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3D-models of Neolithic and Bronze Age axe images at Nämforsen, Sweden

– reveals long-distance contacts and new implications for chronology and cultural context

Introduction

The purpose here is to present, analyze and discuss new observations from the last years' photogrammetric documentation of the Nämforsen' rock carvings, with emphasis on axe figures, a category that we have previously dealt with some questions still remain to be disentangled (Bertilsson 2019). Results of the documentation accomplished since 2015 raising questions about context and chronology, seemingly more complicated than previously understood. (Bertilsson 2015, 2016, 2017 and 2019, Bertilsson & Bertilsson 2015, 2017, 2018, 2020 and 2021). The 3D models produced enables observations of details and phenomena not previously noticed, making established interpretations less unambiguous and possible to reconsider. First, some comments on recent years' research on "Northern Hunters Rock Art" (Goldhahn et al. 2010, cf. Bertilsson 2012, Goldhahn 2021).

The concepts Northern and Southern tradition considered to reflect an actual difference between hunter-gatherer's rock art and farmer's rock art. The former with northern attributes like single-line ships with moose-headed prows and moose head axes with ears. In this way, the style combined with the geographical location and an assumed chronological significance, is said to confirm that the rock art reflects a cultural form enshrined in its stylistic development. As this may give rise to a circular reasoning Trond Klungseth Lødøen (2017) discusses these concepts problematic impact on the interpretation and dating of the carvings in Western Norway highlighting the distinct features the rock art in, Vingen and Ausevik shares with the Atlantic and Megalithic rock art traditions, e.g., representations of circles and deer at Campo Lameiro in Galicia, Spain and cup-and-ring figures in Northumberland, England. This touches upon issues of chronology and context of the Nämforsen petroglyphs brought forward in the last century (Hallström 1960, Baudou 1977 and 1993, Forsberg 1993, cf. Lindgren 2001). This discourse is illustrated by Baudou's study of the petroglyphs in relation to the nearby settlement site Ställverket (Baudou 1993). There, he concludes that the petroglyphs had been produced during three main periods; an initial in the Early and Middle Neolithic, 4,000 - 2,300 BC; a subsequent in the Late Neolithic, 2,300 - 1,800 BC and a final in the Early Bronze Age, 1,800 - 1,400 BC. Then, he claims that the indigenous carving tradition ceased, and was replaced by "On the coast a southern Scandinavian ideological tradition that is increasingly in opposition to the interior" (Baudou 1993, translated here). Kalle Sognnes considered "the form classifications and analyses to be inadequate" concluding that no single interpretation alone can explain the Northern Tradition proposing that the three largest sites - Vingen, Alta and Nämforsen, functioned as entrances to the area and as common meeting places of middle Scandinavia (Sognnes 2017)

although this feature does not explain its pictorial content.

The empirical data

Our empirical data consists of the 3D documentation of the rock art panels accomplished since 2015 by photogrammetry using SfM technology (Bertilsson & Bertilsson 2015, Bertilsson 2016, Bertilsson & Bertilsson 2017, 2018, 2020 and 2021). The work is based on the unit of rock carving, as described in Hallström's' original documentation (1960) and used in the inventory 2001-2003 (Larsson & Broström et al 2018). This system not even conforming to the solid principles of the National Antiquities Inventory of the last century, still the use of it having the advantage that the new data collected being comparable with Hallström's system. Since 2015 233 rock carving surfaces have been documented photogrammetrically, which, would mean that 92% of the total number of 252 carvings documented by Larsson and Broström. However, some 30 carvings only being documented in parts during 3 years due to the lichen vegetation possible to remove only gradually by alcohol spraying, 79% is a more accurate number.

The intention here is to expand our previous study of the Early Bronze Age axes carved at Nämforsen to also include other types of axes (Bertilsson 2019). To extract a single type of figure from a overall context may seem bold, but still motivated since this context is partly a chimera, because the total amount of images we now see and document was accumulated over a long period of time and with varying intentions (cf. Ljunge 2016, Sapwell 2017). This means, for example, that various image types may have been carved and used on different occasions, individually or in groups keeping or changing its content and meaning through time (Bolin 2010, cf. Nilsson 2017). The gradual accumulation of images was a continuous process, just as the viewing; the images from the Early Neolithic may have been viewed during the Late Neolithic and those from both of these periods during the Early Bronze Age. Several questions then arise: Was it perceived that the previous pictures were already old? Were new images deliberately placed close to old ones (Sapwell 2017)? Regardless of the carver's intention, unknown to us, we may assume that a distinct form like a carved axe that resembles a known type of axe also represents one. That it perhaps was carved with the intention of symbolizing another phenomenon or activity does not automatically make it become less of an axe. "But nonsense is nonsense and snuff is snuff, albeit in golden cans, and roses in a cracked jar are still always roses," (Fröding 1894 translated here).

