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At the threshold of the Viking Age: New dendrochronological dates for the Kvalsund ship and boat bog offerings (Norway)

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ABSTRACT

Kvalsund in the Herøy archipelago, Møre og Romsdal County, provides a sheltered harbour in a high-risk seascape along the west coast of Norway: the peninsula Stadlandet is considered the most dangerous part of the seaway between central and south Norway. At least three separate offerings were identified in a bog along the sound, one of which was excavated in the 1920s. The excavation uncovered the remains of two vessels: an ordinary boat and a ship, which were both difficult to date at the time of discovery.

The site is of significant interest for two reasons. First, from a technological perspective: the ship is technologically regarded as preceding the Oseberg ship type (c. AD 820), but later than the Nydam ship (AD 310–320). The date of the ship type is consequently important, as part of the evolution of the clinker built ship of the Viking Age. Secondly, from a ritual perspective: the site was interpreted in the 1920s as an offering, and as comparable to Early Iron Age bog offerings in Denmark (a category which the Nydam ship belongs to).

In 1980, the Kvalsund find was radiocarbon dated, placing the find in the range of the 7th to 8th centuries AD. This indicates that the Kvalsund offerings were later than the Early Iron Age bog offerings in Denmark. Since the 1980s, most ships from the Late Iron Age in Norway (i.e. c. AD 560–1050) are provided with a more accurate date by dendrochronology, but the Kvalsud vessels have lacked dendrochronological dates. This article presents the site, the finds, and a new dendrochronological date for the Kvalsud vessels.

1. Introduction

Scandinavia is famous for the Vikings, and perhaps in particular for the marvellous and well-preserved Viking ships, such as the submerged ships from Skuldelev in Denmark, and the ships deposited in barrows from Oseberg, Tune, and Gokstad in Norway. Scandinavian Iron Age boats in general were light constructions, being built using the clinker (*lapstrake)* technique that riveted long planks to fasten to the keel with each plank overlapping (Crumlin-Pedersen 1991, 69-82). These vessels were well suited for both sailing in the open sea and up rivers, which enabled the Vikings to conduct their infamous swift raids as recorded in the historical sources. The vessels were built in a variety of sizes, from boats with one or two pairs of oars, to ships of considerable length. This article discusses two clinker-built vessels from the Scandinavian Iron Age in western Norway.

While a few of the most famous Viking ships were found in richly furnished graves, the focus of this article is on two vessels from a site interpreted as a bog offering, dated originally between the 5th and 8th centuries. The Kvalsund vessels, excavated in the 1920s, were at the time compared to Danish Iron Age bog offerings (Shetelig and Johannesen 1929, 56 and passim). In 1980, nettle (*Urtica dioica* L.) from the Kvalsund site was radiocarbon dated, and the date placed the site in the range of the 7th to 8th centuries (Myhre 1980) (Fig. 1). This indicated at the time that the Kvalsund offerings were later than most Early Iron Age bog offerings in Denmark. Methods of radiocarbon dating have improved since 1980 (Nordeide & Gulliksen 2007); moreover, a more accurate dendrochronological date is required.

A more accurate date for the Kvalsund vessels is required for two reasons. Firstly, from a technological perspective, the ship type is considered to be earlier than the Oseberg ship type (ca. 820 AD), but still later than the Nydam type (AD 310–320) (Shetelig and Johannesen 1929, 55–56; Bonde 1990; Bonde 1997). This significantly links the ship technology of both the early Iron Age and the Viking Age. The introduction of the sail is a key issue in the evolution of ship technology, which has been assumed to occur at the beginning of the Viking Age (ca. 800 AD). The ships from Grønhaug, (ca. 780 AD) and Storhaug

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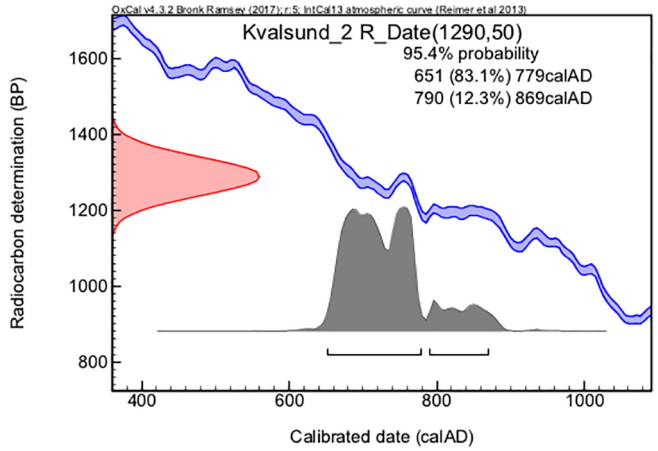

Fig. 1. Radiocarbon date (T-3755), calibrated November 2017 by OxCal.

(ca. 770 AD) are for instance characterised as rowing ships (Bonde and Stylegar 2009), while the earliest evidence for the use of the sail in Scandinavia is the Oseberg ship, dated ca. AD 820 (Bonde 1994, 128-147).

