

# Rock Art and Coastal Change in Bronze Age Scandinavia

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**ABSTRACT** Marine imagery comprises a large portion of the motifs currently found on Bronze Age rock art in Scandinavia. This imagery has often been discussed in terms of religion and cosmology. This paper departs from Alfred Gell's work on art and agency and asks: if rock art has agency, is it possible that this could also be used to affect elements of the environment? In certain regions of Scandinavia makers of rock art had an obsession with marine imagery which in some regions correlate with more extreme coastal change. This suggests that the connection between marine imagery and the shoreline may not be just cosmological but also associated with environmental change. Proposed cosmologies in the region involve elements of the environment, so environmental changes might have caused inhabitants to renegotiate their cosmological views. This paper looks at three examples that highlight this possible connection.

## Introduction

The Bronze Age (BA) rock art of northern Europe has often been discussed in terms of cosmology and religion. In recent decades these cosmologies have convincingly linked coastal rock art sites, marine imagery and watery landscapes. Along the coasts of Scandinavia in the BA, post-glacial land uplift (isostasy) caused the shoreline to 'retreat' (shoreline displacement) in many regions. Though shoreline data has for some time been used to date rock carvings, the social effects of this environmental change are also now being discussed. This paper proposes a model that connects shoreline-associated cosmologies with environmental change and social action. It asks if there is a greater intensity of marine imagery in those regions that experienced extreme coastal changes after the last Ice Age. If there is, then this may suggest the connection between marine imagery and the shoreline may not be just cosmological but also associated with environmental change. This relationship may have altered the purpose of the placement of rock art as the shorelines disappeared. This paper will first review cosmologies proposed by among others, Knut Helskog and Flemming Kaul. It will then look to the anthropologist Alfred Gell for a theory of the agency of art. The proposed model will then be discussed in regards to two study areas that experienced environmental change based on the recent detailed studies of Johan

Ling: Bohuslän (west Sweden) (Ling 2008), Østfold (southeast Norway) (Vogt 2012) and Uppland (east central Sweden) (Ling in press). It will also look at Simris parish, Skåne (south Sweden), where marine imagery occurs, but minimal shoreline displacement took place (Fig. 1).

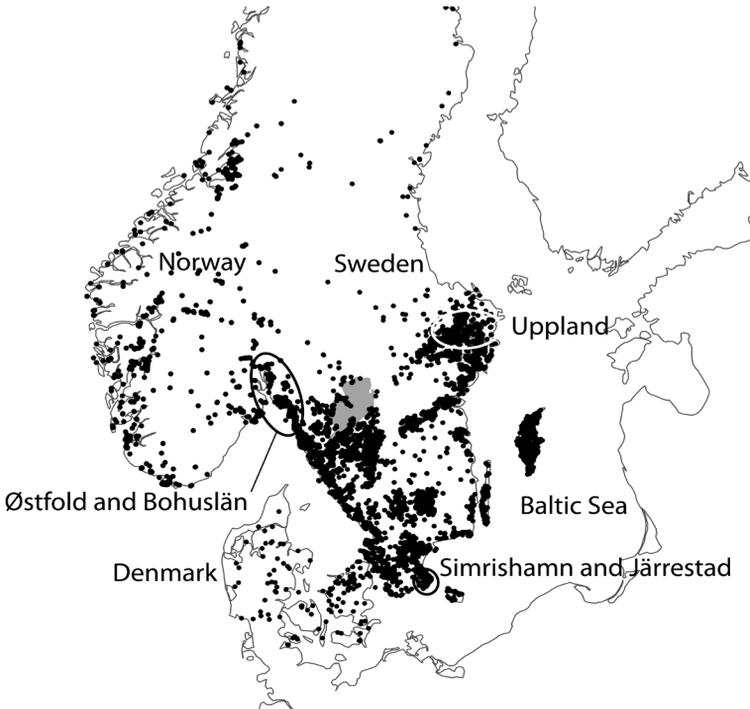


Fig. 1. General distribution of rock carvings in Scandinavia including cup marks and figurative carvings, with names of sites discussed in the text. Map constructed by the author.

#### Relevant cosmological theories and environmental change

Rock carvings constitute the largest body of pictorial information from Scandinavian prehistory, and have often been the foundation for cosmologies proposed in the BA. Christer Westerdahl (2006:8) has gone so far as to say, ‘To an illiterate tradition pictures like rock carvings is a prime form of exhibition’ of prehistoric cosmologies. Cosmological theories have historically been inspired by a range of sources from Egyptian religion (Sprockhoff 1955) to Norse mythology (Gelling & Davidson 1969) and have gone through varying phases of popularity in the history of research. In the 1970s and 80s religious theories dominated interpretation but were less concerned with integrating these cosmologies with the surrounding landscapes and other archaeological

phenomena. Today this is commonplace. Throughout Scandinavia marine imagery comprises a large percentage of the motifs on BA rock carvings: in Sweden alone we know of at least 15,000 examples. Marine imagery is also dominant on portable bronzes: in Denmark over 800 ship images have been found on a minimum of 420 ornamented bronzes (Kaul 1998:257). There have been several recent publications that have sought to contextualize rock art imagery with cosmologies that revolve around elements of the environment. Among these are Helskog's (1999) proposed 'shoreline connection' based on rock carvings in northern Norway and Kaul's (1998) tripartite cosmology based on portable Danish bronzes.

