Press. Chicago.
- Kurlansky, M. 1999. *Cod. A biography of the fish that changed the world*. Vintage. London
- Kvalø, F. 2000. Oversjøiske reiser fra Sørvest-Norge til Nord-Vest Jylland i eldre bronsalder. En drøfting om maritim realisering og rituell mobilisering. Opubl. hovedfagsoppgave i Arkeologi framlagt vid Arkeologisk Institutt vid Universitetet i Oslo. Oslo.
- Kvalø, F. 2004. Facing the sea in Bronze Age Norway: the ship, the sea and society. *The Dover boat in context. Society and water transport in prehistoric Europe* (Clark, P. ed): 111-121. Oxbow Books. Oxford.
- Lagerbring, S. 1797. *Sammandrag af Swea rikets historia, ifrån de äldsta til de nyaste tider*. Stockholm.
- Lakatos, I. & Feyerabend, P. 1999. *For and against method. Including Lakatos's lectures on scientific method and the Lakatos-Feyerabend correspondence*. University of Chicago Press. Chicago
- Lambert Johansen, K., Terp Laursen, S. & Kähler Holst, M. 2004. Spatial patterns of social organisation in the early Bronze Age of South Scandinavia. *Journal of Anthropological Archaeology* 2004 (23): 33-55.
- Larsson, Th. B. 1986. *The Bronze Age metalwork in Southern Sweden. Aspects of social and spatial organization 1800-500 BC*. Archaeology and Environment 6. Umeå.
- Larsson, Th. B. 1994. Skeppet under bronsåldern. Funderingar kring relationen mellan praktik och symbolik. *Odlingslandskap och fångstmark. En vänbok till Klas-Göran Selinge* (Jensen, R. red): 221-227. Riksantikvarieämbetet. Stockholm.
- Larsson, Th. B. 1997. *Materiell kultur och religiösa symboler. Mesopotamien, Anatolien och Skandinavien under det andra förkristna årtusendet*. Arkeologiska Studier vid Umeå Universitet 4. Umeå.
- Larsson, Th. B. 2002. De döda, de ”andra” och djuren. *Bilder av bronsålder – ett seminarium om förhistorisk kommunikation. Rapport från ett seminarium på Vitlycke Museum 19.e-22.e oktober 2000* (Goldhahn, J. red): 91-111. Acta Archaeologica Lundensia, Series in 8° 37. Lund.
- Leach, E. 1982. *Social anthropology*. Oxford University Press. New York
- Lekberg, P. M. 2002. *Yxors liv – människors landskap. En studie av kulturlandskap och samhälle i Mellansveriges senneolitikum*. Coast to coast-book 5. Uppsala.

- Lévi-Strauss, C. 1969. *The elementary structures of kinship*. Eyre & Spottiswood. London.
- Lewis-Williams, J. D. 2002. *The mind in the cave. Consciousness and the origins of art*. Thames and Hudson. London.
- Liedman, S. 1997. *I skuggan av framtiden. Modernitetens idéhistoria*. Bonnier. Stockholm.
- Liedman, S. 2006. *Stenarna i själen. Form och materia från antiken till idag*. Bonnier. Stockholm.
- Leroi-Gourhan, A. 1993. *Gesture and speech*. MIT Press. Cambridge, Mass.
- Lindholm, K. 1997. *Kulturlandskapet förutsättningar och förändring under 2500 år. Världsarvsprojektet*. Bohusläns museum, Rapport 1997:5. Uddevalla.
- Lindman, G. 1997. *Fortid i Bua. Arkeologiska undersökningar av fornlämningarna 345, 383 och 483, Morlanda socken, Orust, Bohuslän*. Riksantikvarieämbetet UV Väst Rapport 1997:21. Kungsbacka.
- Lindman, G. & Ortman, O. 1997. *Arkeologiska slutundersökningar. Arkeologiska undersökningar för motorvägen Lerbo-Torp Del 1, Hus och odlingsspår*. UV Väst, Avdelningen för arkeologiska undersökningar, Riksantikvarieämbetet. Mölndal
- Ling, J. 2004a. Beyond transgressive lands and forgotten seas. Towards an maritime understanding of rock art in Bohuslän. *Current Swedish Archaeology* 12: 121-140.
- Ling, J. 2004b. *Hällristningsmiljöer i Göteborgsområdet. Spår efter förhistorisk kommunikation i landskapet*. Göteborgs StadsMuseum. Göteborg.
- Ling, J. 2005. The fluidity of rock art. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet, Göteborg 2003-10-09/12* (Goldhahn, J. red): 437-460. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Ling, J. 2006. Elevated rock art. Maritime images and situations. *Adoranten* 2005: 5-32.
- Ling, J. & Bengtsson, L. 2006. Maritime representations in vertical space. *Samfunn, symboler og identitet. Festskrift til Gro Mandt på 70-årsdagen* (Barndon, R., Innselset, S. M., Kristoffersen, K. K. & Lødøen, T. K. red): 525-538. Universitetet i Bergen Arkeologiske Skrifter, Nordisk 3. Bergen.
- Linge, T. 2005. Kammeranlegget i Mjeltehaugen – eit rekonstruksjonsforslag. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet, Göteborg 2003-10-09/12* (Goldhahn, J. red): 537-559. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Linge, T. 2006. Båtar på berg utmed havet – om to ristningslokaliteter på kysten av Sogn og Fjordane. *Samfunn, symboler og identitet. Festskrift til Gro Mandt på 70-årsdagen* (Barndon, R., Innselset, S. M., Kristoffersen, K. K. & Lødøen, T. K. red): 539-549. Universitetet i Bergen Arkeologiske Skrifter, Nordisk 3. Bergen.
