

THE SALME SHIP BURIALS

Two Eighth-Century Mass Graves
on Saaremaa Island, Estonia

RECENT RESEARCH



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ACTA Universitatis Tallinnensis: Humaniora

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Recent Research

Edited by Lembi Lõugas and Heidi Luik

Tallinn University Press

Tallinn 2026

Acta Universitatis Tallinnensis, Humaniora

The Salme Ship Burials: Two Eighth-Century Mass Graves on Saaremaa Island, Estonia. Recent Research

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This book was supported by the Research Fund of the Tallinn University and the Archaeological
Research Collection, Tallinn University.

The post-excavation analysis of the Salme burial finds has been supported by the Swedish Research
Council project The Viking Phenomenon (2015-00466) at Uppsala University, and by Tallinn University.

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ISSN 2228-026X

ISBN 978-9908-64-000-6

TLU Press

Narva mnt 25

10120 Tallinn

tlu.ee/en/tallinn-university-press

Printed by Tallinn Book Printers



TALLINN UNIVERSITY



THE VIKING
PHENOMENON

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5. GAMING PIECES AND DICE FROM SALME SHIP BURIALS

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ABSTRACT

Numerous bone gaming pieces and a dozen dice have been found in the Salme ship burials. This paper provides an overview of the number, size and appearance of the gaming pieces, their manufacture and the materials used, as well as the find contexts. Most of the gaming pieces are made of whale bone, fewer are from cattle femur head, these latter all coming from Ship I. For some gaming pieces and dice species were determined by ZooMS. The shape of the gaming pieces, the material used to make them, as well as radiocarbon dating of some pieces, support the dating of these burials to the 8th century. This article seeks an answer to the question of how many sets the gaming pieces found in the Salme ship burials could come from. Since a large number of the pieces were not found in their original locations, and the *hnefatafl* game uses a different number of gaming

pieces depending on the size of the game board, it is not possible to produce any definite answers. However, the pieces in Ship I come from at least two sets. In the case of Ship II, four sets can be identified by their findspots. These gaming pieces were clustered on or next to some individuals or groups of skeletons. More questionable are the pieces located in the middle of the ship, partly as some have been removed from their original locations by the digging of cable trench 3. It is possible that these represent three sets of pieces. In all, there appear to have been at least nine sets of gaming pieces in the two ships.

KEYWORDS: *Viking Age archaeology, Scandinavian archaeology, Estonian archaeology, ship burials, whale bone, gaming equipment, Eubalaena glacialis*

INTRODUCTION

In both Salme ship burials, gaming pieces form the most numerous find group after ship rivets. In total 72 hemispherical bone gaming pieces were found in association with Salme Ship I and 245 with Ship II. In addition to the gaming pieces, ten dice are also among the finds. These objects have already been briefly discussed in reviews of the fieldwork published immediately after the

excavations (Konsa *et al.* 2009, 58, fig. 7; Peets *et al.* 2011, 34–35, figs 6, 10–11; 2013, 47, fig. 7) and in the artefacts chapters in the book introducing the excavation results and find material from the Salme ships (Peets & Luik 2023, 36–37; Luik & Peets 2023, 79, 82–83). The find catalogue of this book (Lõugas *et al.* 2023a) contains information on the findspots of gaming pieces and dice,

both in the lists of finds and on the find plans. Most are depicted on the photo plates in this publication. The gaming pieces from Ship I have been previously discussed in more detail (Peets & Maldre 2010). This article provides an overview of the number, size and appearance of the found gaming pieces, their mode of production and the materials used for their manufacture. Furthermore, some pieces and dice have been analysed as parts of a paper discussing whaling in Scandinavia in the

Late Iron Age (Hennius *et al.* 2023). In addition to summarising the information from previous publications, the present paper seeks to investigate how many gaming sets are represented in the Salme ships. As far as possible, we have tried to answer this question by means of the find contexts of the pieces, as well as considering their material, the size of the pieces, and the number and findspots of so-called king pieces.

HNEFATAFL, TABLUT AND OTHER GAMES

Gaming utilities, such as gaming pieces and dice, are present in Scandinavia at least from the Roman Iron Age and onwards. In most cases, the gaming pieces, and in some rare cases also the remains of gaming boards, have been found in burials, including boat burials. Gaming pieces found in Vendel Period burials are generally made of whale bone. They have been found in for example the burials at Valsgärde, Vendel, Vallentuna and Ultuna in Sweden (Arwidsson 1942; 1954; 1977; Stolpe & Arne 1912; Sjösvärd *et al.* 1983; Peets & Maldre 2010, 60–63; Hennius *et al.* 2023, 6, fig. 4). From the Viking Age, gaming pieces of bone, including whale bone, as well as glass and amber are also known from the area of present-day Sweden, Norway, Denmark, Great Britain, Germany, France, etc. (Arne 1934; Arbman 1943; Sjöqvold 1974; Price 1989; Owen & Dalland 1999; Whittaker 2006; Rundkvist & Williams 2008; Hennius *et al.* 2023).

The gaming pieces have often been assumed to have been used when playing board games such as *hnefatafl*, which is mentioned in the saga literature. There are numerous publications on the history of the game, presumed rules, and finds of gaming pieces (e.g. Sperr 2005; Whittaker 2006; Rundkvist & Williams 2008; Peets & Maldre 2010; Hall & Forsyth 2011; Spjuth 2012; Kimball 2013; Hall 2016; Schulte 2017; Hennius *et al.* 2018; 2023). The rules of *hnefatafl* have been reconstructed from a Saami game called *tablut*, recorded in 1732. According to the reconstructed rules there are two teams in the game, defenders and attackers, with the number of attackers twice the number of defenders, and the defenders including a different-looking so-called king piece. By moving the pieces, the attackers want to capture the king. The defenders should guide the king to one corner. The *tablut* game board had 9×9 squares and the required number of pieces was 25, including 16 attackers, eight defenders and a king (Rundkvist & Williams 2008, 95;

Spjuth 2012, 14). It has been suggested that the size of the gaming boards could range from 7×7 to 17×17 squares. The smallest board required 13 pieces: eight attackers, four defenders and a king, while the largest required 73 pieces (48 attackers, 24 defenders and a king). However, such large gaming boards were probably rare (Rundkvist & Williams 2008, 93–97, table 3). Viking Age gaming boards are believed to have typically been made for 11×11 or 13×13 squares (e.g. Spjuth 2012, fig. 4), with the required number of gaming pieces being 37 or 49, respectively (Rundkvist & Williams 2008, table 3). For example, a fragment of an oak board with 13×13 squares has been found in the Gokstad ship (Nicolaysen 1882, 46, pl. VIII: 1). A gaming board found in Ballinderry, Ireland, has 7×7 holes where pieces with pegs could be placed (O'Neill Hencken 1933; Rundkvist & Williams 2008, 96; Schulte 2017, fig. 2).

Strategy games like *hnefatafl* have often been associated with male warrior culture, as the game required strategic planning, just as was needed in battle (Whittaker 2006, 106; Kimball 2013, 70; Hall 2016, 440, 446). However, there are also female graves with gaming pieces. In the early phase, gaming pieces are primarily found in rich burials, and most often in those of men. Nevertheless, the number of finds in graves and in, for example, the culture layers at Birka, suggest the practice of gaming was quite widespread. Particularly in the Viking Age gaming pieces are quite frequent in non-elite burials as well as in female burials (Sandberg 1994, 61–62). To associate games primarily with warrior culture can in other words be questioned.

When playing *tablut* or *hnefatafl*, dice were not needed. This means that the discoveries of dice together with gaming pieces indicate that the original rules of *hnefatafl* differed from the rules of *tablut*. It is possible that dice made it possible to play a number of different games or variants of such.

GAMING PIECES AND DICE FROM THE SALME SHIP BURIALS

GAMING PIECES IN SHIP I

SHAPE AND SIZE. Visual and scientific analysis reveal that 21 of the gaming pieces from Ship I are made from cattle femur heads and 51 from whale bone (Figs 1–2). The diameters of the whale bone gaming pieces range from 3.6 to 4.6 cm and the height from 1.7 to 3.6 cm, the diameters of the cattle bone pieces are from 3.8 to 4.5 cm and the height ranges from 2.0 to 3.5 cm

(Peets & Maldre 2010, 58, table¹). Most of the gaming pieces are intact, although some are only preserved as fragments (Lõugas et al. 2023a, pls 7–9, 12).

¹ One fragmentary gaming piece is missing in this table (see Lõugas et al. 2023a, pl. 12: 223).