In 1999 Helskog published an article entitled 'The Shore Connection...'. In his study he analyses the locations of rock carvings in northern Norway. These carvings are categorised as the 'Northern hunting tradition', though are not devoid of marine imagery. A large percentage of these carvings in northern Scandinavia are found in the shore zone or are strongly associated with water. Helskog suggests the placement of carvings was determined by religious beliefs, such as those drawn from Arctic aboriginal and other circumpolar populations. This cosmology paints a picture of three worlds, and the shoreline is the point of connection between these three worlds. They are the sky as the upper world, the land as the middle world and underwater as the lower world. Helskog relays that 'Spirits in other dimensions are 'contacted' by people in order to gain control over animals, resources, diseases, people, spirits, life... Could, then, the shore...represent the appropriate place for rituals that connected people with the worlds of the spirits?' (Helskog 1999:79). He argues that the rock images are inseparable from the landscape they inhabit and therefore their placement near the water's edge was based on the belief that this was a site of communication (see also: Lahelma 2005a-b; Wrigglesworth 2007, 2010).

Denmark lacks the large open-air rock faces so prevalent in the Norwegian and Swedish post-glacial landscapes and so inhabitants chose instead to ornament bronze objects. Kaul (1998) has created a tripartite religious system derived from meticulous observations of these Danish portable bronze artefacts, which has been adopted and tailored at various rock art sites throughout south Scandinavia (see also Skoglund 2010). The marine imagery portrayed on the bronze objects is not limited to ships; many are part of scenes with representations of water and eel-like animal shapes. The bronze ship images have often been discussed in relation to the southern tradition of rock carvings and the two media are both considered in Kaul's system, which he applies in south Scandinavia. His model is largely based on the movement of the sun. In his system, he argues that at night the sun is drawn under the sea by a ship, and in the daytime is drawn across the sky by chariots and horses in a representation of the cycle of a day, a season, a year or possibly even a lifetime. The differences in medium, complexity and size of the carvings on bronzes versus rock make it implausible to make direct compositional comparisons; but the overwhelming presence of marine imagery

on both is obviously striking. For Kaul, as for Helskog, the shoreline is important as a transitional site between the sky and sea, between day and night.

In fact many archaeologists are dealing with religious systems that involve elements of the environment. Hans Bolin (2000:171) argues that the 'location of rock art near lakes, rivers and watercourses suggests that the theme of water was a central element in the ancient mythological belief system'. These systems give importance to the shore, sea and the movement of the sun, which they see reflected in the rock carvings and portable bronzes. Another example can be taken from Vincent Vieira's (2010) model, which connects sea-level change, mythology and rock art. This study was conducted on the eastern side of Lake Onega, northwest Russia, where the swan motif appears in rock carvings. His viewpoint is similar to that of Helskog as the distribution of rock carvings in this area is also deliberately shore-bound at the convergence of land, water and sky. Rising lake levels occurred as a result of climatic cooling and evidently may have submerged earlier Onega sites (2010:259). Vieira proposes that the frequency of the swan motif may have been a '... cognitive attempt to resolve external challenges within the context of an existing mythological framework...the swan may have been perceived as the most powerful agent for the intended reversal or control of such [environmental] challenges (or as a solution for their effects)' (2010:259-60).

Cosmology by definition is a reflection of a social group's understanding of their world: how it came to be and how it functions. It is comprised of a series of explanations, a mode of understanding the world around oneself. And these proposed cosmological systems do revolve around the environment. Yet in certain areas of Scandinavia in the BA the environment, especially in the coastal zone, was unstable. In areas such as Bohuslän and Østfold, the present day shoreline is nearly 15–20 m below that of the BA (Hygen 2000:22). In southwest Uppland, shoreline altitude was 25 m.a.s.l. c. 1700 BC but dropped to 15 m.a.s.l. by 700 BC (Ling in press:16). In other areas, such as southeast Skåne, the change was relatively small. This paper does not focus on arguing for or against established theories of BA cosmologies as presented above. It does however assume that BA understandings of the workings of the world would have been in direct relationship with the environment and argues that the production of rock art was a part of this relationship. Assuming that the cosmological beliefs just presented were so bound to the environment and specifically to the shoreline, how then would shoreline displacement affect these cosmological beliefs? And what kind of reaction would the changes inspire?

These questions have more often been proposed in regard to the south Scandinavian Mesolithic. Lars Larsson (2004) suggests environmental change might have been a factor in the deposition of portable art and the placement of graves. He proposes that prehistoric peoples would have been forced to reconsider their understanding and view of their world as the environment changed. Larsson argues that the environmental changes were extreme enough to have been recognised in the landscape, and would

have been psychologically jarring. He writes that 'being forced to change one's physical map from one generation to the next must have had consequences for the mental map' and therefore the changes must have not only had practical but also symbolic consequences (Larsson 2004:223). By connecting the distribution of rock art sites, with graves and finds of amber pendants, he observes that each feature was deliberately placed near water. Larsson (2004:223) wonders if this action was a 'means to try to achieve balance in a changing world'. In his proposition the deliberate placement of special objects might have been the intentional use of 'art' to have an effect on the environmental changes. This brings us to the anthropologist Gell.

