Summary. The oldest boat depictions in rock art from northern Europe have previously been dated to about 5500–5000 BC. A recent discovery of rock art boat depictions at Valle in Nordland County, northern Norway, made in the ground technique, pre-dates the earlier known boat depictions by more than 3000 years. The rock art at Valle is dated by shoreline dating to be between 10,000 and 11,000 years old. The find has implications for the rock art material record, is likely to alter current views and have an impact on the research history of rock art in northern Norway. The boat is depicted in outline, life size, measuring more than 4 m in length. The closest parallels are the Arctic skin boats found in the ethnographic record. The settlement record from northernmost Europe during the Early Mesolithic supports a maritime and highly mobile strategy that would require boats and an advanced maritime technology. It would not be possible to settle the numerous islands along the coast without seaworthy boats. The boat find has implications for the appreciation of the maritime colonization of seascapes in northern Norway during the Early Mesolithic, being part of the pioneer settling of northernmost Europe after the Ice Age.

INTRODUCTION

Occasionally an archaeological find is reported that changes the material record, alters current views and shakes research history to its foundations. This paper concerns one of those finds. It has implications for the knowledge of Stone Age maritime technology. The Early Stone Age (Mesolithic) for this area of northern Norway dates to between c.9500 BC and 4000 BC, with the Early Mesolithic spanning c.9500 BC–8000 BC, the Middle Mesolithic c.8000 BC–6500 BC and the Late Mesolithic c.6500 BC–4000 BC (Bjerck 2008) the Late Stone Age is between c.4000 BC and 2000 BC. The new site gives fresh information on ground rock art in northern Norway, the oldest rock art in northern Europe. The motifs in the Mesolithic ground rock art⁴ have so far consisted exclusively of game animals, typically elk, reindeer, bear and marine

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Footnote: Ground art is by definition a petroglyph produced by abrasive action, see Bednarik 2003.
mammals. In contrast, rock art from the Late Mesolithic onwards shows a larger range, including human representations, boats, artefacts and even narrative scenes and compositions depicting activities such as reindeer hunting and whale hunting (Gjerde 2010, 394–401, fig. 284).

Now the first boat representation in ground rock art has been discovered. The boat figure found at Valle is about 10,000 to 11,000 years old and to my knowledge the earliest known boat depiction in Europe, maybe even in the world.

The pioneer landscape of the outer coast and the archipelago in this part of northern Norway is dominated by small fjords between high coastal mountains. The postglacial changes led to a rapid land uplift in the Early Mesolithic in the area where large parts of the coast would have been previously submerged. The landscape appears even more dramatic with the steep mountains and cliffs. During the Early Mesolithic the glaciers would still have been present inland not far from the littoral, leaving a narrow coastal corridor (e.g. Kleppe 2014; Glørstad 2016; Stroeven et al. 2016) for settlement (Fig. 1).

THE BOAT FIGURES AT VALLE

Valle is located in Efjorden in northern Norway. The site has four separate panels, Valle 1–4. The rock art at Valle was first reported in 1931 and soon documented by Gjessing (1932). Valle 1 has five life-sized animal figures: two seals, one cetacean (a porpoise, according to Gjessing), a reindeer and a more indistinct animal suggested by Gjessing to be a reindeer. Valle 2 has 2 animals, a bear which could be a polar bear (Gjessing 1974, 7) and a reindeer.

When first documenting the site Gjessing was well aware that more figures might be found at a later stage, as the weather conditions were unfavourable at the time (1932, 60). The figures are best visible from the side with the sun low in the sky, during morning and early evening. What is much more surprising is that the newly found figures at Valle 3 are of a completely different sort – namely boats.

The best preserved boat representation (1) at Valle is about 4.05 m in length. Unfortunately, the rock surface at one end of the boat is eroded, so only either the bow or the stern is preserved. It is likely that the boat was about 4.5 m in length when it was made, as the depiction would most likely not have cut across a fault line in the rock. The size from keel to gunwale varies along the length of the boat, but on average the hull measures about 40 cm in depth from keel to gunwale. The ground lines are about 2–3 cm wide, similar to the other depictions at Valle. Few details of the boat can be discerned since it is depicted in outline seen from the side and appears as a silhouette (Figs. 2–5). The line of the bow or stern is steep, almost vertical, with a prominent and almost horizontal horn.