That Nämforsen itself was the most important factor for the choice of location seems obvious. Joakim Goldhahn emphasized the thunder of the rapids as an attractive factor, acoustically and visually, for the people in the surrounding landscape (Goldhahn 2002). The outstanding location at the intersection between the hinterland and the coast, the river's outlet and the sea, the hunter-gatherer population and the visitors from far away, where the different worlds met must have had an inherent power (cf. Tilley 1991). A crucial aspect for the understanding the petroglyphs is the chronology; when were they made? In which period and when in this period? Occasionally or continuously? Although, an overall chronology already exists it seems to have some gaps. The common view is that the practice of petroglyphing began in the Early Neolithic, 4000 BC and continued in the Middle Neolithic, and in the Early Bronze Age until around 1400 BC, when the indigenous = northern tradition, ceased and was replaced by a southern one (Baudou 1993 above, Forsberg 1993). If his assumption is correct, there is a place continuity but not a cultural ditto. The idea seems relevant and the proposed use of the place is by no means impossible. However, more recent research has shown, that a different interpretation of the context is at least as conceivable (Käck 2009).

Ideological positions

In our view, the majority of images in intention and design are pictorial and thus can be expected to represent actuals object or phenomena, although not always exact depictions of original objects or creatures. We may imagine a case where a picture of a ship was carved as a depiction of one that just arrived at the rapids, the similarity and representativeness being high. The image of a ship may also have been made from memory illustrating a previous event – the long sea trip getting there, or the first appearance of foreign long ships. The similarity depending on when the carving was made – directly or long after the event, but also on the carver's image memory and design ability. In a third case, a ship may have been carved to give the impression of ownership of such a ship or that it was highly coveted. Regardless of the reason for carving an image at Nämforsen or elsewhere, the intention was to influence the surrounding world, in the broadest sense of the term. Some recent years research, may give the impression that previous rock researchers believed that the reason for carving an image was to show that object only. This could possibly apply to Sophus Müller's view that pictures like rock carvings was made to fill in an empty space, as decorations (cf. Bertilsson 2015). However, Malmer's explanation of the relationship between bronze-rich areas and rock-carved ditto already (1981) implies that the carver aimed at influencing the surrounding world through the agency of the images (Bertilsson 2020).

According Fredrik Fahlander, the imagery is strictly non-representational, the rock art ships depictions being neither realistic nor symbolic representations, of real ships but constituting boat-beings or rather fantasy figures, intended to affect the surrounding world by its agentive power produced through their visual mode and their location. This makes it uncertain if ship images considered to represent real Bronze Age ships actually do. One reason for this is, he argues, that no finds of such ships have been made in Scandinavia. Moreover, he hypothesizes, that certain motifs were enlarged to compensate for the increasing distance to the water because of the land uplift (Fahlander 2019). Courtney Nimura argues similarly claiming that the meaning and content of the carvings had to be renegotiated as the water receded (Nimura 2015). In contrast to Fahlander, she and Richard Bradley claims that the carved images are representative and have symbolic meanings, the actual difference between the Northern and Southern Traditions depending on different belief systems (Bradley & Nimura 2013). In our view, we cannot exclude any of these interpretations of the rock art, despite often presented as opposites. So, without the intention to take a stand for any of them, we leave the door open for the time being. However, it seems doubtful if the lack of actual ship finds from the Bronze Age can be seen as evidence that the ships carved into the rock surfaces along the coasts had not existed. The ships may have sunk in deep water; they may be completely embedded in thick clay sediments in the uplift areas; they may have been used as funeral ships on crematoria or they may have rotted away or been dismantled when becoming obsolete etc.

In recent years, storytelling that has become relevant for explaining the rock carvings through various studies (Bolin 2010, Skoglund 2018). Peter Skoglund suggests that motifs were depicted to convey information and attract senses of sight, touch, and movement across the panels and helped to convey and conduct powerful narratives in ritual performances. A large rock art panel in Aspeberget in Tanum displaying important themes like journeys and self-confirmation in contrast to more distant outsiders of a narration (Rédei et al. 2018). This work demonstrates the narrative dimension of rock art and the importance of experienced events for the content of the imagery, and an explanation for its accumulation through repeated visits and later changes during the Bronze and Iron Age (cf. Nilsson 2017).

The empirical data

The rock carvings on the islands Laxön, Notön and Brådön in Nämforsen are one of the largest concentrations of panels and images in all Scandinavia. The inventory in 2001-2003, accounts for almost 2600 individual images registered with 2D-documention using a three-step method with artificial lightening of the panels, painting the figures with slurred chalk powder and tracing them on transparent plastic (Larsson, Broström et al 2018). The type-definable figures consist of 387 ships / boats, 104 anthropomorphic figures, 711 animal figures, of which 461 moose, 21 fishes, 8 birds and 1 bear, 29 foot-prints, 1 circle cross and 126 cup marks, and in addition a total 107 axes of which 29 picks. The 3D-documentation still in progress has given rise to big changes when compared to the 2D ditto, the interpretation being changed or images not verified for by Larsson & Broström registered figures for 25% of the carvings on Laxön and Lillforshällan and of at least 50% of these on Notön. The 3D-documentation on Notön in 2021, also resulted in an increase of individual figures by 40% (Bertilsson & Bertilsson 2021).