Secondly, the site is convincingly interpreted as a bog offering site, and should consequently be associated with a series of bog offerings of boats or parts of boats along the coast of Norway (Fig. 2) (Shetelig and Johannesen 1929, 34-40). The date for most of these finds is unknown, although a few are dated to the Iron Age, including the Viking Age (Nordeide 2015). This article presents a new dendrochronological date for the Kvalsund vessels, discusses the consequences for interpreting the vessels, and offers a new interpretation for the classification of the site.

2. The site and excavations

Kvalsund in the Herøy archipelago is located at a strategic point along the west coast of Norway. The sound provides a sheltered harbour before crossing west of the peninsula Stadlandet, considered the most dangerous part of the seaway along the coast of southern Norway (Fig. 3). The locals in this area still depend on boats for travel. Several burial cairns from the Bronze Age and later periods along the sound testify to the importance of the sound in pre-modern times. The site at Kvalsund is located at a slightly sloping bog along this sound, nearly eight metres above sea level (Holmboe 1929, 17).

The vessels were discovered by farmers while cutting peat in the bog in 1920. The excavator assumed they were deposited at different times and included (parts of) at least four vessels discovered in various areas of the bog, and concluded that none of these were associated with burials (Shetelig and Johannessen 1929, pp.32–33). Two of the deposits were not investigated further, but other parts of the bog were excavated later that year, and parts of two vessels were revealed (Shetelig and Johannesen 1929, 32–33). The remains of both vessels had been mixed, but it was determined that the deposit was north –south aligned and levelled in a flat deposit. None of the vessels were complete when they were recovered (Shetelig and Johannesen 1929, 29) (Fig. 4).

The excavation and post-excavation work involved several of the

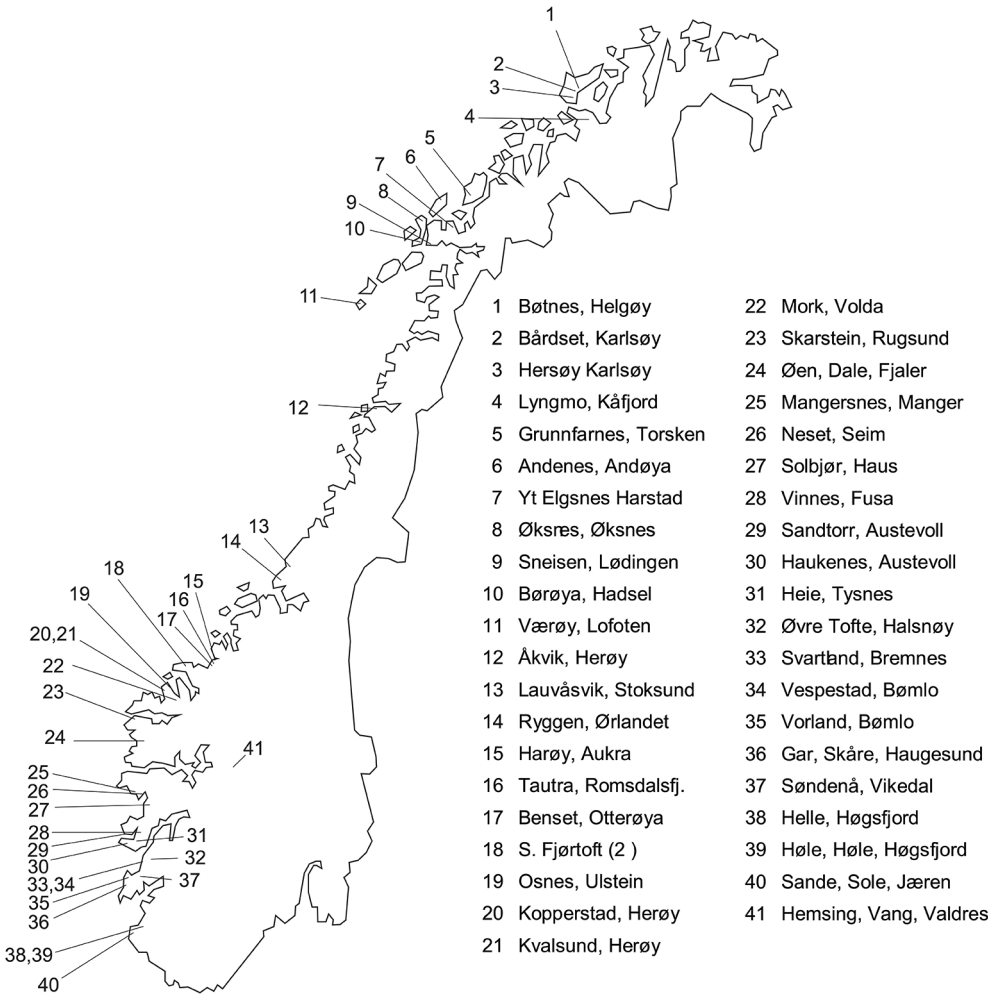

Fig. 2. Distribution of bog found boats / part of boats in Norway, after Nordeide 2011b, 250. Kvalsund is no. 21.