Figure 1. Cattle bone gaming pieces from Ship I. Presumable set I: 1 (SM 10601: 12, 15–16, 19–21, 24–27). Photo: Jaana Ratás.



Figure 2. Whale bone gaming pieces from Ship I. Presumable set I: 2 (SM 10601: 32–34, 37–47, 49–50, 53, 57, 61, 63). Photo: Jaana Ratás.

MANUFACTURE. The natural shape of the femur head has been used for the cattle bone gaming pieces, with the characteristic hollow of the femur head visible on the convex side (Fig. 1). The bones of both young (under 3.5 years old) and adult animals have been used (Peets & Maldre 2010, 58). To make the gaming piece, the head of the femur has been separated from the rest of the bone either by sawing or, in some cases, particularly with bones from young animals, with the help of a precise blow with an edged tool. After sawing, the lower, flat side of the pieces are usually left unrefined (Peets & Maldre 2010, 67).

In contrast whale bone gaming pieces are turned. The convex side shows turning lines, and most of them have a conical or pyramidal depression in the centre of the lower side, associated with the attachment of bone to a lathe (Peets & Maldre 2010, 56, fig. 4).

ORNAMENTATION. Four bovine bone gaming pieces and one whale bone piece show finely engraved lines on the surface (Figs 3–7). While the images engraved on the whale bone piece were already noticed during excavation, the lines on the cattle bone pieces were later discovered by Liina Maldre during the examination of bone material in the laboratory (Peets & Maldre 2010, 70). The lines are very fine and barely noticeable, being visible only when the light falls on the object at the right angle. In search of an answer to the question of how the lines were made, different cutting blades were tested, with the most similar lines obtained by

scraping with a flint chip. Flint tools from the Viking Age are extremely rare in central Sweden and other types of tools or materials used to make the engravings need to be discussed further. For such lines to have been visible when playing, we can assume that the contours had to be coloured, for example with ochre, indigo, copper oxide, soot or charcoal (*ibid.*, 71–72). The filling of patterns carved into bone objects with paint has occurred at various times, at least since the Roman period, probably with dyes for example soot, which were mixed with beeswax (MacGregor 1985, 70; Lobisser 1999, 266 ff). Dark pigment has also been preserved in the ornament of one of the combs found in Salme Ship II (Luik *et al.* 2020, 34, fig. 10).

As ornamentation on the gaming pieces is worn and poorly visible, it is not certain what is depicted. Although the ornament on the whale bone piece (Fig. 3) has been assumed to be a human image (Konsa *et al.* 2009, 58, fig. 7: 2), other variants are also possible. The image has been interpreted as the intertwined roots of Yggdrasil, the sacred ash tree of the ancient Norse, and dragon or serpent heads (Peets & Maldre 2010, 73–77, figs 7–8b). Whatever the motif is, it appears to be an incised version of one related to Style C ornaments. These motifs have in the centre a three- or four-armed triskelion/cross, entwined and surrounded by animals. This is frequently found on for example Gotlandic box brooches (Nerman 1969, pls 167–170, 221–224). Variants of this motif also appear on shield bosses in Valsgärde (Arwidsson 1942, fig. 32; 1977, pl. 8). This is probably the king piece.

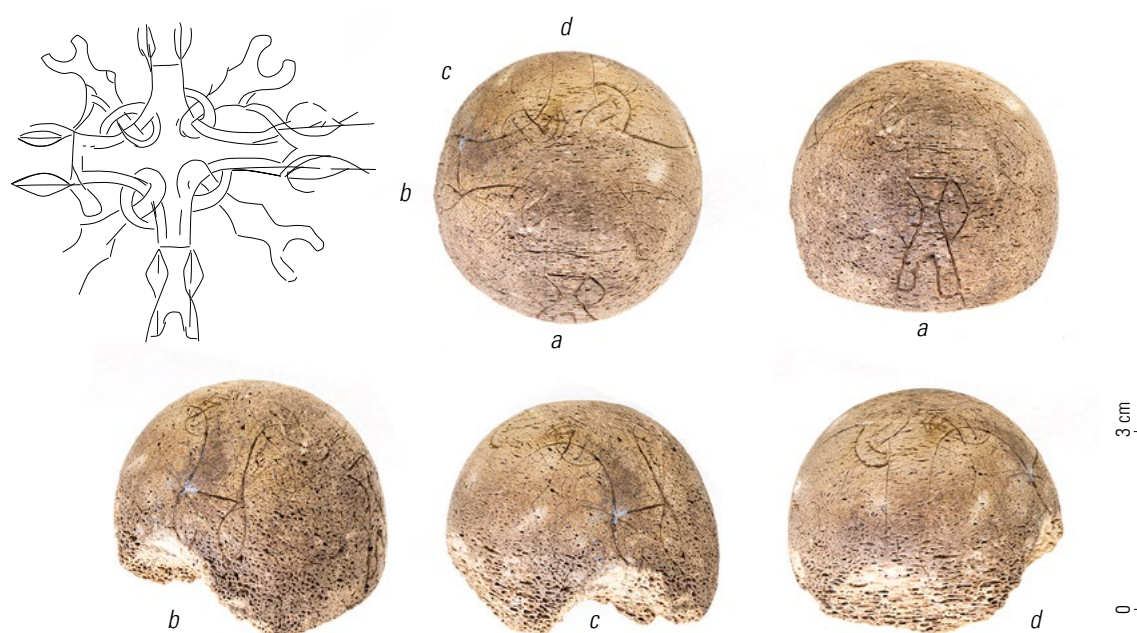


Figure 3. Whale bone king piece from Salme Ship I. Views of different sides are marked by the letters a, b, c and d. Presumable set I: 2 (SM 10601: 222). Photos and drawing: Jaana Ratas.



Figure 4. Presumable king piece made from cattle bone from Salme Ship I with thin engraved lines on the gaming piece. Presumable set I: 1 (SM 10601: 14). Photo: Kanut Conservation and Digitisation Centre.

Three of the cattle pieces have the same engraving while the fourth has a different one. The figure on the latter (Fig. 4) is very poorly preserved. Parallel lines running in three directions can be surmised, in which the contours of a triskele can be assumed – perhaps this was also a king piece (Peets & Maldre 2010, 77–78, figs 9–9b). There are other examples of gaming pieces with ornaments in the shape of a triskele. Among the 36 whale bone gaming pieces from Valsgärde boat burial 7, there is one specimen with a three-pronged tinned bronze sheet decoration at the top. In Valsgärde 6 were two specimens with three-pronged bronze sheet decoration

present among the 63 gaming pieces from this burial. It seems like two gaming sets were placed in this burial (Arwidsson 1942, 83–84; 1977, 79). A king piece with a triangular copper mount is also known from Ultuna (Hildebrand & Hildebrand 1873) and from a rich Vendel Period cremation grave at Husby in Vagnhärads parish (SHM 19224: e19).

The ornamentation of three gaming pieces seems to be similar to each other (Figs 5–7; Peets & Maldre 2010, 79–82, figs 10–13). Of these, the images are best observable on one piece (Fig. 5), where, according to Jüri Peets and Liina Maldre, a snake, interpreted as the Midgard



Figure 5. Cattle bone gaming piece with engravings from Salme Ship I. A serpent (a) is engraved on the gaming piece, the other engraving (b) has been interpreted as a deer's head or a whale's head and a boat. Presumable set I: 1 (SM 10161: 18). Photos and drawing: Jaana Ratas.

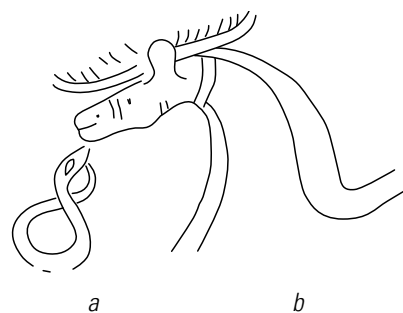
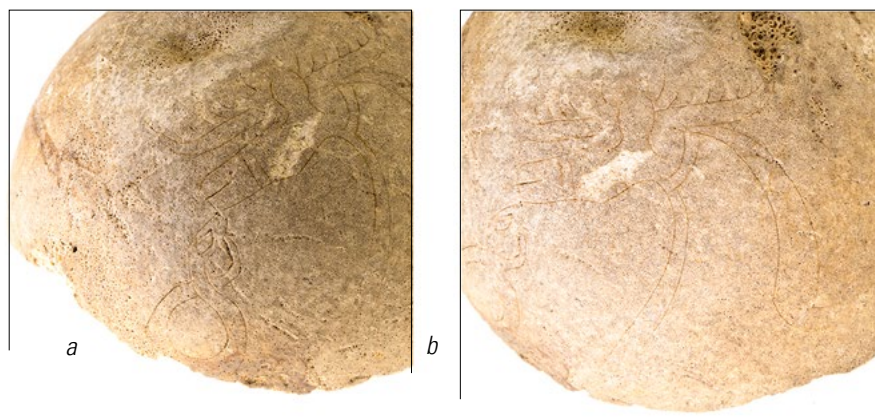




Figure 6. Cattle bone gaming piece with remains of engraving (shown by an arrow) from Salme Ship I. Presumable set I: 1 (SM 10161: 10). Photo: Kanut Conservation and Digitisation Centre.