- Linge, T. 2007. *Mjeltehaugen – fragment frå gravritual*. UBAS Hovedfag/Master 3. Bergen.
- von Linné, C. 1792. *Linné i Västergötland. Carl Linnaeus dagboksmanuskript från västgötareisan 1746, utdrag ur den publicerade reseberättelsen 1747 samt ur andra tryckta arbeten. En antologi*. Norstedt. Stockholm.
- Ljungner, E. 1939. Terräng och jordbruksbebyggelse i Bohuslän. *Bohusläns Fornminnes- och Hembygdsförbunds Årsbok 1938/1939*: 3-153.
- Lundin, I. 1999. *En inventering och dokumentation av maritima ristningar från Vinga till Koster*. Bohusläns museum, delrapport för projekt Blå Skagerrak 1999:44. Uddevalla.
- Lönroth, E. (red) 1963. *Bohusläns historia*. Almqvist & Wiksell. Stockholm.
- Malinowski, B. 1922. *The Argonauts of the western pacific: an account of native enterprise and adventure in the archipelagos of Melanesian New Guinea*. Routledge. London.
- Malinowski, B. 1954. *Magic, science and religion and other essays*. Doubleday. New York.
- Malmer, M. P. 1981. *A chorological study of North European rock art*. Kungl. Vitterhets Historie och Antikvitets Akademien, Antikvariska Serien 32. Stockholm.
- Malmer, M. P. 1989. Principles of a non-mythological explanation of North-European rock art. *Bronze Age Studies* (Nordström, H-Å. & Knape, A. eds): 91-99. The Museum of National Antiquities, Studies 6. Stockholm.
- Mandt, G. 1972. *Bergbilder i Hordaland. En undersøkelse av bildenes sammensetning deres naturmiljø og kulturmiljø*. Årbok for Universitetet i Bergen. Humanistisk Serie 1970, 2. Bergen.
- Mandt, G. 1991. Vestnorske ristninger i tid og rom. Kronologiske, korologiske og kontekstuelle studier. I-II. Opubl. Doktorsgrad i Arkeologi, framlagd vid Bergens Universitet. Bergen.
- Marstrander, S. 1963. *Østfolds jordbruksristninger: Skjeberg*. Intitutet for Sammenliknende Kulturforskning Serie B 53. Oslo.
- Marstrander, S. 1978. The problem of European impulses in the Nordic area of agrarian rock art. *Acts of the international symposium on rock art. Lectures at Hankø 6-12 August 1972* (Marstrander, S. eds): 45-67. Universitetsforlaget. Oslo-Bergen-Tromsø.
- Marstrander, S. 1979. Crossing the North Sea by hide boat from Scotland to Western Norway before the Iron Age. *Universitetets Oldsaksamling Jubileumsår-bok 1979*: 96-101.
- Marx, K. 1973a. The essential formulation of Marxism, from Preface to A contribution to the critique of political economy. *Marxism and art: essays classics and contemporary* (Solomon, M. ed): 29-30. Vintage Books. New York.
- Marx, K. 1973b. The Fetishism of commodities, II, from Capital. *Marxism and art: essays classics and contemporary* (Solomon, M. ed): 39-40. 1973. Vintage Books. New York.
- Marx, K. 1973c. The Immanence of artistic development, I, from Introduction to A contribution to the critique of political economy Marxism and art: essays classics and contemporary (Solomon, M. ed): 61-62. Vintage Books. New York.

- Marx, K. 1973d. The Immanence of artistic development, II, from Theories of Surplus Value. *Marxism and art: essays classics and contemporary* (Solomon, M. ed): 63-64. Vintage Books. New York.
- Marx, K. & Engels, F. 1973. Being, consciousness, and the ideological reflex, from The German ideology. *Marxism and art: essays classics and contemporary* (Solomon, M. ed): 35-36. 1973. Vintage Books. New York.
- Mathiassen, T. 1958. Endu et krumsværd. *Aarbøger for nordisk Oldkyndighed og historie* 1957: 38-55.
- Merleau-Ponty, M. 1962. *Phenomenology of perception*. Routledge. London.
- Miller, U. & Robertsson, A. 1988. Late Weichselian and Holocene Environmental changes in Bohuslän. *Geographia Polonica* 55: 103-111.
- Milstreu, G. & Pröhl, H. (red) 1996. *Dokumentation och registrering av hällristningar i Tanum 1*. Tanums hällristningsmuseum. Tanumshede.
- Milstreu, G. & Pröhl, H. (red) 1999. *Dokumentation och registrering av hällristningar i Tanum 2*. Tanums hällristningsmuseum. Tanumshede.
- Moberg, C-A. 1956. Till frågan om samhällsstrukturen i Norden under bronsåldern. *Fornvännen* 50: 65-79.
- Moberg, C-A. 1971. Regional och global syn på hällristningar. *Kuml* 1970/ 1971: 223-232.
- Montelius, O. (red) 1874. *Bidrag till kännedom om Göteborgs och Bohusläns fornminnen och historia*. Göteborg.
- Montelius, O. 1876. *Bohuslänska hällristningar*. Nordstedt. Stockholm.
- Montelius, O. A. 1884. Om våra förfäders invandring till Norden. *Nordisk Tidskrift* 1884: 21-36.
- Montelius, O. A. 1885. *Om tidsbestämning inom bronsåldern med särskild hänsyn till Skandinavien*. Kungl. Vitterhets Historie och Antikvitets Akademien, Handlingar 30, ny följd 10. Stockholm.
- Montelius, O. A. 1899. Typologien eller utvecklingsläran tillämpad på det menliga arbetet. *Svenska Fornminnesföreningens Tidskrift* 30: 237-268.
