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Ingunn M. Røstad, Elna Siv Kristoffersen, Håkon Reiersen, Unn Pedersen, Marie Dave Amundsen and Sigmund Oehrl (eds)

Technologies – Knowledges – Sustainability
Crafting societies in the first millennium CE

Proceedings of the 74th International Sachsensymposion in Stavanger, Norway

Stavanger 2025

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Cover photo:
The front page: Amber nuggets and semi-finished amber beads and pendants from pit-house 7/91 in Biskupice, Poland. Photo: Marcin Woźniak.
The back page: Suspension loop for gold bracteate S12625, from Hå on Jæren, Rogaland. Photo: Annette G. Øvrelid.

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Preface

"Technologies – Knowledges – Sustainability: Crafting societies in the first millennium CE" was the overarching theme chosen for the 74th Sachsensymposion hosted at the Mueum of Archaeology in Stavanger 16–20 September 2023.

Technology, in its widest sense, provides an avenue to explore relationships between materials, places, people and time. The concept allows researchers from across disciplines to investigate knowledges, skills, innovation, creativity, and to examine relationships and interactions between humans, things, knowledges, raw-materials, and landscapes.

Operating on multiple scales, technology encourages discussions ranging from the crafting, production, use and reuse of specific items to the crafting, consolidation and maintenance of major institutions. It invites both short- and long-term perspectives. Studies of crafting processes permit us to trace knowledge systems and the transmission of knowledge within and beyond creative communities, while particular choices made in the past remain materially embedded in crafted objects that endure to the present.

The call for papers invited contributors to engage with these themes and to explore how the study of technology can shed light on the crafting of societies in the first millennium CE. It also posed a broader challenge: Can insights into past technologies help us navigate choices for the future? At a time when technologies are transforming our planet, can studies of past technologies help contextualize and enrich current debates on the transition to more sustainable societies?

The outcomes of this call were reflected by the scientific program of the symposion and in the selected contributions presented in this volume.

The papers span the time from the Roman Period to the Viking Age. They draw on a wide range of data, including jewellery, weapons, manufacturing waste and production sites, as well as settlements, landscapes, monuments, and materialized ideologies. Geographically, the contributions cover northern Europe from Poland in the east, across Germany, Belgium, and northern France, to Scandinavia in the north and Great Britain in the west. The diverse approaches to the symposion's overarching theme, demonstrated through the many papers presented in this publication, reflect both the breadth of academic traditions represented by the members of the Sachsensymposion and the variety in their academic perspectives.

As part of the sustainability theme, the symposion logo was itself a reuse of the old logo of the Museum of Archaeology. The motif is one of the 16 gold foils found at Hauge in Klepp, a key site in the Jæren prehistoric landscape. The symposion excursion also focused on a selection of the many Migration-period sites near Stavanger – among them the spectacular burial ground at Hå gamle prestegard (Hå old vicarage) by the sea, exposed to the wind and waves of the Jæren outer coast. On the day of the excursion, the site appeared even more spectacular in fierce rain and a thunderstorm. Thankfully, we could seek shelter in the warm atmosphere of the old vicarage and were warmly received with a mountain of tasteful *sveler*, a local traditional dish. Åsa Dahlin Hauken, the author of the recently published monograph on this prominent site guided us through the finds from the burial ground. We were also grateful for the opportunity to visit the inspiring Jærmuseet, and for the generous lunch served to us there.

The 74th Sachsensymposion was the fourth time the symposion visited Norway, and the second time it was held in Stavanger. The previous occasion was in 1971. Our symposion was organised by the Museum of Archaeology at the University of Stavanger in cooperation with The Museum of Cultural History, University of Oslo, and HEI: The Heritage Experience Initiative at the University of Oslo. The venue at the Museum of Archaeology offered participants opportunities to visit the archaeological exhibitions, including *Fabulous Animals*, which opened at the first day of our symposion, and the permanent exhi-

bition *Creativity & Knowledge*, intimately related to the conference themes, exhibiting many of Rogaland's extraordinary Migration-period finds. We were also invited behind the scenes to inspect some newly discovered finds of gold bracteates from Rennesøy. The pleasant facilities and surroundings at the Museum of Archaeology added to the friendly atmosphere and spirit that characterized the proceedings.

The symposion was preceded by a workshop with talks on the ongoing restorations, excavations, and research at the Stavanger Cathedral, presented by Sean Denham, Bettina Ebert, and Sverre C. Guldberg. This was followed by a city tour guided by Arnvid Lillehammer and Ellen Hagen. We are deeply grateful to all of them for generously sharing their knowledge!

The reception at Ledaal Manor was hosted by the then Mayor of Stavanger, Kari Nessa Nordtun, who, one month after the symposium, was appointed national Minister of Education. We wish to thank the Mayor's office and the municipality of Stavanger for hosting this memorable reception. We extend our thanks to organising institutions and sponsors and are particularly grateful for the administrative support provided by Bodil Svendsen, Ingrid Johanne Helland and Marthe Holgersen Kjørkleiv, as well as invaluable help and assistance from PhD students Hilde Skjerping Dahl and Mette Catharina Adegeest in organising the event, all from the Museum of Archaeology.

The venue in Stavanger was intended to be the first with Babette Ludowici as the new chair of the Sachsensymposion. Sadly, at the beginning of 2023, Babette became seriously ill, and she passed away in November 2024. This publication is dedicated to our dear Babette, who over the years has done so much for our research community. We conclude this preface with Babette's life motto, which she shared with us in an email just weeks before she passed away: Always look on the bright side of life!

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Part I
Technologies

Nithijo in Illerup and his colleague in Thorsberg: Some aspects of high class goldsmithing at the beginning of the 3rd century AD. A case study in "active or conscious reception"

CLAUS VON CARNAP-BORNHEIM

Claus von Carnap-Bornheim 2025. **Nithijo in Illerup and his colleague in Thorsberg: Some aspects of high class goldsmithing at the beginning of the 3rd century AD. A case study in "active or conscious reception".** *AmS-Skrifter 29,* 9–18, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

The spoils of war from Roman-period southern Scandinavia offer a wide range of possibilities for analysis and interpretation, also with regard to the production conditions of fine smiths in the 3rd century AD. One striking aspect of this is that for the first time a comprehensive serial production of spears, javelins and shield bosses, which often comprised several hundred pieces, can be proven. This new production process also found its way into silversmithing, as the elaborate shield fittings from Illerup, deposit A, show. The combination of Roman and Germanic elements in the equipment of military elites is striking and has been discussed in the literature since Conrad Engelhardt's discoveries on Thorsberg Moor. Current research into the finds from Thorsberg Moor has revealed a wealth of fascinating individual observations. Through the concept of "conscious or active reception" as a process of appropriation and artistic transformation, these phenomena can now be conclusively summarised in a model that can explain the relevance of this process, especially for the social elites of the later Roman Period in the *barbaricum*.

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Key words: Scandinavian war booty sacrifices, serial production, equipment for military elites, the concept of "active or conscious reception"

Introduction

It is certainly not surprising that the societal and political context in which gold and silversmiths produced their work in prehistory and early history has repeatedly been the subject of archaeological and historical discussions. The value and rarity of the metal, its resistance to corrosion and its connection with the respective social elites allow important insights and modelling in prehistoric and historical epochs. If we now, in the context of this article, consider the 3rd century AD in particular, the comprehensive volume on the "Goldsmith Mysteries" edited by Alexandra Pesch and Ruth Blankenfeldt from 2012 (Pesch and Blankenfeldt 2012) offers a wide-ranging insight into the available archaeological and historical sources, whereas the contributions in this volume focus primarily on northern Europe and the first millennium AD. Even if important contributions (Armbruster 2012; Voß 2012) deal with the Roman Period in the *barbaricum*, it is noticeable that the material of the Roman-period war booty sacrifices, such as from Illerup Ådal, deposit A, and from Thorsberg Moor, was not included in the discussion. Overall, if one surveys the international literature on the Roman Period in the *barbaricum*, it appears that the finds from Illerup and Thorsberg Moor in particular are only very rarely used for the discussion of the development of fine smithing. However, the work of Marzena Przybyła is an impressive exception here, in which the Roman Iron-age stamped silver sheet foils (*Pressblech*) are

comprehensively compiled, typologised and interpreted, and the finds from Illerup and Thorsberg Moor placed in an overarching context (Przybyła 2018). Nevertheless, the impression arises that the potential for interpretation has not yet been fully utilised, as the significance of the two complexes are not, or are at best only marginally considered in the discussion of the emergence of early arts and crafts (or early art) in the Germanic *barbaricum* during the Roman Period and their relationship to corresponding phenomena in the Imperium Romanum (cf. Hardt and Heinrich-Tamáska 2013; Eilbracht et al. 2018). The aim of this article is therefore to focus on the multifaceted material from Illerup and Thorsberg Moor and to discuss the *Pressblech* decoration on shields, helmets, sword equipment and personal equipment in a comparative manner.

The Roman-period war booty offerings open up a group of material for archaeological research that differs fundamentally in its methodological interpretation potential from burial or settlement contexts, as the objects of one single sacrifice were deposited in large numbers, often comprising several thousand pieces, each at a specific point in time and can therefore be regarded as a contemporaneous assemblage. For our topic, this provides interesting scope for analysis and interpretation, as it is an extensive ensemble that represents a simultaneous artefact variation that can be used, among other things, to qualitatively differentiate between simultaneous techniques and allow the assignment of the different metals and techniques to different hierarchical and/or functional groups within a specific interacting group (here, a war band).

Modern research interprets these complexes as the results of ritual offerings of weapons and equipment, which were deposited as thank offerings to a helpful deity by a local population after the successful defence against an attack by hostile armed units (summarised by Rau and v. Carnap-Bornheim 2012). Corresponding ritual offerings on the Jutland Peninsula in the later Roman Period and early Migration Period can now be placed in the context of comparable sacrifices from the 4th century BC onwards that have been documented in western central Europe and northern Europe (Løvschal et al. 2019, 28, fig. 10). Overall, it should be noted that no Roman-period war booty sacrifice has been fully excavated and, of course, the question of whether all the material seized from the defeated enemies was even deposited at the time of the respective sacrifices, must remain unanswered. Therefore, our source material is incomplete in many respects, so corresponding interpretation models must always take these source-critical circumstances into account.

For the question of "Technologies – Knowledges – Sustainability", the several thousand artefacts from the southern Scandinavian Roman-period war booty offerings provide an almost inexhaustible source material. This allows very different approaches and interpretations. One of the important aspects of this is that for the first time in the Germanic *barbaricum* it is possible to prove the serial production of typologically, technically and metrically almost identical objects in large numbers. The large series of spear and javelin heads of the same types from Illerup (Ilkjær 1990, 95 with, for example, more than 300 spearheads of the Vennolum type or Ilkjær 1990, 187 with 306 javelin-heads of the Simris type), but also corresponding types from the Vimose (Pauli Jensen 2008, tab. 12 with, for example, 193 examples of the Skiaker type) provide evidence of the extensive production of such weapons as early as the beginning of the late Roman Period in presumably centralised workshops, which also had consistent access to the raw materials needed and, of course, possessed the required technological knowledge (v. Carnap-Bornheim 1992, 48–50; see also Birch 2018). This also makes it clear, however, that the military milieu was a key factor in the implementation of technological innovation in the Germanic *barbaricum* as early as the Roman Period.

The magnificent shields from Illerup Ådal, deposit A

The magnificent shields from Illerup with their silver-gilt fittings must also be regarded as products of a very early series production. On the basis of the respective finds, they can be assigned to the first deposit at Illerup site A and thus dated to the first decade of the 3rd century (Ilkjær 2001, 363–65 with tab. 34). The five magnificent shields have similar dimensions, with diameters of 98–112cm (v. Carnap-Bornheim and Ilkjær 1996, vol. 5, tab. 14); they are all equipped with silver rim fittings as well as shield bosses and shield grip fittings made of solid silver (v. Carnap-Bornheim and Ilkjær1996, vol. 5, tab. 13). The shield bosses are covered with gilded silver *Pressblech*, in one case (SABN from the SAUE set; see v. Carnap-Bornheim and Ilkjær 1996, vol. 5, fig. 41 with further references) three oval carnelians were set on the rim of the shield boss. Remarkable are the 22 conical shield fittings, which – on bronze base constructions – each have gilded silver *Pressblech* and concentric rows of profiled silver rivets. The formal and technical uniformity of this group is further emphasised by more than 73 en-face masks, which consist of silver-gilt *Pressblech*, also mounted on base plates of bronze. They show bearded or moustached male

heads in en-face view, their eyes indicated either by dots or crosses and the head hair neatly combed backwards.

The analysis of these shield fittings can ascertain the close technical and formal connection of this group, which for the first time also attests a serial production in the field of gold and silver-smithing in the Germanic *barbaricum*. The SAUC set serves as an example: most of the components of this ostentatious shield set were discovered in the central area of the deposit in the find concentration 65/96 (v. Carnap-Bornheim and Ilkjær 1996, vol. 5, 132, figs. 101–3, vol. 6, 127–32, vol. 7, pl. 127–36; for the typology of Roman Iron-age en-face depictions, see Przybyła 2018, 528–37); a shield board fragment with the face mask ICD was found in the eastern part of the excavation and had probably already drifted there by the time of the sacrificial event. The links between this set and the SAUB shield (Figure 1), which was discovered in the eastern part of the excavation in the last year of the excavation, are particularly close (v. Carnap-Bornheim and Ilkjær 1996, vol. 5, 230–33, fig. 177, vol. 6, 222–26, figs. 92–94, vol. 7, pl. 234–45). The analysis of the 36 en-face masks and the 12 conical shield-board fittings shows that the pieces were produced from the same stamps. The only deviations are in the punchings in the pieces, for example in the edge area of the en-face masks. These two sets can be linked to three other magnificent shields by the identical dimensions of individual components (SAUD, SAUE, SAUF; see v. Carnap-Bornheim and Ilkjær 1996, vol. 5, 443 with fig. 261; here Figure 2).

These shield sets regularly include silver shield grips of Ilkjær's type 5a (Ilkjær 2001, 321), two of which bear runic inscriptions. The runic inscription **laguþewa** on the shield grip WVI of type 5a (Ilkjær 2001, 321) from find concentration 41/73 (see v. Carnap-Bornheim and Ilkjær 1996, vol. 5, 69 with fig. 41; here Figure 3, left) can be interpreted as a proper name (see www.runesdb.de/find/175; with reading and extensive literature; accessed 26 April 2024). It therefore stands to reason that this identifies the owner of the magnificent shield SAUE (v. Carnap-Bornheim and Ilkjær 1996, vol. 7, pl. 54–56). In contrast, the SAUF set from find concentration 57/90 (see v. Carnap-Bornheim and Ilkjær 1996, vol. 5, 121 with fig. 88; here Figure 3, right) bears the inscription **niþijo tawide** = "*Niþijō made*" (see www.runesdb.de/find/183 with reading and extensive literature; accessed 26 April 2024), which is unanimously regarded as a maker's inscription and which can be easily integrated into a series of comparable *Tawide*-inscriptions (Rau and Nedoma 2012/2013). The owner of the SAUE shield and the maker of the SAUF shield appear to have had a special relationship via this medium of runic inscriptions. We will discuss this again below. Whether both inscriptions originate from the same hand would have to be the subject of a detailed investigation. Andreas Rau points out that the use of the rare mirror runes **þ** and **w** in both cases could indicate this (oral communication Andreas Rau).

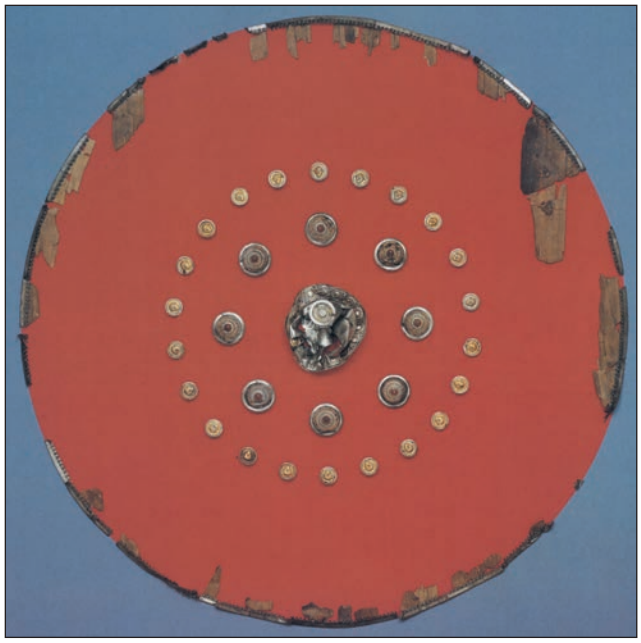

Figure 1. Illerup Ådal, deposit A; shield SAUB with its decoration in silver and gilded Pressblech. After v. Carnap-Bornheim and Ilkjær 1996, vol. 7, pl. 234.

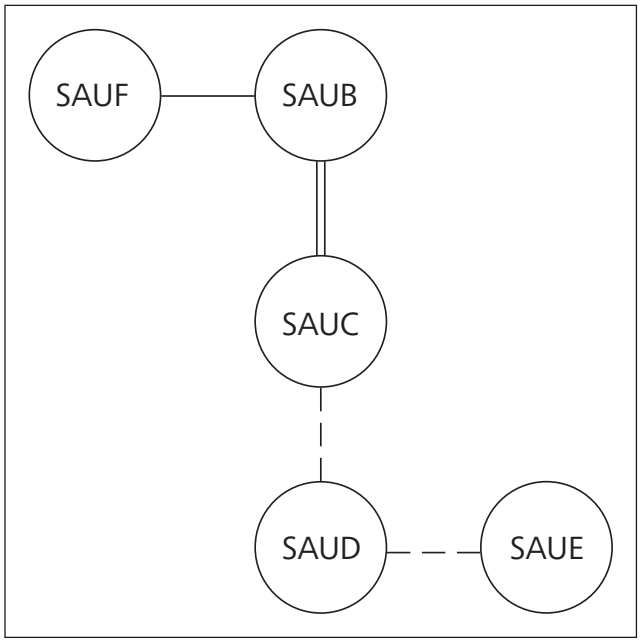

Figure 2. Illerup Ådal, deposit A; connections between five shield sets. lines: identical Pressblech; dots: identical measurements. After v. Carnap-Bornheim and Ilkjær 1996, vol. 5, fig. 261.

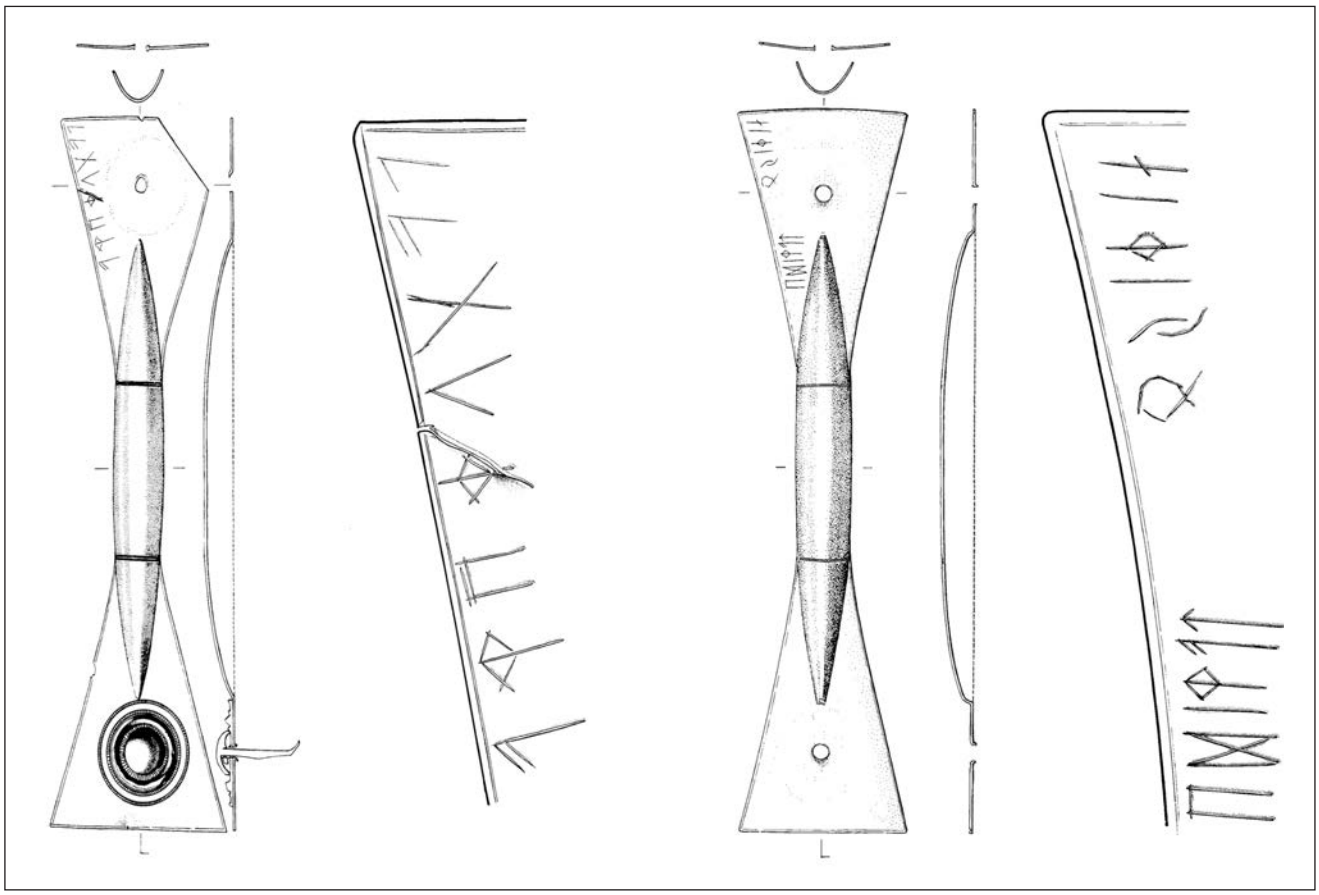

*Figure 3. Illerup Ådal, deposit A. left: runic inscription **laguþewa**; shield grip WVI of set SAUE (after v. Carnap-Bornheim and Ilkjær 1996, vol. 5, fig. 41); right: runic inscription **nithijo tawide**; shield grip TWR of set SAUF. After v. Carnap-Bornheim and Ilkjær 1996, vol. 5, fig. 88; both without scale.*

Figure 4. Thorsberg Moor; old and new reconstruction of the strip cap. After Matešić 2015, fig. 125.

Another remarkable feature of the SAUB set (v. Carnap-Bornheim and Ilkjær 1996, vol. 5, 231–33 with fig. 177) is that each of the shield rivets was decorated with the gilded imprint of a middle 2nd century AD Diva Faustina coin.

The iconographic meaning of the en-face masks from Illerup is unclear and is difficult to decipher with certainty. There are no clear attributes that would define them in Roman or Germanic imagery. However, it is conceivable that they could be interpreted as the reception or transformation of Roman motifs, which were also used as protective images on Roman armour (for an example of Lauersfort, see Matz 1932, 10, Taf. 1.). Here, there are good links to the two from Thorsberg Moor, whose total of 18 en-face masks can be addressed as bacchanalian motifs on the basis of the *corymb* iconography (for details see v. Carnap-Bornheim 1997, 82–83).