Only a little remains of what is likely to be boat figure 2. The length of this keel line is just over 3 m long; however, due to the erosion it is hard to discern more of the figure. The keel line and a straight line for the stern/prow are the most traceable. The height at the stern/bow measures about 40 cm. The ground lines are again about 2–3 cm wide. However, the rock is so heavily eroded that

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2 The site of Valle is also named Finnhågen in the early literature (Gjessing 1932, 60).
3 A fourth panel with rock art was discovered in 2018. It is situated within the same elevation range as the other three sites and is named Valle 4. The motif is interpreted as a porpoise or a seal (Askeladden - National database for cultural heritage sites at The Directorate for Cultural Heritage in Norway, Riksantikvaren).
BOAT-TYPE

There has been a long and ongoing debate in rock art research as to what type of boat the northern rock art images from later periods represented. In the first half of the twentieth century known boat motifs were few in number. Gjessing and Brøgger argued that the images were skin boats (e.g. at Forselv and Rødoey in northern Norway and Evenhus in central Norway) (Gjessing 1936, 130; 1944, 12, 15; Brøgger and Shetelig 1951, 15–20). Gjessing found it is hard to make a good tracing of the figure, although it can be seen when the sunlight hits the rock at the right angle.
ethnographic circumpolar evidence for skin boats as the most likely type. Hallström, on the other hand, was more sceptical about skin boats in his study of the Nämforsen (northern Sweden) and Onega (north-west Russia) material (1960, 353–4). The numerous finds of boats in rock art from Alta (Helskog 1985; 2014) and Vyg (Savvateev 1970; 1977) made from the 1970s onwards has shown some variation in the Late Stone Age boats that can be interpreted as both dugouts and skin boats. Stölting interprets the early boats at Alta and Slettnes in northern Norway as skin boats, while it is likely that the later boats could be made from wood, based on what he defines as constructional details (1997, 22–4). In a recent discussion paper in the Norwegian Archaeological Review, Glørstad finds comparing boats in north Norwegian petroglyphs to ethnographical parallels such as the umiak-like skin boats to be a somewhat speculative act (2013b, 78).

I am clearly not in favour of rejecting rock art as informative when it comes to interpreting boats and marine ventures in the Stone Age (Gjerde 2016; 2017). For a lengthy discussion on the ‘missing boats’ and the boat types in the Early Mesolithic in pioneer seascapes one should consult the discussion in the Norwegian Archaeological Review (Bang-Andersen 2013; Bjerck 2013; Bonsall et al. 2013; Cummings 2013; Eriksen 2013; Fuglestvedt 2013; Glørstad 2013a; 2013b; Rowley-Conwy 2013; Wickler and Pettersson 2013). No actual boats dated to the Norwegian Stone Age have been found (Glørstad 2013b); a recent overview for Arctic Norway indicates that the oldest physical ‘boat’ remains known are paddles, with the earliest dated to 2776–2580 cal BC (Wickler 2019).

Most studies claim skin boats were used only where wood for boat-building was not obtainable. In the Early Mesolithic of coastal Scandinavia, the lack of wood would be one crucial factor favouring skin boats over dugouts (Bang-Andersen 2013; Bjerck 2013). However, inquiries into the overall construction, logistic advantages and flexibility when it comes skin boats of the circumpolar area has been somewhat neglected. An exception, and a clear voice, is Hein...
Bjerck (2013; 2016) who argues for the skin boat due to its qualities in arctic waters. Positive factors enjoyed by the umiak include its light weight that could make it easy to carry on land or draw up ashore without much manpower; its large carrying capacity is also an advantage that is rarely considered. In addition, the boat’s flexibility and speed are essential for hunting sea mammals. A convincing demonstration of this is seen in early whaling where the umiak seems to be superior to the early wooden whaling vessels: the umiak of the Inuit of south-west Alaska was so versatile that it was adopted by 19th-century whalers in preference to the New Bedford whaling boat (Johnstone 1980, 27, with reference to Stefansson).