New axe types

Analyzes of the new 3D-models have shown that the representation of figures and types are more complex and information-rich than previously perceived, exemplified by the identification of EBA axe types common in southern Sweden like flanged axes, pal staves and so-called cult axes (Bertilsson 2019). The moose-head axe previously considered the most frequent type, seems, according this analyze, rather rare only about 10 objects out of a total of 115 can be brought to this type with certainty. A reason for this difference may be sought in the fact that the interpretation of the Nämforsen rock art complex has largely been guided by the hunting and trapping discourse as the starting point for the interpretation (Bertilsson 2017). This have led to a circular-reasoning where the actual reason for most axes classified as moose-head axes deriving, unconsciously, from the fact that the rock art being produced by moose hunters this type of axe would be expected. Irrespective this, the 3D-documentation actually shows that, the most common type is *the pick (swe. hacka)*, a type of rather uncertain definition, with about 40 registrations. The lack of fixed typology is also relevant for the second most common type with about 30 registrations we have chosen to name *megalithic axe* due to its similarity to axes depicted on megalithic tombs in Brittany, France, (Fig.1). It is followed by shaft-hole axe with 15, moose-head ax with 10, palstave with 7, cult-ax with 4 and flanged axe with 2 registrations. All types, except the moose head axe, possible to date to the Early Bronze Age (Bertilsson 2019). The difficulty to type these axes is illustrated by the panels Laxön G3 and D1-15, where the depth and relief of the carved figures have been erased by surface weathering in combination with repeated cleaning and painting of these for public purposes (cf. Bertilsson & Bertilsson 2018). Regardless of this, 3D documentation has created much improved conditions to discover figures which do not appear in 2D documentation (Bertilsson 2016; Bertilsson & Bertilsson 2015, 2017 and 2018).

Picks

The name is given from its shape with a shaft that swinging out at the neck of the axe blade that seems to be attached directly to it much in the fashion of a palstave. The blade is rather long and slightly curved giving it a slightly clumsy appearance. The function is actually also quite unclear, i.e., whether it was a weapon or a work tool (cf. Hallström 1960: 320 "…

Figure 1. Exampels of Megalithic axe types, 1) Kerran. 2) Mané er Hroeck. 3) Dissignac. After Twohig 1981.

Figure 2. Detail of panel Lillforshällan G:1 with five tightly grouped pick axes, 10-25 cm long. Photo and visualization: Catarina Bertilsson.

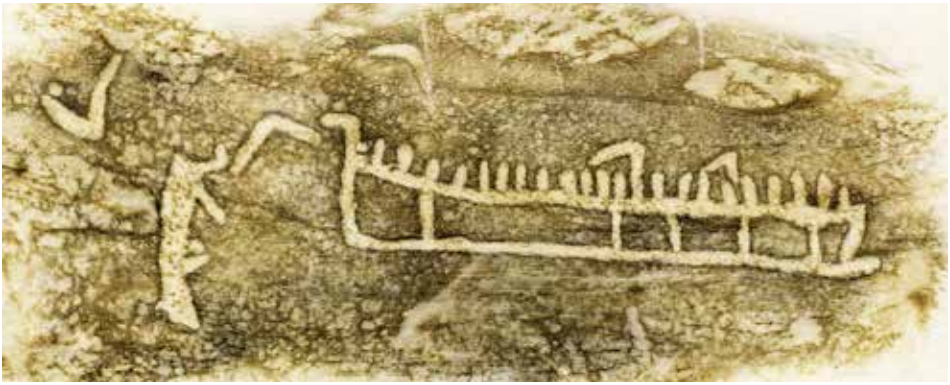
angular figures…"). Like the megalithic axes, it is usually depicted individually. Its size varying from 15 to 45 centimeters. On the panels Laxön D:17 with 4, Lillforshällan G:1 with 5, and Laxön B:2 with 4 registrations, these axes are tightly grouped. The close grouping also applies to G:1 where the lower ends of the shafts of the two largest are connected (Fig. 2). Some possible picks on the magnificent carving Notön C:6-7 are together with some other axes placed in a rising line from the stern and midships. One of the biggest being raised with the right hand by an anthropomorphic figure with three-sided torso and twin-horned head, the axe's shaft constituting an integral part of the arm of the figure, a design also found in a figure of similar shape but with palstaves, further forward towards the stern (Bertilsson 2019 and Fig. 3). The two largest and highest raised possible picks have the shaft placed forward in relation to the neck that protrudes backwards. This, together with the curved shape of the blades may resemble boat axes raising the, hitherto unanswered, question of what these picks actually represent? They have been called both hooks and picks and have been proposed to represent both sickles and scythes (cf. Hallström 1960 and Klungseth-Lødøen & Mandt 2012). If they were scythes, could the reason for depicting them be sought in the introduction of agriculture in the area? This appear far-fetched, since there is no indication of early farming at Nämforsen, and the conditions for cultivation