The discs, the helmet and the sword belt hanger from Thorsberg Moor

It is relatively difficult to establish direct craft links between Illerup deposition A and the extensive early 3rd century AD deposition on Thorsberg Moor at a military elite level, as the material from Illerup is not as diverse as the material from Thorsberg Moor, which has a more Roman or Roman-influenced character. For example, there are still no helmets or *phalerae* from Illerup as they are known from Thorsberg Moor. However, there are close parallels in the opulent sword hilt fittings that were used on imported Roman sword blades (Illerup: sword hilt SAFN, SAFM and SAFH; v. Carnap-Bornheim and Ilkjær 1996, vol. 7, pl. 38, 107, 188; Thorsberg Moor, set 2 after Matešić 2015, 129–31, figs. 69–70). The multi-part handles SAFN, SAFM and SAFH from Illerup and the corresponding counterpart from Thorsberg Moor are made of solid silver, decorated with hammered zig-zag engraving and covered with gilded silver *Pressblech*. It is highly probable that they originated from a workshop in the Germanic *barbaricum*. It should also be noted that the early 3rd century deposit on Thorsberg Moor appears to be somewhat later than the large deposit A in Illerup, although the interpretation of the coin spectrums is not entirely unproblematic. Thus, there is a small chronological difference in the two groups of material, probably spanning only a few years, at most a decade (Bursche 2011, 76–77).

Let us now take a closer look at the material from Thorsberg Moor. The two discs, which were already described by Conrad Engelhardt in his first publication of these finds as very difficult to evaluate (Engelhardt 1863, 29; see also Blankenfeldt 2015, 253–55), are outstanding and a hitherto unique assemblage in the combination of Roman and Germanic motifs. With a diameter of 13.2cm, the two discs have identical dimensions; the inner structure of the surrounding ring zones with gilded decorative *Pressblech* and the Medusa heads are also identical. Their iconographic classification via the *corymbs* on the forehead of the respective masks can be regarded as certain. The two different pictorial programmes on the two discs are notable. Disc 1, with its depictions of the enthroned Mars, can be clearly linked to Roman pictorial models. In contrast, the animal frieze on disc 2 shows a pictorial programme that is more likely to be associated with Germanic ideas. As both discs have identical dolphin punch marks, they must have come from a single hand or workshop that was able to combine Roman and Germanic pictorial elements in a very special way.

The obvious combination of Proto-Roman and Germanic elements in items of elite equipment can be found in several other spectacular examples from Thorsberg Moor. Suzana Matešić recently presented fascinating individual observations, which are of great importance for our thematic complex, on the so-called strip cap and an unusual sword suspension from the site. Conrad Engelhardt presented a profile drawing of the silver face mask and the accompanying strip cap in the fontispiece of his 1863 publication on the find from the Thorsberg bog (Engelhardt 1863, fontispiece, 24, pl. 5, 3 and 4). Although discovered in different areas of the bog, Engelhardt combined the two pieces into one due to the matching helmet and strip cap, which he labelled the "Sølvkrone", silver crown (Engelhardt 1863, 24). The reconstruction drawing of the wearer of this helmet created by Magnus Petersen in 1863 (see Wiell 1997, cover with blurb and p. 251 with further references) took on an almost iconic character, although it did not appear to fit well anatomically, especially at the back of the head. The renewed analysis of the reconstruction history of the strip cap and the reassessment of the fitting points lead to a now convincing solution for the design and combination of face mask and strip cap (Matešić 2015, 196–203, 509–11, fig. 125; see also Matešić 2016; here Figure 4). Both elements now fit together exactly and can be convincingly associated with the Roman mask helmets of the so-called female type (Matešić 2015, 206–8, fig. 126). The deliberate combination of Roman and barbarian elements on this helmet from Thorsberg Moor is particularly evident in the dense row of bird head protomes found on both the face mask and the strip cap. In their formal design, they correspond entirely to those depictions that can also be found on the Type IA scabbard

Figure 5. Thorsberg Moor; scabbard slide. Left after Matešić 2015, Taf. 20. Right: X-ray tomography image of it with two pieces of a lead sheet. After Matešić 2015, Abb. 29. Both without scale.

slides, but also on other later Roman Iron-age militaria (e.g. shield boss from Gommern; see Becker 2010, 110, pl. 35, 62).

A further and particularly impressive example is a scabbard slide discovered by Conrad Engelhardt on Thorsberg Moor in 1858 (Engelhardt 1863, 42, pl. 10, 37; here Figure 5, left). This is undoubtedly the piece of the highest quality in this find group in Roman Iron-age Germanic *barbaricum*. The 25.5cm long and approximately 67g scabbard slide has a bronze base construction, each ending in two lunula-shaped plates. It is richly decorated with gilded silver *Pressblech* and profiled silver rivets (described in detail in Matešić 2015, 339–40, pl. 20; here with her inventory number M 144). The piece can be assigned to type IA due to the bridge designed as a bird head protome, which are known in larger numbers from war booty offerings, though less frequently from grave finds, and which can be dated to the beginning of the later Roman Iron Age (v. Carnap-Bornheim 1991, 7–12). In the case of the scabbard slide M 144 from Thorsberg Moor, it remained unnoticed for almost 150 years that the bridge on the back of the bird head protome is the only example of this group that is firmly closed by a metal plate. Suzana Matešić first realised that there must be something in this cavity because of a very slight noise when the scabbard slide was turned (Matešić 2015, 47). A more precise analysis using X-ray and X-ray tomography images revealed two rolled up lead sheets, which were probably once a single sheet (here Figure 5, right). Despite the lack of comparable pieces from the Germanic *barbaricum,* and although there is no recognisable inscription, Matešić can convincingly prove that corresponding inscribed lead sheets are well known from the Greco-Roman world (Matešić 2015, 48–50). Lead sheets of this type are used as curse tablets (*defixiones*) and are associated with the gods of the underworld (Matešić 2015, 49). For the piece from Thorsberg Moor, such a contextual framework must remain open due to the inability to read a possible inscription on the rolled-up lead. A corresponding assignment will probably only be possible if one day the cover on the back of the bridge is removed and the sheet can be examined in its original state. Even if the documentation of Engelhardt's excavations on Thorsberg Moor generally does not allow the decided combination of objects into sets due to the circumstances of the find, Matešić (2015, 126–27, figs. 67–68) can determine sets against the background of individual elements of decoration, such as the somewhat profiled silver rivets or the use of gilded silver *Pressblech.* This enables a completely new classification of the material from Thorsberg Moor. For example, the mentioned scabbard slide M 144 can be combined with conical end fittings and linked to other

items of equipment, such as the so-called armoured clasps. For the find circumstances of scabbard slide M 144 and end fitting M 295 we refer to Matešić 2015, 309; Engelhardt mentions that both pieces were found situated next to each other.

The magnificent finds from Illerup and Thorsberg and the concept of active or deliberate reception

The examples of fine smithing from Illerup and Thorsberg Moor presented here are closely associated with the military elites. In terms of material and craftsmanship, but also in their strongly symbolic character, they are exceptional assemblages that are considered as part of a system of military ranking against the background of the overall material of the respective deposits in the two bogs mentioned. They make it possible to broadly define the equipment of different levels in the military hierarchy in a way that would probably not be possible based on grave finds.

The Roman components of the respective sets are conspicuous for the splendid equipment from Illerup as well as from Thorsberg Moor, and they require further discussion. What could be the ideological background to the combination of Roman and Germanic elements and how could the practical implementation have been organised?

A certain degree of uncertainty existed early on in the categorisation of these phenomena. As early as 1863, Conrad Engelhardt wrote: "…. og vort endnu mere ufuldstændige Kjendskab til den eiendommelige nordiske Konststiil i den samme Periode gjør det meget vanskeligt af afgjøre, hvad der er romersk, hvad der er "barbarisk" Efterligning, og hvad der er eiendommelig gotisk eller nordisk Konst" "... and our even more incomplete knowledge of a distinct Nordic art style of the same period makes it very difficult to determine what is Roman, what is "barbaric" imitation, and what is peculiar to Gothic or Nordic art" (Engelhardt 1863, 29; author's translation). On the two discs from Thorsberg Moor, Joachim Werner in 1966 referred thus to his work from 1941: "Today I am no longer quite so sure whether the first disc with the quadruple depiction of the seated Mars is really a provincial Roman work." (Werner 1966, 22, 1941, 10–22 with the discussion of the circle of "Saciro workshops"; author's translation). Johannes Brøndsted also argues in favour of the Germanic origin of the first disc in a brief comment: "The piece [the first disc] is obviously Germanic work, made according to the Roman model" (Brøndsted 1940, 204–5, fig. 202; author's translation; Brøndsted 1963, 212).

It was obviously of fundamental importance for the military elites of the 3rd century AD to integrate elements of Roman arts and crafts, such as magnificent shields, breastplates, heavy equipment and helmets into their military status symbols, or to combine these with local Germanic objects. From a purely technical point of view, this presupposes that the local smith producing the jewellery had the relevant knowledge and was ultimately also able to classify and interpret the selection and significance of the Roman components. The use of a stamp depicting the Roman god Mars on the first Thorsberg disc is probably the best example of this; the en-face masks on the magnificent shields from Illerup at least can be interpreted in this way. We must therefore assume that the producers had detailed knowledge of the conditions in Roman fine smithing workshops. Günter Moosbauer has compiled the corresponding written tradition and pointed out that these workshops "radiated artistically and in terms of craftsmanship beyond the periphery of the empire" (Moosbauer 2012, 121; author's translation). There is no corresponding written Roman record of this (Kakoschke 2002, 570–3). We can however assume the individual mobility of fine smiths socialised in the Germanic *barbaricum* to the north-western provinces of the *Imperium Romanum*, though it cannot be ruled out with any certainly that Roman craftsmen were also active in the Germanic *barbaricum* (Table 1).

It is, however, remarkable that the objects presented here, with their relatively diverse figurative representations, do not reveal or form a comprehensive pictorial programme with different elements and abstractions that is legible to us today. This was undoubtedly present in the Roman Empire in the 3rd century AD and became characteristic of the art and craftsmanship of the Migration Period in northern Europe.

For the production process of the military elites' artefacts from Illerup and Thorsberg Moor presented here, close coordination between the client and the maker was absolutely essential. Otherwise, neither the quality of the content nor the effect of the respective objects could be precisely determined and realised. It requires a fine smith with technical finesse and good background knowledge or special expertise to accomplish the corresponding tasks. It is therefore hardly surprising or coincidental that the first evidence of writing can be linked to this milieu at this time. The runic inscription **niþijo tawide** on the TWR shield grip from the SAUF set (v. Carnap-Bornheim and Ilkjær 1996, vol. 5, 120–22, fig. 88, vol. 7, pl. 122) can be linked to the important group of *Tawide*-inscriptions and is probably the oldest evidence of this

Table 1. Fine smiths in the mechanism of conscious reception.

Roman production area	Germanic production area with the conscious reception of Roman models
Roman craftsmen with Roman training	Roman craftsmen with Roman training, active in the Germanic elite milieu
Germanic craftsmen with "Germanic" training in a Roman military context (auxiliary troops)	Germanic craftsmen with Roman training, active in the Germanic elite milieu

group of inscriptions (Rau and Nedoma 2012/2013, 70). It has already been pointed out earlier – albeit in a remotely published paper – that the *Tawide* ("has made") inscriptions represent a translation or self-conscious adaptation of Roman "fecit" inscriptions (v. Carnap-Bornheim 1994, 53; on maker inscriptions on Roman bronze vessels in the *barbaricum*, see Petrovszky 1993; see also Imer 2004, 2010). Andreas Rau on the other hand points out that the early runic inscriptions of the Roman Iron Age "would illustrate the cultural distance between the southern Scandinavian area and the provincial Roman area" (Rau 2012, 373; author's translation). Against this background, it is therefore hardly coincidental that the *Tawide*-inscription from Illerup was not written using Latin or Greek letters, but in a runic script adapted to the language's own phonetics.

Could the phenomena presented here on the basis of a few selected finds from Illerup and Thorsberg Moor now be categorised more securely and conclusively? Could it be integrated into a more general concept that moves away from terms such as adoption, adaptation or influence and could offer further perspectives? The concept of "active or conscious reception", which occasionally crops up in current art historical discussions, lends itself to this. It goes back to Michael Baxandall, who wanted to correct the misleading and monodirectional concept of "influence" in individual artistic creation and replace it with a far more differentiated concept (Baxandall 1985, 1990, 102–5). Christine Tauber recently summarised this field of conflict and its definitional reorientation: "The counter-model to influence thinking is that of conscious reception, reciprocal reference, the adaptation of formal and thematic models and their transformation in the act of appropriation for one's own artistic expressive purposes." (Tauber 2018, 15; author's translation). With the conscious reception or perception of visual art by the viewer, a meaning is thus actively created, which is always already a first step in one's own creativity.

With the concept of "active or conscious reception" as an act of appropriation and transformation, we find a suitable key for categorising the finds and equipment presented here, as well as the runic inscriptions from Illerup and Thorsberg Moor. Individual aspects such as technical skills, knowledge of materials and the availability of the necessary raw materials play a fundamental role in this reception process. The decisive factor, however, is probably that both the client (e.g. *Laguþewa[R]*) and the craftsman (e.g. *Nithijo*) had a detailed common understanding of what was in this case a provincial Roman pictorial programme or a provincial Roman script, appropriated it and knew how to implement and artistically design it in a series of unusual objects and inscriptions (shields, helmets etc.). The conscious reception of Roman models in the military elites' splendid equipment from Illerup and Thorsberg Moor is thus also an instrument of social stratification within the military formations, which carried out the military conflicts of the late 2rd to early 5rd centuries AD in southern Scandinavia. This process once again demonstrates the structural depth and sustainability associated with these events. In addition to the importation of weapons and equipment and the mass production of shields, spears and javelins, a new mechanism of conscious reception of provincial Roman formal language now emerged, the signalling effect of which must have impressed both friend and foe.

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Amber workshops in central Poland during the Roman Period

ADAM CIEŚLIŃSKI AND MARCIN WOŹNIAK

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Archaeological research conducted since the 1960s in western Mazovia (central region of Poland) has unveiled an extensive iron production centre from the late pre-Roman and Roman Periods, referred to as the Mazovian Centre of Metallurgy. This centre, established by the people of the Przeworsk culture, who inhabited vast areas of southern and central Poland from the 2nd century BC to the mid-5th century AD, indicates a significant scale of local iron production, constituting a crucial – though not the only – aspect of the regional economy. Relics of amber workshops have been recorded at several settlements, and remains of all stages of amber processing were discovered: lumps of raw material, semi-finished, and finished products (mainly beads). The presence of amber workshops in western Mazovia is somewhat surprising, as amber does not occur naturally in this part of Poland. Its import could have been linked to an exchange of goods, possibly including regionally produced iron.

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Key words: amber processing, workshops, Roman Period, Mazovian Centre of Metallurgy, central Poland, Przeworsk culture

Introduction

During archaeological research carried out since the 1960s in western Mazovia (central part of Poland west of Warsaw), an extensive iron production centre of the late pre-Roman and Roman Periods was discovered, called the Mazovian Centre of Metallurgy (Orzechowski 2013, 211–20; Woyda 2002, 2005). This centre was created by the people of the Przeworsk culture, who between the 2nd century BC and the middle of the 5th century AD inhabited vast territories of Central Europe, with a core area located in southern and central Poland. The Przeworsk culture has been defined primarily on the basis of characteristic features of burial rites and products of material culture (e.g. predominance of cremation, frequent furnishing of male graves with weapons, local forms of clothing, and ornaments made of iron); to a lesser extent, it is distinguished from neighbouring cultural units in terms of settlement and craftsmanship (cf. Andrzejowski 2010; Kontny 2016; Schuster 2020).

Extensive excavations at the sites in Mazovia also revealed other facets of local production. Among these findings, the most unexpected has been the discovery of amber working activities. Remains of amber processing were identified at five settlements of the Przeworsk culture: Biskupice, Izdebno Kościelne, Regów, Tłuste, and Wierzbin (Figure 1).

Amber workshops in Mazovia: an overview of finds

Biskupice, Brwinów Commune

Biskupice is a large multiphased site with materials from the Stone Age to modern times. It is situated at a wide elevation near the valley of the Zimna Woda river and was discovered in 1971 during field walking. Excavations carried out between 1976 and 1992 covered an area of approximately 31.500m^2 and unearthed several thousands of features, such as the remains of timber-post buildings above ground, pit-houses, wells, lime kilns, hearths, clay pits, and about 3.700 smelting furnaces for iron production of the Przeworsk culture from the late pre-Roman, Roman, and early Migration Periods (the archaeological finds and research documentation are stored in the Museum of Ancient Mazovian Metallurgy

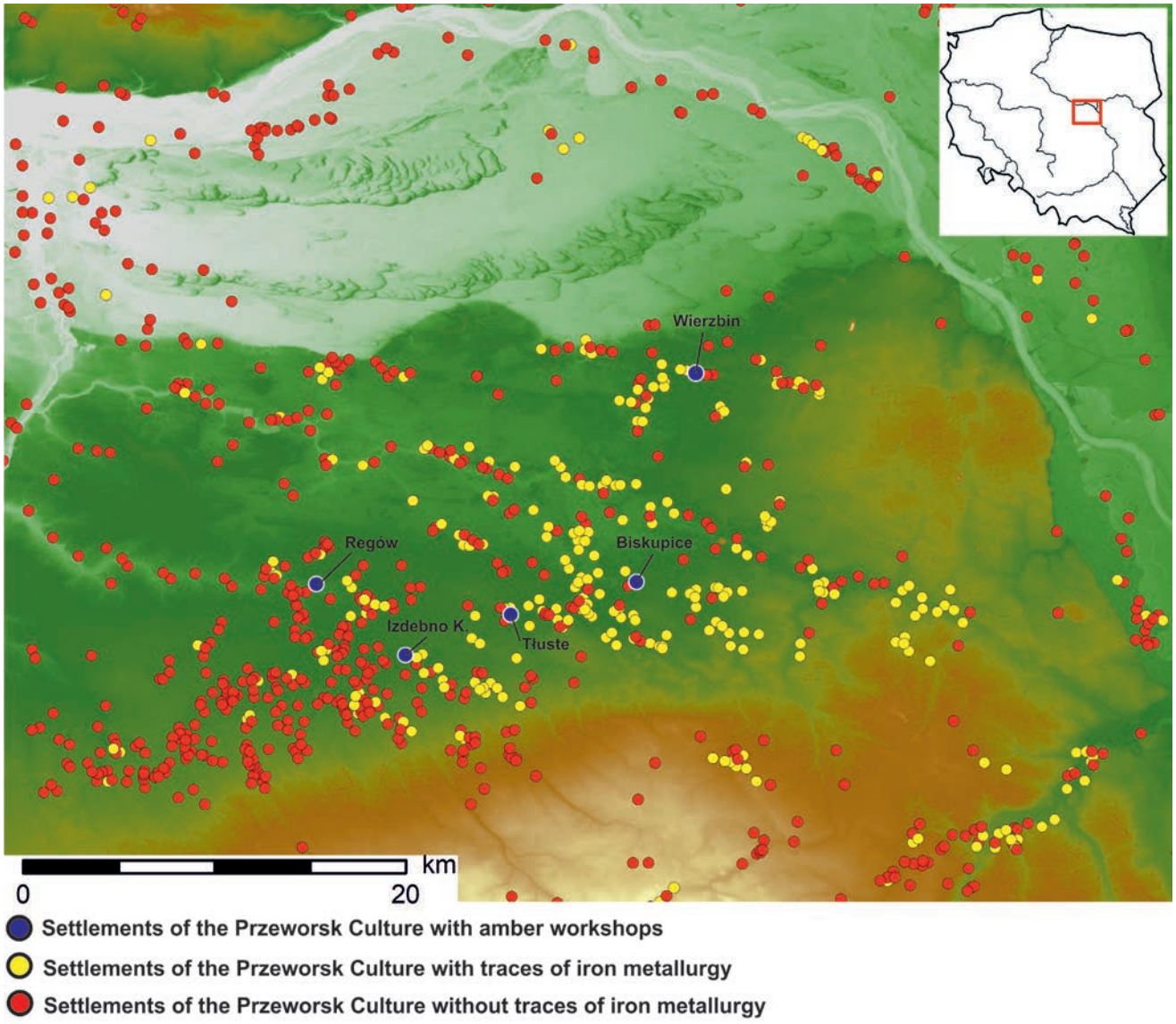

Figure 1. Location of amber workshops within the context of the West Mazovian settlement cluster of the Przeworsk culture. Compiled by Marek Baczewski.

in Pruszków). Remains of amber processing, including artefacts and raw material nuggets with a total weight of approximately 4.5kg, were found in 43 features of various functions. The majority of this material (over 90%) was concentrated in four pit-houses, which likely served as workshops; one of them contained a dense layer of amber artefacts (Figure 2), others only scattered deposits. Various stages of amber processing were evident, including raw material nuggets, production waste, and semi-finished products (Figure 3). Notably, many of these objects, such as disc-shaped beads or elongated pendants, were failed or damaged.

Izdebno Kościelne, Grodzisk Mazowiecki Commune

Izdebno Kościelne is a vast multiphased site dated from the Stone Age to modern times, including large settlements of the Jastorf culture from pre-Roman Period and Przeworsk culture from late Roman and early Migration Periods. It is located in an almost flat area at the edge of the valley of the Basinka river. The sites were discovered in 1971 during survey prospection. Excavations conducted between 1976 and 1978 and in 2008–2009 surveyed approximately 72.000 m^2 of surface area and revealed a variety of structures and features (Domaradzka et al. 2016; Kołacz 1992, 1995). Materials related to the Przeworsk culture included relicts of timber-post buildings above ground, pit-houses, hearths, wells, clay-extraction pits, and settlement pits (Kołacz 1995; Machajewski 2016). Evidence of amber processing was found in two pit-houses and one pit yielded materials representing all stages of production, including finished products (Kołacz 1995, 25–26; Machajewski 2016,

Figure 2. Layer of amber artefacts discovered during exploration of pit-house 7/91 in Biskupice. Photo by Stefan Woyda, Museum of Ancient Mazovian Metallurgy in Pruszków.

213–16; Wielowiejski 1991, 326–31). Feature D1650/2009 stood out in particular, with over 20.000 amber nuggets and products discovered. Noteworthy among the finds were pendants with cannelure-decorated bodies and miniature combs (Figure 4), which are relatively uncommon at other sites.

Regów, site II, Baranów Commune

Regów is a settlement of the Przeworsk culture from the late pre-Roman and late Roman Periods. It is located on a low elevation (dune) at the edge of a valley by a small watercourse. Rescue excavations in 1978 covered 5000 m^2 of the site and revealed various features such as pit-houses, farm pits, wells, a lime kiln, and hearths (Waluś 1980; the archaeological finds and research documentation are stored in the Museum of Ancient Mazovian Metallurgy in Pruszków). An amber workshop was identified in one of the pit-houses that yielded 314 amber artefacts at all stages of processing, including several finished products represented by disc-shaped beads (Figure 5; Wielowiejski 1991, 320–26). A set of objects interpreted as tools for

Figure 3. Part of the amber nuggets (left) and semi-finished amber beads and pendants (right) from pit-house 7/91 in Biskupice. Photo by Marcin Woźniak.

Figure 4. Amber pendants from feature D1650 in Izdebno Kościelne. After Henryk Machajewski 2016.

working amber was also documented in the workshop. These tools and the technical aspects of working amber will be addressed below.

Tłuste, Grodzisk Mazowiecki Commune

Tłuste is a large mulitphased site dated from the Stone Age to modern times. It is located on a flat area at the forks of the Rokitnica and Mrowna rivers. The site was discovered during field walking in 1971 and excavated in 1976 and 2008–2009. A total of about 84.400 m^2 of the site's area was investigated by archaeological excavations, and ca. 4.700 features were found. The most abundantly represented materials were relics of an extensive settlement of the Przeworsk Culture from the final phase of the late pre-Roman to the beginning of the late Roman Periods. More than 840 objects were associated with this unit, including iron smelting furnaces (ca. 330), wells, lime kilns, hearths, pit-houses, and remains of timber-post buildings above ground as well as numerous pits with various functions (Danys-Lasek et al. 2011; Przeniosło et al. 1976; Waluś 1976, 1977). Amber nuggets were recorded in four pit-houses (Lasek 2011, 497–98). Workshops were probably located in two of them, where the majority of the amber artefacts were found.