Fig. 3. The location of Kvalsund, Herøy, on the western coast of Norway. Stadlandet is just ouside the map, to the south.

same experts who participated in the more famous Oseberg project fifteen years earlier: the boat specialist Fred Johannessen, the archaeologist Håkon Shetelig, and the botanist Jens Holmboe. In addition, the Danish botanist Knud Jessen also collaborated. The finds were collected and brought to the University Museum in Bergen. Analyses of the collected material included reconstruction of the boats, analyses of macrofossil plant remains, and one of the first pollen analyses on Norwegian material (Shetelig and Johannesen 1929).

The site was originally, in the Iron Age, constructed by digging a ca. 1.3 m deep pit, almost to the bottom of the bog, but for unknown reasons re-filled half the depth with turf, moss, twigs and more (Holmboe 1929, 20). The vessels were placed on top of this filling. White moss turf (*Cladonia* sp.), pure moss, heather (*Ericaeae*), twigs, and wood chips were placed under the vessels, as well as covered them. Some of these plants, such as the white moss, heather and nettle, did not grow in the area, but had been collected and brought to the site from elsewhere (Holmboe 1929, 21).

The original size of the pit could not be determined, but it was at least three metres wide and fifteen metres long (Shetelig and Johannesen, 1929, 29). Plant remains indicated that the pit had been dug in the spring or early summer (Holmboe 1929, 21). Some stones were placed on the wet surface of the bottom of the pit, probably as

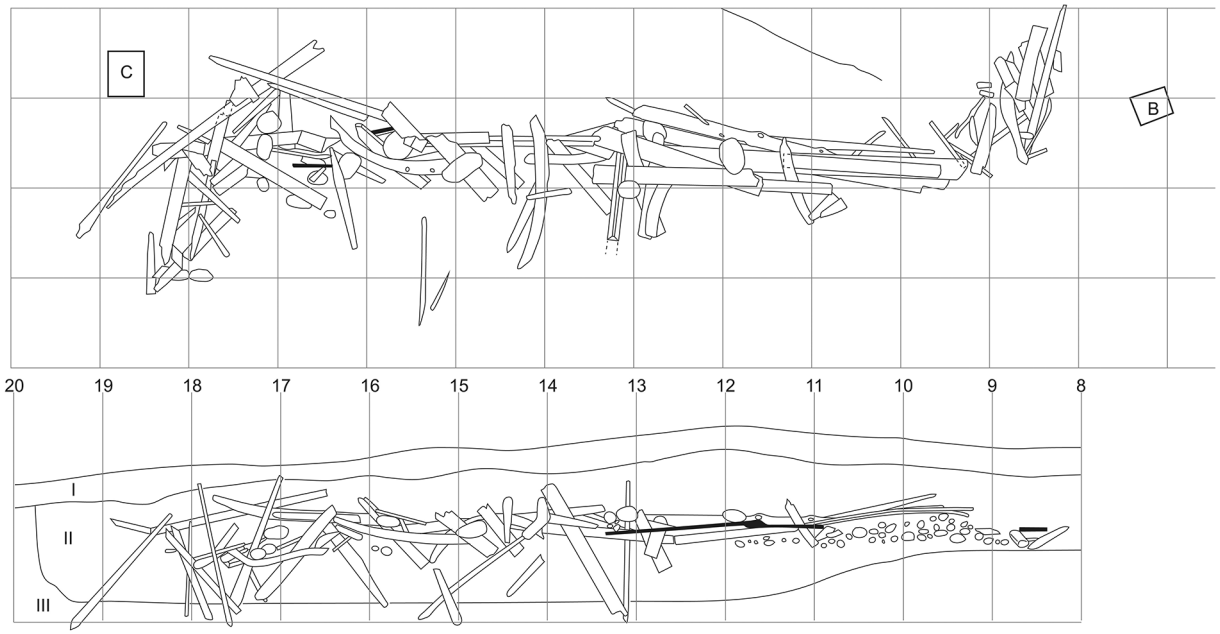

Fig. 4. The bog finds, plan and section. Numbers indicate metres. After Shetelig and Johannessen 1929, 28. Courtesy University Museum, University of Bergen.

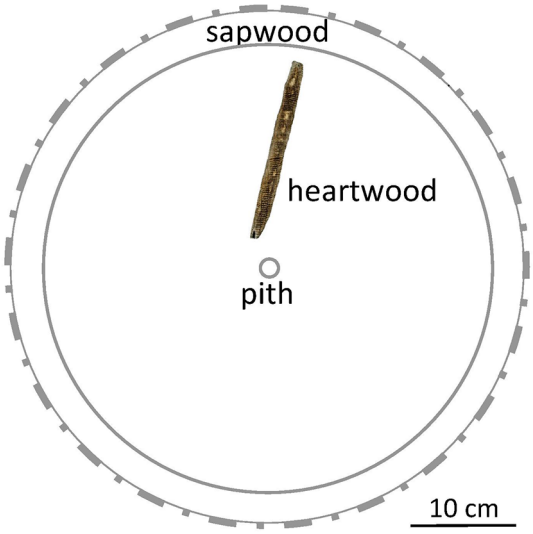

Fig. 5. Cross section of radial split oak plank (7600.60) placed in a cross section of a trunk + 50 cm thick. The sample comprises 122 tree-rings covering AD602-723. Illustration: Claudia Baittinger.

stepping-stones (Shetelig and Johannesen 1929, 27).