Figure 3. Notön C:6-7 panel dominated by the 2-meter-long ship with 50 staffing strokes, 9 human figures with triangular torsos, and 3 having axe-shaped arms and twin horned heads. The two largest in the middle are probably Bronze Handweapons of the type in Fig. 5. Photo and viszualization: Catarina Bertilsson.

and use of such tool at Vingen, the site from which this interpretation originally arose, would have been almost non-existent. It may seem more reasonable that it was a weapon connected to deer (hunt?), a central motif on carving panels i.e., at Nedre Legda where they occur in great numbers alongside with deer (Lødøen & Mandt 2012). Many with about 1-meter-long shafts and size-wise as large or larger than the deer probably depending on a value perspective. At least one of these scythe blades have ears. It could possibly indicate a function as a deer head staves, but since the same phenomenon exists on palstaves, it seems not to have been connected to the function (Bertilsson 2020).

Yet another interpretation of the picks is that they depict be so-called "Nordbottniskt redskap" or Rovaniemi picks whose function nor yet has been determined with certainty. These picks were in use the late Mesolithic but according to Baudou (1992) also during the period he termed the Epineolithic beginning around 2000 BC. One reason that speaks against this interpretation is that the actual artefacts are often roughly chopped and polished only at the edge, while the carved axes are do not show such details. According the German graphic artist Dietrich Evers they were actually boomerangs connected with hunting magic and death cult with its main expression in the large ship on Notön C6-7 (Fig. 3) a representation of "The mythological, oversized ancestral ship, over whose death crew the boomerangs seem to be floating, (Evers 1988, translated here"). Not finding Evers's interpretation particularly convincing; we actually consider his rubbing of Laxön Y:1 possibly depicting two boomerangs, a better example (Fig.4). Regarding these specific axes on Notön C: 6-7, new observations indicates they were neither picks nor boat axes, but rather an actual magnificent object/weapon from the Early Bronze Age. We then refer to the narrow protruding neck and the similarly long, pointed edge part which are characteristics of the so-called bronze hand weapon (ger. Bronzehiebwaffe) found at Stora Mellby in Sösdala, Skåne (Lindqvist 1925, Odelberg 1974: 83, no. 542; Fig. 5). This weapon appears to have been exclusive during the Early Bronze Age, so far having no equivalent in Denmark (personal communication Flemming Kaul). If this hypothesis is true, is it possible that the smaller, more normal-shaped missing protruding neck, picks on C: 6-7 depict some other axe type from the Early Bronze Age? Our suggestion is that they may represent halberds with short shafts and pointed dagger-like blades making a much better chronological match.

Figure 4. The rock carving Laxön Y1 with manned ship, an animal figure and some possible boomerangs. Rubbing: Dietrich Evers.

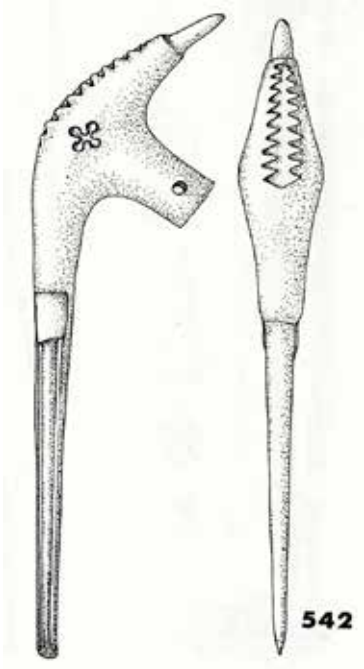


Megalithic axes

The term megalithic axe is a consciously open definition here *simply meaning; those axes carved at Nämforsen that show similarities to the axes depicted in Elizabeth Twohig's compilation of "Hafted Axe, Breton Art", Fig. 4 in Megalithic Art in Western Europe (Twohig 1981* and Fig. 1 above). It may seem like a bold move to define a rather unknown axe type at Nämforsen as so-called Megalithic axes, hitherto mainly known from Brittany, France. The simple reason for this is that the only comprehensive study to date of such axes is that of Twohig from 1981, presenting the types with individual sketches and a common yardstick and grouped according to their appearance on the different megalithic tombs (Twohig 1981). Twohig's compilation still current and valid (e.g., Cunliff 2017), thence fully justified to use for typing axe images at Nämforsen. When applied, it seems that other megalithic types similar to the Mané Lud and Dissignac types also occur at Nämforsen (Bertilsson 2019).

The majority being individually carved without carrier, except for the panel Notön L: 4 where an anthropomorph, adorning the cover of Gustaf Hallström's magnum opus (1960), holds a long-shafted, twin-eared axe, resembling the Mané er Hroeck type (Bertilsson 2019: Fig. 20). Another twin-eared axe having pointed neck and straight edge has no exact parallel among the megalithic axes, although several like the Mané Lud type have similar straight edges (cf. Fig. 1). An alternative interpretation for this newly discovered, rare type suggested (Joakim Goldhahn) is that they are so-called T-shaped tools, its function not yet been determined with certainty, found at the coastal Överveda settlement (Baudou 1977 and Fig. 6a-b), It has been suggested that it was used in the preparation of animal hides but it's possible function therein has yet not been determined (Östlund 2016). In addition, its form and size do not seem to fit well with the carved megalithic axes. The latter having two arms protruding sideways, a third directed downwards like a shaft, while the form of the T-shaped tool certainly has two protruding arms and a downwards arm with short bud-shape ending making it look more like a silhouette of a small animal in motion or even flying bird. Against this background our interpretation that these specific carved images represent megalithic axes seems possible to still argue for.