Wierzbin, Stare Babice Commune

Wierzbin is an Iron Age settlement connected with Lusatian/Cloche Graves and Przeworsk cultures. It is located on a low elevation at the edge of a valley by a small stream. The site was found in 1973 during field walking. Rescue excavations undertaken in 1981 covered an area of approximately 130m^2 and revealed remains of timber-post buildings and several pits (the archaeological finds and research documentation is stored in the Museum of Ancient Mazovian Metallurgy in Pruszków). In one of the pits (no. 12), at a depth of about 40cm, 28 lumps of amber with traces of processing as well as four half-finished beads were discovered.

Amber workshops in Mazovia: a short summary

To sum up, amber processing in the area of western Mazovia was conducted within the settlements. The context of excavated local workshops indicates that they usually operated inside semi-subterranean pit-houses that ranged in size from 5 to 28.5 (usually 11–16) square metres and served both economic and workshop functions. In some of them, evidence of other crafts, such as textile production (e.g., Biskupice, feature 10/1 from 1991), was also recorded.

Amber artefacts found in the west-Mazovian settlements of the Przeworsk culture show that the raw material primarily was used for ornaments, such as beads and pendants. The significant number of objects from Biskupice and Izdebno Kościelne suggests that production at these sites was conducted on a considerable scale. Beads could have been made for exchange, but they certainly also found their way to the local market, which is confirmed by various amber ornaments recovered from settlements, away from workshop sites. In cemeteries, this hypothesis is difficult to verify due to the widespread use of cremation in local burial practices, but it is supported by the inventory of the single inhumation grave excavated in the region: stylistic similarities between the pendants from this grave (Barankiewicz 1959, 194, pl. II:3; III:19, 22, 23) and products from local workshops suggest the existence of distribution networks.

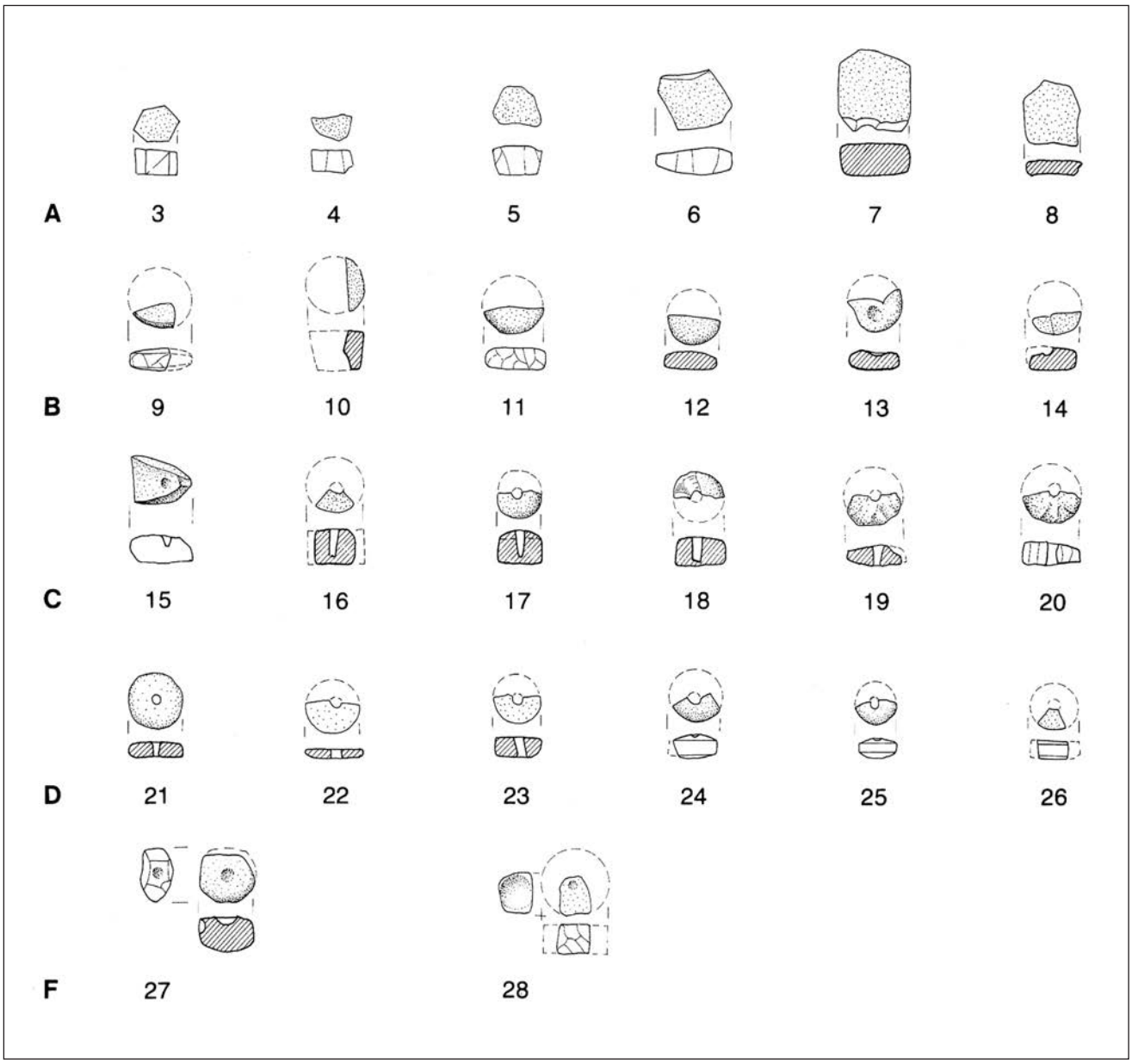

Figure 5. Amber artefacts categorised by degree of processing at Regów, site 2 according to Przemysław Wielowiejski's classification. Group A: Initial forms with traces of machining visible on the surface; Group B: Semi-finished products with grinding marks on the surface; Group C: Semi-finished products with traces of single and double-sided drilling; Group D: End products with ground and polished surfaces; Group F: Objects with traces of reworking. After Przemysław Wielowiejski 1996.

Of the eleven buildings where amber workshops were identified (unfortunately only from two settlements: Izdebno Kościelne and Biskupice), seven yielded artefacts that allowed for more precise dating. Discovered materials – fragments of wheel-made pottery (Izdebno Kościelne, feature 154, D1650; Biskupice, feature 7 from 1990, 70/90 from 1990, 8/1 from 1991), fragments of glass vessels (Izdebno Kościelne, feature D1650) and of terra sigillata (Izdebno Kościelne, feature 154), a multi-layered red deer antler comb (Biskupice, feature 70 from 1990), as well as dress accessories, such as a brooch (Biskupice, feature 10/1 from 1992) and glass beads (Izdebno Kościelne, feature C366) – indicate that the associated workshops operated in the late Roman Period, primarily during phases C1–C2. At other sites, dating of workshops is imprecise and can only be determined within the general framework of the lifetimes of the settlements themselves, i.e., phases B2–D for Regów and A3–C1 for Tłuste (on the chronological system of the Przeworsk culture and its synchronisation with the absolute chronology cf. Godłowski 1970, 10–27, 101–122; Andrzejowski 2010).

Other amber processing areas in Poland

Another centre of amber processing in Poland has been discovered in Kuyavia (in the Vistula River basin). In the northern part of the area inhabited by a population of the Przeworsk culture, where a group of settlements with remains of workshops was documented, including Gąski, site 18, Jacewo, site 4b, Łojewo, site 4, Konary, site 28, Kuczkowo, site 1 (Cofta-Broniewska 1999, 159–69, figs. 1–26; cf. Wielowiejski 1991, 339–43, 1996, 248–50), Inowrocław, site 100 (Bednarczyk 2008), and Janowice, site 2 (Wiśniewski and Kotlewski 2013, 68).

The production of amber objects varied in scale between the settlements, with the most intensive manufacturing at Jacewo, as evidenced by 5000 excavated amber objects. It is worth noting that this is significantly less than at the Mazovian settlements at Biskupice and Izdebno Kościelne. At several other sites in Kuyavia, amber artefacts were uncovered on a much smaller scale and included semi-finished products, which might suggest the presence of further amber processing sites at Gąski, site 24, Inowrocław, site 95, and Krusza Zamkowa, site 3 (Cofta-Broniewska 1999, 168–69, figs. 24–26). According to Aleksandra Cofta-Broniewska (1999, 169), some workshops had been operating as early as the Early Roman Period (e.g. Jacewo and Łojewo), others in the Late Roman period (e.g. Konary, Kuczkowo, and Gąski), just as those in Mazovia. Based on bead forms, Przemysław Wielowiejski (1991, 356, 1996, 256) raises doubts regarding the unequivocal dating of other workshops from the Kuyavian region to the Early Roman Period (Wielowiejski 1991, 356–57, fig. 20, 1996, 256, tab. 5) and rather dates the workshops at Jacewo to the Late Roman Period.

These workshops were located in pit-houses or timber-post buildings above ground. Similar to those in Mazovia, raw material and amber objects from all stages of production were recovered from them. What is surprising is the very low proportion of finished items: only six finished artefacts were discovered, while there were several thousand fragments of waste and semi-finished products at the Jacewo workshop. The workshops produced beads and pendants "in the forms of flattened spheres, double cones, cylinders, barrels, pears, figures of eight, and small flat plates" (Cofta-Broniewska 1999, 169). Numerous fragments of Roman imports, principally glass vessels, terra sigillata, and glass beads, were found in some of these buildings, e.g. Jacewo, workshop 1, and Gąski, features 104, 366, 458 (Cofta-Broniewska 1999, 159–60, 164–65, figs. 6: 18–25, 13: 1–3, 16: 1–9, 17: 11–22). The presence of luxury items of Roman provenance may be indicative of the profits that local craftsmen derived from the exchange of amber objects.

Additionally, isolated workshops are scattered throughout the area of the Przeworsk culture. For example, waste material from the production of amber objects comes from a settlement in Sosnowiec, Greater Poland, excavated to a small extent in 1927 (Makiewicz 1996, 66–67; Makiewicz and Michałowski 1997; Wielowiejski 1997). It was observed in a pit (No. 2) together with charcoal remains, which may indicate the deliberate burning of amber, such as for ritual purposes, due to its aromatic qualities. As the Przeworsk-culture pottery found at the site is not distinctive, the production remains can be dated only within the broad chronological framework of the settlement's use from the late pre-Roman to the early Roman Periods.

From Kurowo in Greater Poland comes another accidental discovery of two pits filled with amber, of which at least one lump bore traces of processing. The lack of further data on these features prohibits linking them to the Roman Period (Makiewicz and Michałowski 1997, 151–52; Wielowiejski 1991, 166, fn. 24). Wielowiejski (1996, 315) classifies this context as a potential amber deposit.

At two settlements in southern Poland, workshops were situated outdoors, likely operating seasonally. At Świlcza, two workshops were located in the immediate vicinity of two pit-houses, each forming a functional complex with the building (Gruszczyńska 1984, 1999a, 1999b; cf. Wielowiejski 1991, 332–39, 1996, 237–44). Both specialised in the production of beads, and most of the semi-finished products were at the same stage of processing. The chronology of the workshops correlates with the well-established dating of one of the pit-houses (No. 1): in its annex, a small hoard of ornaments and coins was found, whose date of deposition "can be put at somewhere in the span of an overlapping of the phases D2 and D2/D3 according to J. Tejral" (Schuster 2016, 250, fig. 25). In absolute chronology, this corresponds to the second quarter of the 5th century, as confirmed by the dendrochronological date of a construction element of the house (AD 433±10).

In Jakuszowice, production waste, semi-finished, and finished products were encountered in a cultural layer dating to the Early Roman Period. The workshop itself could not be identified, but it cannot be ruled out that it operated outdoors, as was the case in Świlcza (Wielowiejski 1991, 342–48, 1996, 244–47).

Evidence of amber working has also been recorded in several features at the Zamiechów settlement in south-eastern Poland (Půlpánová-Reszczyńska 2017, 124–28, figs. 3.42–3.48). Feature no. 302, a pit-house that yielded finished beads, half-products, production waste, and

fragments of raw amber, can be classified as an amber workshop (Půlpánová-Reszczyńska 2017, 73–75, figs. 3.14–3.17, 3.18: 1–3). Based on the pottery, the feature should be dated to the end of the Early and the beginning of the Late Roman Periods. In addition, a single urn grave of a woman and a child was uncovered at the site. Its inventory included 16 amber beads, which is extremely rare in cemeteries of the Przeworsk culture, primarily due to the practice of placing personal belongings and grave goods on the cremation pyre (Půlpánová-Reszczyńska 2017, 101–2, figs. 3.23: 4–19; Reszczyńska et al. 2013, 152–53, figs. 3: 4–19, 8: 2–3).

It is also worth referring to the phenomenon of amber hoards (Wielowiejski 1987). The discoveries made before World War II in Partynice (German Hartlieb), today a district of Wrocław, play a special role in the discussion (Nowothing 1936, 1937; Seger 1931; cf. Dulęba and Markiewicz 2021, 517–22). In 1906 and 1936, three pits filled with a total of about 1300–1500kg of amber (25.5–29.5 Prussian centners; Dulęba and Markiewicz 2021, 535) were found at the pre-Roman Period settlement. In earlier literature, they were attributed to the Przeworsk culture, and their chronology was determined – based on pottery from other features on the site – to the late 1st century BC (Nowothing 1937, 50; cf. Wielowiejski 1991, 355, fig. 20, 1996, 304–5). Fragments of worked and unworked amber were also recorded in one pit-house (No. 1) and in an adjacent pit (feature 11), which may indicate that they are contemporary with the pits interpreted as deposits of raw amber (Dulęba and Markiewicz 2021, 534, figs. 19–20). According to a recent analysis, the pottery from pit-house 1 and pit 11 should be associated with the Jastorf culture population and dated to phase LT C1b (220/210–175/165 BC) and the initial stage of LT C2 (until ca. mid-2nd century BC) (Dulęba and Markiewicz 2021, 537), i.e. to a period clearly earlier than assumed previously. The settlement at Wrocław Partynice was therefore an important site on the amber exchange route to the La Tène World, which is confirmed indirectly by the discovery of an amber workshop at the oppidum of Staré Hradisko in Moravia (Čižmářová 1996; cf. Markiewicz 2023). According to Wielowiejski (1991, 355, 1996, 305), some of the raw material might have been worked on site, in a workshop located in a part of the settlement not yet excavated.

Another large hoard of amber was found in 1914 during trench digging by Austro-Hungarian soldiers at Basonia on the Vistula River (Wielowiejski 1990, 1996, 305–14). Only a small portion of the uncovered amber came into the hands of archaeologists many years after the discovery, but it is estimated that the deposit originally weighed several hundred kilograms. It consisted of lumps of raw material, partly pre-processed, and an undetermined number of beads. Chronological analysis of the 304 surviving lathe-made beads indicates that the deposit dates back to the early phase of the Migration Period (phase D).

Notes on tools and techniques for working amber

As amber is a soft material, many common implements (knife, sharpener) or tools used in other crafts, such as for working antler, bone, or leather (awl, flint chip), can be used in most production phases. Such instruments have been encountered in several workshops and adjacent features, including, for example, iron knives, bone borers, flint burins/borers, and sandstone polishers/honing stones found at Regów, Izdebno Kościelne, Świlcza, or Jakuszowice (Wielowiejski 1991, 348, fig. 15, 1996, 227–28, 235, 241, 245, figs. 4:1–2, 11:12, 15, 16:18–20).

Iron drills were used to make holes in beads and pendants. A broken drill found at the Mazovian settlement of Tłuste was stuck in an unfinished pendant that stylistically was related to a Roman ram-headed patera handle (Wielowiejski 1991, fig. 17, 1996, 253, 263, fig. 19; Wielowiejski and Wielowiejski 1995).

A specialised tool, on the other hand, was the lathe. To date, no remains of such a machine tool have been encountered, although traces of its use can be seen on numerous beads. In the light of the analysis of grave materials from *barbaricum*, the lathe appears in the production of amber beads in phase B2 of the Early Roman Period (cf. Tempelmann-Mączyńska 1985, 97, tab. 6, 8). Ethnographic analogies, for example from the area of north-eastern Mazovia (Kurpie region), indicate that simple devices, similar to the modern "bow" lathe and "small mill" lathe, may have been used (Wielowiejski 1991, 337–38, fig. 17, 1996, 251, 253, fig. 18).

To summarise, beads and pendants crafted by the amber workshops of the Przeworsk culture were predominantly shaped by hand, using knives and similar tools, with a subset undergoing lathe turning during the final processing stage; holes were drilled using bone and iron borers, followed by polishing with stone polishers to achieve the desired finish.

Closing remarks

The existence of numerous amber workshops in the area of the Przeworsk culture is surprising, given that natural amber deposits are found only in a small part of this region, primarily in north-eastern Mazovia (Kurpie region). It is presumed that the majority of raw material

was imported from the southern Baltic Sea shores, particularly from Sambia and the Gulf of Gdańsk, which are known for their abundant deposits of high-quality amber (Bliujienė 2011, 5–11, fig. 2; Wielowiejski 1996, 220–23, fig. 2). Unfortunately, confirmation of this very plausible hypothesis based on physico-chemical analyses is not possible at the present stage of research. Amber deposits from southern Scandinavia, Central Europe, and parts of Eastern Europe (up to the Dnieper basin in Ukraine) geologically belong to the same species, the so-called Baltic amber or succinite (cf. Bliujienė 2011, 335–36).

During the Roman Period, the amber-rich regions in Sambia and at the Gulf of Gdańsk were inhabited by the people of the Wielbark and Dollkeim/Kovrovo cultures (cf. Cieśliński 2016; Nowakowski 1997). Curiously, no remains of amber workshops have been discovered within the territories of these cultural groups, possibly due to a very poor state of research of settlements in the area.

In Scandinavia, the state of research regarding settlements is incomparably better than in Poland, but despite numerous excavations, no feature has been identified so far that could be interpreted as an amber workshop. In his as yet unpublished doctoral thesis on amber artefacts in Northern Europe from the Roman Period to the Germanic Iron Age, Karl Johann Offerman presents a catalogue of settlements where raw amber, semi-finished products, and production waste have been recorded (Offerman 2023, 133–58 with references); of these, only three are in Scandinavia, all of which fall into the category of so-called central places: Lundeborg on Funen (a settlement associated with the central site at Gudme) and Sorte Muld on Bornholm in Denmark, and Helgö in Uppland, Sweden. Unfortunately, at all these settlements, any amber artefacts that could suggest local production have been found outside of structures or features, usually in the cultural layer or as stray finds. Often, there is no basis for precise dating, and the chronological framework for the life span of the settlements themselves is very broad, ranging from the late Roman to the Vendel Periods and even into the Viking Age. For this reason, it is difficult to determine the chronology, frequency, and scale of amber production in Scandinavia and to conduct reliable comparative studies with workshops of the Przeworsk culture. It is worth noting, however, that the number of artefacts confirming local amber production in Northern Europe is so small that it hardly exceeds the amount found at a single small-scale workshop in Central Europe.

The import of raw amber to Mazovia demonstrates contacts of the local population to other regions of *barbaricum*. It might be linked to the trade in locally smelted iron, as the enormous scale of iron production at the Mazovian Centre of Metallurgy undoubtedly represented an important branch of the local economy that exceeded local demand for this metal. However, the chronology of both phenomena poses a challenge, since most of the dated amber workshops are from the Late Roman Period (3rd to 4th centuries AD), while the metallurgical centre is generally associated with the Early Roman Period (1st to 2nd centuries AD). Unfortunately, despite a 50-year history of fieldwork on Mazovian metallurgical settlements, only 14 radiocarbon dates have been made and for only three sites (Janiszewski 2018). These are partly old analyses (from the 1970s), and their precision is insufficient for modern standards. For a solution of this research problem, more detailed studies are required on the production of amber objects and particularly on the chronology of iron production in Mazovia.

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Production, distribution and use of standard and "rogue" Migration Period gold bracteates

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Studies of Migration Period gold bracteates often have focused on the iconography of these fascinating yet enigmatic objects. An enduring secondary interest has been the attempt to understand the technology by which they were produced. In this essay, I examine how three approaches—close observation of bracteates and the dies from which they were struck, modern experiments to reproduce Early Medieval goldsmiths' techniques, and analysis of geographic patterns of the distribution of bracteate find places—can help us comprehend more about how and where bracteates were made. While most bracteates can be grouped according to iconographic and stylistic features, some examples depart considerably from typical bracteate iconographic choices or display unusual details produced by unconventional techniques. The term "rogue" is introduced by the author to refer to such bracteates, with the proposal that some of these rogue pieces may have been fabricated by smiths who did not have access to metal dies or did not have the ability to make beaded edge wire or sturdy suspension loops. In addition, it is noted that many pieces that iconographically deviate from established family groups have been discovered in locations geographically peripheral to other members of their iconographic groups, and in some cases, irregular iconography and atypical techniques intersect.

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"Standard", "bastard", and "rogue" bracteates

Well over one thousand gold bracteates of the Scandinavian Migration Period (ca. 450–540 CE) have been discovered within and beyond Scandinavia. The goal of this paper is to understand more about how and where bracteates were made and used via thorough inspection of unusual bracteates and their dies in light of knowledge gained from experimental reproduction of early medieval techniques as well as consideration of the geographic distribution of these atypical examples. In previous presentations and publications, I have discussed how we believe that Scandinavian Migration Period gold bracteates may have been made during the fifth and sixth centuries CE (Wicker 1994, 1998, 2006). In those works, I described production methods by which I believe most bracteates seem to have been created. Although there is no fixed definition for what constitutes a "standard" production technique, a norm has been implied by offering counterexamples to contrasting technical details that are considered particularly odd or unusual in any way. In contrast to various and varying proposals concerning bracteate technology, the foundational works by Christian Jörgensen Thomsen (1855), Oscar Montelius (1869) and Bernhard Salin (1895) established a standard classification according to general iconographic motifs of Migration Period bracteates as Types A (with a man's head), B (with one or more full human figures), C (with a man's head over a horse-like animal), and D (with animals) based on images in the central stamp. Bracteates of these types are indeed considered to exhibit standard iconography. However, my interest leaves the iconographical to deal with technological and decorative aspects of bracteates; consequently, I propose the term "rogue" to refer to anomalous bracteates that exhibit technical or decorative characteristics that are atypical or unconventional.

Due to the relatively large number of extant bracteates, it is convenient to group exemplars with similar characteristics, whether technical or iconographical (or both), and use various names to describe them. For instance, Morten Axboe (1982, 32–36) introduced the term

"de luxe" loops to describe the technical feature of large bracteate suspension loops richly decorated with filigree or granulation. Overall, there has been more interest in describing bracteates that show unusual imagery rather than uncommon techniques. Axboe (2017, 143) uses the word 'odd' to describe bracteates that he calls "outsiders" as he focuses on atypical iconography rather than abnormal technical or decorative features. In 2007, Alexandra Pesch introduced to bracteate studies groupings of *Formularfamilien* (which I will refer to as Formula Families and abbreviate as FF) composed of bracteates that are so similar iconographically and stylistically that it is difficult to conceive that they were made independently. Pesch (2007, 54) assigned the term "bastard" to refer to bracteates characterized by iconography that does not fully conform to her major family categories yet still appear to be related to or derived from examples in these categories. English usage of the term bastard, which means similar to—but inferior to or less typical than—some standard may not reflect the subtlety of German *Bastardformen*; however, in both English and German usage, the word expresses the idea of something debased from its original form. The word can also connote "hybrid" or "cross-breed", but few of these bracteates actually exhibit hybrid iconography.