A layer of nettle was deposited between the stones, as well as under the boat, and in the layer of the boat finds. Pollen and macrofossils in this layer of nettle revealed the presence of water plants, algae and many water fleas (*Cladocera* sp.). This suggests that the pit was filled with water, forming a pool, before being filled in and covered up. The estimated time for covering the site based on botanical analyses is autumn (Jessen 1929). This means that the site was constructed in spring/early summer and closed in autumn. After this deposition, the bog continued to grow naturally, until it was used for peat harvesting and cultivation in the twentieth century.

3. The finds

The finds are two clinker-built vessels: one considered a ship, and the other a smaller boat. Neither of the vessels were complete, though farmers cutting peat perhaps removed some parts before the excavation. Both were constructed using a combination of pine (*Pinus Sylvestris* L.) and oak (*Quercus* sp.). The shell of the ship was constructed by oak planks supported by frames of pine, while the keel, stem and stern were oak. Furthermore, the gunnels were pine (Johannessen 1929). Besides the vessels and various pointed sticks, branches and stakes, only three objects have been found, all wooden: an arrow, a bowl, and what is interpreted as a speaking-trumpet. The speaking-trumpet was produced from a deciduous tree species of indeterminable species (Shetelig and Johannesen 1929, 38-40). Analyses of the wood recovered revealed that nearly every part of both vessels had been broken into pieces and the damage was almost entirely done by hand, without the use of tools. Only the rudder and a couple of oars were not broken (Shetelig and Johannesen 1929, 34). In addition, some parts had been charred before deposition.

The wood was deposited more or less evenly in the artificial pond, except a number of vertical, protruding wooden objects, such as broken oars, sticks, branches, stakes and twigs. Some of these had been stuck very hard through the soil to the sandy bottom of the bog, which caused one of the oars to break. Unlike the parts of the vessel, these objects were sharpened with an axe or a similar tool before sticking them into the ground. The high number of these sticks and stakes made it difficult to get a clear view of the position of the vessels, and they were consequently left out of the site plan (Shetelig and Johannesen 1929, 30).

In addition to the incomplete status of the finds, the meticulous destruction of the vessels has complicated their reconstructions. The boat, Kvalsund I, is best preserved. Its measurement is estimated to be 9.56 m long, 1.5 m wide and 0.5 m deep to the top of the keel. The boat had two pairs of oars (pine), and although a rudder was not present in the assemblage, the vessel possessed a rudder rib, proving that it had a side rudder. A mast was found, but it is uncertain to which vessel this belonged. There is otherwise nothing to suggest that the boat possessed a sail (Johannessen 1929).

The basis for the reconstruction of the ship, Kvalsund II, is less comprehensive, but some crucial parts of the ship were present, such as parts of the frames from both the prow and bow, along with central parts of the ship. This made it possible to reconstruct the ship by comparing it to similar, more complete ship finds. Its measurement is estimated to be 18 m long, 3.2 m wide, 0.79 m deep to the top of the keel, with 10 pairs of oars (pine) and a rudder (oak) at the side (Johannessen 1929).

4. Dendrochronology

4.1. Sample procedures for a dendrochronological date

As mentioned above, the two vessels were constructed from both pine and oak. The wooden remains were thus surveyed and sorted by species. When taking samples for dendrochronological analysis from a clinker-built vessel, our experience (emperi) has demonstrated that the planks are the best objects to use for determining the dates of the vessel, since a radial cleft/split plank contains most of the tree-rings from the pith to the bark (e.g. see Fig. 5).

Developing new non-destructive methods is prioritized in dendrochronology. Some progress has been made by applying CT to record the tree rings. During a personal conversation between Jan Bill and Terje Thun 31st of May 2010, several limitations were mentioned about the CT; furthermore, limitations have also been mentioned in an article on the subject (Bill et al. 2012). The objects must be moved to a city with a CT machine and fit into a limited chamber. There are also limitations in measuring very narrow tree-rings, which Norwegian material in periods often contains. The method still gives negative results if the objects contain PEG. The cost by using a CT machine is also very high and far above our budget. We are at present not convinced that using CT can provide necessary precise measurements for our purpose. On the other hand, we have long experience in using traditional methods for measuring tree-ring widths. To be able to obtain necessary reliable results for this material, our conclusion was that traditional dendrochronology is the best method.