The Valle boat resembles an Arctic skin boat of the umiak-type. A brief overview of umiaks in museum collections in Greenland, Denmark and Sweden indicates that they are between c.6–10 m long (Petersen 1986, 11, 155). However, according to other information Arctic umiaks can vary in length from some 4 m to about 20 m (Chappelle 1994, 175; Ames 2002, 26). Some umiaks
are similar in profile at the bow and stern, as may also be the case for the Valle boat. However, since the aft of the boat is eroded, this point is hard to establish. It may also be that the remains of the likely boat no. 2 at Valle 3 hint at a vertical stern, although again this is hard to verify since only a small part of this boat remains.

The hull profiles of the Valle boat and the Arctic umiaks as presented by Petersen (1986, 121–7) seem to show a strong similarity. Here, the upright stem and stern of the umiaks were
accompanied by horns or projections, clearly visible on the Valle specimen. The umiak would be lifted by the horns when taken ashore. The frame of the umiak has a concave shape, especially that of the side rib/gunwale; similarly, the boat’s keel is slightly concave. Compared to the sheer stringer lines of the umiak (Petersen 1986, 127, fig. 141; and see Fig. 6 for visual explanation of the term), the boat at Valle resembles them, where the sheer stringers curve down from the prow and stern. The typological range of Arctic skin boats is often forgotten: they are varied both in size and shape, with the most common reference point being the Greenlandic umiak. Seal hide is most frequently used. It is therefore interesting to note that seals are depicted at Valle 1 about 150 m from the boat depiction at the Valle 3 site. The seal is an otherwise uncommon motif in rock art.

**DATING OF THE VALLE SITE**

Due to the land uplift after the last Ice Age, the method of shoreline dating of rock art has been widely applied to rock art in northern Norway. The shoreline dates for when the rock surfaces arose out of the sea gives us maximum or *post quem* dates for the rock art. These dates are usually
well supported by other observations. Many sites such as Slettnes, northern Norway (Hesjedal et al. 1996) and Vy in north-west Russia (Savvateev 1970; 1988; Savvateev et al. 1978) are overlain by marine deposits, demonstrating their shore-bound location in the upper tidal zone. In addition, rock art in the shore zone is rarely covered by vegetation. The clear physically-based arguments are supported by the cosmological interpretation of the shore positioning as argued by Helskog for the Alta material in northern Norway (Helskog 1999), where the change in figures and motifs follows the elevation above sea level of the rock art’s position. The same style of depictions are present at the same elevation. Further, the broader work on circumpolar rock art in northern Europe confirms that shoreline dating is a reliable method by which to obtain relative dates for rock art (Savvateev 1970; 1977; 1988; Savvateev et al. 1978; Baudou 1993; Forsberg 1993; Lindqvist 1994; Helskog 1999; 2014; Sognnes 2003; Gjerde 2010).

The elevation of the carvings at Valle was measured in the 1930s as part of Gjessing’s documentation. Both rock art sites were measured to be c.73 masl (Gjessing 1932, 63). New measurements with modern equipment (CPOS) and accurate to below 10 cm demonstrate that the carvings were made between 70.9 and 76 masl.

At Valle 1, the very lowest part of the figures are not visible due to erosion. However, the lowest measured point is 75.1 masl. The lowest part of the figure at Valle 2 is 72.6 masl. The lowest part of the new boat figure at Valle 3 is situated 70.9 masl. Hence, the lowest parts of the carvings at the three sites at Valle that was previously measured to be c.73 masl lies between 70.9 and 75.1 masl.