While Axboe's and Pesch's designations of outsiders, odd, and bastard concentrate on the iconography of bracteate images, I propose the term 'rogue' to denote bracteates whose technical details diverge from standard examples. Rather than focusing on their iconographic features, I examine details including how the bracteate was stamped, what metal was used, whether and how an edge wire was applied, and what kind of suspension loop was used. Rogue bracteates, as I propose, are related to yet not identical with both what Pesch calls bastard bracteates and Axboe's outsiders. Although Axboe (2017, 143) acknowledges that some of the outsider bracteates are poorly made, he focuses on examples that exhibit inventive or unorthodox iconography. While I am indebted to both Axboe and Pesch for their contributions, rather than emphasizing unusual or innovative iconography as they do, I concentrate here on bracteates that were made with non-standard techniques, not necessarily poorly made but differently made, with non-standard dies, metals, suspension loops, and wire rims. We have many labels to refer to various iconographic issues, but until now have not had a name for technical oddities. Therefore, I introduce the alternate term rogue to highlight how some examples depart from customary or standard types not in their iconographic motifs but rather in technological details. However, some of the bastard pieces that Pesch recognizes, which are associated with—yet different from—certain of her presumably workshop-related family groupings, also have rogue technical details. Finally, I note that the find places of bastard examples often lie along the peripheries of maps of their respective Formula Families as delimited by Pesch. I will return to discuss implications of the geographic distribution of bastard and rogue bracteates later in this essay. In the following pages, I begin with some case studies in which the word rogue can be used to aid our investigation of technical features of bracteates.

Die technologies and experimentation

Close study of bracteates themselves and the dies used to stamp them—a few of which have been discovered in recent decades—has allowed archaeologists to expand their knowledge of the techniques by which most of these objects were made. An image on the front (obverse) of a Migration Period bracteate was produced by striking it directly against a matrix die to impress the central picture field so that the resulting bracteate shows the reverse of the image that had been carved on the die. A die can be used to make multiple impressions. After a bracteate is struck from a die, an outer rim of wire is usually attached to it, presumably to give the disk rigidity and strength as well as to enhance its finished appearance. The reinforced edge can then allow a loop to be attached firmly and securely so that the completed product can be worn suspended as a pendant. The die, and thus the central picture of the stamped bracteate, conveys the picture, that is, the iconography, of a bracteate. Making a die requires a many-stage process that is the most technically demanding stage of producing these objects, and several methods by which to produce dies from various materials are feasible. At least four copper alloy dies (informally referred to as bronze) for striking bracteates are now known, with the first discovered in 1990 at Postgården, North Jutland (IK 572; Axboe 1993), followed by finds in England from Billingford, Norfolk, in 1999 (IK 589; Behr 2010, 50–53), near the Essex/Hertfordshire border in 2004 (IK 609; Behr et al. 2014, 48–49), and at Morley, Norfolk, in 2007 (IK 637; Behr et al. 2014, 69–70). (All bracteates and their dies will be referred to by their "IK" catalogue numbers in the *Ikonographischer Katalog* initiated by Karl Hauck and colleagues, continued in Heizmann and Axboe 2011.) The Billingford die is unusual and could not have functioned like the other three dies enumerated above, thus reinforcing the supposition that not all bracteates were made by the same techniques.

Now that a few copper alloy dies have been discovered, it has become routine to assume that all Migration Period

Figure 1. Fuzzy lines suggest made against a wooden die. Bracteate from Tuvasgården, Halland (IK 356), 2.78cm diameter. Statens Historiska Museum inv. 2989. Photo: Bengt A. Lindberg. CC-BY.

gold bracteates must have been made with similar cast-metal matrix dies; however, following close inspection of the objects, it appears likely that not all bracteate dies were made of the same material or by the same method. Already in the late nineteenth century, Salin (1895, 29) proposed two types of dies, metal and perhaps wood. Use of alternate die materials was debated by Morten Axboe and Birgit Arrhenius (1982) more than a generation ago, before any metal dies were discovered. Arrhenius (1975, 102–7) presented evidence for the use of clay to copy images from existing bracteate models, which would result in slightly minimized results due to shrinkage of the fired ceramic body. Although her theory did not receive much traction, it is likely that some anomalous bracteates may have been pressed with dies made from materials besides metal, including wood and ivory, which would have been more available and more easily worked into a bracteate form than metal. Axboe identified impressions on the obverse of several bracteates (Axboe 1982, 21–23, Appendix III, 58–59) that may reflect the splintering and fraying of fibers, perhaps resulting from non-metallic dies. Fine "hairy" lines on the gold surface of a bracteate from Tuvasgården, Halland (IK 356) are easily observable, and this piece (Figure 1) is one of the primary examples raised by Axboe as evidence of fibrous dies (Axboe and Arrhenius 1982, 306). Pesch (2007, 326) considers this bracteate a bastard member of the Formula Family *F2,a* due to its unusual Type F bracteate imagery, which perhaps was misconstrued by the artist. (The lower case "a" after a FF number indicates that Pesch deems that bracteate a bastard member of the respective FF group.) For both iconographic and technical reasons I regard the Tuvasgården bracteate as a rogue bracteate. Axboe (1982, 58–59) describes visible fibrous lines on numerous additional bracteates, including examples from Espelund, Småland (IK 49) and Gyland, Vest-Agder (IK 67; FF C10,a), both which Pesch includes as bastard examples of FF C9,a and FF C10,a, respectively. While the find locations of these pieces are not remote in the context of the distribution of all bracteates, it is notable that both lie on the periphery of their corresponding Formula Families, as geographic outliers, a feature that is common to many bastard bracteates. In addition, the Espelund bracteate has an unusual loop with large-diameter applied wire which is placed nearly 90 degrees clockwise from the top of the person's head. While applied filigree wire routinely occurs on de luxe loops (Axboe 1982, 36), it is less common on simpler bracteates. Thus, in many respects, the Espelund piece is a rogue bracteate. We may question why a bracteate-maker might use a wood or ivory matrix. I propose that some craftworkers, such as those who made the bastard Espelund and Gyland pieces, may have made objects related to pieces with standard iconography but avoided the requirements of the complex technology of casting. Such examples may have been made where the technology for producing bronze dies was not available.

Experimental archaeology offers opportunities to try to reproduce early medieval metal techniques and thus contribute to our understanding of how certain techniques were carried out in antiquity and the early medieval period. Yet, modern experiments to attempt to reproduce early production techniques often have been criticized, as Arrhenius (1975, 104) complained that Mogens B. Mackeprang with William Larsen (1952, 96) used an anachronistic sand form for casting, an invention that was not used in Europe before the late medieval period. After the discovery of the die from Postgården (IK 572), use of deep, cylindrical dies instead of the newly found flattened example could be critiqued. However, the taller, cylindrical Morley die (IK 637) found in 2007 redeemed Mackeprang and Larsen for their choice. Experimentation proceeds iteratively. Through the years, I have worked with several smiths to try to replicate techniques used in producing Migration Period bracteates, and my first-hand experience at these processes may shed some light on the conditions and mentality that resulted in

unusual approaches to making objects.

The first bracteate-production experiments in which I was involved were carried out by a goldsmith who was accomplished at wire-work but did not have the ability to cast a die. Therefore, our trials focused on making wire for the edge rim, a suspension loop, and the border zones of the disk. Our goal was not to produce an ersatz bracteate but rather to investigate several stages in the production of such work. We spent time making appropriate tools and materials, including punch tools for the border zone of the bracteates, wire for the edge rim, an elaborate suspension loop, and solder to assemble the work. We mounted a glass setting in the center of the pendant since we had no die with which to stamp the central field of the piece, so the pendant we produced, strictly speaking, is not a bracteate (Wicker 2011, 40). Later, I collaborated in experiments with a team of metal smiths to produce and then strike a die. We experimented with various combinations of metals for the bronze and tried striking numerous bracteates from the resulting die with cloth and leather padding. Each of these trials had a specific, reachable goal. In a previous publication, I reported on a true one-sided bracteate that colleagues made for me many years ago (Wicker 2011, 35). They did not have the means to cast a metal die, so they improvised, carving a die in wood and then painstakingly pressing the obverse of the thin gold into the grooves of the wooden die. Using this non-standard method to produce a bracteate could not take advantage of the possibilities of stamping multiples with a metal die.

Despite technical limitations and lack of pertinent skills, the maker persisted. The pitfalls encountered in experimentation helped us appreciate the technical requirements for bracteate manufacture and recognize variance in Migration Period pieces; consequently, when unusual technical features are discernible on a bracteate, I propose that rogue die media and stamping methods should be considered as possible explanations for anomalies.

Some pendants found with bracteates depart entirely from one-sided bracteate stamping methods, and these specimens do not qualify as either bastard or rogue. Two unusual disks found in Sweden display bracteate-type imagery; however, rather than being stamped in true bracteate technique, designs were engraved lightly into the surface of the metal. Both of these objects were found with actual bracteates, at Djurgårdsäng, Västergötland (IK 418 and IK 419), and at Vä, Scania (IK 202 and IK 203). The Djurgårdsäng disk (Figure 2) exhibits an anomalous image and has been assigned a unique number in Hauck's corpus, IK 234, whereas the engraved piece from Vä is a close copy of Vä (IK 203). Pesch (2007, 176) includes it in her Formula Family C6. These examples could either be expedient imitations of existing bracteates, executed more easily than by preparation of a die with which to stamp a disk, or they could be accomplished preliminary sketches for designing bracteate images. Since both pieces were discovered in locations that have yielded finds of actual bracteates and that may have been areas important for bracteate production (Pesch 2011, 244, map), I tend toward the second explanation. Such unusual finds challenge us to consider reasons for their production.

Wire rims and suspension loops

Besides unusual dies, other non-standard bracteate features include atypical methods to make and attach suspension loops and wire edge rims, or alternatively, the complete absence of an applied rim. Additions can be decorative as well as functional, and they were attached after the flan had been struck from a die. An edge rim helps to strengthen a bracteate and deter, if not prevent, bending of the thin gold disk. The loop functions as a practical method by which to suspend a bracteate to be worn as a pendant. It often hides the overlapping of the two ends of an edge wire that curves around the circumference of the disk. Two ways to attach edge wires were commonly used. One method is to attach a circlet of wire with solder onto the top of the flan so that the wire sits on the surface of the piece and is entirely or nearly invisible from the reverse; the alternative is to solder the wire perpendicularly to the outer rim of the disk so that it is equally visible both from the obverse and the reverse of the bracteate.

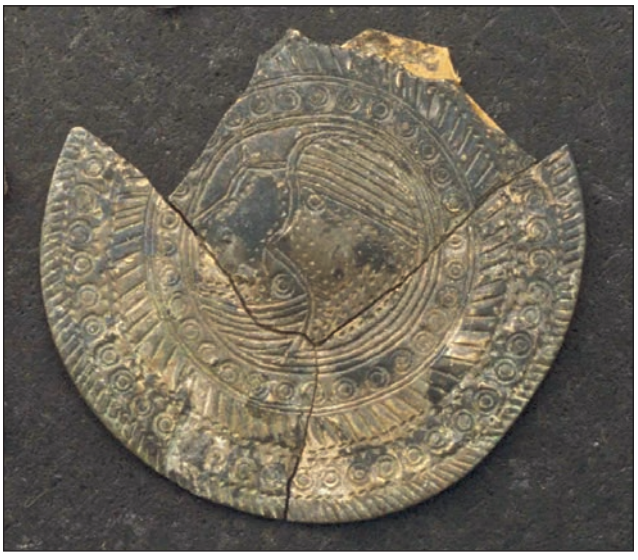

Figure 2. Engraved disk (not a bracteate) from Djurgårdsäng, Västergötland (IK 234), 4.0cm diameter. Statens Historiska Museum inv. 6563. Photo: Ulf Bruxe. CC-BY.

Figure 3. No rim on bracteate from Öland (IK 134), 1.86cm diameter. Pesch: Formula Family C14,a (bastard). Statens Historiska Museum inv. 4562. Photo: Ulf Bruxe. CC-BY.

Figure 4. Loop formed from part of the disk turned back on itself. Bracteate from Burge, Gotland (IK 365.3), 2.73 cm diameter. Statens Historiska Museum inv. 2617. Photo: Ulf Bruxe. CC-BY.

Application of a wire edge rim was standard in the areas of bracteate distribution in southern Scandinavia, especially on large, embellished bracteates. In a few cases, the wire may have been removed, whether pulled off forcibly or detached and lost due to gradual wear and tear; however, if remains of solder are not apparent, it can be difficult to ascertain whether a wire rim originally had been present. Some bracteates apparently never had an edge wire, for example, a small-diameter bracteate from Öland (IK 134) (Figure 3), where the image on the disk was trimmed very close to the outer edge, leaving no room for concentric circles of decoration or to apply a wire. Many Migration Period bracteates found on Gotland share the same features of the small, tightly trimmed flan lacking an edge rim, which may owe to the presence of Roman coins on the island (Lamm and Axboe 1989, 467–68, 475). Similarly, wire rims were not always customary on examples found in England and the Continent, all regions that were peripheral to the main bracteate areas, where small diameter disks are common (see below) and anomalous, rogue techniques occurred. Some bracteates designated by Pesch as bastard varieties of Formula Families—for instance examples from Kydland, Rogaland (IK 460, FF D3,a) and Achlum, Friesland (IK 405, FF D10,a)—lack edge wires, which can be considered a rogue characteristic.

The modern rogue bracteate made by my colleagues with a wooden die had no wire edge rim, apparently because its makers did not have the ability to produce or obtain appropriate wire to encircle the rim of the disk. In general, large standard bracteates in the central geographic area of bracteate distribution rarely lack an edge wire. Accordingly, a set of large die-identical bracteates (IK 594) without provenance that display typical iconography and multiple punched border zones but lack wire edge rims seems peculiar. This group surfaced on the antiquities market in the early 2000s, with one purchased by the Metropolitan Museum of Art (Holcomb 2002, inv. 2001.583) and the other four apparently now in private collections. Pesch (2017) discusses this set and others that have surfaced in recent decades, warning that they may be modern imitations or forgeries.

After the bracteate disk was struck and after the edge wire was attached to it, then a suspension loop was added to the piece. While standard loops are simple or embellished cylinders or tubes (see Figures 1 and 2), there are several rogue options for alternate methods to produce a loop. One alternate loop variety avoided the application of additional pieces of metal and was shaped by bending a portion of the bracteate over itself, as seen on a bracteate from Burge, Gotland (IK 365.4, Figure 4). Another loop type has a flattened tab that extends onto the reverse of the bracteate, as from Hjørring (IK 83). The appearance of a tab-attachment may not be as elegant as the typical cylindrical loop, but it is strong and serviceable, although an unusual, rogue choice to enable suspension.

Figure 5. Loop fixed into place with a pin. Bracteate from Söderby, Uppland (IK 176), 3.88cm diameter. Statens Historiska Museum inv. 5802:A2. Photo: Christer Åhlin. CC-BY.

My colleagues who made the modern rogue bracteate created a suspension loop with tabs that extend over both the obverse and reverse of the disk. The resulting loop was then secured into place through the bracteate with a pin or small nail, which allows the loop to pivot in relation to the disk. This type of loop attachment, with either one pin (allowing pivoting) or two pins (which stabilize the loop and prevent pivoting), is known on a few Migration Period bracteates, including die duplicates from Söderby, Uppland (IK 176) that display both one nail (Figure 5) and two nails. Various unusual bracteates display a flat-tabbed loop, as from Sablonnière, Ile-de-France (IK 398), and a pinned-loop, as from Schretzheim, Bavaria (IK 500). Notably, rogue bracteates with a tab-style attachment have been found in the geographical peripheries of the overall bracteate find distribution—in Uppland, a prominent center but well north of the largest area of bracteate distribution, and in France and Germany. These alternate methods to attach suspension loops to bracteate disks require fewer complex techniques than producing small cylindrical tubes of gold and therefore could be created with simple tools that local smiths may have had available.

Physical characteristics and iconographic distinctions of rogue bracteates

Besides unusual dies, rims, and loops, additional rogue details include non-standard materials and dimensions, as well as iconographic variations. While most of the over one thousand extant bracteates found in Scandinavia and spread across Europe are made of gold, some rogue pieces were made of other metals, namely silver and copper alloys. Although numerous gold bracteates have been discovered in England, several rogue examples in other metals also have been found there (Behr 2010, Behr et al. 2014). In addition, a broken gilt silver bracteate was discovered in a grave at Schönebeck, Saxony-Anhalt (IK 497). This small diameter (2.42cm) bracteate cannot be weighed accurately since it was encased to protect the fragments of this broken disk. The shift to other metals may testify to a restriction of access to gold, as also indicated by the well-documented physical

distinction that bracteates found in Central Europe consistently have smaller diameters and consequently weigh less than Scandinavian examples (Axboe and Hauck 1985, 98–102). These anomalous, rogue small and lightweight bracteates insinuate that the supply of gold was insufficient to meet the desire for golden pendants, so craft workers could respond by limiting the diameter of the disks, restricting the number of concentric rings of punched border zones, trimming the disks very closely, and shifting to alternate metals rather than gold.

Various Late Roman medallions appear to have inspired standard bracteate Types A, B, and C, whereas the imagery of the Type D examples reflects familiarity with Scandinavian animal styles as used on other objects including fibulae and horse-trappings. Some departures from the standard A to D Scandinavian-type bracteate iconography are characteristic of both bastard and rogue bracteates. The bastard variations of Formula Family groups classified by Pesh (2007, 287) emulate standard bracteate imagery but diverge from basic iconographic types in various ways. Pesch notes that there are bastard variations of Type D bracteates in which animal style motifs might have been misunderstood, especially in locations far from the Scandinavian homelands, for instance, examples from the FF D10, a group from Achlum, Friesland (IK 405,1) and East Leake, Nottinghamshire (IK 601). Pesch also describes the copper alloy matrix die found at Billingford, Norfolk (IK 589) as a member of this same bastard group, in which the animal parts are depicted as disconnected and nearly disintegrated.

Occasionally, Pesch's bastard members of Formula Families, defined iconographically, intersect with what I have called rogue bracteates based more on technical and physical characteristics than on iconography. Axboe (2017, 143) refers figuratively to designs "at the edge" of recognizable Formula Families. He distinguishes bracteates that may be considered "second-rate" or "degenerate" from those that may depart from well-established iconographic types but are iconographically productive, leading the way to new image types (Axboe 2017, 152). However, he does not offer a list of all those he considers second-rate. I piggy-back on this mention of odd bracteates; when the iconographic type becomes obscured or unreadable, even the motifs can be considered rogue.

Central places and the distribution of rogue bracteates

Large numbers of standard Migration Period gold bracteates may have been produced in workshops located in so-called "central places", which were important centers often located in recognized navigable coastal or riverine regions. Bracteate dies most likely were initiated and manufactured in workshops at such locations, as proposed by Pesch (2007, 355, map), where dies could have been made under strict guidance and control. She notes that bracteates from various FF groups rarely have the same distribution, and in fact, most of these groups are centered around and near conjectured central places. In these locations, a standard technology of stamping gold disks and their multiples from cast bronze dies may have been employed. We can hypothesize from a workshop point of view that many or most standard gold bracteates and their multiples likely were stamped in the same central places where the dies had been made, although dies also could have been transported to satellite workshops. Pesch (2007, 349) demonstrates that bracteates she assigns to most Formula Families have distinct and only somewhat overlapping distribution areas, reflecting various communication networks, some wider and some narrower. The standard models that form the foundation for the Formula Families of bracteates stimulated the production of closely related pieces within geographic regions. Many of these bracteates subsequently may have been distributed to secondary satellite locales by trade, gifting, or other means, where they inspired further interactions—both bastard and rogue pieces—that reflected the technology and materials available. Beyond the central places, bracteates often were copied, adapted, and interpolated with relative freedom, sometimes exhibiting misunderstandings and improvisation of both iconography and techniques in such locations.

Many anomalous bastard and rogue bracteates have been discovered at some distance from conjectural central places, in areas peripheral to the main distribution of established FF types, sometimes including somewhat remote and marginal inland regions. This does not mean that all bastard bracteates were discovered in remote places. Rather, an examination of Pesch's FF maps reveals that find spots of bastard pieces often lie beyond the locations of the standard examples for several Formula Families (see Pesch 2007, maps B1, B3, B4, C2, C5, C9, C10, C11, C12, C 14, C15, C16 and D10). Each of these maps indicates that FF bastard bracteates were distributed geographically beyond the central concentration of the associated standard groups. For instance, Map C10 (Pesch 2007, 198) shows dispersal across western Sweden with bastard outliers on Scania, Öland, and Jutland, as well as along the southeastern coast of Norway. Another example is Map C11 (Pesch 2007, 207), which reveals a coastal Norwegian spread with outliers extending into deep valleys. In some of these cases, bastard examples also display rogue technical details.

Whereas die duplicates are often unearthed together, attesting to bracteate sets that did not get dispersed, bastard pieces tend to be found individually rather than together with multiples. Perhaps they were produced as lone examples due to irreproducible technologies (including wooden dies) or were circulated and then discovered as singletons as due to accidents of survival. Bearing in mind that our distribution maps show where bracteates were found, not where they were made, most bracteates—whether duplicates or solitary products—likely remained close to where they were produced. Finds of die-linked bracteates, separated from each other and then scattered widely and individually, are informative about long-distance trade and likely exogamy (Andrén 1991; Arrhenius 1992; Behr 2007; Wicker 2019), although they also may testify to the distribution of dies, reflecting that die-identical bracteates could be struck in various locations. In any case, discoveries of die duplicates in separate locations are exceptional, and any bracteates, whether standard, bastard, or rogue, may have stimulated the production of closely related pieces whether at workshops at close or distant locations. While standard bracteates of iconographic types belonging to various Formula Families were likely made in central places where iconography, gold, and skills could be regulated and strictly controlled by an organizational structure, some rogue pieces may have been made—perhaps even covertly—by smiths managing the best they could with the materials and knowledge they had available. Besides considering where standard, bastard, and rogue bracteates were made, we should consider why they were made, for whom they were produced, and whether they were used differently in central places or in locations on the fringes of the distribution of established FF types.

Use of bracteates, whether "de luxe", standard, bastard, or rogue

Bracteates must have been seen and appreciated, perhaps in rituals in the halls and in the context of funerals—even if from a great distance, but close contact with these objects necessarily must have been limited to the makers, the patrons, and the wearers. The largest bracteates with multiple border zones and decorative loops may have been commissioned and used differently than the irregular pieces I have discussed here. While impressive bracteates may have been given publicly as gifts, awards, or honors, more modest examples (even though all gold jewelry must have been stunning) may have been hidden under clothing when worn as an amulet around the neck (Wicker 2020, 366). Some of these examples may have had insufficient loops that allowed the bracteate to fail and consequently fall to the ground. Since we lack sound find contexts for numerous bracteates, we can only conjecture about how they arrived at their locations in the earth. The most spectacular bracteates may have been heirlooms placed in graves or gathered as hoards, while simpler ones, including rogue bracteates, more likely may be discovered as single finds, whether during agricultural work or construction, or by metal-detecting—which might indicate settlement debris.

It is difficult to imagine that a patron would specifically have ordered a rogue bracteate to be made, but a client might accept an odd example or even a defective piece if standard examples were unavailable when the supply of bracteates could not meet the demand for these objects. As we try to understand the instigation for why rogue bracteates were made, we can imagine a metalworker who viewed a magnificent bracteate worn by a woman or displayed in a ritual occurring in a central place who then tried to reproduce the glittering object from memory upon return to the craftworker's home place. This inventive craftworker may not have had appropriate materials, tools, and skills to produce a high-quality piece or even a standard bracteate. However, someone—presumably either the smith or a patron—wanted a bracteate even though lacking the wherewithal to produce one by traditional methods and materials. Some goldsmiths lacked sufficient skill whereas others lacked resources; undoubtedly, some artisans were more skilled than others, and some did not have access to bronze or gold. If metalworkers did not have command of all the necessary technologies to cast a die, did not have appropriate materials, or were not familiar with the conventional iconographic subject matter, they may have improvised. Rogue bracteates reflect unorthodox solutions to the construction details of dies, loops, edge wires, materials, and even iconographic formulas that may have been carried out by makers who did not work through customary channels. Although some viewers of these objects may disparage these smiths as hacks who perhaps displayed excessive, self-assured hubris in the face of limitations, with empathy we can regard them as inventive and creative, devising new techniques of production and displaying independence in iconography.