#### Agency, rock art and environmental change

Anthropologists have always played a large part in the interpretation of prehistoric art. Their theories once dominated the discussions of the role of art in societies, whether prehistoric communities or the traditional societies in which they conducted their studies. But from the 1970s, they began to give art objects a more powerful role in society. They began to view them 'as integral to the processes of reproducing social relations and of developing affective relations with the world' (Morphy & Perkins 2006:10). Gell advocated this view. He claimed that art objects are more than just players in a structuralist system of signs and meanings, words and language. At the time of publication, Gell took a fairly controversial stance by rejecting the idea that art was just a formula for symbolic communication (see Morphy 2009 for opposing viewpoint).

His alternative approach has interested scholars and influenced rock art studies in the last decade (recent examples: Bradley 2009; Ling & Cornell 2010). Gell proposed that art objects exert agency among members of a society. He suggested a new system of relations comprising the actions performed by both objects and agency. This he describes is primarily that of agency. He defined humans as 'primary agents', and artefacts as 'secondary agents'. In his system, humans use artefacts to distribute their own agency in the world, to 'distribute their agency in the causal milieu and thus render their agency effective' (Gell 1998:20). Therefore art is an active part of society created within a matrix of social relations. Gell argued that if art objects have agency, they could have an effect or even cause an effect on members of society. Gell also discussed this type of agency in terms of 'magic'. Magic, as he describes it, is not sorcery or supernatural action but the act of affecting and manipulating social relationships. Ling and Cornell (2010:33) have recently asked:

Could the socio-ritual actions described by anthropologists as 'magic' or 'magical rituals' be broadly similar to the action behind rock art? 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 alter and transforms social positions in the landscape, [and] brings about some desired practical result without the interference of supernatural beings.

Though Ling and Cornell use Gell's conception of agency to discuss social positions, the model that I am proposing uses Gell's system and asks: if rock art has agency, and this agency can be used to have effects on human relationships, is it possible that this agency could also be used to affect elements of the environment? At the very least it seems possible that the placement and purpose of rock art was altered to reflect the receding shoreline. The environmental changes would have posed problems as traditional world-views had to be reassessed. One possible way of arresting the process or reformulating their ideas was the creation of 'art'.

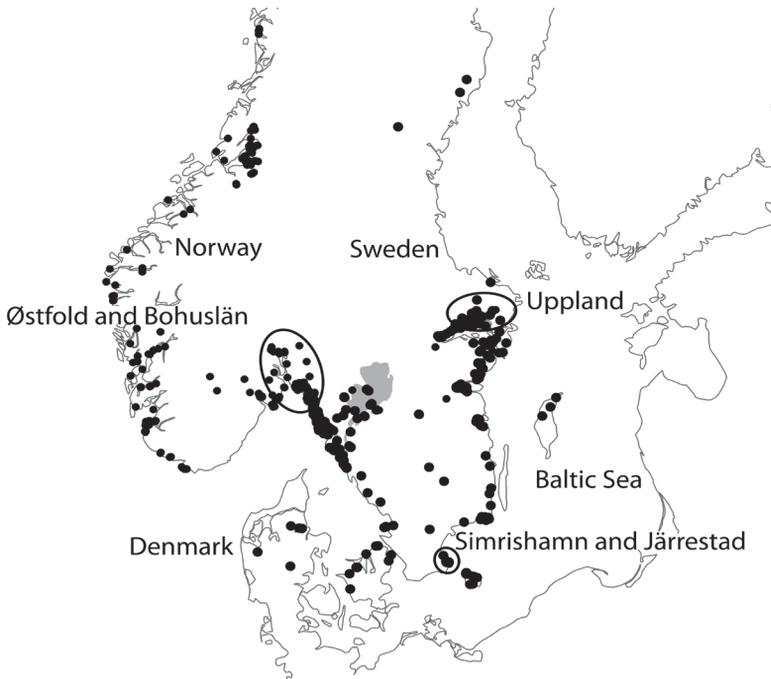


Fig. 2. General distribution of ship carvings in Scandinavia with names of sites discussed in the text. Map constructed by the author.

In order for this proposition to be viable, it must be accepted that inhabitants would have perceived environmental changes in the BA. Archaeologists over the last two decades have looked to, among others, cognitive studies (Mithen 1996, 1998; Renfrew & Morley 2009), anthropology (Ingold 2000) and landscape studies (Tilley 2004;

Tilley & Bennett 2008) to assess perceptions of environmental change. These studies have also affected the way we think about human-environment relations. Jim Leary (2009:228) argues that environmental fluctuations such as sea-level changes cannot merely be categorized as a challenge to 'overcome'; rather the changes and their effects are 'indivisible' from the both the landscape and its inhabitants. To relate this sentiment back to the previously proposed theories: if cosmologies are inherently tied to ones understanding of their environment, it seems logical that changes to this environment might require one to renegotiate these understandings. Leary subscribes to the view often discussed by Tim Ingold (2000) that the relationship between human and environment is a complex weave of perception and cognition in which human and environment are inseparable. Therefore, environmental changes would not have simply caused an effect but rather that the effects of these changes would have been an 'integral part of their world' that may be reflected in the production of rock art (Leary 2009: 235).