- Montelius, O. A. 1900. Solgudens yxa och Tors hammare. *Svenska Fornminnesföreningens Tidskrift* X: 277-296.
- Montelius, O. A. 1917. *Minnen från vår forntid*. P. A. Nordstedt & Söners Förlag. Stockholm.
- Munkenberg, B-A. 2002. "Monumentet", en plats för kollektivets ceremonier? *In Situ* 2002: 27-
- Mörner, N. A. 1990. Glacial isostasy and long-term crustal movements in Fennoscandia with respect to lithospheric and asthenospheric processes and properties. *Tectonophysics* 176: 13-24.
- Nerman, B. 1925. *Det svenska rikets uppkomst*. Generalstabens Litografiska Anstalt. Stockholm.
- Niklasson, N. 1948. En forntida boplat vid Bokenäs gamla kyrka. *Göteborgs och Bohusläns Fornminnesföreningens Tidskrift* 1948: 45-79.
- Nilsson, L. 1991. Arbetsförhållanden inom den bohuslänska sillindustrin 1780-1808. *Arbetare, tjänstemän och lokalhistoria* (Clemensson, P., Losman, B. & Sjögren, B. red): 43-68. Landsarkivet. Göteborg.
- Nilsson, P. 2005. Om boplatlokalisering inom Bråbygdens hällristningsområden. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet, Göteborg 2003-10-09/12* (Goldhahn, J. red): 419-435. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Nilsson, S. [1838-43] 1866. *Skandinaviska Nordens Urinvånare. Ett försök i komperativ ethnografien och ett bidrag till människoslägtets utvecklings historia*. Bd 2. Bronsåldern. Stockholm.
- Nordbladh, J. 1980. *Glyfer och rum kring hällristningar i Kville*. Akademisk avhandling. Utgiven vid institutionen för arkeologi, Göteborgs universitet. Göteborg.
- Nordbladh, J. 1989. Armour and fighting in the South Scandinavian Bronze Age. *Approaches to Swedish Prehistory* (Larsson, T.B & Lundmark, H. eds): 323-333. BAR International Series 500. Oxford.
- Nordbladh, J. 1995. The history of Scandinavian rock art research as a corpus of knowledge and practice. *Perceiving rock art. Social and political perspectives* (Helskog, K. & Olsen, B. eds): 23-34. Novus Forlag. Oslo.
- Nordén, A. 1925. *Östergötlands bronsålder. Beskrivande förteckning med avbildningar av lösa fynd i offentliga och enskilda samlingar, kända gravar samt hällristningar*. Henric Carlssons Bokhandels Förlag. Linköping.
- Nordenborg Myhre, L. 1998. *Historier fra en annen virkelighet. Fortellinger om bronsealderen ved Karmsundet*. AmS-Småtrykk 46. Stavanger.
- Nordenborg Myhre, L. 2004. *Trialectic archaeology. Monuments and space in Southwest Norway 1700-500 BC*. AmS-Skrifter 18. Stavanger.
- Nordlund, Ch. 2001. *Det upphöjda landet. Vetenskap, landhöjningsfrågan och kartläggningen av Sveriges förflutna, 1860-1930*. Acta Regiæ Societatis Skytteanae 53. Umeå.
- Nordqvist, B. 2005. *Husby Klev. En kustboplat med bevarat organiskt material från äldsta mesolitikum till järnålder*. Riksantikvarieämbetet UV Väst, Avdelningen för arkeologiska undersökningar. Mölndal.
- Nyqvist, R. 2001. *Landskapet som ram – hus och grav som manifest (Bohuslän 500 f.Kr – 1500 e.Kr)*. Gotarc Serie B. Gothenburg Archaeological Thesis 20. Göteborg.
- Odner, K. 2000. *Tradition and transmission. Bantu, Indo-European and Circumpolar great traditions*. Norse Publications. Bergen.
- Odner, K. 2006. Helleristninger – maktkamp og etnisitet i Østfold i bronsealderen. *Historien i forhistorien: festskrift til Einar Østmo på 60-årsdagen* (Glørstad, H., Skar, B. & Skre, D. red): 115-127. Oslo Universitetets kulturhistoriske museer. Oslo.
- Oestigaard, T. & Goldhahn, J. 2006. From the dead to the living. Death as transaction and re-negotiations. *Norwegian Archaeological Review* 39 (1): 27-48.
- Ohlmarks, Å. 1963. *Hällristningarnas gudar. En sammanställning och ett förklaringsförsök*. Tiden. Stockholm.
- Oldeberg, A. 1947. A contribution to the history of the Scandinavian Bronze Lur in the Bronze and Iron

- Ages. *Acta Archaeologica* 1947: 1-91.
- Oldeberg, A. 1974. *Die ältere metallzeit in Schweden I*. Kungl. Vitterhets Historie och Antikvitets Akademien. Lund.
- Oldeberg, A. 1976. *Die ältere metallzeit in Schweden II*. Kungl. Vitterhets Historie och Antikvitets Akademien. Stockholm.
- Olsen, B. 1997. *Fra ting til tekst*. Universitetsforlaget. Oslo.
- Ong, W. J. 1990. *Muntlig och skriftlig kultur. Teknologiseringen av ordet*. Anthropos. Göteborg.
- Peirce, C. S. 1934. *Collected papers of Charles Sanders Peirce. Vol. 5, Pragmatism and pragmatism*. Belknap Press of Harvard University Press. Cambridge, Mass.
- Persson, G. 1973. *Postglacial transgression in Bohuslän*. Sveriges Geologiska Undersökning C335. Göteborg.
- Persson, Per 2005. *Fortsatta arkeologiska undersökningar vid Olas, Värö socken Raä nr 202, i juni 2002*. Kust till kust-projektet. Gotarc Serie D. Arkeologiska Rapporter 54. Göteborg.