Weighing all the variables of iconographic and technical details, along with find contexts, workshop identifications, and chronology is a multivariate challenge. The present essay is a case study proposing a nomenclature to convey the significance of technically "different" bracteates. A larger planned comprehensive study will enumerate possible rogue pieces and take into account various find contexts (graves, hoards, settlement finds) as well as

the chronology and even iconography of the rogue pieces. Whether "de luxe" or rogue, all bracteates must indeed have been highly regarded objects that were made, used, and imitated in various ways across northern Europe. Those made by unusual techniques warrant a label by which we can refer to them.

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Convergence of knowledge: The relief brooch from Jorenkjøl, south-western Norway

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Through an interdisciplinary investigation carried out by four researchers we sought to increase knowledge of Migration-period technology and aesthetics. By combining our expertise in archaeology and material science in a detailed inspection of a 6th century brooch, we attempted to understand its life story and the convergence of knowledge behind the elaborate masterpiece. The reverse of the brooch revealed traces of use-wear and a remarkably well-preserved pin arrangement. The use of raw materials suggests a reorientation among artisans from animal ornaments to metals in the terminal phase of the Migration Period: The aesthetic qualities of our brooch are no longer dominated by the chaotic entangled masses of zoomorphic iconography, but rather replaced by a calmer expression of geometric shapes of contrasting colours and materials which highlight the qualities of the metals.

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Introduction: Technology and convergence of knowledge

Discussions on technology inspire a wide range of questions and allow researchers from across disciplines to investigate interactions between humans, things, raw-materials, and places. The inseparability of art, skill, craft, methods, knowledge, understanding, and awareness at the root of the Greek word *tekhne* has been emphasized by Marcia-Anne Dobres (2010, 106 with reference to Ingold, 1988, 1990). A condensed amalgamation of such conditions can, in certain cases, be embedded in a single object. We argue here that the 6th century relief brooch from Jorenkjøl in Rogaland, south-west Norway, is in possession of such qualities (Figure 1).

The understanding of the sequenced crafting processes through the application of *chaîne opératoire* (Dobres 2010; Leroi-Gourhan 1964) offers means to explore the knowledge and skill embedded in sophisticated crafted objects, such as a Migration-period relief brooch (Kristoffersen and Pedersen 2020; Pedersen and Kristoffersen 2018, 2019). Furthermore, the approach has brought to light a comprehension of the various forms of knowledge involved, not only in past practices, but also in our own present engagement with such issues and objects. Theoretical and practical knowledge traditions (Molander 2018, 16), or *knowledgeable practice* and *practical knowledge* (Dobres 2010, 106), are regarded as interconnected in various ways: "Practices are not just ways of doing things, […] they are also ways of being in the world and ways of seeing and understanding the world" (Molander 2018, 14). In discussions on crafts, the concepts *discursive* and *non-discursive* knowledge have been emphasised (cf. Budden and Sofaer 2009). According to Pierre Lemonnier (1989, 156), technology brings together practice and theory: "The technological activity of societies always brings into play a combination of four elements: matter on which an action is directed; objects ('tools' or 'means

of work', including the human body itself); gestures and movements organized in operational sequences; and a specific knowledge…".

Archaeology is interdisciplinary in its nature, in its effort to understand past societies on various scales – from societal structures and world views to the individual objects that form the discipline's empirical basis. An interdisciplinary approach is certainly required in the endeavour of extracting knowledge about the condensed amalgamation mentioned above. We seek here to realize the potential embedded in the Jorenkjøl brooch by combining insights from archaeological approaches and material sciences investigations. The results are presented by two archaeological conservators and two archaeologists. Our cooperation and collaboration was established through detailed physical inspection of this brooch. The research design parallels the interdisciplinarity embedded in the high-quality craft object itself, and in the knowledge it embodies. The application of techniques from archaeometry, combined with the analytical approach *chaîne opératoire,* offer a deeper comprehension of crafts and the contexts in which they evolved and disappeared. Furthermore, recognising the various steps in a technological process and the different materials involved has paved the way for cross-craft perspectives – highlighting the intimate relationships between certain crafts and the artisan's expertise in handling diverse raw materials (Fredriksen et al. 2014; Sofaer 2006). Cross-crafting can be regarded as a kind of relationship between certain crafts that, "implies direct knowledge of production processes involved in the other craft and a real transfer of know-how between crafts and craftspeople," a relationship that can be explored based upon the technical links between objects (Sofaer 2006, 128). The collaborative effort of the authors can also be regarded as a kind of cross-crafting — a convergence of expertise aimed at navigating and uncovering the intricate patterns within the data, and achieving a deep understanding of the artefacts in question, from the smallest ornamental details to technical features. We have directly experienced how our knowledge has developed and grown whilst examining the physicality of the brooch itself over time and on different scales.

Relief brooches and the discovery of the Jorenkjøl brooch

Relief brooches are made by casting silver or copper-alloy, and many seem to be produced locally (Kristoffersen 2000; Meyer 1935) using a complex technology first developed in the provincial Roman workshops of Central Europe (Haseloff 1981, 1–17, 1984: 109, with references). Elaborate items of a certain size, quality, and craftsmanship are regarded as *Prachtfibeln.* Within the Norwegian corpus there are around 60 specimens categorised as such (Kristoffersen 2015a). They are often found in well-furnished burials and formed a conspicuous part of the attire, which indicated a role associated with knowledge, its transmission, and the bearing of tradition (Kristoffersen 2000, 2015a; Martin 2015, 191–232).

This brooch, however, came to light via farming activity, and there is no further information on its find context. It might originate from a disturbed grave, or perhaps a hoard. A small group of contemporary Migration-period relief brooches have been found in hoards (Røstad 2021, 171–75), including another Rogaland brooch from Syre (Kristoffersen and Pedersen 2023). The Jorenkjøl specimen came to the Museum of Archaeology in Stavanger, where Jan Petersen reported that it was found "on the outskirts of a field the summer of 1943" (Petersen 1945, 7, our translation). Petersen describes the brooch precisely, mentioning that it broke in two parts at the weak point in the transition from bow to footplate when taken out of the ground, and that it had later been repaired by soldering. He relates it to similar brooches and underlines, as we do, how unusually well preserved it is.

The Jorenkjøl brooch is quite large and heavy, measuring 13.7cm in lenght, with a weight of 152.7g. Based on stylistic criteria, it is dated to the final decades of the Migration Period, some time before AD 550 (cf. Kristoffersen and Røstad 2020 for a synopsis of the chronological frame). John Hines classified the brooch as a variant of the so-called Bicrome Style, the only one found within Scandinavia, and places it within his group XVI (Hines 1997, 168, 133, 231).

The investigations: scope, methods and techniques

In exploring the Jorenkjøl brooch, we united traditional archaeological analyses with material science methods to investigate: 1) The materials used to produce the brooch, 2) the level of competence and experience behind the observed techniques, 3) the artisans' understanding of the motifs in Migration-period art, and 4) any possible traces of wear and tear which indicate that the brooch has been used, and if possible, how. A key objective of our archaeological examination was to combine insights of ornamentation with insights into technology (building on Pedersen and Kristoffersen 2018), whilst the material science analyses aimed to define and detect the materials and identify use-wear. To avoid destructive sampling, all

Figure 1. The Jorenkjøl brooch found at the farm Skretting, (a) front and (b) back (S6970). Length 13.7 cm. Photo: Annette G. Øvrelid, Museum of Archaeology, University of Stavanger.

analyses were conducted on the surface, which of course creates uncertainties. The analytical method was sufficient to achieve our aims, which were not dependant on the identification of exact alloys or mixtures, but rather to establish a deeper understanding of the raw material use and the objects life story than can be achieved from observation alone. Moreover, our aims included stimulating reflections through the meeting of our different ways of approaching the object.

The first materials science-orientated method applied was visual magnification using a stereo microscope (a Nikon SMZ® with a magnification up to 315x). Photographs were taken by a mounted camera, with a scale. Observations were noted schematically on a picture with the artefact as background. While it is rather straight forward to differentiate between a worn item and one hardly used, it is more complicated to distinguish between past use, post-depositional events and marks added and removed during conservation (Sych et al. 2020). Therefore, conclusions must be drawn with caution, whilst bearing in mind that the brooch was an accidental discovery at the edge of a ploughed field some 80 years ago. However, in Petersen's report, we have a photograph of the brooch front prior to cleaning, and a precise description of how the brooch was cleaned after it arrived at the museum. According to Petersen, the brooch was placed in water and oxidation was carefully removed with a brush. Following this procedure, the gilding on the brooch was revealed (Petersen 1945, 7).

To identify the chemical composition of materials, a portable XRF (p-XRF) was used (a Bruker Tracer 5g, 4W power, 50kV Rhodium target X-ray source and a large area SDD detector with graphene window). Qualitative identification, composition comparisons, and semi-quantitative analyses were conducted using parameters optimized for the detection of heavy chemical elements (50kV voltage, 28μA current and measurement time of 30 seconds). For conducting the measurements and processing the gathered data, Artax software from Bruker was employed. Five spots were targeted, three on the front, and two on the back of the brooch (Figure 2).

A late Migration-period brooch

The p-XRF analysis confirmed our visual observations: The brooch is cast in silver (Ag) and covered by a thick and well-preserved layer of gilding (Figure 2, spots 2 and 3 and the micrograph). Therefore, it is the result of a complicated crafting process with several operations, the mercury gilding being among the last stages (Pedersen 2015; Pedersen and Kristoffersen 2018). For the gilding,

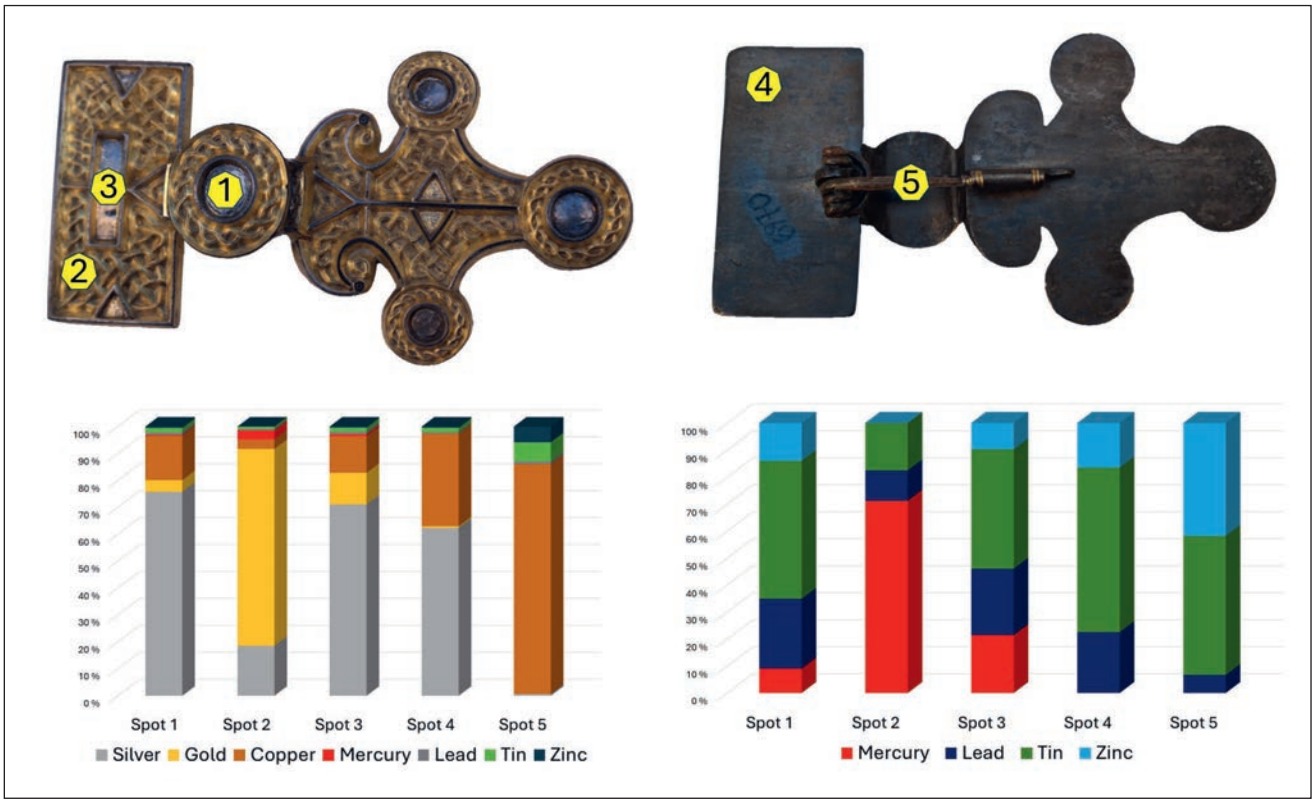

Figure 2. Results from the p-XRF analyses at five selected spots on S6970 along with a micrograph of the gilded surface displayed on the top right (Kidane 2022).

a mixture consisting of gold (Au) and mercury (Hg) was applied to the surface (Figure 2, spots 2 and 3) before the brooch was heated up to ca. 250–350°C (Anheuser 1997). This process causes the mercury to evaporate and effectively binds the gold to the surface, giving the illusion of a brooch made of gold (unless its back is exposed). Microscopy demonstrated that the gilding is evenly applied, which suggests that it was made by experienced hands. In sum, the material analysis identified the many resources used in the crafting process, including silver, gold, mercury and copper alloy (Figure 2, spot 1–5). Based on previous studies of various sites in Scandinavia, clay, wax, wood and charcoal can be added to the list of resources used during the making process (Pedersen and Kristoffersen 2018 with references). There is no doubt that the brooch represents the work of a team of artisans (Pedersen 2015, 43), masters of their craft, making a *Prachtfibel*.

Interlaced patterns and remnants of animal motifs

All ornamental details are cast with the brooch, as pointed out by Petersen (1945, 9), and are accordingly the results of the working of a prior model or mould (Axboe 1984; Pedersen and Kristoffersen 2018). The elevated gilded relief of the ornamentation (Figure 1a) underlines its high quality and the skill of those involved. An interlaced pattern covers the surface, while the animal motifs typical of most relief brooches are absent except for two small animal figures. Their protruding profile heads are located under the bow, with limbs in the connecting panels on the footplate (Figure 1a). The headplate, bow, footplate and panels are framed by sturdy bars in high relief, some of which have a furrow inlaid with niello. This dark sulphur-paste makes a striking contrast to the shiny gold and is equally well applied, further underlining the expertise of the artisans.

The rectangular headplate is divided in two parts by a short, vertical bar in sharp relief, a rectangular central panel, and a triangular panel towards the bow. The rectangular panel has a shiny silver surface without ornament or gilding (Figure 1a). Two additional triangular panels along the framing bar at each side of the headplate have a similar polished surface, but with traces of gilding (Hanna 2022). The aforementioned triangular panel towards the bow features a small ornamental detail in relief, a "Byzantian knot" according to Petersen (1945, 7). A decorative bow disc framed by the solid bar has been cast as a part of the bow, which is typical of the later relief brooches. Here, a two-strand interlace encircles a central circular panel with a silvery polished surface, but with traces of gilding along the edge. A ribbon-loop is

decorating the bow itself, towards the headplate. The panel towards the footplate is slightly smaller due to the modern repair.

On the footplate, in the extension of the bow, there is a triangular panel, identical to the one on the lower part of the headplate. Below the bow are the two previously mentioned animal/birds heads, recognizable by the pronounced eye with inlaid niello and a long muzzle or beak. Discernible in the panel next to the eye motifs are a foot, a looped shaped thigh, a body line and a second loop, probably representing the hind foot. All these elements are unpretentiously shaped. From the above-mentioned triangular panel runs a bar, dividing the footplate. The footplate is decorated with interlaced ornaments similar to the one on the headplate, surrounding two triangular, gilded panels in the centre. Circular panels, similar to but smaller than the panel on the bow, are located in the terminals of the side- and end-lobes. Their two-strand interlace lacks the furrow at the top of the ridges, unlike all other interlaces on the brooch.

A significant reorientation: from ornament to metal

The brooch is well proportioned, with a distinct shape. Despite their simplicity, the ornamentation stands out, rendering a complex impression. The visible qualities of a relief brooch are present in its size, the relief, the gilding, and the intricacy of the ornaments. The more invisible features, such as the tiny animal motifs, are however no longer a prominent feature, they merely persist in a more subdued form within the brooch's design. Throughout the Migration Period, relief brooches are the main medium of the animal style, and the absence of such motifs is significant.

Our aim of selecting the panels without ornaments for XRF-analysis was to investigate whether they could have contained inlays. Petersen, probably inspired by relief brooches with inlays of glass, gemstones and/or gold foils with filigree (e.g. Sjøvold 1993, pl. 6, N34), assumed that these characteristic features had been filled with enamel or niello (Petersen 1945, 10). However, this was not the case; there are no traces of inlays of any kind (Figure 2, spots 1 and 3). The four triangles are gilded, like the rest of the front, but the four circles or the main rectangle on the headplate were not gilded. Here the silver is left visible, with a shiny polished appearance, suggesting that there had been no intention to insert inlays. Clearly then, the purpose was to render these panels with mirror-like surfaces, in particular the circular and rectangular ones. By leaving the silver exposed and uncovered, it makes a striking visual effect and a marked contrast between these mirror-like panels and the gilt interlacing. The contrast is reinforced by the bars inlaid with dark niello. Compared to other relief brooches, it is unusual and therefore noteworthy that the silver is exposed and accentuated. Artisans behind other high-quality brooches have made efforts to extensively gild the pieces, and in doing so, concealing the nature of the cast metal under.

Our observations suggest a significant shift—from animal iconography to an emphasis on the metal itself. This is further supported by observing the back of the brooch, where there is deliberate gilding on both ends of the catch-plate. This is decorated by a pair of gilded grooves which highlight the visual differences between the two metals (Figure 1b). Marit Green (2021) has, with reference to Ingmar Janson (1985), demonstrated a similar development in the Viking-period oval brooches. She argues that the importance of the ornamentation diminished, whilst greater emphasis was placed on the quality of precious metals (Green 2021, 55–6). Likewise, the artisans behind the Jorenkjøl brooch have accentuated metals (and interlaces) at the expense of animal motifs. They showcased the striking and contrasting visual effects of gold, silver and niello. Marie Amundsen (2020) demonstrates how Migration-period artisans deliberatively activated the properties and capacities of gold. Unlike on other relief brooches, the artisans have also highlighted the properties and capacities of silver on the Jorenkjøl brooch.

This reorientation in design and emphasis might be seen as a shift from a metaphorical way of thinking with animals, where various levels of meaning are acknowledged (Kristoffersen 1995), towards a more direct expression. The Jorenkjøl brooch readily displays the technological reality behind the gilding; an object cast in silver. It is what it is, and is not guised as anything else. Although not wholly abandoning the visual effects of the overlaying gold, the artisan revealed the silver underneath and made it stand out in the gilded surface using the gold to accentuate the silver. Similarly, the reorientation away from metaphorical expression might also be apparent in the symmetrical appearance of the brooch. Notably, the brooch displays symmetry both in its outward facing features—such as shape and structure, emphasised by the panels of exposed silver—and in the intricate, concealed details of its patterns. This is in contrast to other brooches, also late examples, where details in the animal figures break with the otherwise symmetrical appearance (Kristoffersen 1995).

On the reverse, the most remarkable feature is the well-preserved pin setting, with a curved catch-plate that

keeps the pin in a stable position (Figure 1b). As Petersen (1945) noted, its conditions is such that the brooch could be used as intended today. This may suggest that the brooch was in an undisturbed context until shortly before it was found, as objects in the plough layer often have damage from modern farming. As on most relief brooches within the modern borders of Norway, the lug for securing the spring axis and the pin are of the single type, located on the headplate just above the bow. Such a perfectly preserved pin setting is a rare occurrence. This is partly explained by the pin being made of copper alloy (Figure 2, spot 5) rather than the more commonly used iron, which is more vulnerable to decay. Considering the unusual use of materials in the brooch, this may be another highly deliberate choice.

Bars and no borders

The shift in emphasis from animal motifs to the materiality of the metal itself is also reflected in the absence of the figurative borders framing the head plate—a feature commonly found on Norwegian relief brooches, at least from the mid-5th century onwards (e.g. Sjøvold 1993, plates, apart from pl. 11–13). Such borders often include animal motifs. Instead, the headplate of the Jorenkjøl brooch is framed by a distinct raised bar (Figure 1a). Such bars even frame all the circular panels, at the bow and terminals of the footplate, and all other edges of the footplate. The bars delimit the brooch and its ornamentation, resulting in a rigid appearance which is further strengthened by raised bars framing all the geometric panels. The raised bars also establish a central line from the top of the headplate, which is repeated at the footplate. In addition, the brooch is entirely solid and massive, in contrast to the open-worked elements of many specimens with figurative borders (e.g. Sjøvold 1993, pl. 6, 7 and 20).

A development from brooches with figurative borders to those framed by a bar can also be recognized in the smaller type of relief brooch, Oluf Rygh's (1885) figure 256, where it is clear that this represents a chronological development, where the ones with bars are the later type (Kristoffersen 1999, 106–9). Of note here is that the later specimens have a simpler execution when it comes to ornamentation, often exhibiting misunderstandings of motifs and barely recognizable animal iconography, and in some cases, also in shape.

Interestingly, bars instead of framing figurative borders are also found in some of the earliest relief brooches of the early 5th century, such as the brooch from Nordheim, Vestfold (Sjøvold 1993, pl. 1, N8), before figurative borders were developed, suggesting that artisans of the 6th century might have been drawing upon knowledge established in the early stages of the technology. Another element on the Jorenkjøl brooch with links to long-lived ideas of how a relief brooch should appear, are the two small animals which still linger in the correct position under the bow. Although simple, the traditional execution indicates some connection to Style I.

Essential information on the manufacture of a brooch is hidden on its reverse (Pedersen 2015, 2021; Pedersen and Kristoffersen 2018 with references), and in this case may point towards the distinct way of executing the casting. The Jorenkjøl brooch seems to be produced in a way that differs from many others; its back is completely flat, apart from a small, raised area on the headplate where the pin lug is fastened (Figure 1b). Accordingly, it lacks the depressions or grooves found on many contemporary relief brooches, typically beneath raised ornaments on the front (Pedersen and Kristoffersen 2018, fig. 2, Pedersen and Kristoffersen forthcoming). However, a flat back also characterises other late brooches with bow discs, such as the one from Gjemmestad (Sjøvold 1993, pl. 12, N53), which belongs to a group of brooches spread over a wide area in Scandinavia, including the broch from Eikeland (Sjøvold 1993, pl. 13, N30; our Figure 5). The fuller understanding of what the flat back entails, and whether it represents a distinct workshop tradition that could potentially be pinned down in time, is a question for upcoming studies (Pedersen and Kristoffersen forthcoming).