If we suppose that environmental change might be reflected in art production, we must concern ourselves with testing this proposal. We know that marine imagery in rock art, predominantly images of boats, generally (but not always) appears near water (Figs. 1 and 2). In order to establish a connection between such images and coastal change, we must look at those regions where we know more drastic changes occurred. It seems possible that there would be more marine imagery in those regions than in areas where change was minimal. We must look at the complexity and frequency of motifs. We must also look at the timeline of production. Rock art production may have intensified in areas where shoreline displacement was obvious. On the other hand, it may have diminished in areas where this environmental change was not so visible. That is because rock art played an active role in relations between people and the 'natural' world.

Case studies: Østfold / Bohuslän, Uppland and Simris parish, Skåne

In north Scandinavia Helskog champions the importance of the shoreline as early as the Late Mesolithic. In south Scandinavia, the cosmological importance of the shoreline probably begins in the Early Bronze Age (EBA). The BA south Scandinavian sites have varied chronologies: rock carvings at Østfold in Norway and the neighbouring Bohuslän in Sweden continued to be produced into the Pre-Roman Iron Age (PRIA). Here the coastal change was extreme. Uppland, in east central Sweden, presents a similar scenario. Here the majority of the images were created in the BA Period III, but sites were re-used and images grew in complexity in the Late Bronze Age (LBA) and into the PRIA. Others such as at Simris in Skåne, southeast Sweden have a shorter chronology, perhaps ceasing production prior to the LBA. In this region coastal change was minimal. Let us look at these regions in more detail.

## Marine imagery and shoreline displacement

It is common to consider Østfold and Bohuslän (including the World Heritage Site at Tanum) together, although they are divided politically between two countries. This region has been amply researched and is probably the most discussed and published rock art region in Scandinavia (Coles 2005; Hygen & Bengtsson 2000; Ling 2008). Most recently David Vogt (2012) has updated the existing catalogue and registered over 470 sites in the Østfold region in the most extensive survey since that of Sverre Marstrander in 1963 (which only covered the Skjeberg area). The 5000 sites in the Østfold and Bohuslän region comprise around 75,000 individual images, and these numbers increase each year (Coles 2005:17). Most of the rock panels with carvings are visible in the landscape and were located in close proximity to the sea in the BA, or at a minimum close to watery locations such as wetlands (Bengtsson 2000; Ling 2008; see Vogt 2012:40-1 for opposing viewpoint).

Ling's (2008) highly detailed study *Elevated Rock Art* reconstructs the BA coastlines in areas of northern Bohuslän enabling a new analysis of rock art distribution in the BA landscape. Ling has shown that c. 70% of sites were located near 'shallow bays, estuaries and inlets' in the BA. In the EBA, the shorelines were c. 16-17 m.a.s.l., c. 14 m.a.s.l. around 1300-1200 BC, falling to 10-11 m.a.s.l. by the end of the BA (2008:111). Many of the sites show a long chronology of use. At Torp, Skredsvik, Bohuslän, the chronology begins as early as the Late Neolithic and continued throughout the BA and into the PRIA (Bengtsson & Ling 2006; Bertilsson & Bertilsson 2006). As sea levels fell, new rock faces and new sections of already carved panels became available for use and it is clear that BA people took advantage of this. This is apparent at Runhäll in Ryk. The first ships carved on the panel originate as early as Period II, but the majority were carved on lower sections of the panel from Period III until the end of the BA at which point the sea no longer touched the rock face (Ling 2008:87-91, see especially the reconstruction, p. 138).

Of the 75,000 images in the region, the boat/ship is the most common, with over 10,000 having been recorded (Hygen & Bengtsson 1999; Ling 2008; Vogt 2012). The ship images dominate the shore-bound panels, whilst other motifs such as human figures and cup marks are generally found on higher ground (Bengtsson & Ling 2007). What is striking is the diversity of forms. The ships vary in size, from 20 cm to over 2 metres (Coles 2005:22). They range from the 'single line type' to the more ornate animal headed prows. Crews are represented by simple strokes, or are adorned with any number of designs from cup marks to large spirals. In certain situations human figures referred to as acrobats are depicted jumping off the ships and others are seen blowing lurs while still others are posed in an adrant position. These various depictions and their sheer quantity are representative of the long chronology of their production. Their connection to watery locales is obvious. Perhaps it is true that 'the coastal strip

or shore may be regarded as a special place with special environmental conditions for social action' (Ling 2008:232). And these social actions would likely have been renegotiated to consider the receding shoreline. As John Coles (2005:101) asserts:

Sea-water had an important role but one that changed over time; a landscape studded with rock carvings linked to the existing sea-level would be altered and probably lose much of its contemporary purpose as the waters withdrew in discernible and inexorable patterns...The important point in all this is that the coasts of Bohuslän and Østfold were not fixed, they were mobile and societies had to accept the variability and be prepared to adapt and develop concepts originally inappropriate to the conditions.

Ling's (in press:2-3) most recent work was conducted in southwest Uppland where he measured over 80 figurative rock art carving panels containing over 2,000 ship images. This work was preceded by, among others, Coles (2000) and Einar Kjellén (1976) who also recognised the relationship between the carvings' placement next to the BA shorelines. Coastal change was also visible here, with shorelines in 1700 BC at c. 25 m.a.s.l. falling to c. 15 m.a.s.l. by the end of the BA in 700 BC (Ling in press:16). Ling's assertions in this region are similar to those from Bohuslän. Carvings were created in what was a BA seascape and many of them were located at the water's edge. Of the relationship between sea and rock carvings in the Rickeby and Hemsta areas, Ling (in press:25) emphatically states: 'Nowhere else in Sweden is this relation so obvious.'