- Persson, P. 1998. *Neolitikums början. Undersökningar kring jordbrukets introduktion i Nordeuropa*. Gotarc Serie B. Gothenburg Archaeological Thesis 11. Göteborg.
- Petrovic, N. 2003. *Beliefs from far away. Context and function of foreign cult objects in the Late Bronze Age Aegean*. Department of Classical Archaeology and Ancient history. Göteborg University. Göteborg.
- Pettersson, J. & Kristiansson, G. 1977. *Hällristningar på Tjörn*. Dalaförlaget. Malung.
- Pettersson, J. 1982. *Hällristningar på Tjörn. Andra delen*. Dalaförlaget. Malung.
- Pettersson, J. 1999. *Skärgårdsverken i Bohuslän. Trankokerier och salterier under 1700-talets sillfiskeperiod*. Stockevik.
- Pettersson, J. 2001. *Skärgårdsbebyggelsen i Bohuslän under norska tiden: särskilt kring 1500-talets sillperiod*. Stockevik.
- Prescott, Ch. 1994. Paradigm gained – paradigm lost? 150 years of Norwegian Bronze Age research. *Norwegian Archaeological Review* 24 (1): 37-48.
- Påsse, T. 2001. *An empirical model of glacio-isostatic movements and shore-level displacement in Fennoscandia*. SKB. Stockholm.
- Påsse, T. 2003. *Strandlinjeförskjutning i norra Bohuslän under Holocen. Strandlinjer och vegetationshistoria. Kvartärgeologiska undersökningar inom Kust till kust projektet, 1998-2002* (Persson, P. red): 31-87. Coast to Coast-books 7. Uppsala.
- Ragnesten, U. 2007. *Individ och kollektiv i förromersk järnålder*. Gotarc Serie B. Gothenburg Archaeological Thesis 46. Göteborg.
- Randsborg, K. 1974. Social stratification in Early Bronze Age Denmark. *Prähistorische Zeitschrift* 49: 38-61.
- Randsborg, K. 1993. *Kivik. Archaeology & iconography*. *Acta Archaeologica* 64 (1). Munksgaard.
- Randsborg, K. 1995. *Hjortspring. Warfare and sacrifice in Early Europe*. Aarhus University Press. Aarhus.
- Raphael, M. 1945. *Prehistoric Cave Paintings*. Pantheon Books. New York.
- Rausing, G. 1984. *Prehistoric boats and ships of north-western Europe*. Liber Förlag and Gleerup. Malmö.
- Renfrew, C. 1987. *Archaeology and language. The puzzle of Indo-European origins*. Cape. London.
- Rex Svensson, K. 1982. *Hällristningar i Älvsborgs län. En inventering av samtliga kända hällristningar i Dalsland och Göta Älvdalen*. Stiftelsen Älvsborgs Länsmuseum. Vänersborg.
- Reybrouck, D. V. 2000. *From primitives to primates. A history of ethnographic and primatological analogies in the study of prehistory*. Univeristy of Leiden. Leiden.
- Risberg, J. (1991). *Palaeoenvironment and sea level changes during the early Holocene on the Södertörn peninsula, Södermanland, eastern Sweden*. Stockholms universitet 1991. Stockholm.
- Rostholm, H. 1972. Danske helleristninger og deres forhold til de øvrige nordiske helleristninger fra bronzetiden. *Holstebro Museums Årskrift 1971/1972*: 20-47.
- Rydberg, L. 2000. Net Circulation and Salinity Variations in an Open-Ended Swedish Fjord System. *Estuaries* 23 (3): 367-380.
- Rønne, P. 1990. *Krumsværd af bronze! Krumsværd af voks*. Opubl. thesis. Copenhagen.
- Rønne, P. 1993. Problemer omkring bronzetidens metalhåndværkere. *Ekonomi och näringsformer i nordisk Bronsålder* (Forsberg, L. & Larsson, Th. B. red): 71-92. *Studia Archaeologica Universitatis Umensis* 3. Umeå.
- Sandin, M. 2001. *Två boplatser från yngre bronsåldern. Fynd: tidskrift för Göteborgs StadsMuseum och Fornminnesföreningen i Göteborg* 2001:16-23.
- Sarauw, G. & Alin, J. 1923. *Götaälvsområdets fornminnen*. Skrifter utgivna till Göteborgs stads Trehundraårsjubileum genom Jubileumsutställningens Publikationskommitté. Göteborg.
- Selinge, K. G. 1966. *Fornlämningar i grändsbygd. Fynd* 1966: 7-36.
- Selinge, K. G. 1969. *Inventering av fasta fornlämningar*. Riksantikvarieämbetet. Stockholm.
- Selinge, K. G. 1989. *Västergötland. Hällristningar och hällmålningar i Sverige* (Janson, S., Lundberg, E. B. & Bertilsson, U. red): 131-146. Forum. Stockholm.
- Selling, S. 2007. *Livets scener och dödens platser : om bronsålder i södra Bohuslän utifrån en gravläggning i Faxehögen, Kareby socken*. Stockholm Studies in Archaeology 41. Stockholm
- Service, E. R. 1962. *Primitive social organization: an evolutionary perspective*. Random House. New York.
- Service, E. R. 1978. *Origins of the state*. PA Institute for the study of human issues. Philadelphia.
- Shanks, M. & Tilley, Ch. 1987. *Social theory and archaeology*. Polity Press. Cambridge.
- Sjöborg, N. H. 1830. *Samlingar för Nordens fornälskare* 3. Stockholm.
- Sjögren, K. 2003. *"Mångfalldige uhrminnes grafvar- " : megalitgravar och samhälle i Västsverige*. Gotarc

- Serie B. Gothenburg Archaeological Thesis 24. Göteborg.