Testimony of the reverse: a well-used brooch

Hints of the brooch's life story are also to be found on the back. Observations using a microscope suggested that it was not new and fresh from the artisans' hand when it was deposited, as the well-preserved front might indicate. There are hardly any traces of wear on the front, the only indications of wear are the rounded edges on the protuberant parts and dulling of the metal on the four corners of the headplate (Figure 1a). Conversely, the reverse has numerous marks in the form of striations, dulling, and some damage including small nicks and chips along the edges (Figure 3). Bearing in mind the careful cleaning of the brooch, these traces of wear further negate the possibility that the mirror-like panels on the front are unfinished elements. The use-wear suggest that the brooch has been worn on a garment for quite some time, in the appearance that we still see today. This interpretation is supported by observations under microscope of two modern replicas of bronze cruciform brooches that have been worn for more than 10 years on wool garments by the staff at the Museum of Archaeology. Visible rounded

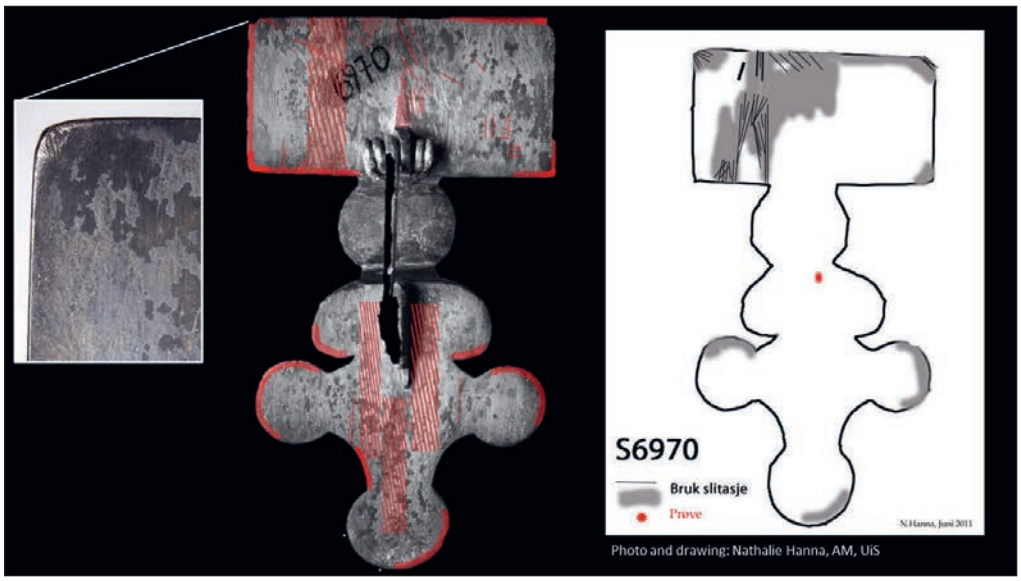

Figure 3. Markings on the reverse on Jorenkjøl. Photo: Nathalie Hanna, Museum of Archaeology, University of Stavanger.

edges were observed on the replicas' feet, along the lower part of their inner side, continuing along the terminal end on both brooches (Hanna 2022). The located trace-wear on the replicas corresponds to their actual positioning on the Jorenkjøl brooch. Moreover, for the replicas, we know exactly how they have been worn; vertically with the headplate in the upper position. Although this is not a well-defined experimental study, it provided us with insight into how a similar brooch attached to a wool garment gets worn, which in turn informed our discussions of the Migration-period brooch.

Use-wear, such as rounded edges and dulled metal, was mainly detected on the headplate and on the protruding parts of the Jorenkjøl brooch (Figure 3), such as the edges of the profile heads and the terminals in the side- and end-lobes (Hanna 2011, 2022). When combined with the insight from the replicas, the use-wear indicates that the brooch was diagonally worn, with the headplate upwards. These observations, furthermore, suggest that the most significant wear-marks are located at the edges to the right-hand side (when seen from the back, Figure 3), indicating a preferred position on the right side of the garment. Considering that the brooch is rather heavy, we find it likely that friction would increase and more easily leave such wear-marks. The limited amount of wear and tear on the front suggest that it was rarely exposed to friction here, therefore it was worn atop of the clothing.

The detected wear and tear seem to correspond to that found on other brooches. The copper-alloy relief brooch from Syre, which is undoubtedly from a hoard, is of a similar form and size (Figure 4). The brooch has distinct use-wear on both lower corners of the headplate, especially on the left side and on the left side lobe (when seen from the back), as well as the end lobe (Hanna 2011). Like Jorenkjøl, it must have been worn on a garment for some time (Kristoffersen and Pedersen 2023). Although a record of the exact position of such brooches in graves is uncommon, the use-wear on the Syre and Jorenkjøl brooches corresponds to the placement of such brooches in graves where it is known (Kristoffersen 2000, 376–86; Vedeler et al. 2018). This attests that the relief brooches were worn in a diagonal or horizontal position under the neck, in most cases with the headplate turned upwards or to the side, towards the right or left. Relief brooches often occur in addition to at least three other brooches: a pair and a third brooch, and analysis of preserved textiles in the Sande grave indicates that the relief brooch was fastened on a garment worn over the dress, probably some kind of cloak (Vedeler et al. 2018).

The positioning of Anglo-Saxon square-headed brooches corroborates the diagonal position close to the neck, in the several cases where skeletal remains and the position on the deceased are knowns (Hines 1997, 282–92). However, in this context, they are often found with the headplate pointing downwards. Hines (1997, 293) found that the amount of wear and repair indicates that these brooches were intensively used. Nineteen brooches in his corpus "show signs of repair in antiquity, while several more were fairly certainly used in a broken state to judge by the abrasion of broken edges." No significant variation in the amount of wear on brooches from phase to phase was detectable.

The visual inspection of the pin on the Jorenkjøl brooch suggests that it is forged by hammering. A slightly bent or bowed pin might have been expected considering the brooches weight and extensive use. The stress on the pin might, however, have been reduced by having the brooch additionally fixed or sewn to the garment with

Figure 4. The relief brooch from Syre, Rogaland (S9269). Length 13.1cm. Photo: Annette G. Øvrelid, Museum of Archaeology, University of Stavanger.

Figure 5. The relief brooch from Eikeland, Rogaland (S9181). Length 7.9cm. Photo: Annette G. Øvrelid, Museum of Archaeology, University of Stavanger.

textile or leather (Hines 1997, 293). Relief brooches from Bayern, Germany are known to have been encased and fastened by way of textile and leather covering the brooch (Bartel and Knöchlein 1993; Gutsmiedl-Schümann 2015, 464–65 with references). The headplate of a brooch from München-Perlach was encased in leather which was covered by colourful linen textile, and another brooch was edged by a tablet woven band. Brooches from Waging were fastened by way of ingenious leather- and textile straps (e.g. Bartel and Knöchlein 1993, fig. 17). However, in the case of Jorenkjøl there are no indications on the brooch front to point to such devices.

Local or foreign?

The hidden traces of gilding on the reverse side may connect the Jorenkjøl brooch to a local tradition in Rogaland in the first half of the 6th century. This feature is quite common in the area, found on the relief brooches from Syre, Eikeland, and Hovland (Sjøvold 1993, pl. 5, N35), and the practice also extends to other artefact groups, such as the clasps from Syre (Kristoffersen and Pedersen 2023, fig. 3) and the brooch from Torland (S440), which is shaped like the type R256, but unusually large. The completely flat reverse, on the other hand, sets Jorenkjøl apart from other local brooches with groves on their back, including those from Hovland and Torland, while the flat back is shared with the Eikeland and Syre brooches. The Eikeland brooch, well known for its runic inscription (Liestøl 1965; Knirk 2015, 427–32; Kristoffersen 2015b, 433–39; Figure 5), is nearly identical with Jorenkjøl in shape and proportions. It does, however, differ in its smaller size (a length of merely 7.9cm), by being made of copper-alloy, and in lacking the mirror-like panels. Additionally, Eikeland is decorated with animal iconography, although this is of the above-mentioned decreased quality. Found with the headplate downwards on the chest of the buried body between two small, equal-armed brooches, the Eikeland brooch differs from Jorenkjøl in the way it was worn on the garment, in that, unlike other relief brooches in the Norwegian corpus, it might well have been used as a "third brooch" (Kristoffersen 2015b, 434–35). It belongs to a small group with similar specimens from eastern and middle Norway and Sweden (Sjøvold 1988; Sjøvold 1993, pl. 13, S18 and recent metal detector finds, see Kristoffersen et al. forthcoming), which suggests it might not be a local object. Could this be the case for Jorenkjøl as well? Thorleif Sjøvold (1988, 214, figs. 1–3) relates the Jorenkjøl brooch to a larger group, comprising nine brooches

from a wide area in Scandinavia, from Troms to Scania, which includes the Eikeland example. However, because of Jorenkjøl's divided foot, he does not fully incorporate it into the group.

In summary, we have seen that distinct bars framed the Jorenkjøl brooch, while figurative borders, like the ones on Syre and most relief brooches from Norway, are lacking. We have seen that this is also the case with other late Migration-period brooches with discs on the bow from across Scandinavia – as well as with some of the earliest relief brooches. That the distinct bar is a late development is supported by the forementioned smaller brooch type, R256.

As described above, Jorenkjøl's traditional position on the garment is supported by the identified traces of wear. This is also the case with the brooch from Syre, with the characteristic late disc on the bow form, like Jorenkjøl. It is, however, distinguished by its high-quality animal iconography as well as its figurative borders. Its ornamentation suggests a link to the relief brooches from Sogn (Sjøvold 1993, pl. 15), however the completely flat reverse does not connect it with this group. These kinds of complex relationships are often found in the Norwegian corpus of relief brooches. The complexity is an indication of how the artisans' individuality and ideas are mixed up with influences from other artisans or their products. It is a mix of creative innovations, copied features *and* references to enduring local traditions (cf. Pedersen and Kristoffersen 2018; Kristoffersen and Pedersen 2020; Granbo 2024), and thus represents a convergence of knowledge across the regions in which the artisans operated.

Our investigation has uncovered lively activity among and between artisans in this terminal phase of the Migration Period, with creative innovations and reorientations, copied features, *and* references to long-lived local traditions. In a lecture in 1925, Haakon Shetelig expressed his thoughts on the latest development of Style I. Being unable to detect any general decline in artisanship, he argued that Style I disappeared when the quality was at its peak: "As with the transition from the Migration-period style to the early Vendel style, I believe that first-class items were continually created, and that it is precisely these works that convey the progression from one style to the other. We also have reliable examples showing that a single artist can work individually and distinctively, outside the main lines of the style's development" (Shetelig 1926, 109, our translation). The fact that, at least in some areas, the animal ornaments maintain their quality is contested by the late brooches from Sogn, whose surface and elaborate borders are crawling with well executed animals, such as the magnificent brooch from Sandal (Sjøvold 1993, pl. 15, N57). The Jorenkjøl brooch clearly suggest that a change is taking place, or that one artisan is experimenting with a new expression, one where animals end up in the margins and all ornaments are delimited by stricter borders, while shiny metals stand out. With regards to the animal iconography, other brooches do show a decline in quality, while the skills in making a gilt brooch with niello inlays, and, in Jorenkjøls case, the dexterity in shaping interlaces, are maintained. The rather confusing pattern of similarities and differences across Jorenkjøl, Eikeland, and Syre, supports Shetelig's thoughts on a high degree of complexity in this change, an intricacy we will continue to explore.

Towards a conclusion: Combining observations and experiences

Gathering the results from our interdisciplinary study, we can see that the Jorenkjøl brooch can be confidently described as a frequently used *Prachtfibel,* made by skilled craftspeople with artistic talent and access to high quality raw materials. It is well-proportioned, and the high relief ornamentation gives an impression of complexity, despite their simplicity. Gilding covers the surface, allowing the light to play, while the dark niello and the shiny silver panels create striking contrasts and reveals the brooch as an object of silver. In other words, the visible qualities of a relief brooch are preserved, in its size, the relief, the gilded expression, and the intricacy of the ornaments. However, the animal motifs have become more subtle to the point that they are almost gone.

As relief brooches are the main media of the animal style, their absence is important. Likewise, the distinct, new use of raw material appears significant. Silver brooches are rare among the later examples, and this one has a considerable amount of silver, with the metal so clearly exposed in the mirrorlike panels. We have interpreted this as a reorientation, indicating that the animal iconography is about to lose its meaning, and a preference for the metals and their qualities is taking over, in this terminal phase of the Migration Period. This is a time when precious metal is laid down in hoards in the form of large silver brooches or objects made of gold, suggesting that the reorientation reflects ongoing changes in the thought-world.

Although we now know that the late Migration-period brooches were used and worn, it is still such brooches, like Syre and potentially Jorenkjøl, that are found in hoard contexts, underlining the importance of these transformable metals in Migration-period society.

The aesthetic qualities of the Jorenkjøl brooch are no longer dominated by the gilded, chaotic entangled masses of animal iconography, representing a metaphorical way of thinking. They are replaced by a calmer, more direct expression of geometric shapes of contrasting colours and materials, an expression, we argue, that may follow on into the Early Merovingian Period. We have, in a previous publication, stated that the animal iconography in Style I seems to disappear from its old core areas in south-west Norway at the end of the Migration Period, and does not develop into Style II (Kristoffersen and Pedersen 2024). It takes some hundred years before a new craft tradition with iconography featuring animal motifs emerges to regain its prominence in the expression of the elite identity along the southern North Sea coast. In contrast to the major changes in the material record more generally, Ingunn M. Røstad (2018) has emphasised a continuity in development from relief brooches to disc-on-bow brooches, of which the earliest specimens, such as the little brooch from Gjukastein, Voss, Vestland (B664), does seem to share some likeness to our brooch. The only animal figures on the little disc-on bow brooch, the two animal/birds' heads protruding below the bow, are nearly identical to the ones from Jorenkjøl. The connection between these brooches, close in time and perhaps even contemporary, is emphasised by the aesthetics of the Gjukastein brooch, being created by geometric shapes of contrasting colours and materials, however in a typical Merovingian style of gold and inlayed red garnets. Consequently, the material reorientation observed in the Jorenkjøl brooch—from a metaphorical way of thinking to a more direct expression—formed part of a larger trend linked to ongoing and complex changes.

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Manufacturing and secondary treatment of gold foil figures

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Alexandra Pesch 2025. **Manufacturing and secondary treatment of gold foil figures.** *AmS-Skrifter 29,* 51–59, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

Gold foil figures form a fairly standardised class of archaeological finds in the Vendel or Merovingian Periods. Their overall production process appears to be fundamentally simple. Nevertheless, there still are many unanswered questions regarding the technique and the timing of the various work steps. This article sheds light on the options during and manipulations after fabrication, focussing on discernable alterations to already finished gold foil figures, such as the attachment of additional gold strips that apparently were intended to represent neck rings. Actions like this either belong to the usual and proper usage of gold foil figures in the context of the related cult, or they are evidence of later adaptations of individual gold foil figures, possibly for other religious or even secular practices. Other pieces show various signs of damage, such as scratches or puncture marks, some of which appear to have been inflicted deliberately. However, as this kind of manipulation cannot clearly be assigned to a specific time, considerations about their purpose remain problematic.

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Introduction

The charming golden foils with embossed human figures are a truly fascinating class of finds from the first millennium AD. They were called *guldgubbar* by Swedish fishermen, who noticed them in the 18th century (Lamm 2004, 60). Since then, similar finds have come to light at many Scandinavian sites – and in today's Scandinavia only. The old term *guldgubbar* (cf. Dan./Norw. *gubber*), meaning "golden old men", is still in use today; but the English wording "gold foil figures" seems more appropriate, as a large part of them are depictions of women, while others feature a couple of woman and man. Frequently, however, the gender is not clearly recognisable. In rare cases, so far only from Bornholm, animal figures are depicted.

Much ink has been spilled on these tiny objects. Numerous publications by renowned scholars (especially Watt 1992, 2004, 2007, 2019; Lamm 2004; see also Hauck 1998; Pesch and Helmbrecht 2019; Rundkvist 2023) have addressed various facets of the topic, such as the pictorial representations, the places where they were found, or the general significance of the objects. Without delving deeper into the problems of the concrete semantic, religious, and social meanings of the gold foil figures, it can be argued that they basically served to visualise and circulate specific ideas, traditions, and philosophies: they were means to conduct cultural and religious rituals and to communicate with the gods or other supernatural beings (Helmbrecht 2011, 270–72, 2013, 12; Pesch and Helmbrecht 2019, 440–41; Sundqvist 2019; Watt 1992, 224).

Among other things, issues relating to the production technologies of the tiny foils were addressed in scholarly writing, but there still are unanswered questions. In this article, I will shortly summarise the current state of research concerning the manufacturing of gold foil figures and present some thoughts on secondary treatments: what actually belongs to the primary production sequence of gold foil figures, and which later manipulations can we find?

The making of gold foil figures

It is striking that gold foil figures rarely occur as single finds in the archaeological record. At sites where their

exact find locations are known, they always seem to occur in larger, sometimes even huge quantities. This leads to the conclusion that gold foil figures usually were produced and used in large numbers. For central places like Sorte Muld, where to date more than 2600 gold foil figures have been found, it is reasonable to assume a kind of mass production (cf. Pesch and Helmbrecht 2019, 430–31). And despite the variety of postures and gestures (Watt 2004, 204–9, 2007, 2019, 44–47), costumes (Mannering 2017; Mannering and Strand 2008), and attributes (Watt 1992, 208, 2004, 209–14) that are depicted, the gold foil figures remain a relatively standardised group. Basically, there are only three motifs: 1. a single female, male, or sexually indeterminable figure, 2. an anthropomorphic couple, or 3. a zoomorphic figure. Other motifs, such as buildings, ships, plants, or landscapes will be searched in vain. In shape, the majority of the figures are rectangular – they are never, for example, triangular or roundish.

But there are different manufacturing types of gold foil figures (for the definition, see Watt 2019, 36–37). The "classic" types, to which belong the majority of finds, were made from wafer-thin gold foil that was stamped with dies, i.e. patrices with positive relief. Additionally, there are examples where the outlines of the figures were cut out directly of gold foil. Sometimes even plastic figurines are referred to as gold foil figures, due to their miniature size and their spatial association with gold foil figures. Thus, "gold foil figures" were not all produced in the same manner.

In fact, the actual production of a large part of the gold foil figures essentially can be reconstructed quite well. Researchers have dealt with this before, most notably Margrethe Watt, who has followed each and every track in the world of gold foil figures (e.g. Watt 1999), and Jan Peder Lamm (2004, 109–12). All that is needed is a piece of gold sheet and a die; then the sheet is pressed on the die or vice versa. After that, the embossed part is cut out of the sheet, and the gold foil figure is complete.

This may sound very straightforward, but right from the beginning, there are a lot of difficulties and possible alternatives in the processing (cf. Figure 1). To start with, the manufacturing of sheet metal is not easy at all. In the Vendel Period, no devices were known to roll out gold into thin sheets; instead, gold had to be hammered out in order to create wafer-thin foils (see Armbruster 2012). This is a time-consuming and exhausting process that also requires the material to be heated frequently, or it becomes brittle and cracks (Gullman in Lamm 2004, 113); this task needs a lot of experience and skill (Armbruster 2012; Pesch 2015, 515–19). And, first of all, the

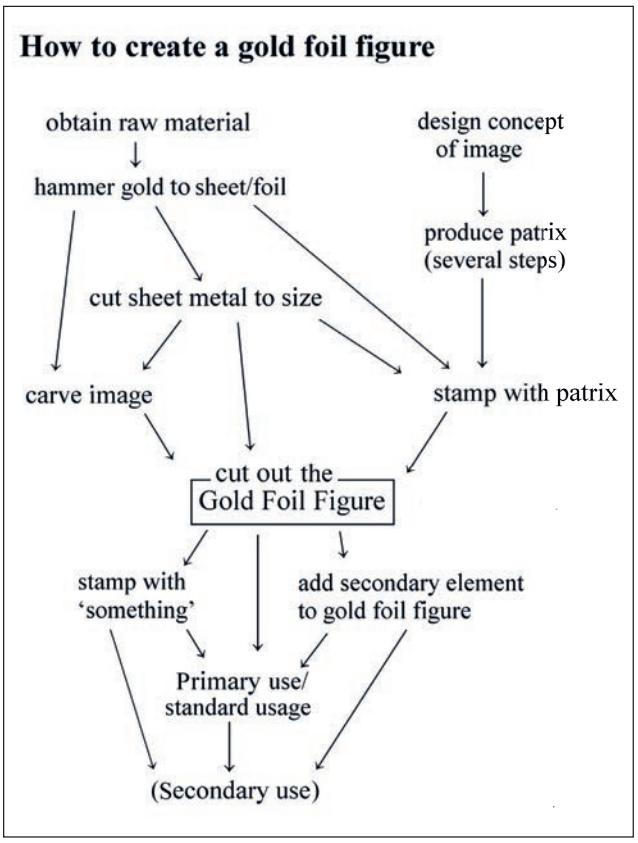

Figure 1. The steps and options of making a gold foil figure. Diagram: Alexandra Pesch.

raw material is needed. In the Vendel Period, gold was relatively rare – in contrast to the earlier Migration Period, the "golden age", where Roman *solidi* coins were available in abundance and served as source for gold. The shortage that began in the middle of the 6th century could be a consequence of the "Late Antique Little Ice Age" (Büntgen et al. 2016), the climatic catastrophe that began in AD 536 and covered the Northern hemisphere with a long-lasting veil of dust. This destroyed the harvests and led to hunger, armed conflicts, and major changes in the way of life in the North (Axboe 2001; Gräslund and Price 2012; Høilund Nielsen 2015), which also cut off the inflow of Roman goods. People began looking for new ways to communicate with the gods, and so, probably at the end of the 6th century, the gold foil figures were invented (Pesch and Helmbrecht 2019, 443–45, 2024). Thanks to the extreme thinness of the foils, the gold could be used sparingly for their production (Watt 2004, 216). In purely mathematical terms, around 100 gold foil figures could be produced from a humble gold ring (wedding ring) (Gullman in Lamm 2004, 113) – or put another way, from one roman *solidus* with an average weight of 4.5g dozens of specimens could be fabricated.

Returning to the problems of manufacturing, the process of stamping is not easy either. First and foremost,

a die is required. Using dies makes it possible to produce whole series of figures featuring exactly the same motifs. Several series of such die-identical specimens are known, either from the same site or from different places (see e.g. Eketorp hoard: Lamm 2004, 65–66; Pesch and Helmbrecht 2019, 24–25; Uppåkra series: Watt 2004, 179). In most cases, the dies are lost, but they can be reconstructed based on the gold foil figures that were made with them. In 2019, Margrethe Watt identified a total number of 725 different dies (Watt 2019, 39); and in recent years a growing quantity of genuine dies for gold foil figures have come to light, often discovered by metal detectorists, but also found in regular excavations (Watt 1999, 2019, 39–40, 47–48). They are made from copper alloys and come in different shapes. Usually, they are metal blocks that show the motif on the top, always in positive relief (= patrices). Due to their small size, they are difficult to handle, but it is possible that originally, they were set in a holder or some sort of lining; in any way, thin pads of leather or fabric were required while stamping to prevent damage to the gold foil. The dies from Järrestad in Scania, Sweden and Vester Egersborg in Sjælland, Denmark feature long handles on the face bearing their images (Lamm 2004, 105; Watt 2019, 58). Strangely enough, some of the known "dies" are actually too large to be used as stamps for tiny gold foil figures (see e.g. Watt 2019, 57, fig. F); whether these are objects of a different purpose, despite their clearly gold foil figure-like images, is a matter of debate.

Up to this point in the proceedings, the production of classic gold foil figures with dies may sound like a more or less formalised and standardised procedure. But this is not really the case, because every piece was processed manually. The figures were cut out individually, usually in simple square shapes. Figures from the same die can be cut in different ways, however (cf. Watt 2004, 179, fig. 11). Often the cut followed a framing that was already laid out in the die (concerning framing, see Behr 2019). Many figures were even completely freed from the background sheet and cut out, following all body contours; many examples for the latter come from Sorte Muld, Bornholm, for example, but also from several other places (see e.g. Lamm 2004, 100–1; Watt 2004, 180–84, 2008, 51).