Just as in Bohuslän, many of the figurative rock carving panels were partially covered by water when they were first carved, yet carving continued even when the shoreline became detached. This is especially apparent at Boglösa 138:1. Here the first ships were carved just above the shoreline on the rock face, with the lower section carved after EBA Period II and the majority of the images carved from this period onward. Interestingly, when the sea was no longer touching the panel (and in fact was already 100m west) there are images from Period V (in press:25-31). This process is echoed at Boglösa 141:1, where the majority of the ship images (of which there are 60) were carved onwards from Period II-III (in press:31-33). PRIA carvings are more rare than in Bohuslän (only 4 of the figurative panels in Ling's study), but Ling (in press:16) attributes this deficit to the lack of suitable rock faces between 15 and 5 m.a.s.l. The carvings in southwest Uppland generally followed the disappearing shoreline, though depending on the altitude of the panels, shoreline displacement would have occurred at different periods in the BA. The majority of the panels relate to Period III yet Ling (in press:76) notes that though production in the LBA period IV-V decreases, the images become 'highly innovative and elaborate' and these images were mainly carved onto panels already established for rock art production as opposed to using new panels that would have become available by the displaced sea.

## Marine imagery and minimal shoreline displacement

The rock carvings of Skåne have also had a long history of research, beginning with Carl-Axel Althin in 1945, Stig Welinder in 1974 and Göran Burenhult's extensive documentations in 1973. These studies comprise the initial recordings of the well-known sites such as Sweden's largest burial cairn Kivik, the collection of panels around Simrishamn and the inland site at Järrestad. More recently Sven-Gunnar Broström and Kenneth Ihrestam (1996, and 2011 additions) produced a comprehensive inventory of the Simris parish rock carvings, Coles (1999) has reinvestigated Järrestad, Chris Tilley (2005) has explored the entire Simris parish (see also Skoglund 2005) and Kivik has also been reassessed (Randsborg 1993; Goldhahn 2009). Österlen, this southeast region of Skåne, falls in the area of the Scandinavian isobase maps where little postglacial uplift is shown to have occurred, due to its distance from the Fennoscandian glacier's thickest point (see Ekman 1996, Eronen et al 2001). Southeast Skåne and the area around Simrishamn is less well-studied than its southern or western counterparts, where such investigations as the Ystad Project have paid special attention to prehistoric environmental changes. Björn Berglund (1991:73) does assert that on the southern coast of Skåne sea levels were generally c. 2 m.a.s.l. than the present day shore and Björn Gedda (2007:20 as cited by Ling 2008) claims sea level was c. 2-3 m.a.s.l. at the onset and 1 m.a.s.l. at the close of the BA. The shoreline purportedly withdrew at a faster rate for a short period from c. 1300 BC yet these smaller changes (c. 7mm/year) would have been more difficult to perceive as opposed to those in Bohuslän or Uppland (Mörner et al. 2009).

Yet despite the lack of coastal change, the carvings in the vicinity of Simrishamn and the grave carvings at Kivik, approximately 15 m north of this area, are both coastally located. Kivik is 75m in diameter and the cairn is high enough to be seen from the sea (Tilley 2004). The Simris 19 ship carvings are considered to be chronologically similar to Kivik's ship carvings, and these are dated to the EBA Per I or II (Per III at the very latest) (Kaul 1998:78; Skoglund 2005). The simpler panels with fewer ships can be typologically dated to Period III and earlier. By Chris Tilley's (2004) account the combined Simris panels can boast at least 83 ships. More recent calculations show this number to be closer to 100 (Riksantikvarieämbetet 2011). The main panel (Simris 19) is less than 3m from the shore. When you stand on the rock face you can see almost 180 degrees of sea in front of you despite the presence of a main road and a parking lot (Fig. 3). The panel is predominated by 45 ship and 53 axes but only c. 10 cup marks. The ships are generally aligned perpendicular to the coast, though in certain clusters they appear upside down or in pairs with their keels or stems facing each other as if they are turning a circle around an imaginary axis.

Though Järrestad is not a coastal site, scholars have treated it as part of the network including Kivik and Simrishamn (Tilley 2004) for in the right weather you can in fact spot the sea from this slightly higher ground. Järrestad 4, just inland of Simrishamn, contains less marine imagery than at Simris 19. Cup marks, of which there are 338, predominate on the panel. And though the 29 boats / ships are still prominent, the focus seems more geared towards human activity (Tilley 2005:153). Järrestad is covered in 96 feet and 90 foot soles, which are rarely represented elsewhere in the region. It also contains the one human representation in Skåne, the famous dancer / swimmer (Bradley 2000; Coles 1999). The carvings could have been produced up to the LBA and the site is also associated with burials of that date (Coles 1999:178-9), though other rock carvings in the area originate from the EBA (Järrestad 4) (Kaul 1998:91). Peter Skoglund (2005:113-115) has discussed the superimpositions of carvings on other carvings and combinations of motifs, which he imagines is a representation of changing meanings of the motifs. He sees a divergence in BA ideology in Period II, when the symbolism of the axe diminished, yet the ship symbol continued being created. So although Järrestad perhaps has a longer chronology than Simris, the intensity of marine imagery and its relationship to a marine environment are weaker.



Fig. 3. View from rock panel Simris 19 looking out at the water (Photo: C. Nimura 2010).