Figure 7. Cattle bone gaming piece with remains of engraving from Salme Ship I. Presumable set I: 1. (SM 10161: 29). Photo: Kanut Conservation and Digitisation Centre.

Serpent, a deer's head or a whale's head and a boat can be seen. The remaining two pieces (Figs 6–7) have less ornamentation, and it is probable that both pieces are more worn. A snake facing a stag has been depicted on southern Scandinavian KG4 coins dated to the first half of the 9th century, which are believed to be modelled after X series sceattas with the Wodan-Monster motif, minted in Frisia or in Ribe in the 8th century² (Malmer 1966, 204–209, fig. 6: 7, pl. 2; Barrett 1990, 173 ff., fig. 8;

Kilger 2008, 275–276, fig. 8.8). Several researchers have interpreted the snake on these coins as the Midgard Serpent biting his own tail and a stag as a reflection of four stags who dwelt beneath the Yggdrasil ash tree (e.g. Kilger 2008, 276–277 and references therein). Perhaps the gaming pieces with drawings were placed at the corners of defenders' positions (Peets & Maldre 2010, 77), or as 'chiefs' of attacking groups positioned at the sides of the gaming board. In both cases there should be four of them, but as the Salme I grave was heavily damaged, some gaming pieces have probably been destroyed or lost.

² The authors thank Søren Michael Sindbæk for drawing attention to these coins.

GAMING PIECES IN SHIP II

All the bone gaming pieces from Ship II are made of whale bone. The pieces are of different sizes. Most of them are similar in size to the whale bone pieces from Ship I, measuring 2.9–4.5 cm in diameter and 1.6–3.0 cm in height. However, there are also smaller pieces with a diameter of 1.7–2.6 cm and a height of 0.9–1.6 cm (Fig. 8). Some of the pieces, especially those located in the lowermost burial layer, where the preservation conditions were less favourable, have an eroded surface and are partially broken, and their current dimensions might not correspond to the original dimensions of the pieces.

None of the gaming pieces from Ship II have incised patterns, although some are modified in a way that indicates they were king pieces (Figs 9–10; Lõugas *et al.*

2023a, pls 71: 532, 77: 1728, 91: 402, 101: 424, 109: 883). Among them are two pieces with iron pins (Fig. 9: 1, 4), one piece with a bronze pin (Fig. 9: 5) and two pieces with bronze covers, one of which (Fig. 9: 2) belongs to group of small pieces and the other (Fig. 9: 3) is preserved as fragments only. One piece (Fig. 10: 1) has a large irregular hole through the middle, which is hard to explain.

As exceptions to the pattern of whale bone pieces are two presumable gaming pieces in other materials. One of these is a hemispherical fossil (SM 10602: 860; Lõugas *et al.* 2023a, pl. 109: 860) similar in size to the gaming pieces. This was found in one of the assemblages of bone gaming pieces (see below, set II: 4). Due to its shape and size, it was a suitable replacement for a lost gaming piece.



Figure 8. *Small whale bone gaming pieces from Salme Ship II. Set II: 3 (SM 10602: 422–431, 449). Photo: Jaana Ratas.*



Figure 9. *King pieces from Salme Ship II. 1 – presumably set II: 2; 2 – set II: 3; 3 – set II: 4; 4 – presumable set II: 6; 5 – presumable set II: 5 (SM 10602: 402, 424, 883, 645, 532). Photos: Jaana Ratas and the Kanut Conservation and Digitisation Centre.*



Figure 10. Presumable king pieces from Salme Ship II.

1 – whale bone piece with oval hole, 2 – piece of quartz with flat smoothed bottom. Both lack an exact find context (SM 10602: 1728, 1730). Photos: Kanut Conservation and Digitisation Centre.

The other anomalous object is made of quartz (Fig. 10: 2) with one side smoothed so that it can be placed upright. Since the quartz piece is different from other gaming pieces, it is tempting to interpret it as a king piece. However, the location of this object in the grave is unknown.

DATING

Four radiocarbon analyses have been performed on the gaming pieces in Ship I, two on cattle bone pieces and two on whale bone. As a result of the reservoir effect in the whale bone the results are somewhat different, but it is still probable that they all belong to the 8th century (Lõugas *et al.* 2023b, 101, table 8, fig. 69). The shape also indicates a similar dating. Most of the Salme gaming pieces are hemispherical and have their widest point at the bottom. In Sweden, gaming pieces of this type, which according to Petersen's typology belong to type A, were the most common during the Vendel Period (Petersen 1914). Some gaming pieces are also slightly narrower at the bottom and the widest part is at the middle of the piece. In Petersen's typology, such gaming pieces belong to type B (*ibid.*). This type was

more common in the Viking Age but was used alongside type A during the Vendel Period. Whale bone was also the most common material for gaming pieces of types A and B (Hennius *et al.* 2018, 618–619, figs 5–6, 8; 2023, 3, fig. 2).

DICE

Three dice from Ship I have reached the museum collection (Fig. 11; Lõugas *et al.* 2023a, pl. 12). A few dice that were found before the archaeologists arrived have been lost (see Peets & Luik 2023, 36, and references therein). Seven dice were found in Ship II (Figs 12–13; Lõugas 2023a, pls 72, 90, 91, 109). All are oblong and cuboid in shape. For the ones that are so well preserved that the markings can be observed, the smaller square faces at the ends have the numbers 1 and 2 marked by dots and double circles, and the numbers 3–6 are on the elongated, rectangular sides. The dice from Ship I are clearly made of cervid antler, as are four dice from Ship II (Fig. 12). Three of the dice are made from the teeth of a large cetacean (Fig. 13).



Figure 11. Antler dice from Salme Ship I: 1–3 (SM 10601: 210, 211, 227).

Photos: Jaana Ratas and the Kanut Conservation and Digitisation Centre.



Figure 12. Antler dice from Salme Ship II: 1 – set II: 1; 2–3 – *presumable set II: 5*; 4 – set II: 2 (SM 10602: 336, 568, 552, 751). Photos: Jaana Ratas, Reet Maldre and the Kanut Conservation and Digitisation Centre.

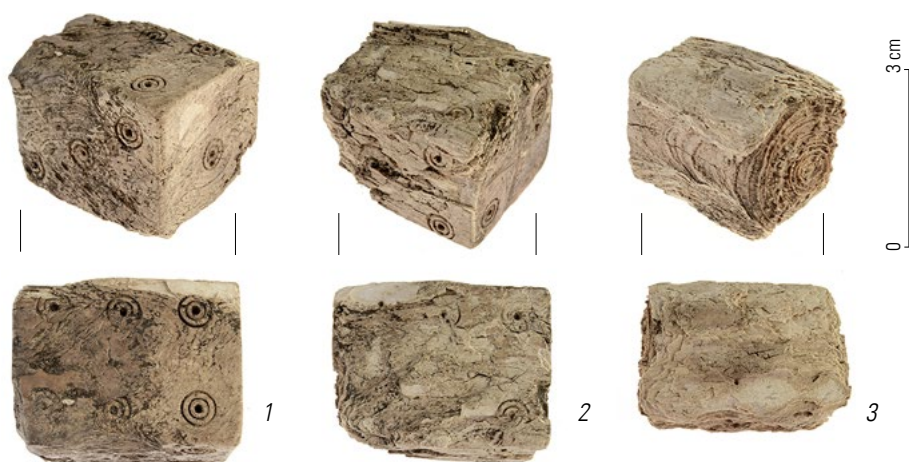


Figure 13. Dice made from sperm whale teeth from Salme Ship II: 1–3 set II: 4 (SM 10602: 865, 876, 963). Photos: Jaana Ratas and the Kanut Conservation and Digitisation Centre.