Traditional dendrochronology still permits us to attempt to cause as little damage as possible to the samples. In this case, to avoid unnecessary damage of crucial parts of the vessels for later exhibition and analyses, sampling did not include components of the ship with details characteristic for the description of the type of vessels. These parts are mainly made of pine, and consequently pine samples were excluded, selecting samples only from the planks, which were made from oak. For most of the planks, it could not be determined if they belonged to the boat or the ship due to missing information from the publication of the find. This would hopefully not cause too much of a bias, particularly because the find appears as an integrated mix of both vessels in one single deposit. Besides, it is assumed that they may have been produced at the same time and place (see Shetelig and Johannesen 1929, 67-73).

Using a bandsaw, samples for the examination were taken as cross-sections from fragments of oak planks, and at the same time, the sampling avoided important portions of the planks that may be used for later exhibition and reconstruction. This kind of material leaves out other sampling procedures such as non-destructive procedures due to the deformation of the wood caused by cell collapse and shrinkage. When utilizing cross-section sampling, there is a great chance to avoid tree-rings that cannot be measured, e.g. as in sample B7600.49 (Fig. 5). Nineteen samples were from seventeen of the planks; two of the planks had two samples taken from each. After the study, all samples will be

Table 1
Relative dating. Triangular matrix based on the relative cross-dating of the individual tree-ring curves. *t*-values over 0.00 \ = overlap less than 20 years. - = *t*-values less than 0.00. * = empty triangle. For *t*-values, see Baillie & Pilcher 1973.

curves	-	-	N361t010	N361t011	N361t012	N361t013	N361t014	N3610099	N3610129	N3610139	N3610149	N3610159	N3610199
–	start	dates	AD669	AD578	AD621	AD558	AD566	AD552	AD602	AD687	AD705	AD622	AD655
–	dates	end	AD733	AD670	AD745	AD753	AD750	AD655	AD723	AD761	AD766	AD679	AD726
N361t010	AD669	AD733	*	\	5.48	2.72	5.52	\	2.84	6.18	1.45	\	4.23
N361t011	AD578	AD670	*	*	4.24	6.92	9.92	4.84	3.46	\	\	3.42	\
N361t012	AD621	AD745	*	*	*	6.95	9.37	5.26	8.81	3.86	3.06	5.58	5.44
N361t013	AD558	AD753	*	*	*	*	8.22	11.28	7.41	0.72	0.77	4.27	3.93
N361t014	AD566	AD750	*	*	*	*	*	5.45	7.17	4.71	2.98	4.81	6.36
N3610099	AD552	AD655	*	*	*	*	*	*	4.91	\	\	5.27	\
N3610129	AD602	AD723	*	*	*	*	*	*	*	1.73	\	4.61	6.30
N3610139	AD687	AD761	*	*	*	*	*	*	*	*	3.26		3.98
N3610149	AD705	AD766	*	*	*	*	*	*	*	*	*	\	6.10
N3610159	AD622	AD679	*	*	*	*	*	*	*	*	*	*	3.43
N3610199	AD655	AD726	*	*	*	*	*	*	*	*	*	*	*

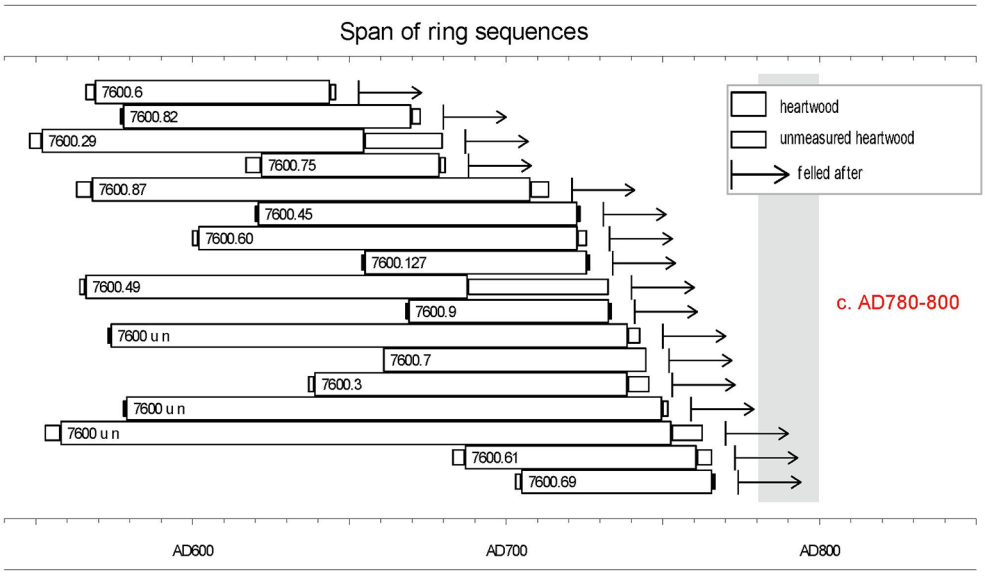

Fig. 6. The Kvalsund find. Bar diagram showing the position of the tree-ring curves. The rectangles show the position on a time scale, their length and as such the number of tree-rings preserved in each sample. None of the samples have sapwood preserved, it was either removed by the shipbuilder or lost over time by degradation and finally lost in the excavation phase. AD780-800 is an interpretation giving the time of felling for the oak trees used for the vessels. Sapwood estimate, see Christensen & Haveman 1998.