## Concluding remarks

How should we interpret this comparison? The motifs and chronologies of these sites behave differently. Bohuslän and Østfold both have a direct relationship with the sea; they experienced drastic coastline changes and they have a chronology that extends into the PRIA. Uppland also has a direct relationship with the sea and shoreline displacement. There are less LBA and PRIA carvings than in Bohuslän and Østfold though the later carvings increased in complexity and were carved on reused panels. Ships, however, dominate the Simrishamn carvings, are directly related to the sea and have a shorter chronology. Production ceases earlier in this area where the sea-level change had little effect on the coastline. Järrestad is situated inland; it has a longer chronology dominated by foot soles and cup marks, and seems to have a stronger relationship with nearby burial mounds. It is feasible to apply some of the cosmologies discussed in this paper to any one of these sites, but the evidence also suggests that shoreline displacement may have instigated a renegotiation of these cosmologies. Perhaps in areas that experienced little shoreline displacement the production of rock art was not affected so drastically. In areas where the coastline was receding, the intensity of the production of marine imagery might have been a reaction to environmental change.

The theoretical model introduced in this paper is being considered in the author's current research. In this work a new database has been created in one Geographical Information System (using ArcGIS 10) by combining the heritage agency databases from Denmark (Kulturarvsstyrelsen: Fund og Fortidsminder), Norway (Askeladden) and Sweden (Riksantikvarieämbetet: Fornsök). The database includes all archaeological features registered by the three agencies but focuses on rock carvings from the Mesolithic through to the PRIA. This database enables a pan-Scandinavian investigation of the occurrence of marine imagery and other figurative imagery in rock carvings. General shoreline data is also included at both a national and regional level. The database uses isobase maps and prehistoric shoreline approximations based on known relative sea level changes from published sources. There are other factors to consider than general isostatic and eustatic fluctuations. Absolute sea level and relative sea levels must take into account bathymetric gradations in the coastal areas. These data should provide an idea of where the sites were located in proximity to the BA shoreline, and possibly help illuminate how visible the coastal changes might have been. This methodology is geared toward analysing a broader picture of Scandinavian rock carvings but also allows for local and smaller regional scale differences, of which many became apparent in the building of this database (see Sörman and Wessman 2011 for a theoretical discussion of the intersections of micro and macro scale research in BA Scandinavia).

Of course there have been many other explanations for the placement of rock carving panels containing marine imagery in what were once seascapes, and these

are important to note. Westerdahl (2005) has written extensively on taboos in the maritime sphere. Others have focused on the possibility of marking BA ship landing sites or sea markers. Many champion the shorelines as sites of maritime rituals and performances (Ling & Cornell 2010), as ritual expressions (Hauptmann Wahlgren 2002), as sacred places (Helskog 2004; Mandt 2001) or centres for trade/meeting places (Malmer 1981; Grønnesby 1993; Randsborg 1993; Bengtsson 2004; Kristiansen & Larsson 2005). Yet in any of these examples, it is without a doubt that the maritime environments of Scandinavia played an important role in the large-scale networks of BA life. At the coast and along inland waterways boats would have been used to travel, transport goods and possibly deliver the dead to their resting places. The maritime sphere was important in everyday life and this importance must have also had a symbolic, cosmological or religious nature. Often we explain the purpose of cosmological and religious systems in terms of a society's need to find stability and understand phenomena that would have baffled the prehistoric human. Fluctuations in the maritime arena such as shoreline displacement would therefore have played a part in the nature of this entwined relationship.

Two main questions must be asked, which must be posed at different scales of analysis. The first is whether maritime imagery was always associated with the water's edge and whether different designs were employed in inland areas. On a general level this can already be seen in distribution maps derived from the three heritage agency databases. Particularly in south Scandinavia the ship image occurs mainly in coastal areas or along inland waterways and lakes. The second is the relationship between rock art production and coastal change. This raises a still more fundamental issue. By considering existing theories of cosmologies in both the southern tradition and northern tradition of rock art we are led to champion the importance of the shore and watery environments. By using Gell's theory of art and agency the proposed relationship between rock art and coastal change can be contemplated on a smaller regional scale. In doing so, it seems plausible that the carved rocks were directed not only to a living audience but also to the unpredictable character of the sea itself.