Three dating methods have been applied to the ground rock art: style, technique and shoreline. Initially when the first sites were discussed by archaeologists, the large naturalistic figures in the ground technique were assigned to the Early Stone Age, implying that the earliest rock art from northern Norway had its origin in the Palaeolithic art of Europe (Hallström 1907a; 1907b; 1908, 78–83; 1909; Brøgger 1909). Drawing upon shoreline position, style and technique, Gjessing dated the ground rock art to the Mesolithic since they were all located above the limit of the Tapes transgression, and the carved rock art to the Late Stone Age (1932, 47, 50; 1945, 264, 272).
However, Simonsen (1979, 478) refuted the Mesolithic date, placing all the hunters’ rock art to the Late Stone Age on stylistic grounds and a general belief that rock art could not be older than the Late Stone Age. The most thorough study on the dating of the ground rock art is Hesjedal’s (1990; 1993; 1994) on the rock art in the Ofoten area. He questioned the previous stylistic dating and presented a scheme that relied solely on raised shorelines and geological data. Hesjedal found that the lowest figures on the earliest panels of polished rock art in Nordland dated to between 9900 uncal. BP and 8500 uncal. BP (Hesjedal 1990, 111–12; 1994, 4–5, tables 1 and 2).

Even though the shoreline-based dating of rock art has been criticized (Johansen 1972, 226; Simonsen 1978, 32; Lødøen 2015, 82), this is the best method currently available for this region and the ground rock art. I would argue, in agreement with Hesjedal’s (1990; 1994) studies, that the ground rock art can be related to its position on the shoreline, and so apply shoreline dating. In my PhD thesis (Gjerde 2010, 183–97), the dating of the Ofoten material including the Valle site was studied by applying the computer program SeaLev (Møller and Holmeslet 1998), accepting the shortcomings in the uncertainty concerning the simulation program and to a degree in the datasets. Despite these slight imprecisions, the data would still lie within an accepted deviation due to the rapidness of the land uplift (Møller pers.com.). Accordingly, the rock art was believed to be about 11,000 years old, with a calibrated date of around 8840–9150 BC for the 73 masl position (Gjerde 2010, 196, fig. 99).

The new elevation data does not radically change the old shoreline dating, due to the rapid land uplift (see Table 1). Applying isobase 26 in Møller’s programme, the Valle 1 site is dated to 9700 BP (9240–9185 BC), the Valle 2 site to 9600 BP (calibrated to 9140–8840 BC) and the Valle 3 site 9600 BP (calibrated to 140–8840 BC). In his study, Hesjedal subtracted 2 m from the medium shoreline, so as to allow the rock art to be above water all the time (Hesjedal 1990, 110; 1996, 33). A similar alteration of the elevation to account for sea spray and tidal differences has also been applied by Sognnes (2003) for the central Norwegian rock art. Since the velocity of the land uplift was initially extremely rapid in this area, only gradually slowing down, subtracting 2 m from a site like Valle makes next to no difference to the shoreline dating. The tidal difference in the area is about 3 m between high tide and low tide. Applying 60 masl as the shore line, if the carvings were not located directly in the shore zone, would give a date of about 9200 BP (8450–8320 BC). Hence, even if the carvings were not situated in the shore zone and made when the shore was more than 10 m lower, they would still be more than 10,000 years old.

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4 Later Simonsen accepted the early dates for the ground rock art: Simonsen 2000.
5 Oxcal v 3.10

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TABLE 1

The dating suggestions for the Valle rock art, with elevation data.

| Site | masl | masl applied | Isobase | BP Møller | OxCal BC |
|------|------|--------------|---------|-----------|---------|
| Valle 1 | 75.1 | 75 | 26 | 9700 | 9240–9185 |
| Valle 2 | 72.6 | 72 | 26 | 9600 | 9140–8840 |
| Valle 3 | 70.9 | 71 | 26 | 9600 | 9140–8840 |

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THE VALLE SEASCAPE

The Valle rock art site in northern Norway lies in the outer reaches on the south-western side of the Efjorden area in the Ballangen Municipality. The Efjorden fjord is one of the tributary fjords to the larger Ofoten fjord. The site is located on the eastern side of the present Vallebukta bay. South of the site, the steep mountain side ends in the tall mountain range of Valletindan with its summit at Breiskardtinden at 883 masl. South of the Valle 1 panel is the hilltop Finnhågen at 191 masl. Reconstructing the landscape by raising the sea-level at Valle to about 70 masl (Fig. 7) indicates that both the rock art sites would have been located in a small bay that today is the Moldforvikdalen valley.