Table 2
Absolute dating. Values for cross-dating (*t*-values). The chronology for the find (N361m003) with reference chronologies for oak from (supposed) west Norway. Values equal to or greater than 3.50 are regarded as significant indicator of a likely match. For *t*-values, see Baillie & Pilcher 1973.

curves	-	-	N361m003	
–	start	dates	AD552	
–	dates	end	AD766	
n058m002	AD499	AD702	5.90	N Grønhaug 3 timber mean
N057M106	AD523	AD778	7.24	N Storhaug 11 timber mean
Karmøy	AD499	AD778	8.28	N Storhaug + Grønhaug 14 timber mean
N0471m93	AD549	AD815	6.70	N Oseberg ship 11 timber mean
N Vestlande…	AD499	AD815	8.69	N West part Norway ships etc. Grønhaug – Storhaug - Oseberg 25 timber mean

returned to the museum in Bergen.

4.2. Results

All samples have been dated. None of the samples contained sapwood, and consequently the result can only be understood as *terminus post quem*, but with the number of samples, it is still possible to give a fair interpretation. The number of tree-rings varied from 53 to 195, and the patterns of the tree rings cross-date (Table 1) and are averaged into a chronology covering a period of 215 years. This chronology cross-dates with material from two other finds from the western part of Norway and place it at AD 552–766 (see below). When taking into account that none of the samples have sapwood preserved, the actual date for the felling of the trees used in the construction of the two vessels is estimated to be at the end of the eight century, ca. AD 780–800, thus dating the vessels at the threshold of the Viking Age (Bonde 2017) (Fig. 6, Table 2).

The dendrochronological investigation shows that some samples might be from the same tree as the tree-ring curves from the samples in general show high similarity to one another. The tree-ring curves from the two samples identified to be from the boat (according to Shetelig and Johannesen 1929 69, 73)[1] fit in with the tree-ring curves from the other samples, and the curves from the samples appear to be relatively homogenous (Bonde 2017). Due to the fragmentation/splitting of the planks some of the samples examined might come from the same plank.[2] Based on the result shown in the bar diagram it is not possible to tell which sample belongs to which vessel (Fig. 6). This supports Johannessen's interpretations from 1929, that the boat and the ship were probably produced at roughly the same time and place (Johannessen 1929, 65).

The new date proves that the Kvalsund vessels are more or less

[1] Sample no. B7600.127 and B7600.69 are interpreted as parts of the boat.
[2] Sample no. B7600.29 and B7600.69

contemporary with grave ships from Karmøy in Rogaland; for example, the ship in the burial mound at Grønhaug is characterised as a 15 m long rowing ship, dated ca. AD 780, and buried in ca. AD 790–795. Furthermore, the ship in the Storhaug burial mound is characterised as a rowing ship also, dated ca. AD 770, buried during the summer of AD 779 (Bonde & Stylegar 2009).

5. Discussion

Johannessen saw a link between the Kvalsund ship and both the Oseberg and Nydam ships, and he guessed that the Kvalsund vessels were constructed sometime between the dates of the two other ships. Johannessen's original idea is supported by our results, but the Kvalsund vessels are much closer in time to the Oseberg ship than the Nydam ship: our new date of the Kvalsund vessels implies that they are only twenty to forty years earlier than the construction of the Oseberg ship.

Compared to the Nydam ship, the Kvalsund ship's rowlocks resemble the rowlocks of the Nydam boat, but its rudder attachment is more advanced. In addition, the keel had been changed to resemble that of a long ship, with increased strength and stiffness (Christensen 1984. For the Nydam ship: see Rau 2013).

Despite the short time span between the construction of the Kvalsund and the Oseberg ships, it is reasonable to describe the Oseberg ship as more advanced than the Kvalsund vessels. The Oseberg ship is so far the earliest evidence of a vessel constructed to sail in Norway, built as a combined sailing and rowing ship (Bill 2008). The keelson and the mast fish in the Oseberg ship represents an early development in this technology, but still possessed insufficient technology regarding the use of sail. The mast fish split and had to be repaired (ibid.). Compared to the Oseberg ship, the Kvalsund ship may represents a transitional phase between a rowing ship and a ship built for sailing. Although a mast is present among the finds, there was no mast fish or keelson discovered. This may, however, be explained by the incomplete deposition or other factors may be involved in conditions regarding recovery and preservation. After all, the bog had been exploited by peat diggers in the 20th century. The Kvalsund vessels and the Oseberg ship also differ regarding oar-holes, since there were no oar-holes discovered for either of the Kvalsund vessels. A long piece of a gunnel proved they had rowlocks instead (Shetelig and Johannesen 1929, 68).[3]

Recent analyses have suggested that the Oseberg ship was constructed in ca. AD 820, using oak timber from western Norway (Bonde & Stylegar 2009). Dendrochronological results combined with geographical location of sites and technological observations may indicate that all these ships could have been constructed in western Norway (Bonde 2017). The combination of pine and oak is still used in traditional boat building in western Norway, for example Oselvaren, boats constructed in Os, south of Bergen utilize this method (Økland, 2016, 47–50). The date even opens the possibility that the same people may have been involved in the construction of both the Kvalsund vessels and the Oseberg ship.