Fig. 5. Bronze hand-weapon, 30 cm in size, from Early Bronze Age found at S sdala, St. Mellby, Scania in Sweden in the form of a narrow, sharp bronze tip tucked into a, elegantly designed, decorated holder of deer antlers, originally provided with a wooden shaft cf. Fig. 3.



Kerran axes
depictions at Nämforsen and Åmøy

In the eastern part of the panel C:6-7 on Notön between two contoured moose, is a three-armed figure that looks different from the others (Fig. 6c) and there are similar three-armed designs on the carving on the large, high-raised and steeply sloping massive rock, Notön Q:1 (Larsson & Broström et al 2018:92). This panel has some 30 moose, at least 5 anthropomorphs in

Fig. 6a. A so-called T-shaped tool of animal bone, 13 cm in size, which function, whether a tool for preparing animal hides or bones or a "cult" object has not been determined. Photo: Örnsköldsviks museum.

Fig. 6b. Same as 7a above as drawing. Drawing: Arvid Enqvist, Örnsköldsvik Museum.

Figure 6c. Eastern part of Notön C6-7 with two contoured moose and between them a distinct three-armed figure, about 15 cm in size, possibly a megalithic axe of the Kerran type marked with red outline. Photo and visualization: Catarina Bertilsson.

adorers' position, some axe-carriers and other anthropomorphs. In different parts of this engraving are these three-armed figures, 15-20 cm in size, similar to the one on Notön C:6-7. The downward "shafts" are straight and short, and the two overlying arms of both these figures slightly bent. These figures could be depictions of megalithic axes of the Kerran type, individually depicted and size-wise somewhat smaller than the moose and anthropomorphic figures on this panel. Are these figures perhaps too large to depict real axes? Assuming the use of a value perspective often seen on rock carvings, weapons, warriors and other figures may have exaggerated size compared to other objects depicted. Since no finds of real Kerran axes have so far been made at Nämforsen or anywhere else in Sweden or Scandinavia, there is no possibility of making comparisons with real artefacts. However, similar figures, close to 40 centimeters size actually appears on the Åmøy carving and Rudlo carvings (Fett & Fett 1941: Åmöy IV.2 and Fig 7). At Vingen, there are some figures on the panel "Bak Vehammaren" resembling Kerran axes erected on the back of deer's (Klungseth Lødøen & Mandt 2012: 184, fig. 9.2).

Megalithic axes depicted in Alta

A panel at Alta in Finnmark, depicts a ship with moose-headed prow and crew of 9 single-lined anthropomorphs, of which 4 raise three-armed objects – resembling megalithic axes of the Kerran type. The smaller of anthropomorphs stands in the rear of the ship and raises with his right arm one of the axes, the upper part of which protrudes just above the rail. The next axe bearer stands midships and raises with his left arm a similar, though substantially larger axe, his head adorned with a similar but smaller axe. Finally, in the front of the ship is a rear-facing anthropomorph with a marked three-sided head who, with his right arm, raises an axe of the same form and size as the previ-

Figure 7. Tracing of part of the carving Rudlo with ships, foot prints and top left shafted axe of the Kerran type. After Fett & Fett 1941.

ous. Opposed to him is an anthropomorph raising a spear-like object whose upward point tangles the axe blades down side. Further ahead in the ship, there is finally another, somewhat smaller, anthropomorph with downward arms, the right being connected with a short upward spear head (Fig. 8 and Helskog 2012: 118). The shape of the anterior spear head, with its curved shape and evenly tapered sides, resembles both the spear heads in bronze and the flint daggers belonging to period I of the Bronze Age in southern Scandinavia (Montelius 1917, cf. Bolin 2010).

The context of megalithic axes and picks

At the first example Notön L:4, there are two axes with long shafts, raised by anthropomorphs, surrounded by about 10 moose, 1 wolf, 1 bird and possibly 1 horse (!) and additional 2 anthropomorphs. This deviates from all the other megalithic axes being individually depicted and at least, the 4 of the Kerran type so far discovered, although on panels with moose, ships and anthropomorphs, but peripherally located on the panels (Fig.12). A similar placement seems to apply to the specimens found on the carvings at Åmøy and Rudlo in Rogaland, Norway. The Ole Pedersen engraving in Alta presents a completely different picture, the Kerran axes raised by anthropomorphs standing in a large and