By raising the shoreline to simulate the pioneer landscape, the outer coast and the archipelago in Nordland region looks very different than from today. The flat areas in the lower

![Reconstructed landscape at Valle](http://wileyonlinelibrary.com)

**FIGURE 7**
Reconstructed landscape at Valle. The Valle site is marked by a dots, and the reconstructed coastline at 70 masl is outlined against the then sea-levels. The mountain ranges in the area restrict movement, and the coastal location would require boats as communication in the area. (Illustration: Jan Magne Gjerde). [Colour figure can be viewed at wileyonlinelibrary.com]
elevations of the coast would have been submerged, creating an even more dramatic landscape with steep mountains and cliffs. There are fewer harbours or areas suitable for settlement. The skin boat is ideal in this landscape: its flexibility means that it is perfect for landing and launching since it could be lifted ashore without much manpower. Movement in the landscape would also be dependent more on boats and an advanced maritime technology.

As vegetation changes in the area are limited, the Valle site today can be instrumental in reconstructing the earlier landscape (Gjerde in Solli et al. 2010, 65–72). Both Gjessing (1932, 63) and Simonsen (1970, 65; 1991, 62) were puzzled that marine animals such as seals and porpoises were depicted so far from what they believed was the coastline of the period. But with the shoreline raised to about 70 m, the Valle area would be a coastal location in the mountainous archipelago.

I have previously argued (Gjerde 2010, 208–12) that rock art sites with large figures were clearly visible from afar. The sheer size of the figures would make this rock art stand out and visible when moving in the seascape. During the Early Mesolithic colonization phase, these sites would act as reference points in the seascape/landscape. In a broad sense this effect would be similar to the marking the land as argued by Taçon (1994). This rock art could thus function as signposts imbued with information and so important for the initial colonization of these seascapes (Gjerde 2010, 154–5). The nearby ground rock art sites (Fig. 1), also dated by shoreline dating to the Mesolithic, at Leiknes (Gjerde 2010, 201–6) and Nes (comprising the four sites Fjellvika, JoSarsaklubben, Nes Fort Øst and Nes Fort Vest; Gjerde 2010, 208–12) might also have acted as such places demarcating the terrain in a highly mobile and changing seascape. Some of the figures at these sites can be seen from a distance of about 300–500 m away and from a boat (Gjerde 2010,154–55, 201–4, 210–12). Socializing the seascape by making highly visible rock art would be an important means of communication for the pioneer people in this area.

PIONEER SETTLEMENT, ARCTIC MARITIME TECHNOLOGY AND ROCK ART

The pioneer settlement of the Scandinavian peninsula, and particular along the Norwegian coast, has been associated with a maritime technology (Gjessing 1942; 1944; 1945; Bjerck 1994; 2008; 2009a; 2009b; 2016; Glørstad 2013b). We know that the pioneer settlers in northernmost Europe had boats. It is not possible to operate in this seascape without an advanced maritime technology. The settlement of the outer islands, e.g. the large Sørøya island in Finnmark County in northern Norway, would have required seaworthy boats. Most settlements are situated on the outer coast-lines, numerous sites are found on small islands, preferably with good natural harbours (Bjerck 1994; 2016, 5; Breivik 2014, 1480). The new boat representation at Valle is most likely a skin boat of the sort that would be ideal for settling the Norwegian coast. Bjerck has recently suggested that the boat was the main agent in everyday life in the archipelago of the Northern coast in the pioneer phase, referencing the abundant settlement record at raised shorelines in northern Norway and Sweden. ‘In the Scandinavian seascapes, both travelling and subsistence depended on seaworthy vessels’ (Bjerck 2016, 1). The extreme coastal location of Early Mesolithic sites suggests that the initial development of seaworthy boats and offshore marine foraging was central to the colonization of the Scandinavian seascapes (Bjerck 2009a; 2016; Bjerck et al. 2016). It is suggested that the Early Mesolithic marine foraging was more focused on seals than fish (Bjerck et al. 2016), as seals are considered as central in the economic basis of the pioneer settlers of Norway and Sweden (Wikell and Pettersson 2009; 2013; Breivik 2014; Bjerck et al. 2016; Skar
et al. 2016). The animals at Valle indicate the importance of both marine and terrestrial animals in rock art, and may be an indicator of the available resources (albeit this is debated). The earliest site at Valle, Valle 1, includes five animals: two seals, a porpoise, a reindeer and one unidentified member of the deer family. Given that Valle 1 is the earliest rock art site, it is clear that the marine focus is more significant here than at the Late Mesolithic sites in northern Europe (e.g. Alta in northern Norway), which are dominated by terrestrial fauna (reindeer and elk). However, the Vyg site in north-west Russia focuses on both the Beluga whale and terrestrial fauna (elk and reindeer).