The date of the Kvalsund vessels suggests they are contemporary with the two ships in the tumuli from Grønhaug and Storhaug on the island Karmøy, Rogaland, which both have been characterised as rowing ships. As such, the Kvalsund ship fits in with these ship types, but it also may signify a development in future ship constructions. Considering the vessels may have been used for some time, the deposition at Kvalsund could be only 20 – 40 years earlier than that at Oseberg, the burial at Oseberg is dated AD 834 (Bonde 1997).

The new date proves that the deposition at Kvalsund is contemporary with a wide range of different ritual sites. However, the bog finds of Kvalsund I and II differ from contemporary, Iron Age finds. Firstly, they are not graves, since no human remains have been recovered at the site. The deposition however contained damaged or destroyed objects. Graves contemporary with the Kvalsund vessels may have had objects such as weapons bent or damaged in other ways (Lund 2013), though most grave goods were not intentionally damaged. Boats and ships from graves were not usually destroyed like at Kvalsund. The long duration of time from the opening and closing of the vessels is different from a typical burial as well. A burial is expected to be quick, and no longer than the time that it takes to prepare the burial site and grave goods, and would have started soon after the person died, with perhaps an ancestry cult in subsequent years. Recent theories that state that the Oseberg burial preparations and rituals lasted the entire summer season is not verified by the original publications (Christensen 1992, Gansum 2004). On the contrary, closer investigations of the duration of time the Oseberg burial took reveals that the original theory was correct after all (Nordeide, 2011a). Analyses of the Oseberg burial, including geological and botanical analyses, suggested that the preparations of the ritual happened very fast, not lasting the entire summer like at Kvalsund (Brøgger 1917, passim; Brøgger et al. 1917, passim).

The Kvalsund site was interpreted as a bog offering site by the excavators, which seems reasonable. An almost direct parallel seems to be from Örsmossen in Uppland, Sweden, where four log boats were found in a bog in 1912 (Larsson 2007, 238-239). Two of the boats were intentionally destroyed, but in this case, an axe was used to destroy the boats. It is significant that the boats were found together with a combination of twigs, brushwood and branches, like at Kvalsund. Though the Örsmossen find is not coastal like Kvalsund and the boats are smaller, the overall picture is similar to the Kvalsund finds, as is the date of ca. AD 800 (ibid.).

Moreover, since 1929, more bog offerings have been recorded along the west coast of Norway (Nordeide 2011b, 248-252). Several boats, or rather parts of boats, have been found along the western coast. In particular, the ship from Bårset should be mentioned, found in a bog at Nord-Kvaløya, Troms by farmers digging peat, and excavated by a zoologist in 1931 (Pedersen-Leijon 2002, 2). Due to a non-professional excavation, we do not know much about this find, except that several parts of the vessel were deposited in a bog without any associated grave or other artefacts recorded. Is has later been dated through dendrochronology to ca. AD 850–895 (Pedersen-Leijon 2002, 9). The geographical location of these bog finds indicates an association to the outer coast and not the more sheltered areas along the fjords (see Fig. 2).

Wooden sticks and stakes have been observed elsewhere, too, stuck into the ground in bogs, sometimes placed in circles or concentric circles. Pointed sticks and stakes stuck into the ground were also recorded in the Storhaug ship barrow (Opedal 1998, 65). Most of these pointed wooden pieces have not been dated, but they are particularly concentrated to the west coast of Norway, and when they are dated, they tend to be dated from the Roman period to the Viking Age, with the majority of dates from the Late Iron Age (ca. AD 590–1050) (Nordeide 2011b, 248 – 252; Sylvester 2012). The pointed sticks stuck into the ground at Kvalsund combine this group of finds with the boat offerings in bogs.

5.1. New interpretations

Considering the totality of the site in context of the new date, not only the ship technology, but the site as a ritual site turns out to be of great interest. Kvalsund was, at the time of excavation, more comparable with similar sites in Denmark from the Early Iron Age, for instance the bog offerings at Nydam, Als (Hjortspring), Vimose, Thorsbjerg and Kragehul (Shetelig and Johannesen 1929, 39–40). Such sites include a wide range of different offerings in bogs, including vessels, weapons, twigs and pointed wooden sticks and stakes, of which many had been stabbed into the ground, and of which some were burned. The Danish finds were intentionally destroyed as well (Ilkjær, 2002). We know today that several of the bog offerings in Denmark were not actually

[3] Sample no. B7600.28

deposited in bogs, but in lakes that had formed into bogs after deposition (Jensen 2004, 88–93; Ilkjær, 2000, 2002). Kvalsund was a bog at the time, not a lake, but the site was turned into a pond due to ritual construction and deposition. This difference should perhaps not be exaggerated, but the date from Kvalsund is also significantly later than bog finds from Denmark. We now know that there was a gap of several centuries between the above mentioned offerings in Denmark and the offering at Kvalsund, for instance at Illerup, which is one of the latest among the Danish examples: four different depositions are recorded at Illerup, dated from ca. AD 200 to the 5th century (Ilkjær 2000, 32).