- Skoglund, P. 2005. *Vardagens landskap – lokala perspektiv på bronsålderns materiella kultur*. Acta Archaeologica Lundensia Series in 8° 49. Lund.
- Skoglund, P. (med bidrag av Broström, S. & Ihrestam, K.). 2006. *Hällristningar i Kronobergs län. Motiv, myter och dokumentation*. University of Lund, Institute of Archaeology, Report series 97. Lund.
- Sognnes, K. 1983. *Bergkunsten i Stjørdal 1, Helleristningar og busejting*. Universitetet i Trondheim. Trondheim.
- Sognnes, K. 1987. *Bergkunsten i Stjørdal 3. Hegraristningane*. Gunneria 62. Trondheim.
- Sognnes, K. 2001. *Prehistoric imagery and landscapes. Rock art in Stjørdal, Trøndelag, Norway*. BAR International Series 998. Oxford.
- Sognnes, K. 2003. On shoreline dating of rock art. *Acta Archaeologica* 74: 189-209.
- Solheim, S. 1940. *Nemningsfordomar ved fiske*. Oslo.
- Sprockhoff, E. 1956. *Jungbronzezeitliche Hortfunde der Südzone des nordischen Kreises: Periode V*. Verlag des Römisch-germanischen Zentralmuseums. Mainz.
- Stjernquist, B. (red). 1983. *Struktur och förändring i bronsålderns samhälle. Rapport från det tredje nordiska symposiet för bronsåldersforskning*. University of Lund Institute of Archaeology, Report Series 17. Lund.
- Streiffert, J. 2004. Hus från bronsåldern och äldre järnåldern i Bohuslän. *Landskap och bebyggelse* (Claesson, P. & Munkenberg, B. red): 135-154. Bohusläns museum. Uddevalla.
- Streiffert, J. 2005. *Gårdsstrukturer i Halland under bronsålder och äldre järnålder*. Riksantikvarieämbetet Skrifter 66. Kungsbacka.
- Strömberg, H. 1983. *Båttyper på hällristningar i Kville. Ett inlägg i diskussionen om hällristningsbåtarnas konstruktion*. Bohusläns museum. Uddevalla.
- Svanberg, F. 2005. House symbolism in aristocratic death rituals of the Bronze Age. *Dealing with the dead. Archaeological perspectives on prehistoric Scandinavian burial ritual* (Artelius, T. & Svanberg, F. eds): 73-98. Riksantikvarieämbetet, Skrifter 65. Stockholm.
- Svedhage, K. 1997. *Tanumsslätten med omgivning*. Rapport 1997:13. Bohusläns museum. Uddevalla.
- Svestad, A. 1995. *Oldsakenes orden. Om tilkomsten av arkeologi*. Universitetsforlaget. Oslo.
- Sylvester, M. 2006. Haugvikbåten fra Sømna- en plankebygd båt fra yngre bronsealder eller førromersk jernalder. *Viking LXIX*: 91-106.
- Syvertsen, K. I. J. 2002. Ristninger i graver – graver med ristninger. *Bilder av bronsålder – ett seminarium om förhistorisk kommunikation. Rapport från ett seminarium på Vitlycke Museum 19.e-22.e oktober 2000* (Goldhahn, J. red): 151-183. Acta Archaeologica Lundensia, Series in 8° 37. Lund.
- Syvertsen, K. 2005. Rogalands ristninger i graver som transformerande og stabiliserende faktorer i tilværelsen. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet, Göteborg 2003-10-09/12* (Goldhahn, J. red): 503-520. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Tesch, S. 1993. *Houses, farmsteads, and long-term change. A regional study of prehistoric settlements in the Köpinge area, in Scania, southern Sweden*. Uppsala.
- Thedéen, S. 2004. *Gränser i livet – gränser i landskapet. Generationsrelationer och rituella praktiker i södermanländska bronsålderslandskap*. Stockholm Studies in Archaeology 33. Stockholm.
- Thedéen, S. 2005. Till frågan om hövdingadömet under bronsåldern. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet, Göteborg 2003-10-09/12* (Goldhahn, J. red): 385-401. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Thomsen, C. J. 1836. *Ledetraad til nordisk Oldkyndighed*. København.
- Thrane, H. 1975. *Europæiske forbindelser. Bidrag til studiet af fremmede forbindelser i Danmarks yngre bronzealder (periode IV-V)*. Nationalmuseets Skrifter. Arkæologisk-Historisk Række 16. København.
- Thrane, H. 2006. Swords and other weapons in the Nordic Bronze Age: Technology, Treatment, and context. *Warfare and society: archaeological and social anthropological perspectives* (Otto, T., Thrane, H. & Vandkilde, H. red): 491- 505. Aarhus University Press. Aarhus.
- Tilley, Ch. 1991. *Material culture and text. The art of ambiguity*. Routledge. London.
- Tilley, C. 1994. *A phenomenology of landscape: places, paths, and monuments*. Berg. Oxford.
- Tilley, Ch. 1999. *Metaphor and material culture*. Blackwell. Oxford.
- Tilley, Ch. 2004. *The materiality of stone. Explorations in landscape phenomenology*. Berg. Oxford.
- Trigger, B. G. 1989. *A history of archaeological thought*. Cambridge University Press. Cambridge.
- Turner, V. 1995. *The ritual process. Structure and anti-structure*. Aldine de Gruyter. Hawthorne.
- Ullén, I. 2003. *Bronsåldersboplatsen vid Apalle i Uppland*. Arkeologi på väg - undersökningar för E18. Riksantikvarieämbetet UV Uppsala Rapport 1997:64. Uppsala.