ZooMS DETERMINATION OF MATERIALS USED FOR GAMING PIECES AND DICE

Concerning some of the gaming pieces from Salme Ship I, it was possible to determine the raw material as bovine femur heads based on a visual examination of the characteristic features of the bones (Peets & Maldre 2010, table). However, when examining the whale bone gaming pieces found in Ship I, the question of what material it was arose. The pores visible on the lower, flat side of the pieces did not resemble the pores of elk or red deer antler. During a visual comparison with other types of bones, it was suggested that the gaming pieces were made of whale bone. This was confirmed by ^{13}C analysis, which indicated the marine origin of the raw material: for the two analysed gaming piece fragments (SM

10601: 58, 76) the $\delta^{13}\text{C}$ values were -16.1‰ and -16.2‰ , respectively. The $\delta^{13}\text{C}$ value of the cattle bone piece in the same analysis series was -21.4‰ , which was similar to the result for the calf bone found in Ship I (-20.9‰). At that time, it was not possible to determine the species of whale, or which skeletal parts were used to make these gaming pieces (Peets & Maldre 2010, 56).

In the case of the gaming pieces found later in Ship II it was clear, based on previous experience, that they are all made of whale bone, although again it was not possible to determine which species. Regarding the dice, four were made from cervid antler and three from some other raw material, as their end facets were lacking the

pores characteristic of the structure of antler. They were rather constituted of concentric circles reminiscent of the annual rings of wood. Such a structure is also characteristic of the teeth of sperm whale, a member of the *Odontoceti* family. However, this determination was uncertain.

Numerous whale bone pieces are found among Scandinavian gaming pieces, mainly among finds from the Vendel and Viking Periods (Hennius *et al.* 2018; 2023). Since ZooMS (Zooarchaeology by Mass Spectrometry) can determine animal species using only a small amount of material, there is the opportunity to identify more precisely the species used to make bone artefacts. In the study of Scandinavian gaming pieces, ZooMS analysis was first performed on nine gaming pieces from Valsgärde and Gamla (Old) Uppsala. Results were obtained from five samples all of which turned out to be made of bone from the *Balaenidae* family, presumably the North Atlantic right whale (*Eubalaena glacialis*) (Hennius *et al.* 2018, 622). After some time, a more extensive ZooMS study followed, during which, in addition to gaming pieces obtained from several Swedish and one Danish site, analysis included 17 gaming pieces and 3 dice from Salme (Hennius *et al.* 2023). A total of 68 samples were analysed, and in all the successful cases they proved to be made from the bones of a whale species belonging to the *Balaenidae* family. This was most likely North Atlantic right whale, but we cannot completely rule out the bowhead whale (*Balena mysticetus*) (Hennius *et al.* 2023, 6, supplementary material). For comparison, samples were also taken from two gaming pieces made of bovine femur found in Ship I. As

expected, ZooMS analysis confirmed that this was cattle (*Bos taurus*) bone (*ibid.*). Two of the dice, one of them from Ship I and the other from Ship II, were of cervid antler, probably elk (*Alces alces*). The interpretation of cetacean tooth dice was confirmed and more precisely identified as originating from a sperm whale (*Physeter macrocephalus*) (*ibid.*).

In the context of Estonia, whale bone can undoubtedly be considered an exotic and rare material. In central eastern Sweden, where the men buried in the Salme ships probably came from, whale bone products are equally rare except for gaming pieces, where whale bone was widely used from the 6th century onwards. As many as 50–70% of the Vendel and Viking Period gaming pieces found in Sweden are made of whale bone, and there are thousands of individual pieces in the museum collections. The gaming pieces have been interpreted as an indication that active whaling took place during this period. Suggested hunting grounds are northern Norway, where there was also large-scale production of marine oil in slab-lined pits. The purpose of the hunt was primarily to obtain baleen, meat, and blubber, bone gaming pieces could have been a by-product of this activity. The gaming pieces could have been part of a large-scale trade from northern central Scandinavia (see Hennius *et al.* 2018; 2023). The three dice made of sperm whale tooth from Salme II are currently considered unique. In this connection, it is significant that they all belonged to the same set (see below for more detail).

FIND CONTEXTS AND SETS OF GAMING PIECES

One of the essential questions in the studies of the gaming pieces is how many gaming sets they form in each ship. Unfortunately, it is not easy to give a simple answer since the number of pieces varied according to the size of the gaming board used. In addition, both ships were partially destroyed when the cable trenches were dug and probably not all the gaming pieces have been preserved. An indication to the number of sets represented in the graves can be given by the possible king pieces and the number of clear concentrations. In the case of Ship I, the gaming pieces and dice were scattered, and most of them were not found in situ. In the case of Ship II, a large number of the gaming pieces were located near the skeletons and around them, including compact assemblages. But a substantial number of pieces was also found in the cable trenches that run through the site, and as a result of this digging

some pieces ended up outside the ship contour, some quite far away from it. Gaming pieces located more closely together most likely come from the same set. Some conclusions can also be made on basis of the sizes, shapes and materials of the pieces (Table 1, Figs 14–15).

THE CONTEXTS, SHIP I

As already mentioned, the gaming pieces and dice from Ship I were found in the damaged part of the ship (Lõugas *et al.* 2023a, 116 ff., pls 7–9, 12). The different sets can only be interpreted based on the material of the gaming pieces and the fact that some of them have similar engraved patterns. Since the gaming pieces of Ship I are made of different materials – 21 of cattle bone and 51 of whale bone – then, if we assume that the pieces of one set are primarily made of the same material, it is safe

Table 1. *Gaming pieces and dice in the Salme ship burials. Gaming pieces that cannot be associated with any set using their find context are missing from the table*

ship	set	gaming pieces (including king pieces)		king piece		dice		find context	
		number	material	number	material	number	material		
I	I: 1	21	cattle bone	1 + 3 ¹	cattle bone	3 + ? ²	antler	disturbed area	
	I: 2	51 ³	whale bone	1	whale bone			disturbed area	
II	II: 1	24	whale bone	-	-	1	antler	skeletons X and XI	
	II: 2	46 + 11 ⁴	whale bone	1	whale bone	1	antler	skeletons IX, XII and XIII	
	II: 3	29	whale bone	1	whale bone	-	-	skeletons XIV, XV and XXVII	
	II: 4	33	whale bone + 1 fossil	1	whale bone	3	whale tooth	skeleton XXXII or XXII and XXVI	
	II: 5	96 ⁵	25–36	whale bone	1	whale bone	2	antler	square J/4, presumably skeleton XXIX
	II: 6		22–29	whale bone	1	whale bone	-	-	squares J/3, K/3– K/4, presumably skeleton XXX
	II: 7		31–49	whale bone	-	-	-	-	cable trench 3, squares A/2–A/7, J/3–J/4, presumably skeletons XVI–XVII, XXIV–XXV, or XXXI
	?				1 ⁶	whale bone			not known
		?			1 ⁷	quartz			not known

¹ Three gaming pieces with similar engraved pattern, presumably not king pieces but positioned at the corners of defenders or as ‘chiefs’ of attacking groups (Figs 5–7).

² Some dice were lost before archaeologists arrived, but the exact number is unknown.

³ It is not clear if these pieces belong to one or two sets.

⁴ These 11 gaming pieces were in the leg area of skeletons IX, XII and XIII, it is not clear if they belong to the same set.

⁵ These gaming pieces most likely come from three sets, but one cannot be sure what pieces exactly belong to what set; therefore, the next column gives a possible range of how many pieces could be included in this set.

⁶ With large hole in the middle. It is not certain if it is a king piece (Fig. 10: 1).

⁷ It is not certain if it is a king piece (Fig. 10: 2).

to assume that they represent at least two sets (Peets & Maldre 2010, 73).

From the description above we can assume that the two engraved gaming pieces were king pieces, which also suggests at least two sets (*ibid.*, 78). One is made from a bovine femur head (Fig. 4) and could be the king piece for the set made from cattle bone. In addition, there are three other gaming pieces of cattle bone on which identical figures were probably scratched (Figs 5–7). If we assume that all the engraved pieces were king pieces, there would be five king pieces among the 72 gaming pieces. In that case each of the five sets would have consisted of 14 or 15 gaming pieces (there may have been

more pieces in the ship, as some of them were probably lost when the ship was damaged). However, it seems more likely that each set consisted of pieces made of the same material. In this case, there would be as many as four king pieces among the 21 cattle bone pieces, which would make the set size only 5–6 pieces, which is apparently too few, even considering that some pieces have not survived. There are 51 whale bone gaming pieces, including one king piece (Fig. 3). They possibly belonged to one large set, but it is also likely that another king piece were lost when the burial was damaged. To sum up, two sets of gaming pieces can be confidently identified in the Ship I burial.