Figure 8. Ship with moose-headed stem and manned by armed anthropomorphs, of which 4 raise three-armed objects - Kerran type megalithic axes? Painted carving at Ole Pedersen 11A, Alta in Norway. Photo: Ulf Bertilsson.

artistically designed ship adorned with a moose head prow. It seems like an action scene exhibiting the context in which the axes performed, immortalizing an event so unique it had to be carved in stone to be remembered and narrated. The high degree of design precision and object details emphasizes the timed event, like a snapshot commemorating a unique visit of strangely equipped foreigners coming from far away. However, it is maybe too bold to suggest that it was undertaken in the sweeping wave of the megalithic explorers/the Bell Beaker people? Especially since the axe armed anthropomorphs travel in a ship with moose head prow. Meanwhile, down south at Åmøy in Rogaland the figure context looks rather different, displaying large "fleets" of ships but with very few anthropomorphs being depicted indicating that the core of the event was the repeated waves of arrival of the first long ships (Melheim & Ling 2017, Cunliffe 2017 and Ling & Koch 2018). Both these phenomena – axes and ships occur at Nämforsen too, but accompanied by moose. The images interpreted as megalithic axes there may have had the function of highlighting the particular importance of the panels concerned as an illustration to a story or myth. Maybe like an official stamp marking that "The Bell Beaker people was here". It is worth noting that the Kerran type axes identified so far are placed on large and prominent carvings, Notön C: 6-7, L:4 and Q:1, the first one being unique, displaying the tallest ship at Nämforsen; the second also figure-rich like the third that has a unique placement on prominent high and steep cliff, the largest of its kind at the site. It's possible that these panels illustrate important narratives or tales, the first of the long sea-journey and the other two displaying the moose importance and the reason for the megalithic/ Bell Beaker people's visit there exploring for fur, meat and perhaps ore, goods constituting the comparative advantages of this region (cf. Earle & al. 2015, Bertilsson 2019).

Trying to untangle the context and chronology of the axes a brief compilation of how the axes are placed and presented on carvings, using some basic attributes selected to cover as many properties as possible will be made. If the axes are individually depicted; closely grouped; stand on ship's rails; are erected in ship's prows; lifted by anthropomorphs; integrated into bodies; and finally, if they have long shafts, producing the following result: (See Table 1)

All axe types may be individually depicted. The pick is the only type that may be depicted closely grouped. This property agrees with some axe depictions elsewhere, the Järrestad carving in Skåne, Sweden and a carving at Motecchio di Darfo in Valcamonica, Italy in both cases concerning shafted axes similar to halberds from the Late Copper Age/Early Bronze Age (C. Bertilsson 2015, Anati 1976:92, Fig. 82, cf. Burenhult 1981). All types, except megalithic may appear

Table 1.

Axe type	Megalithic axe	Pick axe	Metal axe
Individually depicted	x	x	x
Grouped		x	
Standing on rail	x	x	x
Erected in prow			x
Lifted by anrthropom.	x	x	x
Integrated into body			x
Long shafted	x		x

standing on ships rails. Only metal axes are erected in ship's prows. All types may be lifted by carriers but while it is common for metal axes, it is unusual for megalithic axes and, close to never occurring for pick axes. Megalithic axes are never presented as being integrated in torsos or arms, pick axes may be that in a few cases and metal axes also in some more. Both megalithic axes and metal axes may be long-shafted, while pick axes never are.

Evaluation of the observations

In our view, the fact that axes of all three axe types may be presented individually depicted shows that the phenomenon axe was equally valued as moose and ship. The fact that only picks are grouped shows that these axes were perceived somewhat differently than the other two types. Picks and metal axes were placed standing on ship's rails indicates a link between these two figure types and their significance, arriving at Nämforsen by the sea-going ships they are depicted on. The fact that only metal axes have been depicted erected in ships' prows show that these two phenomena were interrelated, an axe-adorned prow giving a signal value marking the special dignity and function of a ship, may be as a ship of war. All three axe types may be carried by anthropomorphs, but it is very rare for picks and relatively rare for the other two types. Megalithic axes are never presented as integrated into body parts like torsos or arms of anthropomorphic figures, while picks and metal axes may be, as observed on Notön C:6-7. Pick axes are never provided with long shafts while as megalithic axes may be, and metal axes often are.

From this brief analysis it seems reasonable to assume that axes were highly valued objects worthy of extra attention. Although, not as frequent as moose and ships, the axes obviously occupied a prominent place in the minds and actions of the people at Nämforsen. It is worth repeating that the number of carved axes corresponds roughly to the number of carved human figures, 105 and 104 respectively, while the number of carved moose, 463 is more than four times that, and that of ships, 387, almost is. In a study of the depiction of halberds raised by male anthropomorphic figures with marked sex at Mont Bego in France, Christian Horn (2013) interpretation is that this is a result of the construction of a new masculine identity triggered by the appearance of metal weapons. Could a similar explanation might be expected at Nämforsen considering the great number of axes being depicted, metal axes included? May be not, since an obvious difference being that the sex of the axe carriers is not specifically marked, with the exception of the anthropomorphic figures having triangular torso that may indicate strong masculinity. Interestingly, there are also pick-like objects carved on Monte Bego that are interpreted as actually depicting flat and flanged axes of copper or bronze (De Lumley et al 2003, Figs. 22-31).