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## References

- Althin, C. A. 1945. *Studien zu den Bronzezeitlichen Felszeichnungen von Skåne*. Lund: Gleerup.
- Ballard, C., Bradley, R., Nordenborg Myhre, L. & Wilson, M. 2003. The ship as symbol in the prehistory of Scandinavia and South-east Asia. *World Archaeology* 35: 385-403.
- Bengtsson, L. & Ling, J. 2006. Scandinavia's most finds associated rock art sites. *Adoranten* 2006: 40-50.
- Bengtsson, L. 2004. Cup marks for the common people, images of the elite. In: Milstreu, G. & Pröhl, H. (Eds.) *Prehistoric pictures as archaeological source*. 167-77. Göteborg: Gotarc.
- Berglund, B. 1991. The Late Bronze Age Landscape: Landscape, land use and vegetation. In: Berglund, B. (Ed.) *The Ystad Project - The cultural landscape during 6000 years in southern Sweden*. 73-77. Copenhagen: Ecological Bulletins 41.
- Bertilsson, U. & Bertilsson, C. 2006. Excavations at the Rock Carvings at Torp in Skredsvik in Bohuslän, Sweden in the early 1990s. *Adoranten* 2006: 74-85.
- Bolin, H. 2000. Animal Magic: The Mythological Significance of Elks, Boats and Humans in North Swedish Rock Art. *Journal of Material Culture* 5: 153-176.
- Bradley, R. 2006. Danish razors and Swedish rocks: cosmology and the Bronze Age landscape. *Antiquity* 80: 372-8.
- Bradley, R. 2009. *Image and audience: rethinking prehistoric art*. Oxford: Oxford University Press.
- Bradley, R., Skoglund, P. & Wehlin, J. 2010. Imaginary Vessels in the Late Bronze Age of Gotland and South Scandinavia: Ship Settings, Rock Carvings and Decorated Metalwork. *Current Swedish Archaeology* 18: 81-106.
- Broström, S.-G. & Ihrestam, K. 1996. *Skåne: 1996 års inventering av hällristningar på Österlen*. Tumba: Riksantikvarieämbetet BOTARK-rapport.
- Broström, S.-G. & Ihrestam, K. 2011. Hällristningar i Östra Nöbbelövs S:N, Skåne. Tumba: Riksantikvarieämbetet BOTARK-rapport.
- Burenhult, G. R. 1973. *The rock carvings of Götaland: excluding Gothenburg county, Bohuslän and Dalsland, Part II: Illustrations*. Lund: Gleerup.
- Coles, J. 1999. The dancer on the rock: record and analysis at Järrestad, Sweden. *Proceedings of the Prehistoric Society* 65: 167-87.
- Coles, J. 2000. *Patterns in a Rocky Land: Rock Carvings in South-West Uppland, Sweden*. Uppsala: Univ.
- Coles, J. M. 2005. *Shadows of a northern past: rock carvings of Bohuslän and Østfold*. Oxford: Oxbow.
- Ekman, M. 1996. A consistent map of the postglacial uplift of Fennoscandia. *Terra Nova* 8(2): 158-165.
- Eronen, M., Gluckert, G., Hatakka, L., van De Plassche, O., van Der Plicht, J. & Rantala, P. 2001. Rates of Holocene isostatic uplift and relative sea-level lowering of the Baltic in SW Finland based on studies of isolation contacts. *Boreas* 30: 17-30.
- Gedda, B. 2007. Landskapsrummets fysiska möjligheter. In: Artursson, M. (Ed.) *Vägar til Vetland. En bronsåldersbygd I nordöstra Skåne 2300 – 500 f. Kr*, 17-25. Stockholm: Riksantikvarieämbetet.
- Gell, A. 1992. The Technology of Enchantment and the Enchantment of Technology. In: Coote, J. & Shelton, A. (Eds.) *Anthropology, Art and Aesthetics*. Oxford: Oxford University Press.
- Gell, A. 1996. Vogel's Net: Traps as Artworks and Artworks as Traps. *Journal of Material Culture* 1: 15-38.
- Gell, A. 1998. *Art and agency: an anthropological theory*. Oxford: Clarendon.
- Gelling, P. & Davidson, H. R. E. 1969. *The Chariot of the sun and other rites and symbols of the Northern Bronze Age*. London: J. M. Dent & Sons.