THE CONTEXTS, SHIP II

There are 245 gaming pieces in Ship II, which is more than three times as many as in Ship I. Most of them have the find location marked on the plans from the excavations, although some are not lying in situ due to damage from the cable trenches, and some pieces are probably lost and not recorded. In the following, are contexts with gaming pieces found near skeletons presented first (Fig. 14). In most cases, they cannot be linked to one specific skeleton, but to a layer and a group of skeletons lying next to each other. It is worth noting that no gaming pieces were found near the skeletons of the uppermost burial layer. The same layer is also missing other objects such as combs (see Luik & Ljungkvist 2026).

Gaming pieces associated with the skeletons of the northern row of in the middle burial layer were found in two assemblages around and between skeletons IX–XIII (Luik & Peets 2023, fig. 47). A smaller assemblage was scattered around the skulls and shoulder girdle of skeletons X and XI. Additional pieces and a die (Fig. 12: 1) were located a little further to the east of the assemblage (Fig. 14: 1). In addition, the gaming piece that came to light in square B/2 already in spit 2, probably belong to this set

(SM 10602: 90; Lõugas *et al.* 2023a, pl. 62). A total of 24 gaming pieces and one die appears to belong to this set.

Another larger assemblage of gaming pieces was in the thorax area of same group of skeletons, lying under the bones of the left arm of skeleton IX and between skeletons XII and XIII (Fig. 14: 2); the assemblage contained 45 pieces and one die (Fig. 12: 4). An additional eleven gaming pieces were scattered around the legs of skeletons IX and XII, but it is not clear if they also originated from this set. A remarkable find in this context was a king piece (Fig. 9: 1) that appears to have been placed in the mouth of skeleton XII (Fig. 14; Peets *et al.* 2011, 35, fig. 11). This king piece was not found near either of the two sets, but it seems most likely that it is part of the larger set between skeletons XII and XIII, because this set was partially lying on the body of skeleton XII.

Two additional gaming pieces can be assumed to come from the skeletons in the first row of the middle burial layer. The pieces were found in cable trench 1 north of the skulls of this row, outside the ship contour. One (SM 10602: 179) was located in square C/4 and the other (SM 10602: 1679) in square C/6 (Fig. 15; Lõugas *et al.* 2023a, pls 66 and 69).

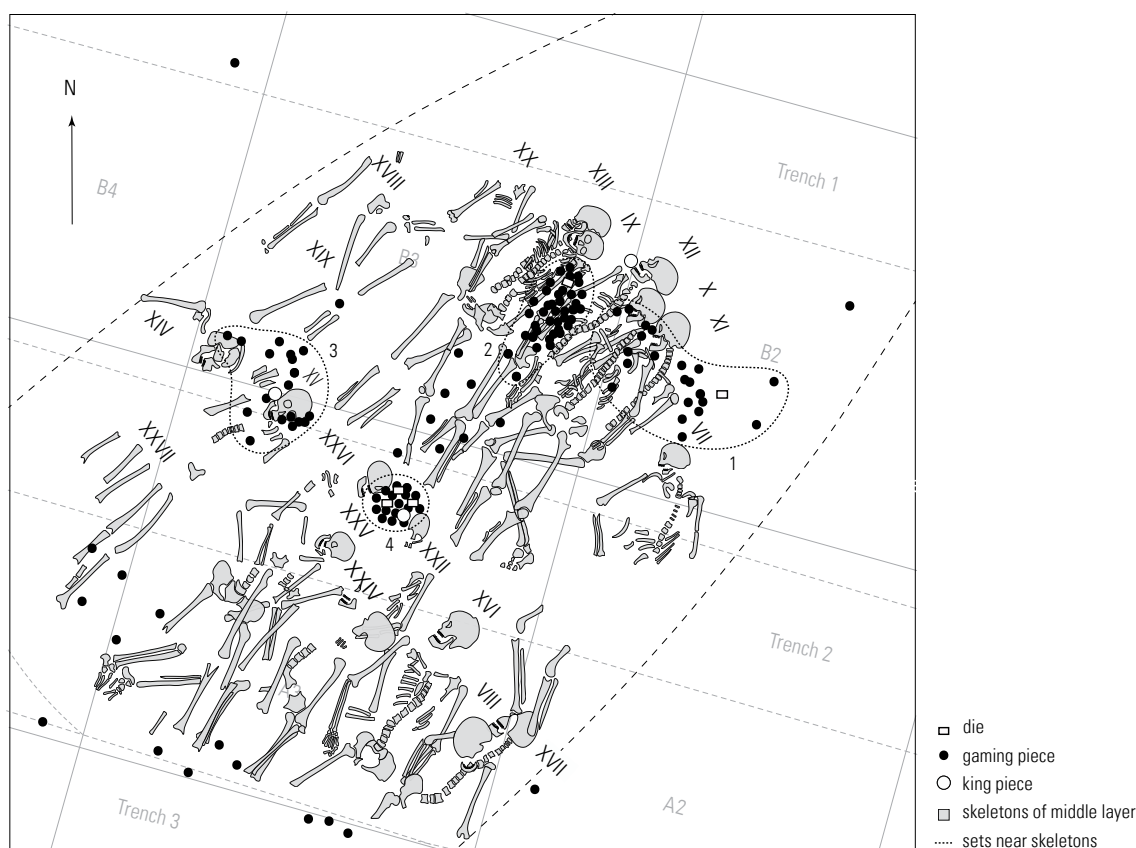


Figure 14. Gaming pieces near the skeletons (indicated by Roman numerals) in the middle burial layer in Salme Ship II. Presumable sets (II 1–II 4) of gaming pieces. Map after Lõugas *et al.* 2023a, modified by Aive Viljus.

In the second row of the middle burial layer, a group of gaming pieces was located around the heads and shoulders of skeletons XIV, XV and XXVII (Fig. 14: 3; Luik & Peets 2023, fig. 50). Most of them were located by the skulls of skeletons XV and XXVII. A few more pieces were scattered near the shoulders of skeleton XV, near skull XIV and a little to the northeast of these heads. Presumably, the same set could also include the piece (SM 10602: 449) located at the knees of skeletons XIX and XX in the middle burial layer, and two pieces found between the leg bones of skeleton XXXII which was buried in the lowermost burial layer (SM 10602: 706, 785) (Luik & Peets 2023, figs 47 and 51). In short, this set counts 29 gaming pieces, among them one king piece (Figs 8; 9: 2). These gaming pieces deviate from the rest in the grave as they are of smaller dimensions.

The gaming pieces from the fourth group were located in a tight concentration; they were probably deposited in a pouch or bundle. This set began to emerge in the middle layer of skeletons, between the skulls of skeletons XXII and XXVI (Fig. 14: 4; Luik & Peets 2023, fig. 50). When digging deeper, they appeared to have been placed in the pelvic region of skeleton XXXII in the lowermost burial layer, as if they had been placed in the lap of the dead person (*ibid.*, fig. 51; Peets *et al.* 2013, 47, fig. 7). However, since there was a layer of sand between the bones of skeleton XXXII and the set of gaming pieces, Jüri Peets considers it possible that the pouch with gaming pieces was placed between the heads of the above-mentioned men during the inhumation of the second row of the middle burial layer (Luik & Peets 2023, 77). This nearly intact assemblage contained 32 gaming pieces, including a king piece (Fig. 9: 3) and the fossil (Lõugas *et al.* 2023a, pl. 109: 860) of similar size and shape as the pieces. There were also three dice in the assemblage, all made of sperm whale teeth (Fig. 13). A few more pieces may come from the top of this assemblage and been dislodged during the digging of cable trench 2. One piece (SM 10602: 44) was found in square B/4, north of cable trench 2, and three pieces (SM 10602: 1663, 1677, 1717) were in trench 2, away from ship contour in squares A/6 and A/7 (Fig. 14; Lõugas *et al.* 2023a, pls 62, 66, 69).

From the lowermost burial layer, two pieces (SM 10602: 706, 785) already mentioned above were recovered between the leg bones of skeleton XXXII, although these probably originate from the middle layer, from the assemblage located around the skulls of skeletons XIV, XV and XXVII (Luik & Peets 2023, fig. 51). Another single gaming piece (SM 10602: 822) was found between the leg bones of skeleton XXVIII, approximately above the right knee, in square A/3 (Luik & Peets 2023, fig. 51). It may have originated from another assemblage of

gaming pieces, of which some were found in trench 3 (see below).