- Valbjørn, K. V. 2003. Building and testing a Hjortspring boat. *Hjortspring. A Pre-Roman Iron-Age warship in context* (Crumlin-Pedersen, O. & Trakadas, A. eds): 235-236. Ships and Boats of the North 5. Roskilde.
- Vandkilde, H. 1996. *From stone to bronze. The metalwork of the Late Neolithic and Earliest Bronze Age*. Jutland Archaeological Society, Publications XXXII. Aarhus.
- Vandkilde, H. 2006. Archaeology and war: Presentations of Warriors and Peasants in archaeological interpretations. *Warfare and society: archaeological and social anthropological perspectives* (Otto, T., Thrane, H. & Vandkilde, H. red): 57- 75. University Press Aarhus. Aarhus.
- Varberg, J. 2005. Flint och metal – mellem stenalder og bronzealder i Sydsandinavien. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet,*

- Göteborg 2003-10-09/12 (Goldhahn, J. red): 67-81. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Varenius, B. 1998. *Han ägde bo och skeppslid. Om rumslighet och relationer i vikingatid och medeltid*. Studia Archaeologica Universitatis Umensis 10. Umeå.
- Victor, H. 2002. *Med graven som granne. Om bronsålderns kulthus*. Aun 30. Uppsala.
- Vogt, D. 2001. Continuity and Discontinuity in south Scandinavian Bronze Age and Rock art research. *Theoretical perspectives in rock art research* (Helleskog, K. red): 99-109. Novus Forlag. Oslo.
- Vogt, D. 2006. *Helleristningar i Østfold og Bohuslän. En analyse av det økonomiske og politiske landskap*. Det humanistiske fakultet, Universitetet i Oslo. Acta Humaniora 254. Oslo.
- Wahlgren, K. H. 2002. *Bilder av betydelse. Hällristningar och bronsålderslandskap i nordöstra Östergötland*. Stockholm Studies in Archaeology 23. Stockholm.
- Wahlgren, K. H. 2004. Switching images on and off. Rock carving practices and meaning in Bronze Age life-world. *Prehistoric pictures as archaeological source* (Milstreu, G. & Pröhl, H. eds): 149-165. Gotarc Serie C. Arkeologiska Skrifter 50. Göteborg.
- Weibust, J. 1958. *The Crew as a social system*. Norsk Sjøfartsmuseum. Oslo.
- Welinder, S. 1977. *Ekonomiska processer i förhistorisk expansion*. Acta Archaeologica Lundensia, Series in 8° Minore 7. Lund.
- Westerdahl, C. 2003. *Vänern: landskap, människa, skepp. Om en maritim inlandskultur vid Vänern*. Båtdokgruppen. Skärhamn.
- Westerdahl, C. 2005. Seal on Land, Elk at Sea: Notes on and Applications of the Ritual Landscape at the Seaboard. *International Journal of Nautical Archaeology* 34: 2-23.
- Widholm, D. 1998. *Rösen, ristningar, riter*. Acta Archaeologica Lundensia, Series in Prima 4° 23. Lund.
- Widholm, D. 2006. *Sacred sites. Burial customs in South Scandinavian Bronze and Iron Age*. Kalmar Studies in Archaeology I. Kalmar.
- Widholm, D. (red) 2007. *Stone ships. The sea and the heavenly journey*. Kalmar Studies in Archaeology III. Kalmar.
- Wihlborg, A. 1978. Sagaholm. A Bronze Age barrow with rock-carvings. *Meddelanden från Lunds Universitets Historiska Museum 1977/1978*: 111-128.
- Winter, L. 2002. Relationen mellan Medelhavsområdets och Sydsjaskandinavien bildvärldar. *Bilder av bronsålder – ett seminarium om förhistorisk kommunikation. Rapport från ett seminarium på Vitlycke Museum 19.e-22.e oktober 2000* (Goldhahn, J. red): 201-221. Acta Archaeologica Lundensia, Series in 8° 37. Lund.
- Worsaae, J. J. A. 1882. *The industrial arts of Denmark. From the earliest time to the Danish conquest of England*. Chapman & Hall Ltd. Covent Garden.
- Wrigglesworth, M. 2000. Ristninger og graver som sted. En visuell landskapsanalyse. Opubl. Hovedfagsoppgave i Arkeologi. Arkeologisk Institutt Universitetet i Bergen. Bergen.
- Wrigglesworth, M. 2002. Ristninger og graver i landskapet. *Bilder av bronsålder – ett seminarium om förhistorisk kommunikation. Rapport från ett seminarium på Vitlycke Museum 19.e-22.e oktober 2000* (Goldhahn, J. red): 185-199. Acta Archaeologica Lundensia, Series in 8° 37. Lund.
- Wrigglesworth, M. 2005. Vognmotivet i en vestnorsk bronsealderkontekst. *Mellan sten och järn. Rapport från det 9:e nordiska bronsålderssymposiet, Göteborg 2003-10-09/12* (Goldhahn, J. red): 561-570. Gotarc Serie C. Arkeologiska Skrifter 59. Göteborg.
- Yates, T. 1993. Framework for an archaeology of the body. *Interpretative archaeology* (Tilley, Ch. ed): 31-72. Berg Publishers. Oxford.
- Zizek, S. 1989. *The sublime object of ideology*. Verso. London.
- Åberg, L. 1839. Hällristningar från Bohuslän uti Sverige. *Annaler for Nordisk Oldkyndighed 1838/1839*: 387-390.
- Åberg, L. 1842. Anmärkningar rörande figurteckningar från forntiden. *Annaler for Nordisk Oldkyndighed 1842/1843*: 348-356.
- Åkerlund, A. 1996. *Human responses to shore displacement. Living by the sea in Eastern Middle Sweden during the Stone Age*. Riksantikvarieämbetet, Skrifter 6. Stockholm.