Chronological issues – Stone Age

Although, we have been able to provide a more nuanced and varied picture of the context of the axe types depicted at Nämforsen, the task to set up a detailed chronology remains. Some implications may be extracted from their occurrences in terms of level above the sea on panels; the megalithic axes occur both on one of the highest located engravings, Laxön G:3 and on some very low panels like Notön L:4. A similar relationship applies to the pick axes found on the high located Lillforshällan G:1, but also on several lower-level panels. The metal axes rarely appear on higher positioned engravings, but commonly on lower positioned ones like Laxön C:1 and Notön C:6-7. It has been suggested that the panels Laxön G:3 and Lillforshällan G:1 may have been carved around 5000 BC in the Late Mesolithic. This could also, theoretically still, apply to the lower placed engravings such as C:1 on Laxön and C: 6-7 on Notön (Gjerde 2017). However, the recently made analyzes of the 3D-models has resulted in discoveries of metal axes

from the Early Bronze Age on these two engravings, strongly indicating that they were entirely produced in this period (Bertilsson 2019). Although, some of these artifacts and images have been recorded and noticed before these rather obvious interpretations may have been obscured by the "hunters' straight jacket" (Lindgaard 2014). This is actually the case even in the above study by Jan Magne Gjerde (2017) being based on the assumption that rock art complexes such as Nämforsen and Alta belong entirely to the Northern tradition hence limiting the materials and areas used to compare with. A problem when comparing only with materials that confirms what is being assumed, the chance to produce new answers or knowledge will be automatically restricted. At the same time, researchers have begun to question whether it is meaningful to continue to maintain this division (e.g., Klungseth Lødøen 2017 above, see also Gjerde & Stebergløkken 2018). Not arguing for the complete rejection of this discourse, but by putting it into a wider context and introducing new sets of comparative data, new questions resulting in new knowledge as Per Ramqvists' (2017) study on changing burial customs will emerge. Another example is the expanding research on the chronology of the spread of megalithic tombs in Europe (Schultz Paulsson 2019). This concerns also the carvings of axes, ships and aquatic mammals like whales engraved on menhirs and megalithic tombs in Brittany. These new achievements are of great interest for our ongoing study of megalithic axes at Nämforsen (Cassen & Grimauad 2020).

The Neolithic and Early Bronze Age

When discussing the possibility that the Mané Lud type axe on Laxön G:3 could be dated to the 5th millennium BC we reached a positive conclusion. At the same time, stressing a later dating to around 2500 BC more plausible pointing to the need for additional comparative data (Bertilsson 2019). Although such data now exist, with the discovery of additional potential megalithic axes, it does not include any more axe of this particular type, but instead of the stylized Kerran type. This specific type has been dated to the beginning of the 3rd millennium BC, based on the fact that they occur on gallery graves raised in this period in France (Serge Cassen personal communication). Other megalithic axes of the St. Denec and Manio types have been dated to the same period, one possible figure yet identified at Nämforsen (Bertilsson & Bertilsson 2020). The early axe-carvings in Brittany having flat, pointed blades and bent shafts are interpreted as being depictions of jade axes which constituted the most sought after and most prestigious objects of the time in Europe. Occasional finds being made in Denmark dating to the Ertebølle phase and copied in flint during the beginning of Neolithic (Sørensen 2011). These axes are also a strong indicator of the earliest agricultural advance towards north in Europe, including southern Scandinavia. But so far, no engravings depicting this type of axe have been discovered at Nämforsen. Therefore, the dating suggested earlier for the axe on G:3above, to the Middle Neolithic around 2500 BC seems more realistic than a Late Mesolithic one. Moreover, this dating suggestion agrees quite well with Helskog's dating of the moose-headed ships with anthropomorphs raising Kerran axes and spearheads on the Alta carving - Ole Pedersen 11A which he places in period III (2700 - 1700 BC) of his chronological schedule (Helskog 2012: 29).

A wide time gap or early flanged axes and halberds?

As for the picks, comparative data on rock carvings indicating they are halberds, an interpretation we proposed above for some of these axes displayed onboard the ship on Notön C:6-7. Regardless of that, along with the other metal axes depicted on this particular engraving, it demonstrates the great importance and special attention devoted to axes. Here we are presented with "the whole package" we need to further clarify both the typology

and chronology; the metal axes, as we have previously shown, being palstaves from period II of the Early Bronze Age, a possible date would be around 1500 BC. If then, the shafted and long-bladed axes carried by anthropomorphs were to be boat axes dating to the Middle or Late Neolithic period sometime between 2800 and 2300 BC, they would be at least 800 older than the bronze palstaves. Something that cries out loud for a plausible explanation for this large time difference. Such a case could be that the long ship and boat axes were the first images to be engraved and thereafter to have been subsequently supplemented and updated with new types of anthropomorphic figures and axes. However, examination of the high-resolution 3D-models of Notön C:6-7 displays the same carving technique for all figures indicating they were made synchronically, as no clear-cut additions or superimpositions can be observed. Another, less likely, explanation would be that the metal axes previously identified as palstaves, instead represent flanged axes with spatula or spoon-shaped blades having an earlier date, namely Late Neolithic II, 2100 - 1800 BC, of which some real axes have been found in Møre og Romsdal in Norway (Rønne 2012).