- Goldhahn, J. 2009. Rock art for the dead and un-dead: Reflections on the significance of hand stones in Late Bronze Age Scandinavia. *Adoranten* 2009: 95-103.
- Grønnesby, G. 1998. Skandinaviske helleristninger og rituelle bruk av transe. *Arkeologiska Skrifter fra Historisk Museum, Universitet i Bergen* 9: 59-82.
- Hauptmann Wahlgren, K. 2002. *Bilder av betydelse: Hällristningar och bronsålderslanskap i nordöstra Östergötland*. Lindome: Bricoleur Press.
- Helskog, K. 1999. The Shore Connection: Cognitive Landscape and Communication with Rock Carvings in Northernmost Europe. *Norwegian Archaeological Review* 32: 73-94.
- Helskog, K. 2004. Landscapes in rock-art: rock-carving and ritual in the old European North. In: C. Chippindale & G. Nash (Eds.), *The Figured Landscape of Rock-Art. Looking at Pictures in Place*, 265-288. Cambridge: Cambridge University Press.
- Hygen, A-S. 2000. A border region in Scandinavia. In: Hygen, A-S. & Bengtsson, L. (Eds.) *Rock carvings in the borderlands: Bohuslän and Østfold*. 19-23. Gothenburg: Warne Förlag.
- Hygen, A.-S. & Bengtsson, L. (Eds.) 2000. *Rock carvings in the borderlands: Bohuslän and Østfold*. Gothenburg: Warne Förlag.
- Ingold, T. 2000. *The perception of the environment: essays on livelihood, dwelling and skill*. London: Routledge.
- Kaul, F. 1998. *Ships on bronzes: a study in Bronze Age religion and iconography*. Copenhagen: National Museum of Denmark.
- Kjellén, E. 1976. *Upplands hällristningar*. Stockholm: Kungl. Vitterhets historie och antikvitetsakademien.
- Kristiansen, K. & Larsson, T. B. 2005. *The rise of Bronze Age society: travels, transmissions and transformations*. Cambridge: Cambridge University Press.
- Lahelma, A. 2005a. Between the Worlds: Rock Art, Landscape and Shamanism in Subneolithic Finland. *Norwegian Archaeological Review* 38: 29-47.
- Lahelma, A. 2005b. The Boat as a Symbol in Finnish Rock Art. In: DeVlet, E. G. (Ed.) *Mir naskal' nogo iskusstva: sbornik dokladov mezhdunarodnoi mezhdunarodnoi konferentsii*. Moskva: Institut arkhologii RAN.
- Larsson, L. 2004. Land, water and symbolic aspects of the Mesolithic in southern Scandinavia. *Before Farming* 03/04: 215-226.
- Leary, J. 2009. Perceptions and responses to the Holocene flooding of the North Sea lowlands. *Oxford Journal of Archaeology* 28: 227-237.
- Ling, J. 2008. *Elevated rock art: towards a maritime understanding of Bronze Age rock art in northern Bohuslän, Sweden*. Göteborg: Göteborgs universitet.
- Ling, J. (In press). *Rock Art and Seascapes in Uppland*. Oxford: Oxbow Books.
- Ling, J. & Cornell, P. 2010. Rock Art as Secondary Agent? Society and Agency in Bronze Age Bohuslän. *Norwegian Archaeological Review* 43: 26-43.
- Malmer, M. P. 1981. *A chorological study of North European rock art*. Stockholm: Vitterhets historie och antikvitets akademiens handlingar.
- Mandt, G. 2001. Women in disguise or male manipulation? Aspects of gender symbolism in rock art. In: Helskog, K. (Ed.), *Theoretical perspectives in rock art research*. 290-311. Oslo: Novus forlag: Instituttet for sammenlignende kulturforskning.
- Marstrander, S. 1963. *Østfolds jordbrukristninger*. Oslo: Universitetsforlag.
- Mithen, S. J. 1996. *The prehistory of the mind: the cognitive origins of art, religion, and science*. London: Thames and Hudson.
- Mithen, S. J. (ed.) 1998. *Creativity in human evolution and prehistory*. London: Routledge.
- Mörner, N-A., Lind, B.G. & Possnert, G., 2009: Heimdall's Stones at Vitemölla in SE Sweden and the chronology and stratigraphy in the surroundings. *Geogr. Ann.* 91 A(3): 205–213.
- Morphy, H. 2009. Art as a Mode of Action: Some Problems with Gell's Art and Agency. *Journal of Material Culture* 14: 5-27 .

- Morphy, H. & Perkins, M. 2006. The Anthropology of art: A Reflection on its History and Contemporary Practice. In: Morphy, H. & Perkins, M. (Eds.) *The anthropology of art: a reader*. 1-32. Oxford: Blackwell.
- Randsborg, K. 1993. Kivik. Archaeology and ideology. *Acta Archaeologica* 64: 1-147.
- Renfrew, C. & Morley, I. 2009. *Becoming human: innovation in prehistoric material and spiritual culture*. Cambridge: Cambridge University Press.
- Riksantikvarieämbetet. 2011. *Fornsök* [Online]. Stockholm: Riksantikvarieämbetet. [Accessed June 2011].
- Skoglund, P. 2005. *Vårdagens landskap: lokala perspektiv på bronsålderns materiella kultur*. Stockholm: Almqvist & Wiksell International.
- Skoglund, P. 2010. Cosmology and Performance: narrative perspectives on Scandinavian rock art. In: Goldhahn, J., Fuglested, I. & Jones, A. (Eds.) *Changing Pictures: rock art traditions and visions in northernmost Europe*, 127-138. Oxford: Oxbow Books.
- Sörman, A. & Wessman, A. 2011. *Towards a Broader picture – Regional Perspectives and Beyond*. Unpublished.
- Sprockhoff, E. 1955. *Das Bronze Zierband von Kronsbagen bei Kiel: eine Ornamentsrudie zur Vorgeschichte der Vögelsonnenbarke*. Neumünster: Karl Wachholtz.
- Tilley, C. Y. 2004. *The Materiality of Stone: explorations in landscape phenomenology: 1*. Oxford: Berg.
- Tilley, C. Y. & Bennett, W. 2008. *Body and image: explorations in landscape phenomenology 2*. Walnut Creek: Left Coast.
- Vieira, V. 2010. A Context Analysis of Neolithic Cygnus Petroglyphs at Lake Onega. *Cambridge Archaeological Journal* 20: 255-261.
- Vogt, D. 2012. *Østfolds helleristninger*. Oslo: Universitetsforlaget.
- Welinder, S. 1974. A study on the Scanian rock carvings by quantitative methods. *Meddelanden från Lunds Universitets Historiska Museum* 1973-74: 244-75.
- Westerdahl, C. 2005. Seal on Land, Elk at Sea: Notes on and Applications of the Ritual Landscape at the Seaboard. *The International Journal of Nautical Archaeology* 34(1): 2-23.
- Westerdahl, C. 2006. Maritime cosmology and archaeology. *Deutsches Schiffahrtsarchiv* 28: 7-54.
- Wrigglesworth, M. 2007. Bronze Age rock art and burials in west Norway. *Arqueología y Territorio* 4: 251-261.
- Wrigglesworth, M. 2010. Bronze Age rock art and religion in a maritime perspective. In: Goldhahn, J., Fuglested, I. & Jones, A. (Eds.) *Changing Pictures: rock art traditions and visions in northernmost Europe*. 186-96. Oxford: Oxbow Books