- Ørsnes, M. 1959. Borbjergfundet. *Aarbøger for nordisk Oldkyndighed og historie 1958*: 1-107.
- Østmo, E. 1990. *Helleristninger av sørsjaskandinaviske former på det indre Østlandet. Fylkene Buskerud, Akershus, Oslo, Oppland og Hedmark*. Varia 12. Oslo.
- Østmo, E. 2005. Over Skagerak i steinalderen. Noen refleksjoner om oppfinnelsen av havgående fartøyer i Norden. *Viking 2005*: 55-82.

Personal Communications

- Bengtsson, Lars O. Vitlycke Museum, Tanumshede. 2007-05-10; During fieldwork in Bro, Stångenäset.
- Earle, Timothy. Northwestern University, USA. 2005-05-11; Seminar at Vitlycke Museum, Tanumshede.
- Jonson, Leif. 2006-09-12; at Naturhistoriska museet, Gothenburg.
- Kaul, Flemming. National museum of Denmark. 2004-05-11; Seminar at Vitlycke Museum, Tanumshede.
- Påsse, Tore. SGU. 2004-11-12; at SGU, Gothenburg.
- Risberg, Jan. Department of Physical Geography and Quaternary Geology, Stockholm University. 2005-04-12; During fieldwork in Tanum.
- Vandkilde, Helle. University of Århus, Denmark. 2005-05-11; Seminar at Vitlycke Museum, Tanumshede.
- Rydberg, Lars. Earth Sciences Centre, Gothenburg University. 2005-09-14; at Earth Sciences Centre, Gothenburg University.

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APPENDIX 2

Appendix 2. Table of all the measured rock art sites from Bohuslän; their altitude (m.a.s.l) and chronology (Per) in relation to the shoreline model according to Berntsson/Risberg (B) and to the model suggested by Pässe (P).

Municipality	Parish	Area	RAÄ	m.a.s.l	Per	B	P
Göteborg	Askim	Backa	87	8.02	V	7.8	6.0
Göteborg	Askim	Hovås	31	8.08	V	7.8	6.0
Göteborg	Askim	Backa	162	9.34	V	7.8	6.0
Göteborg	Askim	Hovås	27	12.03	V	7.8	6.0
Göteborg	Askim	Hulan	268	9.02	V	7.8	6.0
Göteborg	Björlanda	Högstena	250	18.13	V	7.8	6.0
Göteborg	Frölunda	Påvelund	68	23.12	V	7.8	10.8
Göteborg	Lundby	Vikan	316	10.02	V	7.8	6.0
Kungälv	Solberga	Flögen	50	11.88	I	11.0	9.0
Lysekil	Brastad	Rixö	123	19.63	PRIA	9.6	7.8
Lysekil	Bro	Brodalen	622	15.14	III-V	12.8	11.0
Lysekil	Bro	Lennestad	636	14.72	III-V	13.1	11.3
Munkedal	Svarteborg	Rom	13	13.18	V-VI	12.2	10.4
Sotenästet	Askum	Kärrshålan	107	14.23	V	11.6	10.8
Sotenästet	Tossene	Åby	73	19.02	I-PRIA	15.3	13.5
Sotenästet	Tossene	Bovallstrand	107	12.88	IV	12.2	10.4
Tanum	Kville	Edsten	114	12.83	PRIA	10.2	8.4
Tanum	Kville	S.Ödsmål	172	13.88	III-IV	13.4	11.6
Tanum	Kville	Kville	55	15.23	V	12.2	10.4
Tanum	Kville	Edsten	112	14.45	V	12.2	10.4
Tanum	Kville	Hakeröd	226	14.80	V-VI	12.2	10.4
Tanum	Kville	Hakeröd	227	15.20	III-IV	13.4	11.6
Tanum	Kville	Hakeröd	228	15.58	IV-V	12.9	11.1
Tanum	Kville	S. Torp	208	15.65	V-VI	12.2	10.4
Tanum	Kville	S. Ödsmål	82:4	16.81	II-IV	15.0	13.2
Tanum	Kville	Hakeröd	224	16.89	IV	12.9	11.1
Tanum	Kville	S.Ödsmål	209	19.09	II-IV	15.0	13.2
Tanum	Kville	S.Ödsmål	82:3	17.87	II-IV	15.0	13.2
Tanum	Kville	S.Ödsmål	82:2	17.94	II-IV	15.0	13.2
Tanum	Kville	S.Ödsmål	82:1	19.32	II-IV	15.0	13.2

Municipality	Parish	Area	RAÄ	m.a.s.l	Per	B	P
Tanum	Kville	S.Ödsmål	82:2	17.94	II-IV	15.0	13.2
Tanum	Kville	Hakeröd	226:1	15.14	V-VI	12.2	10.4
Tanum	Kville	Hakeröd	226:2	14.81	V-VI	12.2	10.4
Tanum	Kville	Torsbo	158	27.87	I	16.5	14.7
Tanum	Svenneby	Nasseröd	6	14.80	V-VI	12.2	10.4
Tanum	Tanum	Tyft	425:1	13.02	PRIA	10.2	8.4