Additionally, there are figures that were not die-stamped, but simply cut out of the gold foil in outline. Less frequently, figures occur that have been scratched into rectangular gold foils, while others have been both scratched and cut out. And, as a final variant, there are figures that were cut out first and then stamped – not with the usual dies, but using unusual means, including apparently the face of a Roman figurine (see Watt 2019, 55, fig. 1A, 65, fig. 20). It is impossible to tell whether the stamping was performed before or after the cutting, as both ways are feasible. Partly, the procedure depends on the shape of the die: if it is a small block die, the handling seems to be easier if the die is repeatedly pressed on a large gold sheet rather than on a tiny rectangle of foil; but if the die has a handle, it appears more likely that it was the foil that was pressed on the die – and in this case, small pieces would work better. But this is merely hypothetical.

All in all, production techniques were diverse (see Figure 1). Still, as various types of gold foil figure production (such as stamped, scratched, or cut) occur in the same places, they do not come from different production sites and do not represent local styles or traditions.

Some gold foil figures are so unique or so simple that they may have been made by untrained persons. But the majority, especially the stamped ones, were obviously produced by specialised craftsmen on a large scale. Although it is unclear whether the actual manufacturers of the figures cut them out in their entirety or whether the users (e.g. priests or cult specialists, customers, or worshippers) removed, for example, the rims of the foils, a huge amount of objects was fabricated. But it was not a mass production in a modern sense: it can be concluded that all gold foil figures were processed individually during their primary manufacturing.

Secondary features

After primary production, further activities with gold foil figures can be identified. There are indications for secondary reworking and manipulations of the tiny images as additional aspects of the manufacturing process. Furthermore, there have been deliberate destructions of gold foil figures.

A surprising feature that has been noticed before in scholarly writing are secondary neck rings: a good example is a gold foil figure from Uppåkra (Figure 2) in southern Sweden (Watt 2004, 182; cf. Back Danielsson 2013, 13). It is die-identical to other foil figures from that famous central place, but the only one in the series that is equipped with an extra gold strip. This strip is placed around its neck – obviously a secondary element in the creation of the foil figure and its imagery.

This would hardly be remarkable if it was an isolated case, but some more specimens with such secondary neck rings have been published; seven of them come from Sorte Muld (Figure 3). The secondary neck rings occur on very different types of gold foil figures, including stamped and roughly cut-out pieces, that are neither motif-like foils, in terms of elements such as gestures or clothing,

nor particularly fine-looking or otherwise outstanding specimens. Most of them have no gender-specific characteristics, but there is no clearly recognisable female figure among them. This is strange, because different types of *primary* neck rings occur on stamped gold foil figures on both men and women (cf. Pesch 2015, 523–25; Watt 2008, 48). These rings already were created in the die and are an important part of the overall imagery.

The phenomenon of secondary neck rings is also known from another group of finds: Scandinavian figurines, some of which are almost as small as gold foil figures (Helmbrecht 2011, 366–70; Zachrisson 2019). A little figurine from Gullhullet, Bornholm (Figure 4a), features a neck ring of twisted wire, wrapped twice around the neck, and seems to be something between a gold foil figure and a figurine. Further examples are the statuettes from Slipshavn, Denmark, and Kymbo, Sweden (Figure 4b; Zachrisson 2003, 2019, 107–9). The latter actually has a primary neck ring, too, which closely resembles that of a figurine that was found in Gudme, Funen (Figure 4c); but here, there is no secondary neck ring. It is possible, though, that this primary ring was meant to be some sort of basis for attaching a secondary ring. Like the majority of the gold foil figures with secondary neck rings, the figurines are naked, wearing *only* a neck ring, thus underlining the overall importance of this feature.

In real life, golden neck rings were markers of dignity and power (Capelle 1999; Lamm 1994; Watt 1999, 211–13), especially in northern Europe and long before crowns came into fashion. Thus, a practice of applying them to humanoid figures appears to have been widespread, and it seems to have been a relatively common way to treat little figures in the Migration and Vendel Periods – even despite the fact that many secondary gold rings may have been lost in the ground. But for what specific purpose were the figures equipped with neck rings? Were those rings meant to concretise the motif (in the sense of an attribute), or should they add yet another layer of meaning? Were they intended to reinforce the image's message and power? Or should they simply increase the value of the figure with their additional gold? Ornamenting the extremely tiny, fragile foils with extra strips without damaging them surely was not at all easy. Therefore, there must have been a good reason.

Figure 2. Die-identical gold foil figures from Uppåkra, Scania, Sweden, height 1.3cm. The left one is equipped with a gold strip, folded around its neck. Photo: Bengt Almgren (Lund University Historical Museum).

The performance of a secondary action involves a second time horizon – which, however, cannot be defined. Manipulations like the addition of a neck ring could have been made during the primary production process. In this case, these operations would belong to the actual manufacturing of the gold foil figures, performed by the craftspeople themselves, and related to the proper primary function of the foils, their "standard usage" – about which we, regrettably enough, do not know anything more specific. Another possibility is that they happened shortly after the production. Then, the people who obtained, maybe purchased, and used the tiny foils added the rings, as individual acts – but still within the frame of the traditions concerning the standard usage. This might have to do with the performance of special rituals in which individual gold foil figures were used, such as in an act of initialising their expected agency. As a third option, the rings could have been added later, perhaps *much* later, and then, for example, in the context of a completely different action than the standard usage. In this case, this action could be evidence of a re-use of gold foil figures.

Literature on gold foil figures refers to belts as another secondary element (Back Danielsson 2013, 12), and one of the cut-out foils from Sorte Muld (Figure 3b) indeed not only has been equipped with a neck ring, but also with a belt made of a gold strip. In my research, however, I found this one example only. With figurines, I am not aware of any examples featuring secondary belts. In contrast, belts are very common as primary decorative elements. On gold foil figures, they appear regularly, sometimes in combination with a neck ring, and frequently, they are the only feature of an otherwise nude figure. Like neck rings, belts are considered a sign of dignity, and in mythology and folk belief, they are associated with physical strength and power (Runde in Meineke et al. 1999, 176–77; Watt 1999, 213).

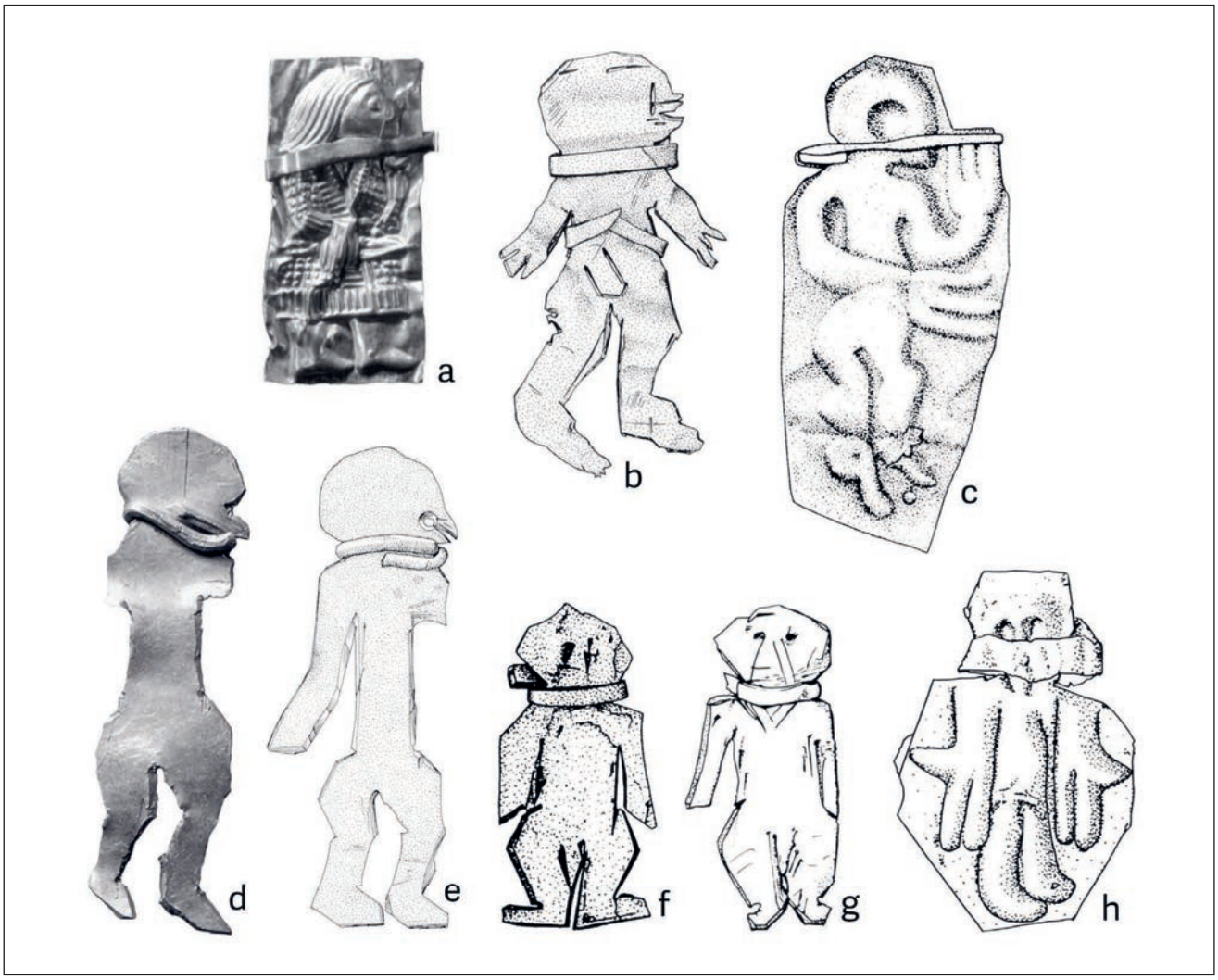

Figure 3. Eight gold foil figures with secondary golden neck rings from Uppåkra (a), Sweden, and Sorte Muld (b–h), Bornholm, Denmark; height of a 2.1cm. a–f: after Watt 1992, 2004, 2019; g and h: drawing Paula Haefs.

A third phenomenon of additions to gold foil figures mentioned in literature is a secondary *phallos*. Evidence for this, however, is even less convincing. There are gold strips from Uppåkra that are crudely shaped into humanoid figures (Watt 2004, 199–200), and one of them has been pierced with a rectangular piece of gold that protrudes on both sides (Figure 5). If this addition really was meant to represent a penis, as was tentatively suggested (Back Danielsson 2007, 121–22; Watt 2004, 199–200), it would be the only example to date; three related figures from the same site are even more doubtful. Besides, primary markers of genitals are very rare (Watt 2019, 43), so I am afraid this is leading nowhere. There is far too little evidence to assume a common or widespread custom.

The destruction of gold foil figures seems to be yet another type of secondary treatment, as many foils show scratches and dents. But were they damaged deliberately? It is extremely difficult to attribute such "injuries" to intentional actions with any certainty. Scratches and dents as well as tears and cracks can easily happen during the centuries the objects spent in the ground, simply by chance and natural courses. A certain number of the finds surely have actively been torn apart by human agency, but again, that this kind of destruction was the result of an *intended* action is hard to prove. In fact, we can only assume deliberate actions if a regularity is recognisable on different foils, a recurring pattern of scratches, perforations, or even breaks (cf. Hydman in Axboe et al. 1999, 235; Back Danielsson 2007, 124–26; see also Back Danielsson 2013). If scratches are concentrated on specific areas of the gold foil figures, such as the head or the genitals, this may serve as an indication for deliberate damage (see Watt 1992, 216, fig. 10a).

Another case that allows to think confidently of deliberate actions is when gold foil figures were rolled up (see e.g. Watt 2019, 65, fig. 18), as this cannot have happened by chance. I assume that a relatively common practice existed that belonged to the standard usage of gold foil

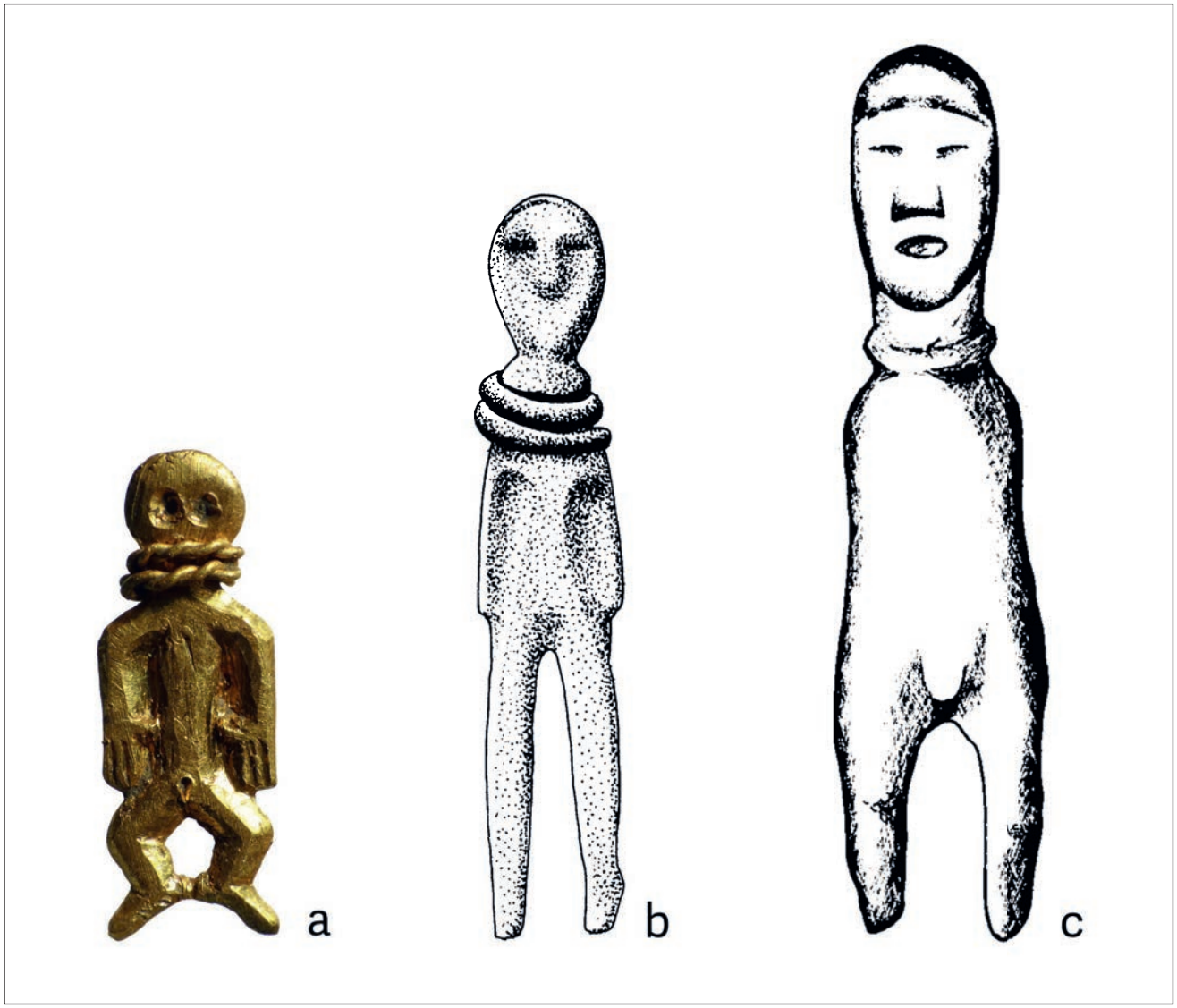

Figure 4. Figures (not to scale) from: Gullhullet, Bornholm (a), height 1.3cm, after Watt 2019, 55, fig. 1B; Kymbo, Västergötland, Sweden (b), height 3.4cm, after Capelle 1999, 459, Gudme, Funen, Denmark (c), height 6.7cm, after Hauck 1992, 555.

figures; the same applies to careful folding, which is a relatively frequent phenomenon (Watt 1992, 224). Parallels for this practice are Antique curse tablets (*tabellae defixionis*), made of lead (Brodersen and Kropp 2004). They were inscribed with curse formulas against a particular victim. The person who commissioned the curse activated its magical power by folding or rolling up the foil. Here, analogies can only be established theoretically, and the act of folding gold foil figures remains uncertain in terms of its significance.

So, what purpose did the destructions have? Did they have a specific meaning; did they carry an additional message? Was folding and rolling intended to enhance the desired effect of the images – as offerings or votives, for example? The damaging could have acted in a capacity similar to today's postmarks, which devalue and deface the beautiful postage stamps, but may also serve the actual purpose of the stamps themselves. Was folding meant to activate the figures – a practice that we know from the Antique lead curse tablets, for example? Then again, it also seems possible that destructive manipulations were directed against the gold foil figures themselves – against the images and against their overall purpose and social background. As images very specifically reflect political, religious, or cultural conditions, a destruction or manipulation can be an act of aggression against these conditions. We would have to assume that destructive actions happened outside the standard usage, probably at a later time.

And finally, destruction can also have had the purpose of taking the objects out of circulation by making them unusable for other people. In this case, the destruction

Figure 5. Gold foil figure with additional piece of gold (phallos?) from Uppåkra. Height 2.05cm, after Watt 2004, 200.

was not directed against the images and the beliefs they represent, but simply against unwanted usage by third parties.

Some more interesting cases of secondary treatment should be put on record. Some of the cut-out foils from Sorte Muld show multiple perforations or punch marks, which in one of them (Figure 3g) are concentrated mainly in the genital area. This is worth mentioning, because something similar has been observed in one of the slightly older Migration-period gold bracteates: during its conservation, numerous perforations and scratches were observed on the large B-bracteate from Söderby, Sweden (IK 538) (Axboe et al. 1999; Lamm et al. 2000). The central figure as well as the other figures of the bracteate were maltreated with stabs to the head, heart, and genital areas. The cited experts describe the damaging as a literally aggressive action, in an almost orgiastic manner, and interpret this procedure as a possible desecration ceremony, before the bracteates (and the hoard) were deposited in the earth as a sacrifice. Jan Peder Lamm even considered a ritual reminiscent of black magic (Axboe et al. 1999, 235). There were, in fact, similar practices in Antiquity: Roman magical figurines, for example, crudely made of clay, show multiple holes and other damages, especially in the head, abdomen, and genital areas (Nüsse 2011). They are interpreted in the context of harmful magic; today, the clay figurines would properly be called voodoo dolls (cf. for concepts of magic in general: Birkhan 2010; Daxelmüller 2005; Engemann 1975; Helmbrecht 2011, 41–44; Priesner 2019). So are the gold foil figures' stab wounds indications for black magic? Were they directed against someone or something the figures represent? This also depends on the question of whether the gold foil figures are ultimately images of gods (Hauck 1993; Holmqvist 1960; Lamm 1994, 117–24; Steinsland 1991) or rather representations of humans (Gustafson 1900; Pesch and Helmbrecht 2019, 438–40). In fact, it is difficult to say to what extent religious ideas or generally conducted rituals play a role here. However, the "*phallos*" from Uppåkra (Figure 5) probably should be seen in this context, too: the little figure was pierced and thus perhaps ritually killed.

Intentional destruction does not really occur regularly on a majority of the gold foil figures: manipulation and defacement of various kinds certainly exist, but remain the exception. As standard practice, it is difficult to recognise clear patterns for certain manipulations; but it seems that secondary treatment rather is evidence of individual actions of individual persons, albeit within the framework of generally known options of handling during the standard usage process. Thus, I assume that destructions do not reflect the aggressive rejection of the overall religion associated with the gold foil figures; instead, they may be expressions of special care or perhaps indication of magical beliefs. But still, the majority of the finds does not show deliberate scratches or perforations, they are not folded or torn, and they are not decorated with secondary elements.

Conclusion

In the making of gold foil figures, various levels of manufacturing, shaping, and further processing can be identified. There is evidence of manipulations probably meant to upgrade the foils, but also deliberate destruction to the tiny images. In this, it seems indicated that different time horizons are involved, but primary and secondary treatments cannot be distinguished easily in terms of time.

Perhaps systematic examinations, e.g. with 3D photomicroscopes, could provide further insights into the tools used, the techniques, and perhaps even the chronology of the changes. But for the time being, it remains problematic to try to assign image manipulations to a specific religious or political milieu, as the destruction of images is a widespread phenomenon throughout the ages, caused by many different reasons. Keeping this in mind, no conclusive statements can be made about the concrete religious or political backgrounds of the secondary treatments, and the interpretation of such actions remains hypothetical, too.

The majority of gold foil figures, however, obviously entered the soil intact: the images were used exactly as they were produced. Being as fragile and delicate as gold foil figures are, they certainly were not meant to be used more than once. In the end, they were disposable products, not made for sustained usage.

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Iron-cased cloisonné brooches from the Early Medieval cemetery of Harmignies, Prov. Hainaut, Belgium: some aspects of production

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In this article, *the Mero-Jewel project* (BRAIN-be 2.0) presents its first production-focused research results regarding iron-cased cloisonné brooches from the Merovingian cemetery of Harmignies. The aim is to elucidate technical aspects of production to possibly differentiate artisanal tendencies or shared knowledge, which helps identify the network of production and exchange in which these objects circulated. To this effect, the composition of these brooches is discussed, and key observations are made regarding techniques, material composition and decoration. While specific workshops remain undefined, the article discusses future avenues of research while considering the large amount of data retrieved from this relatively small, yet representative sample.

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Key words: Early Medieval, cloisonné jewellery, production, Mero-Jewel, Harmignies, cross-craft interaction

Introduction

The Early Medieval Period in Northwestern Europe (450–725 CE) can be characterised as an era of transition marked by significant socio-political, economic, and religious changes. At the same time, the rich and varied material culture found in cemeteries presents a strikingly uniform character and testifies to the existence of several extensive networks of cultural, material and technological trade and exchanges. This aspect is particularly evident in Merovingian jewellery, where it is clear by the sheer number of jewels that a large segment of the population could easily acquire these products (Theuws 2024). Indeed, many graves, mostly women's, but not exclusively, contained beautiful sets of fibulae, hairpins, rings, necklaces, earrings and other types of jewellery manufactured with sometimes quite simple techniques such as lost wax casting with a decorated mould. The raw materials and finished products circulated in Northern Gaul via well-functioning and complex long-distance trade networks extending to parts of Asia (Calligaro et al. 2007; Drauschke 2011). Despite the evident skill and creativity displayed in the craftsmanship of these artefacts, comprehensive analyses within Belgium have been notably lacking compared to neighbouring countries (Claes *et al*. 2025).

The *Mero-Jewel project* (https://www.belspo.be/belspo/brain2-be/projects/Mero-Jewel_E.pdf), within which this article's research was conducted, is coordinated by the Royal Museums of Art and History (RMAH) in collaboration with the Royal Institute for Cultural Heritage (KIK-IRPA) and the University of Liège (ULiège). The project comprises an in-depth study of Merovingian jewellery, encompassing their precious materials, production techniques, and exchange networks. Funded by the Belgian Science Policy Office under the Brain.be research program, the project began in 2023 and will run for four years. Mero-Jewel aims to address the gap in research regarding Early Medieval jewellery in Belgium by adding a significant volume of fresh scientific data, enriching existing international evidence, and enabling comparative analysis. Central to the project is the interdisciplinary study of the craftsmanship of Merovingian jewellery.

Additionally, we seek to postulate distinct workshop practices and demonstrate chronological shifts and trends within this specific object category.

This article marks a pivotal initial step in our study, focusing on iron-cased cloisonné brooches, a jewellery category prevalent in the Harmignies cemetery (Prov. Hainaut, Belgium), with a representative sample of 21 items. These artefacts, excavated in the late 19th century, constitute a cornerstone of the Merovingian section at the RMAH but remain largely unpublished. Iron-cased cloisonné brooches were more numerous in Northern France and Belgium than elsewhere (Vielitz 2003, 18), but despite their prevalence, have never been subjected to microscopic and material-technical analyses. Through our investigation, we have scrutinised the different components, material compositions, and the construction of these multi-material brooches. With these initial results, our project, still in its early stages, aims to enrich scholarly discourse on this specific brooch type and propose future research perspectives.