In addition to the gaming pieces found near the better-preserved skeletons, numerous were also found in cable trench 3, which cut through the ship, and south of this trench (Fig. 15). In the same area the upper layers of the ship burial were also damaged by other modern construction and levelling work. Only the lower parts of the lower extremities of individuals XXIX and XXX were preserved in this region (Allmäe 2023, fig. 41). These skeletons formed the third, southernmost, row of the middle burial layer. Many gaming pieces were probably also removed from their original positions due to the digging of the cable trench and levelling work. Most of the gaming pieces found there were in squares A/2–A/4, J/3–J/4 and K/3–K/4 at different depths (Fig. 15; Lõugas *et al.* 2023a, pls 62, 66, 69, 73, 76). No less than 96 gaming pieces, including two king pieces (Fig. 9: 4–5) and two dice (Fig. 12: 2–3), were recovered from the squares in this area. Another king piece might be a piece with a hole (Fig. 10: 1), the original location of which is unknown as it was recovered from a pile of excavated soil at the end of the excavation, as was the above-mentioned quartz piece (Fig. 10: 2).

The largest number of gaming pieces was found in square J/4, where the feet of the destroyed skeleton XXIX extended. There was a total of 36 gaming pieces in this square, most of them in the centre. The majority were obtained from spits 8 and 9, but a few came out already in spits 6 and 7. One king piece and both dice (Fig. 9: 5; 12: 2–3) were found in square J/4. Additional gaming pieces were found in the adjacent square J/3, where, in addition to the tibiae of skeleton XXIX, bones from the lower extremities of skeleton XXX were found. Fifteen gaming pieces were scattered there, found at various depths, from spits 5–13. Some of them were in the southern part of the square, and some in cable trench 3 in the northern part of this square and at the southern edge of the trench. There were fewer gaming pieces in the adjacent southern squares K/4 and K/3. A total of fourteen gaming pieces were found there, most of them, including one of the aforementioned king pieces (Fig. 9: 4), were located outside the ship contour in spit 5. To the north, in squares A/2–A/4, twenty pieces were found, most of which were in or near cable trench 3. Two pieces in square A/2 came from spit 1, outside the ship contour. One piece in square A/3 was found at the edge of the trench, in spit 2, and the other five pieces were deeper in the ditch, in the spits 12 and 13. Twelve pieces were found in square A/4, located in spits 7–11. Eleven more gaming pieces were found in cable trench 3, west of the ship contour in squares A/5–A/7 (Lõugas *et al.* 2023a, pl. 76).

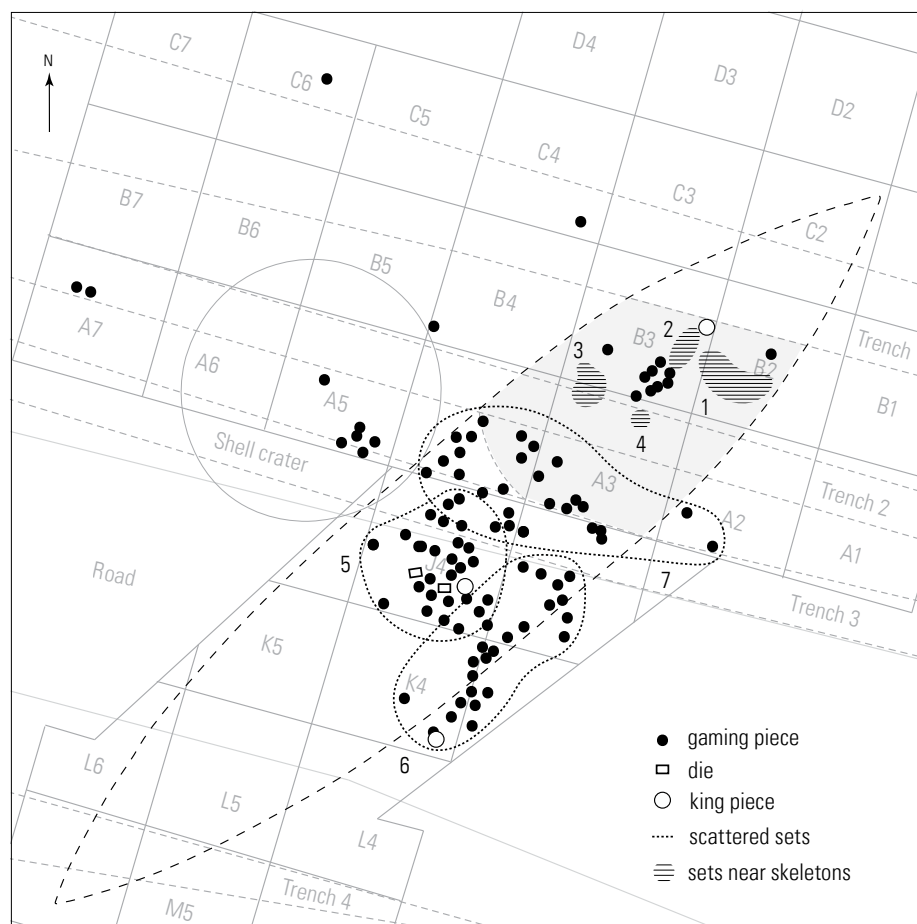


Figure 15. *Gaming pieces in Salme Ship II. Presumable sets of gaming pieces (II 1–II 7). Map after Lõugas et al. 2023a, modified by Aive Viljus.*

These gaming pieces probably come from at least three sets. Pieces from one set were in the central and southern parts of square J/4 and might have been deposited at the feet of skeleton XXIX. This set may also include both dice and one king piece (Fig. 15: 5). The second set might have consisted of pieces, including one king piece, located in squares K/3, K/4 and the southern part of square J/3, near the legs of skeleton XXX (Fig. 15: 6). The third set could consist of the gaming pieces that were in squares A/2–A/7 and the northern part of squares J/3 and J/4, which were probably scattered over several

metres when excavated soil was shovelled back into cable trench 3 (Fig. 15: 7). There is no king among these pieces, but given that they come from such a crude intrusion it is likely that they have been lost, missed or still lie in cable trench soil outside the excavated area. Originally, these gaming pieces could have been placed by the legs of someone buried in the second row of the middle burial layer (skeletons XVI–XVII, XXIV–XXV) or located next to the partially destroyed southernmost skeleton XXXI in the lowermost layer (Fig. 14; Luik & Peets 2023, figs 50–51).

GAMING PIECES AND GAMING BOARDS IN SCANDINAVIAN BURIALS AND ELSEWHERE

Even if the Salme burials are unique in many ways, it might be worth comparing the depositional patterns with other burials that have gaming pieces. Depending on the burial site and the preservation condition of the grave goods, it is sometimes possible to determine how the gaming pieces were placed in the grave.

Gaming pieces can be clustered together and placed in a burial in a leather or textile bag or pouch, for example

in Sanday on Orkney (Whittaker 2006, 105–106; Hall 2016, fig. 1). In addition a gaming board can be placed in the grave (Price *et al.* 2019, figs 2–3), sometimes only indicated by preserved metal nails or rivets, as in Valsgårde burials 6 and 8 (Arwidsson 1942, 83–85; 1954, 93, 94; Whittaker 2006, 106). In some burials, the gaming pieces have been placed on the gaming board, and because of the placement of pieces it is assumed that they were not

in the starting position but rather placed as if the game was in progress. This is the case with Valsgärde burial 7, where the king piece was at the corner of the board as if victory had been achieved in the game (Hall 2016, 446, fig. 3; Arwidsson 1977, pl. 45). In the case of the amber gaming pieces found at Skamby, Östergötland, it is assumed that they were found scattered because the pieces were not placed in the grave but on the roof of the tomb, and that they fell into the grave when the roofing collapsed (Rundkvist & Williams 2008, 88).

Nothing is known about the original placement of gaming pieces in Salme Ship I due to the earlier disturbances of the burial. In the Salme Ship II, one of the sets, which was located above the pelvic bones of skeleton XXXII and between skulls XXVI and XXII, the pieces of which were located together in a cluster, must have been deposited in the burial in some kind of pouch or bundle. A number of gaming pieces were also located as a compact but elongated assemblage between skeletons XII and XIII, so they too may have been in some sort of bundle. More scattered were the two sets of pieces by skeletons XIV, XV and XXVII. The largest number was found by the skulls of skeletons XV and XXVII, although some of the pieces were also found a little further from the skulls. It seems that this set of small gaming pieces was not in a pouch when deposited in the grave, because in addition to the pieces that were not compactly together, they were found both above and below skull XXVII. The relocation of objects could have occurred as a result of the decomposition of the corpses and other taphonomic processes.