The new date makes it more relevant to compare bog offerings in Denmark and at Kvalsund in terms of universal symbols in phenomenological terms, rather than as parallel features. Because vessels and water are at the core of the activity at this particular locality, and because there is a high risk of shipwrecking in this area, the vessel offerings may have been related to this danger in order to prevent shipwrecks, and therefore save or bring back lives, which is an element of fertility rituals in the widest sense.

The Kvalsund site combined earth, water, plants, and wood that penetrated the soil and were broken into pieces. These are common features along the western coast and in Danish bog offerings, features which fits into ideas of a fertility cult. This is further underlined at Kvalsund by the seasonal data: the preparation for the rituals started when plants started growing in spring, and closed when they could be harvested, in autumn.

There seems to have been a careful collection of plants in addition, such as nettle, heather and white moss. We notice a lack of metal and stone objects, contributing to the impression of a strong focus on wood. Wood is a resource produced by growing plants, which in this case were stuck into the wet ground, in a pond. We may interpret this as a way of 'planting' wood, perhaps symbols of trees, into a wet environment during spring '/early summer, which again calls for the interpretation of the inserted, pointed pieces of wood as a kind of fertility cult. Furthermore, burning could be a ritual of regeneration. Many similar rites have been observed through times around the world and Scandinavia, with trees as a central element. Sometimes the tree may be represented by branches and the rituals may include fire, but also collection of various plants. Such rituals often took place in May, which could fit the starting time of the Kvalsund site (Eliade 1976, 309-323). Perhaps similar features such as planting pointed sticks or inserting boat parts in bogs along the western coast could be interpreted in the same way. A side of fertility cult is regeneration, immortality, and eternal life (Eliade 1974 [1958], 265–331 and passim), which must indeed have been an important aspect of seafaring, particularly at this dangerous part of the coast. It should not surprise us if we find rituals along the coast meant to prevent the loss of lives at sea.

The occurrence of nettle may be indicative of the same, although this is more of a speculative association. The fibres of this plant was used in fine, woven textiles, and weaving is a frequent symbol of the woman, associated with water and vegetation cycles, observed in many different areas globally, particularly researched by the specialist in comparative religion, Mircea Eliade (Eliade 1974 [1958], 154–188). Boats have been observed to have been used as a fertility symbol throughout prehistory as well, for example, in Bronze Age rock carvings (Crumlin-Pedersen & Munch Thye 1995; Larsson 2007, 237). What is poignant in this context, however, is that the boat in burials is interpreted by other scholars as ensuring *árs ok friðar (good year and* peace), and hence fertility in its widest sense (Larsson 2007, 379). There was also an element of physical strength demonstrated at Kvalsund, since the destruction of the vessels and parts of the vessels seems to have been done by hand. It is otherwise difficult to explain why just the pointed sticks had been cut and sharpened with an axe.

The locality of Kvalsund is particularly significant, because this area has a high risk of shipwrecking. Vessels, soil, physical strength, wood and water are at the core of the activity at this particular locality. Combining these aspects with fertility cultic practices, the bog offerings may have been performed in order to prevent shipwrecks, and to save or bring back lives. This may be one of the reasons why bog offerings of boats and wood are found along the coast, particularly in the coastal region of western Norway where many ships have wrecked throughout history.

6. Conclusions

The date of the Kvalsund ship to ca. 780–800 AD makes the ship type contemporary with the rowing ships found in the tumuli at Storhaug and Grønhaug at Karmøy. The Kvalsund ship may have had a sail, although the construction was not yet fully developed as a sailing ship. It represents a transition between a rowing ship and the typical Viking long ship, which combined rowing and sailing. The ship represents the development of technology, which was crucial to Viking activities overseas in the centuries to come. A mast is the only evidence of the boat / ship had the possibility to sail. They may have understood the idea of sailing, but the vessel may have not been constructed to be able to sail.

Bog offering of vessels and graves containing vessels represent two types of very different religious rituals in the Late Iron Age Scandinavia. The Kvalsund site illustrates the great variety of Viking Age cult practices (Svanberg 2003, Nordeide 2011b). Bog offerings, particularly the bog offering of a ship and boat at the Kvalsund site, may be interpreted as a cult site intended to protect the lives of seafarers in the context of a Viking Age high-risk seascape.

CRediT authorship contribution statement

Sæbjørg Walaker Nordeide: Investigation, Resources, Writing - original draft, Project administration, Supervision. **Niels Bonde:** Methodology, Formal analysis, Investigation, Data curation, Writing - original draft. **Terje Thun:** Methodology, Formal analysis.

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