Tanum	Tanum	Tyft	234 :1	13.07	VI-PRIA	11.2	9.4
Tanum	Tanum	Tyft	425:2	13.21	V-VI	12.2	10.4
Tanum	Tanum	Tyft	234 :2	13.69	V-VI	12.2	10.4
Tanum	Tanum	Orrekläpp	369	13.69	PRIA	10.2	8.4
Tanum	Tanum	Orrekläpp	241	14.14	PRIA	10.2	8.4
Tanum	Tanum	Gerum	311	14.74	II-III	15.0	13.2
Tanum	Tanum	Tegneby	841	15.46	V	12.2	10.4
Tanum	Tanum	Ryk	213	15.63	V-VI	12.2	10.4
Tanum	Tanum	Gerum	870	15.70	V	12.2	10.4
Tanum	Tanum	Ryk	215	15.85	V	12.2	10.4
Tanum	Tanum	Ryk	219	16.22	V-VI	12.2	10.4
Tanum	Tanum	Skalmeröd	474	16.54	V-PRIA	12.2	10.4
Tanum	Tanum	Ryk	216	16.93	V-VI	12.2	10.4
Tanum	Tanum	Tegneby	62	17.45	V	12.2	10.4
Tanum	Tanum	Kasen	326	17.30	V-PRIA	12.2	10.4
Tanum	Tanum	Bräcke	450	17.33	V-VI	12.2	10.4
Tanum	Tanum	Knäm	468	17.93	I-II	16.5	14.7
Tanum	Tanum	Orrekläpp	241	14.13	PRIA	10.2	8.4
Tanum	Tanum	Kalleby	427	14.73	III	14.0	12.2
Tanum	Tanum	Bräcke	446:2	18.06	V	12.2	10.4
Tanum	Tanum	Kyrkoryk	321	18.23	IV-VI	12.9	11.1
Tanum	Tanum	Kyrkoryk	335	18.40	IV-VI	12.9	11.1
Tanum	Tanum	Litsleby	65	18.71	I	16.5	14.7
Tanum	Tanum	Ryk	217	18.91	IV-VI	12.9	11.1
Tanum	Tanum	Litsleby	66	18.12	V-VI	12.2	10.4
Tanum	Tanum	Tegneby	48:1	19.03	III-VI	14.0	12.2
Tanum	Tanum	Apseberget	19	19.20	V	12.2	10.4
Tanum	Tanum	Apseberget	120	19.04	III-IV	14.0	12.2
Tanum	Tanum	Tuvene	836	19.09	V	12.2	10.4
Tanum	Tanum	Tegneby	48:2	19.34	III-IV	14.0	12.2
Tanum	Tanum	Litsleby	65:2	19.91	IV-V	12.9	11.1
Tanum	Tanum	Kyrkoryk	336	20.40	V-VI	12.2	10.4
Tanum	Tanum	Tegneby	345	20.93	V-VII	12.2	10.4
Tanum	Tanum	Tuvene	33	21.92	IV-V	12.9	11.1
Tanum	Tanum	Tegneby	105:2	23.20	IV-V	12.9	11.1
Tanum	Tanum	Apseberget	12	23.45	IV-V	12.9	11.1
Tanum	Tanum	Tegneby	105	23.71	III-IV	14.0	12.2
Tanum	Tanum	Vitlycke	1	23.42	I-PRIA	16.5	14.7
Tanum	Tanum	Litsleby	80:2	26.23	II-III	14.0	12.2
Tanum	Tanum	Tengeby	75	27.00	IV-V	12.9	11.1
Tanum	Tanum	Bro	193	27.82	III-IV	14.0	12.2
Tanum	Tanum	Spräcklebäck	232	28.10	III-V	14.0	12.2
Tanum	Lur	Välle	426	19.02	V	12.2	10.4
Tanum	Svenneby	Svenneby	66	15.43	V	11.5	10.7
Tanum	Tanum	Bro	192	16.74	III-V	14.0	12.2
Tanum	Tanum	Tegneby	61	14.83	V	12.2	10.4
Tanum	Tanum	Tegneby	490	15.28	III-V	14.0	12.2
Tanum	Tanum	Apseberget	17	19.07	III	14.0	12.2

Municipality	Parish	Area	RAÄ	m.a.s.l	Per	B	P
Tanum	Tanum	Tegneby	63	19.05	III-V	14.0	12.2
Tanum	Tanum	Litsleby	67	24.04	LN II-I	16.5	14.7
Tanum	Tanum	Bräcke	443	16.72	V	12.2	10.4
Tanum	Tanum	Tegneby	64	16.01	V	12.2	10.4
Tanum	Tanum	Apseberget	22	27.38	I	17.0	15.0
Tanum	Tanum	Lövåsen	325:1	17.27	IV-V	12.9	11.1
Tanum	Tanum	Lövåsen	321:1	17.54	IV-V	12.9	11.1
Tanum	Tanum	Lövåsen	319:1	17.73	IV-V	12.9	11.1
Tanum	Tanum	Kalleby	419	18.49	IV-V	12.9	11.1
Tanum	Tanum	Kalleby	944	19.67	IV-V	12.9	11.1
Tanum	Tanum	Kalleby	421	21.78	IV-V	12.9	11.1
Tanum	Tanum	Kalleby	418	21.46	IV-V	12.9	11.1
Tanum	Tanum	Kalleby	417	24.41	IV-V	12.9	11.1
Tanum	Tanum	Litsleby	75	27.25	III-PRIA	14.0	12.2
Tanum	Tanum	Fossum	255	44.23	IV-V	12.9	11.1
Tanum	Tanum	Ryk	970	15.20	V	12.2	10.4
Tanum	Tanum	Torsbo	156	31.61	I	17.0	15.0
Tanum	Tanun	Tegneby	72	36.63	PRIA	10.2	8.0
Uddevalla	Herrestad	Utby	58:4	13.12	IV-V	11.5	10.7
Uddevalla	Herrestad	Utby	58:1	17.22	V	11.5	10.7
Uddevalla	Herrestad	Utby	58:2	17.92	V	11.5	10.7
Uddevalla	Herrestad	Utby	58:3	15.22	V	11.5	10.7
Strömstad	Vette	Gråslös	607	18.23	IV	15.0	13.0