Of interest is the set that was located by the shoulder regions and skulls of skeletons X and XI. Some of them were located more closely together near the left shoulder of skeleton XI, while the rest were scattered further away

in different directions. In this case, too, it does not seem likely that they could have been placed in a pouch or bundle. Perhaps these pieces were originally placed on the gaming board. Considering the distance of the pieces from each other, this would indicate quite a large board, with a side length of 80–90 cm. Nevertheless, the length of the side of the gaming board found in Valsgärde burial 8, for example, was 85–90 cm (Arwidsson 1954, 93–94; Rundkvist & Williams 2008, 96; Henniuss *et al.* 2023, fig. 1). The possibility that at least one gaming board could have been present in Salme Ship II is suggested by the find of an iron handle (SM 10602: 205; Lõugas *et al.* 2023a, pl. 70: 205), which would be suitable as a handle for a gaming board (cf. e.g. Arwidsson 1954, 93, pl. 27). The handle was found outside the ship contour in square B/5, at the south edge of cable trench 1 (Lõugas *et al.* 2023a, pl. 69: 205). Given that trench 1 ran close to the skulls in the first row of the middle burial layer, it is possible that the handle was dislocated during the digging of the trench and was originally located north of this row of skeletons. However, this is only an assumption as the handle could also have originated from a wooden box or chest. Similar box handles are known, for example from Viking Age graves in Birka (e.g. Arbman 1940, pl. 259 ff.).

For the three supposed sets that were in and to the south of trench 3, the gaming pieces were more closely concentrated in square J/4, although not quite as densely as if they had been in some kind of bundle. However, one must consider the fact that the upper layers of this area have been damaged by construction and levelling, and far from all pieces were found in their original locations. The rest of the pieces in this area were even more scattered, especially those found in trench 3 and at its edges.

THE NUMBER OF GAMING PIECES AND THE SIZE OF THE GAME BOARDS

The gaming piece sets mentioned above are hypothetical as both ships have been damaged by previously dug cable trenches and by road works. Many pieces were no longer in their original positions, and some have definitely been lost. As mentioned in the introduction, the number of gaming pieces used in the *hnefatafl* game is uncertain, and the question is if it would be possible to specify the number and size of sets placed in the Salme ships considering all the source-critical factors.

The beginning of this article presents the necessary number of gaming pieces for different variants of *hnefatafl*. However, the sets that have been found in intact

burials, do usually not correspond with the rules for this game. The numbers of pieces above would apply if each set contained all the pieces needed for the game, including attackers as well as defenders and the king. In this case, the defenders and attackers should be distinguishable from each other. For this reason it has been suggested that some of the gaming pieces were painted, even if painting perhaps is unlikely concerning the amber and glass pieces (Rundkvist & Williams 2008, 95). Therefore, it has been suggested that one owner's set consisted of identical pieces plus a king piece that was distinguished from the others, and that each player used his or her own

pieces according to the role assigned in the game (*ibid.*). If the possible size of the game boards ranged from 7×7 to 17×17 squares, the smallest necessary number of gaming pieces would be nine, and the largest 49. But this assumption is contradicted by the fact that in the case of Viking Age glass pieces, sets with different gaming pieces have also been found in burials (e.g. from Birka: Arbman 1940, pls 147: 1, 148: 1).

Therefore, as the number of gaming pieces in a set could vary greatly, it is not possible to determine the number of sets based on the number of pieces found. The number of dice does not help either, as they are not always present in the sets of gaming pieces deposited in burials, although in some cases there are even three dice (e.g. Arbman 1940, pl. 147: 3; Price *et al.* 2019, fig. 5). Three dice were also present among the pieces of a set that was found together as a compact assemblage at Salme (Figs 13; 15: 4). In the northern row of the middle

burial layer, one die (SM 10602: 336) was located near the left shoulder of skeleton XI (Figs 12: 1; 15: 1), and another (Figs 12: 4; 15: 2) was in a cluster of gaming pieces between skeletons IX, XIII, and XII, i.e., one die for both presumed sets. There were two dice in square J/4 (Figs 12: 2–3; 14: 5), where there were also plenty of gaming pieces.

Thus, the best measure to infer the number of sets is the number of king pieces. However, here too we must consider that both ship burials are damaged and some of the gaming pieces may have been lost. We should also keep in mind that the rules of *hnefatafl* have been derived from *tablut*, played by the Sami in the 18th century and therefore earlier games could have had different rules. Different individuals might also have had different preferences for these games, which is reflected in the different number of gaming pieces in the sets as well as the varying numbers of dice.

SUMMARY

The number of bone gaming pieces from the Salme ship burials is remarkable, but difficult to interpret as they are found in damaged mass graves and associated to several individuals with varying certainty. Considering the material of the gaming pieces, the number of king pieces and the location of the pieces in the burials, we can assume that the pieces come from at least nine game sets, two of which were deposited in Ship I and seven in Ship II. However, the possibility that there were more sets cannot be ruled out.

The shape of the gaming pieces and the material used for their manufacture – primarily whale bone – as well as the radiocarbon dating of the four pieces from Ship I, support the dating of the burials to the 8th century. The material used to make the gaming pieces and dice are different. Most of the gaming pieces are made of whale bone, with ZooMS analysis saying the source is probably North Atlantic right whale. A smaller number of pieces from Ship I are made from cattle femur heads. Most of the dice are made from cervid antler, probably elk. Three other dice, all originating from the same set of gaming pieces, are carved out of whale tooth, with ZooMS analysis of one die revealing it originated from a sperm whale. Unlike the use of bones from the right whale, the use of sperm whale teeth is extremely rare.

From a comparative perspective with boat graves in central Sweden, the Salme gaming equipment has many

similarities in composition and raw material. The major general difference lies in the placement of these objects. In the ‘ordinary’ boat graves the gaming pieces, generally together with their board, are placed in an area in front of the deceased. In the same area are horse bridles, wooden vessels and arrows. Most of the Salme gaming pieces have a different placement as they (and many of the arrows) were placed on or directly adjacent to individual bodies. This could be seen as a deviation, but it probably reflects how the Salme burials are improvisations, made in special circumstances. They also reveal the personal and symbolic value of the gaming pieces and the vital function they had for those who travelled into foreign territories. Many objects that were vital to travelling warriors, such as belts, knives, whetstones and strike-a-light sets, are partly or entirely missing in the Salme burials. In contrast to these objects, gaming pieces and dice had a role and meaning that made them both vital and dispensable for the funeral.

ACKNOWLEDGEMENTS

We would like to thank the Tallinn University Research Fund Archaeological Legacy in Focus: The Long-term Development of the Coastal Estonian Cultural Space project (grant no. TF3123) and the Viking Phenomenon project at Uppsala University, funded by the Swedish Research Council (grant 2015-00466).

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MÄNGUNUPUD JA TÄRINGUD SALME LAEVMATUSTES

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RESÜMEE. Salme I ja II laevmatustes on luust poolkerakujulised mängunupud rauast laevaneetide järel kõige arvukam esemerühm. Salme esimesest laevast (Salme I) leiti 72 mängunuppu ning teisest laevast (Salme II) 245 nuppu. Lisaks mängunuppudele on leitud hulgas kümme täringut. Mängunuppe kasutati *bnefatafl*i ja arvatavasti ka teiste lauamängude mängimiseks. Mängunuppe on teada paljudest leiukohtadest nii

Skandinaavia maades kui ka kaugemal. Avaldatud on arvukalt publikatsioone, mis kirjeldavad mängunuppe ning *bnefatafl*i ajalugu ja mängureegleid. Vastavalt mängulaua ruutude arvule võis mängu jaoks vajalik nuppude arv olla väga erinev. Väikseima teadaoleva, 7×7 ruuduga laua puhul on see 13 (kaheksa ründajat, neli kaitsjat ja kuningas). Suurimatel mängulaudadel arvatakse olnud 17×17 ruutu, sel juhul on vaja 73 mängunuppu

(48 ründajat, 24 kaitsjat ja kuningas). Kõige tavalised olid 11×11 ja 13×13 ruuduga mängulaud. Arvatakse, et *hnefataffi* reeglid olid sarnased saamide mängu *tablut*'i reeglitega, mis on üles kirjutatud 1732. aastal. Selles mängus täringuid ei kasutatud, kuid on võimalik, et *hnefataffi* puhul kehtisid siiski teistsugused reeglid või olid täringuid vajalikud mõnes teises mängus.