Chronological issues – summing up

An attempt to summarize the implications for the chronology looks like this; the carving of a megalithic axe on G: 3 Laxön may have been made during the Late Mesolithic/Early Neolithic period on the basis of the common dating of this axe type in Brittany. The single-line ships with moose head stems represented on Lillforshällan may also originate from that period. In years, it would probably be approx. 4000 BC which coincides with the earliest dating for the settlement of Nipan on the northern shore (Lindgren & Olofsson 2004). The extensive production of red ocher that took place on the site shows a clear decline at the end of the Middle Neolithic making it doubtful if there was a permanent settlement there then This is a highly interesting information put in relation to previous assumptions that the carving at that time was in full swing (Baudou 1993). At the same time, Lindgren and Olofsson (2004) emphasize that signs of settlement re-occurre in the Bronze Age - Pre-Roman Iron Age. The extensive processing and analysis made of the finds from the settlements at Råinget and Ställverket largely confirms their assumption of a first, less extensive, Neolithic phase and a more articulate and extensive such demonstrated by an intensive occupation during the Early and Middle Bronze Age (references in Bertilsson 2017). At the same time, the previous assumption that Ställverket served as a regional gathering place – aggregation site, during the millennia is clearly contradicted in Jenny Käck's extended study in her thesis. Instead, the settlement seems to have been of the base camp type, that housed a smaller group, like an extended family for long periods but displaying the highest intensity in the Late Neolithic and the Early Bronze Age (Käck 2009).

Käck further discusses a possible connection between the southern Scandinavian finds and the carvings and the possibility that they are contemporary something that would entail that the people settled at Ställverket also made the carvings. A follow-up question then arises whether the population that lived there, for example, were southern Scandinavians traveling or whether they belonged to a more local population that had adopted a southern Scandinavian ideological tradition (Käck 2009:100). A positive outcome of Käck›s investigation is that the necessity to consider the carvings as a phenomenon separate from the two nearby settlements decreases, and it becomes possible instead to see them in one and the same context. Something that seems completely reasonable and was actually suggested already by Gustaf Hallström (1960:332). It also means that you do not have to go into the slightly convoluted reasoning that the carving peaked at a different time than the settlements. If we also consider the

possible effect for the chronology of our assumption above that the so-called picks in fact represent halberds from the transition phase between the Neolithic and the Bronze Age, and the highest raised axes on Notön C: 6-7 represent the bronze hand weapon from period I, around 1700 BC, the time gap narrows enough for enabling contemporaneity and in that case also with Ställverksboplatsen. In addition, it allows the assumption that the splendid ship manned with twin-horned anthropomorphs and exhibiting various types of detailed metal axes was carved at one and the same time.

Whatever the case, our review here clearly show that axes depicted on the rock carvings at Nämforsen were important, highly valued objects. Without claiming the chronology being definitely clarified, it can be hypothesized that axes were depicted individually, and sometimes carried by anthropomorphs in the Early Neolithic about 4000 BC. In the Late Neolihic/Early Bronze Age about 1800 BC, metal axes like halberds (the picks) were depicted in certain contexts either standing on the rail and or erected in the prow of ships. This indicates that the axes reached Nämforsen by sea-routes transported by large, long-distance sea-faring ships, that constituted extraordinarily events being so important, not to say remarkable, that they were continuously depicted on the rocks of the in the middle of violent rapids at Nämforsen. Slightly later in the Early Bronze Age, metal axes were depicted held by anthropomorphs who raise shafted axes as if to display their powerfulness and splendor surrounded (and adored) by moose herds, perhaps also demonstrating that the cult and ritual arena by then had moved ashore. In this way, the practice of the axes seems to mirror special events and functions being evidence of rituals and travelers' tales alongside with its pure chronological implications.

Conclusions

The main results of this study can be summarized as follows:

- Megalithic axes of various types - Mané Lud, Mané er Hroeck, Kerran and St. Denec are depicted.
- Images of Kerran axes also appear on the carvings in Åmøy, Rudlo and Alta, in Norway.
- Some megalithic axes can possibly date to about 4000 BC but in general most likely to about 2500 BC.
- The type of figure that has been alternately called angular figures, scythes or picks axes are considered to represent halberds.
- The double-edged axes on Notön C: 6-7 strongly resembles a so-called bronze hand weapon.
- The largest ship at Nämforsen, C:6-7 with all attributes, crew and weapons was carved at the beginning of the Early Bronze Age like the most of the other carvings.
- This means that the vast majority of carvings coincides with the most intensive settlement period at Ställverksboplatsen

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