The Arctic skin boat was perfect for settling the seascapes of northernmost Europe. The boat enhanced and made possible the mobile strategy of people colonizing these areas of the North. Bjerck’s (2016) ‘All-On-Board’ model for the colonization of the seascapes in the Early Mesolithic by people who were highly dependent on marine foraging (for seals) is supported by the location and the motifs in this early rock art. The depiction of an Early Mesolithic boat amongst the rock art hints to the significance of the boat. Arctic umiaks as described by Ames (2002, 29) and Chapelle (1994, 174) will carry more than a ton of cargo and 5–10 persons (Fig. 8). As Bjerck (2016, 12) states: ‘This means that the boat easily may carry the things the co-travellers need, tools, raw materials, equipment, fuel, food, and a tent with poles to name a few’. The Arctic umiak, according to Bjerck (2016, 12) was designed for long-range as well as short-range travel, bulk transport and hunting activities. The boat at Valle has a length of more than 4 metres and would fit such a boat as described by Bjerck, where the carrying capacity is maintained, as well as being optimal for such as seal hunting, where speed and flexibility are imperative. The boat would also be relatively easy to handle when pulled shore or launched: in the later rock art in Alta just two people carry a boat (Fig. 9. Gjerde 2010, 149, fig. 78).
CONCLUDING REMARKS

More than a century after the discovery of the first ground rock art site where solely large game is depicted in a naturalistic style, the first boat motif has been discovered. The boat figure is in the naturalistic style and most likely represents a full-size boat more than 4 m long, in keeping with the animal figures that are also life-size. It is also made in the same ground (polished) technique. The closest parallel to the boat figure(s) at Valle is the Arctic skin boats, most commonly known the Greenlandic umiak.

Considering the critical impact of the weather and light (sun) on the visibility of the rock art, it is very likely that there are more figures at Valle and more sites with rock art in the Ofoten area in northern Norway. However, much of the rock surfaces are eroded, and the rock art lost in these areas.

Based on shoreline dating, the Valle boat figure is contemporary with the other figures at Valle, and is to be dated to c.10,000–11,000 years old. Such a vehicle would be ideal for colonizing the seascapes in northern Norway during the Early Mesolithic. Its discovery modifies the current views and knowledge on Stone Age rock art. A study of known boat depictions from the Stone Age along the Norwegian coast indicates that the earliest known boat figures (prior to the finding of the boat figure(s) at Valle) are to be dated to c.5500–5000 BC: they comprise the carvings in Norway, north-west Russia and Sweden. Equally old boat depictions are found in Finland.
(Gjerde 2017). Marine ventures such as seal-hunting, whale-hunting and reindeer-hunting from boats are expressed in rock art in Alta in north Norway and Vyg in north-west Russia, again from about 5000 BC (Gjerde 2016).

Thus, the new-found boat at Valle pre-dates the earlier known boat depictions by about at least 3000 years, placing it in the time of the pioneer settlement of Norway. It is most likely one of the earliest known boat depictions in the world. Revisiting rock art sites with new eyes and new technology is important. As seen at Valle, one needs to be present at the right time of day to see the figures. Most likely there are more panels and new finds to be found at new and previously recorded sites in the future.

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