Salme I mängunuppudest 21 on veise reieluuppeast ja 51 on vaalaluust (jn 1–2). Veiseluust nuppude puhul on ära kasutatud reieluupea loomulikku kuju. Vaalaluust nupud on treitunud, enamikul neist on alumisel küljel kooniline või püramiidikujuline lohk, mis on jäänud nende kinnitamisest treipingi külge. Viie mängunupu pinnal on graveeritud jooni, mis kohati on kulunud (jn 3–7). Vaalaluust nupu (jn 3) graveeringu puhul on oletatud, et kujutatud on inimest või hoopis Põhjala usundi püha saarepuu Yggdrasili põimunud juuri ja draakonite või madude päid. Veiseluust nuppudest ühel on vaevu nähtavad kolmes suunas kulgevad jooned (jn 4). Kolmel veiseluust nupul on tõenäoliselt olnud ühesugune ornament, kuid neist kahel on see säilinud väga katkendlikult (jn 6–7). Kõige paremini säilinud graveering kujutab madu ja hirve (jn 5). Graveeringuga nupud võisid olla kuningannapud ja ründajate rühmade pealikud.

Kõik Salme II laeva luust mängunupud on vaalaluust. Enamik neist on umbes sama suured kui I laeva vaalaluust nupud, kuid leidub ka rühm väiksemaid nuppe (jn 8). Ühelgi II laeva nupul graveeringuid ei ole, kuid mõne ülaosas on rauast või pronksist teravik või mingi pronksdetaili jäänused (jn 9), tõenäoliselt on need kuningannapud. Võib-olla olid kuningannapud ka suure ovaalse lohuga nupp ning lamedaks töödeldud alumise küljega kvartse (jn 10).

Täringud on pikliku risttahuka kujulised, nende otsatahud on tähistatud ühe ja kahe silmakesega, piklikel küljetahkudel on 3–6 silmakest. Kolm sarvest täringut saadi Salme I laeva kaevandist (jn 11). Salme II kaevamistel leitud seitsmest täringust neli on sarvest (jn 12) ja kolm vaala hambast (jn 13).

Kui veise reieluuppeast nuppude materjali määramisel probleeme polnud, siis vaalaluust määramist raskendas asjaolu, et Eesti arheoloogilise leiumaterjali hulgas seni vaaluust leide polnud. Mõnest I laeva nupust tehtud ^{13}C -analüüsid kinnitasid toormaterjali merelist päritolu. Hiljem nii I kui ka II laeva vaalaluust mängunuppudest võetud proovide ZooMS-analüüsid andsid kõigi puhul tulemuseks silevaallaste sugukonda kuuluva liigi, kes tõenäoliselt on põhjaatlandi vaal. Täringute puhul oli sarvest eksemplaride analüüsi tulemuseks punahirv/kabehirv/põder, tõenäoliselt põder. Vaala hambast täringul määrati liigiks kašelott.

Küsimusele, mitmest komplektist võivad leitud mängunupud pärit olla, ei ole kerge vastata. Kuna mõlemad laevmatused olid lõhutud, ei olnud paljud nupud enam algses asukohas, osa nuppe on tõenäoliselt hävinud või kaduma läinud. Salme I puhul leiti peaaegu kõik nupud läbi laeva kaevatud kaablikraavist ja selle ümbrusest. Arvatavasti kuuluvad ühte komplekti 21 veiseluust mängunupp. Vaalaluust nupud võivad pärineda ühest suurest või kahest väiksemast komplektist (tabel 1: I).

Salme II puhul asus osa nuppe rohkem või vähem kompaktselt koos lõhkumata luustike läheduses, kuid osa oli kaablikraavide ja teetööde tõttu algselt asukohast eemale sattunud (jn 14–15). Kaks kogumit nuppe oli luustike IX–XIII ümbruses. Neist väiksem oli hajali luustike X ja XI koljude ning õlavöötmee ümbruses, sellesse võisid kuuluda ka mõned kaugemal eraldi asunud nupud (jn 14: 1). Suurem kogum mängunuppe paiknes üsna kompaktselt kolme luustiku, IX, XII ja XIII ülakehade piirkonnas (jn 14: 2). Võimalik, et sellesse komplekti kuulusid ka nende luustike jalgade ümbruses asunud nupud. Rühm teistest väiksemaid nuppe oli hajusalt luustike XIV, XV ja XXVII koljude ja õlgade ümbruses (jn 14: 3). Neljanda komplekti moodustas tihedalt koos paiknenud nuppude kogum, mis asus keskmise matusekihi luustike XXII ja XXVI koljude vahelisel alal (jn 14: 4) ja alumise kihi luustiku XXXII vaagnaluudel, nagu oleks see asetatud selle maetu sülle. Selles kogumis asusid ka kõik kolm vaala hambast täringut (jn 13). Lisaks mainitud komplektidele oli suur hulk nuppe laiali ruutudes A3, A4, J3, J4, K3 ja K4. Neist osa olid algselt kohast eemale nihkunud kaablikraavi 3 kaevamise käigus ja osa tee alla jäänud ala tasandamisel. Arvatavasti võivad nupud pärineda vähemalt kolmest komplektist (jn 15: 5–7). Oletatavad komplektid, neisse kuulunud nuppude, sealhulgas kuningannapude ja täringute arv ja materjal ning leiukontekstide andmed on esitatud tabelis 1.

Skandinaaviast ja mujalt pärit võrdlusmaterjali põhjal võis hauapanuseks olla nii terve mängunuppude komplekt koos mängulauaga või ilma selleta, aga ka ainult mõni üksik nupp. Mängunupud võisid paikneda tihedalt koos, olles matusesse asetatud mingis kotis või kompsus. Mõnikord on need üle kalme laiali puistatud ja mõnel juhul olnud asetatud mängulauale. Ka Salme matuste puhul oli vähemalt osa mängunuppe laeva asetatud kotis või kompsus.

Nagu eespool nimetatud, võis komplekti kuuluda üsna erinev arv mängunuppe. *Tablut*'i reeglite põhjal oli mänguks vajalik üks kuningannupp, neljaga jaguv arv kuninga kaitsjaid ja neist kaks korda rohkem ründajaid. Üks võimalus on, et komplekti kuulusid kuningas ja nii kaitsjad kui ka ründajad, kes pidid omavahel eristatavad olema. Teine võimalus on, et mängijale kuulusid

ühesugused nupud ja teistest eristatav kuningas ning iga mängija kasutas vajalikku arvu nuppe oma komplektist, vastavalt talle mängus osaks saanud rollile. Sel juhul oleks väikseim vajalik nuppude arv 9 (7×7 mängulaua puhul) ja suurim 49 (17×17 mängulaua). Skandinaavias on matustest leitud komplekte, mis sisaldavadki ainult ühesuguseid nuppe. Kui luust nuppude puhul võis eristamise jaoks olla osa neist värvitud, siis merevaigust nuppude puhul värvimine tõenäoline ei ole. Leidub aga ka komplekte, milles on erinevaid, näiteks eri värvi klaasist nuppe. Seetõttu pole võimalik komplekte mängunuppude arvu põhjal kindlaks teha. Üheks võimaluseks on kasutada selleks kuninganuppe, mis pidid igas komplektis olema. Kuid kuna mõlemad Salme laevmatused on lõhutud, pole

kindel, et kõik kuninganupud on säilinud. Arvestada tuleb sedagi, et *bnefataff*'i puhul ei pruukinud kehtida täpselt samad reeglid, nagu kehtisid saamide *tablut*'i mängus 18. sajandil.

Kokkuvõtvalt on Salme laevmatuste mängunuppude arv märkimisväärne. Tõenäoliselt pärinevad need vähemalt 9 mängukomplektist, millest kaks oli I laevas ja seitse II laevas, kuid komplekte võis olla ka rohkem. Enamik mängunuppe on vaalaluust, üks komplekt oli veiseluust. Täringute hulgas on rohkem sarvest eksemplare, haruldased on kolm vaala hambast täringut, mis kõik olid ühes kompaktselt koos asunud kogumis. Mängunuppude suur hulk viitab sellele, et neil oli oluline koht sõjameeste meelelahutuses pikkade retkede ajal.