Earlier research

Since researchers began exploring Early Medieval archaeology in the 19th century, they have shown particular interest in jewellery, specifically those pieces crafted from precious metals and adorned with gems and glass. Traditionally, this object group was examined to discern patterns indicative of social status, hierarchies or group identities (Koch 1998; Martin 1997). Scholars focused on the type and placement of brooches in reconstructing costumes, hoping to uncover regional variations in dress that might reflect distinct (ethnic) ways of wearing such adornments (Koch 1998, 518–19, 521, 535; Müller and Steuer 2011 [1994], 133–34; Siegmund 2000, 218–20). This approach was deeply rooted in nationalistic and ethnic interpretations of archaeological material and faced significant criticism over time, as exemplified by Effros (2004) and others (Hakenbeck 2011; Sorg 2022, 12). Frank Siegmund (2000, 228) contributed to these critiques by suggesting that attempts to identify regional variations in brooch placement encountered a notable uniformity instead. He observed widespread, similar changes in the positioning of brooches, which did not indicate regional (or ethnic) differentiation in deposition practices.

The 20th century search for past ethnicities also led to an interest in chronologically differentiating archaeological finds to assign them to historically attested ethnic groups (Meier 2020, 238). This process culminated by the mid-century with the development of typochronologies, greatly enhancing the precision of dating Merovingian funerary ensembles. Presently, typochronologies such as AG Franken (Müssemeier et al. 2003) and LPV (Legoux, Périn and Vallet 2004) enjoy widespread use, enabling placement of objects within narrow chronological intervals. However, they have encountered criticism for their perceived oversimplification and rigidity, potentially overlooking nuances such as inheritance practices, extended object biographies as well as unique objects that resist straightforward classification (Kars 2011; Martin 2020; Meier 2020). Typochronologies also largely overlooked aspects like materiality and more technological details of the production process, as mostly decorative and morphological characteristics were considered for object classification. Scholars have now mostly moved away from ethnic and purely typochronological interpretation to instead focus on economic aspects, manufacturing techniques, and materials required for the production of jewellery.

Within the category of Merovingian jewellery, cloisonné brooches have frequently been studied. As its name implies, these brooches are characterised by the use of thin metal strips, typically made of gold, silver (often gilded) or copper alloys that form compartments or cloisons, creating intricate designs, usually geometric and occasionally zoomorphic. The cells are filled with backing paste and foils, the latter frequently made of gilded silver featuring fine grid patterns, and are inlayed with garnet stones or, less commonly, coloured glass.

Numerous publications discuss the origin of cloisonné brooches and their typochronological and technical developments. A milestone in this regard was Birgit Arrhenius' (1985) monograph on Merovingian garnet jewellery, in which she identified a series of workshops in the German Rhineland and Southern Germany. Although this publication remains a significant academic work, there are some issues regarding localising production areas based on the material characteristics of the backing paste, which have proved difficult to verify (Horváth 2012, 210). Some decades later, Kathrin Vielitz (2003) researched garnet cloisonné brooches, focusing particularly on typochronological classification. Her work emphasised the importance of morphological characteristics but did not examine the production techniques and materials used.

An exemplary avenue of material and production studies were the analytic methods for determining the origin of garnet stone inlays. Notably, Thomas Calligaro and colleagues conducted non-invasive PIXE analysis, providing conclusive results for identifying the provenance of garnets (Calligaro et al. 2002, 2006–2007). Their research revealed that Merovingian goldsmiths used

garnets from six distinct sources: 5th and 6th century types I, II (almandines) and IIIa (almandines/pyropes) from different regions in India; type IIIb (almandines/pyropes) from Sri Lanka; and 7th century types IV and V (pyropes), possibly from Portugal, and Bohemia, respectively. These findings revolutionised the study of garnet jewellery, as the garnets' origin confirms their makers' involvement in long-distance exchange networks.

In subsequent years, other aspects of cloisonné production were taken up. In her doctoral study on 5th and 6th century polychrome fine metalwork from the Carpathian Basin, Eszter Horváth considered aspects such as materiality and technological details of the production process (Horváth 2013). She further refined Arrhenius' classification of different types of cloisonné by concentrating on the technology of cell work construction (Horváth 2012, 215–16). Horváth's work demonstrated that a single typochronological group might present major differences in technological details and materials. She warns that ignoring distinct production methods might produce false conclusions regarding workshop origins and distribution patterns. Through her observations, Horváth discerned different workshop practices based on their cell work technologies, thus distinguishing local products of Langobard-period Pannonia from imported objects.

Most recently, projects in Germany, such as the *Weltweites Zellwerk – International Framework* project, delved into the social and symbolic significance of garnet jewellery, as well as questions about its economic role (Quast et al. 2017), but results remain largely unpublished.

Overall, previous studies on production-related factors regarding cloisonné jewellery confirm that detailed examination of the materials and techniques used can reveal aspects of their production and potential workshop tendencies. This encourages us to scrutinise the technological aspects of iron-cased cloisonné brooches.

The case of Harmignies: an introduction

Our subsequent analysis focuses on iron-cased cloisonné brooches from the Harmignies cemetery. This particular category of brooches was selected for study because it has been suggested to be a regional product (Vielitz 2003, 18, 97), yet they have never been examined in detail. The Harmignies cemetery provides a substantial sample of these brooches, which have remained unpublished despite the considerable time elapsed since the site's excavation at the end of the 19th century. These excavations uncovered 351 graves dating from the late 5th century (MA1: 470/80–520/30 CE) to the third quarter of the 7th (MR2: 630/40–660/70 CE) (Claes and Vrielynck 2025). Of the 351 excavated graves in the Merovingian necropolis of Harmignies, 261 contained grave goods. Among these, 104 graves contained jewellery such as beads, rings, pins, earrings, or brooches. Of these, 92 were female, 8 were male, and 4 were of undetermined gender/sex. Because skeletons were not or poorly preserved, determining gender mainly depended on the excavator's notes from the 1890s, which sometimes classified graves as "male" or "female." Additionally, the preserved material culture plays a role in this assessment. Traditionally, jewellery is associated with female graves, while weapons are linked to male graves. Although we recognise the limitations of using material culture for gender determination, the context of the excavation necessitates this gendered interpretation of grave goods. In total, 57 graves contained brooches: 49 were female and 8 were male gendered. The majority (N=33) were cloisonné brooches, discoid (N=28), rosette (N=3), or lobed (N=2) in shape, with measurements ranging from 1.9 to 3.3cm. With the exception of two pairs of brooches, they all have an inlaid central motif, around which the cell walls radiate. The earliest and smaller cloisonné brooches feature glass, garnet, bone or amber inlays (still to be confirmed by analysis), while the later and larger brooches display more elaborate central motifs with pressed sheets, a mix of filigree and/or garnet stones, and in two cases, – two radial zones with inlays. These types succeed each other more or less chronologically as more intricate examples from MA2 (520/30–560/70 CE) replaced the smaller brooches. Cloisonné brooches were mostly placed near the neck or on the deceased's chest. Only some pieces dating to MA2 (520/30–560/70 CE) were found lower on the body.

Iron-cased cloisonné brooches: first Mero-Jewel results

For the study of the iron-cased cloisonné brooches, the Mero-Jewel project combined traditional archaeological contextual research with non-invasive visual and elemental analyses for material-technical studies. We performed microscopic analyses, hand-held and micro-XRF-analyses, radiographies, and SEM-EDX on 21 intact and partially preserved iron-cased cloisonné brooches (Figure 1). The handheld XRF analysis was conducted using the S1 Titan 800, while the μ-XRF analysis utilised the ArtTAX model (both BRUKER, Germany). Both X-ray tubes were equipped with a Rh anode and operated at 50 keV, without any filters, with the analysis conducted in open air. The pXRF had a beam size of 6mm, and measurements were taken over 35 seconds. In contrast, the μ-XRF featured a beam size of 0.07mm and the analysis was carried out for 200 seconds of real time.

Figure 1. Overview of the iron-cased cloisonné brooches in the Harmignies corpus. Of the pairs, the most representative piece is depicted each time.

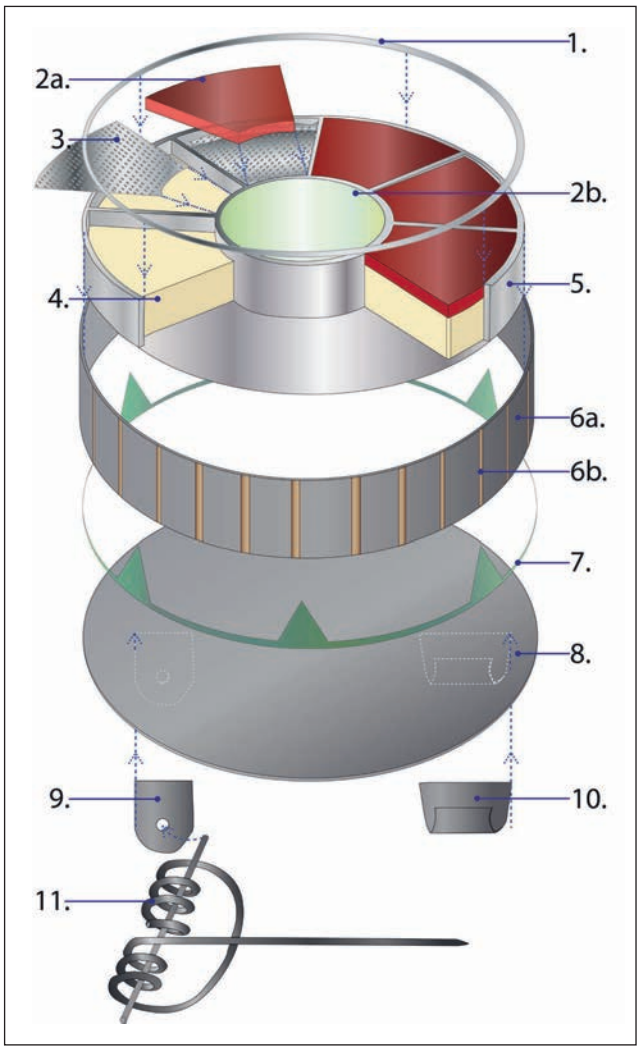


Figure 2. Schematic representation of the different constituting components of an iron-cased cloisonné brooch (Lippok after Gilg et al. 2010). The numbers represent: 1. Topping, 2. Inlays (a) and central motif (b) 3. Backing foil, 4. Backing paste, 5. Mount frame, 6. Side plate (a) with wire inlay (b)*, 7. Jointing wire*, 8. Base plate, 9. Spiral holder, 10. Pin holder, 11. Rod, spiral and pin. *These elements were not observed in all iron-cased cloisonné brooches.*

All brooch components were described and recorded in our flexible and open-source database, designed to facilitate comparison between objects. This approach allowed exploration of material, technical, and decorative similarities among components, aiding in understanding possible workshop-related practices or shared ideas in brooch production. These ideas must have circulated among artisans, as workshops were likely transient or composed of several itinerant artisans. Artisans would also have depended on one another for materials, tools, technical expertise, and ideas (van Wersch 2022, 280). Therefore, our primary focus is on shared knowledge, highlighting the dynamic nature of craftsmanship and the dissemination of techniques and styles.

Regarding the Harmignies corpus, caution is warranted due to modern conservational treatments that have not been recorded and are not always immediately visible. Previous conservation-restoration interventions such as cleaning, consolidation and reconstruction, and the application of resins, varnishes, or other substances may have significantly altered the materials, their current appearance and the original assembly of the different components. These interventions sometimes caused the replacement or erroneous relocation of garnet stones, foils, and pressed sheet motifs. In what follows, we accounted for such changes relative to the original condition when assessing the technical characteristics.

The components of a typical iron-cased cloisonné brooch

Figure 2 shows a schematic representation of the components of the studied brooches. We will elaborate on each component below, discussing their material compositions and technical characteristics if applicable. Table 1 contains all details regarding the material composition of each analysed brooch, providing an additional level of detail that will not be discussed further in the text.

Figure 2, element 1 indicates the topping, an addition that seems typical for the iron-cased cloisonné brooch variant with garnet inlays (element 2a), although sometimes absent, as shown on brooch no. 2 (Figure 1). When present, this metal top layer is located on the brooch's outer rim and consists of the same material as the cell walls of the mount frame (element 5), which is mostly silver, often gilded. This topping may have functioned by unifying and maintaining the integrity of the different components, notably the mount frame and the iron outer case (element 6), and covering the possible gap between them. Ultimately, it enhances the visual aspect of the finished product by giving it a silver rather than iron appearance.

Figure 2, element 2a represents the inlays set into the mount frame. These inlays, almost exclusively garnet stones, radiate in a concentric field around a central motif (element 2b). The garnets all share more or less the same arch-segment shape, designed to conform to the form of the cloison, with average dimensions of 0.6 by 0.7cm in height and width and 0.1cm in thickness. Brooch pair no. 13 shows a different arrangement of the cloisons with a more geometric pattern and a combination of garnet and glass inlays. The garnet stones exhibit more or less smooth edges, although several small traces of breakage are visible on almost every stone. Garnet inlays always

Table 1. Handheld XRF results and µXRF results of a selection of iron-cased brooches

Object	Location	Au (gold)	Ag (silver)	Cu (copper)	Fe (iron)	Sn (tin)	Zn (zinc)	Pb (lead)	Type of alloy
B004481 - 003	topping		xxx	xx	xx				silver alloy
	side			xxx	xxx				inlay = copper
	back		x	x	xxx				iron
B004537 - 004B	central motif	x	xxx	xx	xx			x	silver alloy, iron from the case
	cloisonné	x	xxx	x	xx				silver alloy, iron from the case
	side		xx	xxx	xxx				inlay = silver alloy
	back			xx	xxx				iron case and some parts of copper
									pure copper
µXRF results	side – inlay			xxx					silver alloy
	cloisonné	xx	xxx	xx	x				Silver alloy with addition of leaded copper alloy
	central motif	xx	xxx	xxx	x		x	xx	
B004585 - 006	cloisonné			xxx	xx	xxx			bronze
	topping			xx	xxx	x	x	x	heavily corroded
	side			xxx	xxx		x		
	white inner layer			xxx	xxx	xxx		x	
	back			xx	xxx				iron with copper corrosion
B004618 - 002A	central motif	xx	xx	xxx	x	xx	x	x	gilded copper-silver alloy
	cloisonné	xx	xxx	xxx	xxx	x			gilded copper-silver alloy
	side		x	xx	xxx	x			case= iron
	back		xx	xx	xxx	xx			
µXRF results	cloisonné	xx	xxx	xxx	xx		x	x	gilded silver alloy
	central motif	x		xxx		xx		x	gilded copper alloy
	side	xx	xxx	xxx			x	x	gilded silver alloy
	side	xxx	xx	xx	xx				gilded silver alloy
B004629 - 002B	central motif	xxx	xxx	x			x		gilded silver alloy
	topping	xxx	xxx	x	x		x		gilded silver alloy
	side	x	xxx	x	x		x		silver alloy
B004691-003B	central motif			xxx	x	xx	xx	xx	quaternary brass
	side			xxx	x	x	xx	x	quaternary brass
	pin construction				xxx				iron
	back				xxx				iron
B004691-003A	central motif			xxx	x	x	xx	x	copper alloy (brass)
µXRF results	cloisonné			xxx	x	x	xx	x	copper alloy (brass)
B004526-011	central motif	xxx	xx	xx					gold alloy
µXRF results	cloisonné	xx	xxx	xx					silver alloy
	side				xxx				iron

Table 1 continued. Handheld XRF results and μXRF results of a selection of iron-cased brooches

Object	Location	Au (gold)	Ag (silver)	Cu (copper)	Fe (iron)	Sn (tin)	Zn (zinc)	Pb (lead)	Type of alloy
B004492-001B	central motif			xxx	xx	x	x	x	copper alloy
μXRF results	cloisonné	xx	xxx	xx	x				silver alloy (gilded?)
	side	x	xxx	xx	x				silver alloy (gilded)
	side			x	xxx				iron
B004545-003	central motif			xx	xxx				
μXRF results	topping	xx	xxx	xxx	x			x	silver alloy
	side - inlay			xxx					pure copper
	side			xx	xxx				
B004581-002	cloisonné	xx	xxx	xxx	x			x	silver alloy
μXRF results	topping	xx	xxx	xxx	x			x	silver alloy
	side - inlay			xxx			xxx		copper alloy (brass)
	side	xx	xxx	xxx	xx			x	silver alloy
	side - triangle			xxx	x				pure copper, remaining Fe of the case
	side				xxx				pure iron
B004536-001A	cloisonné	xx	xxx	xx					silver alloy
μXRF results	side			xx	xxx				
	side - edge	x	xx	xx	xxx				
	back				xxx				pure iron

coincide with mount frames in silver (gilded) alloys. In instances where the brooches feature glass inlays without garnet, such as numbers 11 and 12, they occur in bronze or brass mount frames. In these cases, the geometrical design of the inlay work also differs from the typical radial field present on the brooches with garnet stones.

The inlays of the central motif (element 2b) each display various round designs and different materials ranging from small glass, bone, and amber inlays to small circular metal sheets with pressed motifs. These metallic central motifs comprise copper and silver alloys, often gilded and sometimes consisting of similar material components as the mount frame (Table 1), suggesting that one workshop was potentially responsible for producing both components. In two instances, brooches nos. 8 and 14, the central motifs are composed of gold, while the mount frames are crafted from gilded silver alloys. Conversely, brooch no. 12, which features a purely geometrical design, lacks a central motif.

Analyses of the garnet stones have not been conducted yet. Scheduled chemical analyses with PIXE-PIGE at the CEA of the University of Liège will help us determine the origin of the gems. Previous analysis (Mathis et al. 2008) indicated that type I garnets, originally from India, were most dominantly present in our regions.

Figure 2, element 3 represents the backing foils, which are extremely thin (<0.02cm) silver-gilded foils located underneath the garnet inlays. Adams' experiments (Adams 2006, 18, 20) hypothesise that these foils were produced by pressing a thin metal sheet between a positive and a negative die. Other authors have attested six types of patterns on the foils (Avent and Leigh 1977; Vielitz 2003, 21), but in the present corpus, only the waffle pattern and box grid pattern were attested. The waffle pattern, the predominant type, features a fine pattern of approximately 3 ridges per mm. Brooch no. 7 clearly deviates from this pattern, with one ridge per mm. Regarding the box grid pattern, the second most common type in our sample, we observed that the grids are not always consistent, as seen in brooch pair no. 6, where the grid is divided into three lines vs four lines in one box. Also, the backing foils are not all oriented in the same direction, some are even placed up-side-down. Occasionally, the backing foil can be seen as folded around the sides of the

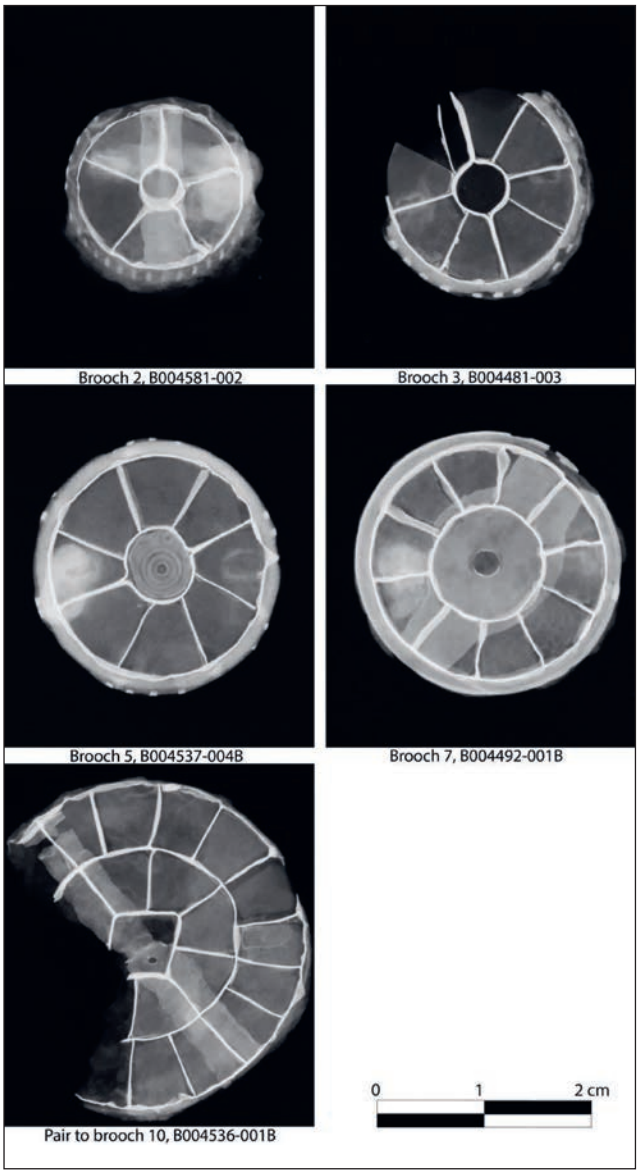


Figure 3. Radiography images reveal partial base plates on brooches nos. 2, 7 and 10; demonstrate double cell walls forming the central motif on brooches nos. 3 and 5; and show the wire inlay in the iron case on brooches nos. 2, 3, and 5. The jointing wire with triangles can also be perceived along the upper and right side of the side plate of brooch no. 2 and on the lower right side of brooch no. 10.

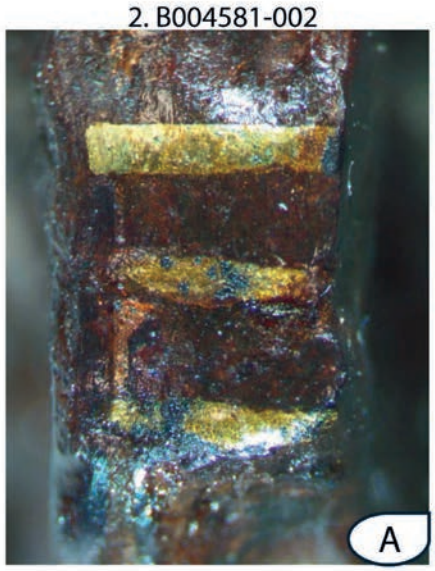
garnet stones. In the case of brooch no. 9, two separate sheets of foil were added as one, possibly indicating the scarcity and/or reuse of the material.

Vielitz (2003, 23) has shown that although the waffle pattern was generally present in Northern France, Belgium and the German Rhineland, the box-grid pattern was much rarer in Northern France and Belgium than in the German Rhineland. She even stated that iron-cased brooches nearly exclusively contain the waffle pattern (Vielitz 2003, 24). The differences Vielitz observed in the distribution of backing foil types may be a proxy for certain workshop practices or shared ideas around the stylistic decisions in the production of backing foils in certain areas. The fact that these types occur over large distances could suggest standardised production or, at least, the circulation of a shared idea of what these foils should look like. Additional analysis should be aimed at meticulously recording the distances between the lines of the patterns to establish comparability between patterns and potential common origin of different samples. Archaeological evidence of a bronze stamp with boxed grid pattern has been previously found in the site of Wijnaldum in the Netherlands (Nicolay and Aalbersberg 2018, 67) and at Bornholm, Denmark (Adams 2006, 18), providing clear evidence of foil production in Frisia and Denmark.

In Figure 2, element 4 represents the backing paste underneath the foil and inlay. Where observable, the backing paste displays an optically rough consistency and a brown, yellow or orange hue. It is sometimes unclear if the backing paste was originally orange and brown or if the iron case's metal corrosion (rust) affected its colour. Other samples appear light beige to white. This likely categorises the backing pastes from Harmignies as sand paste, as described by Arrhenius (1985, 86) and Vielitz (2003, 24–25). However, since our sample's backing pastes could not be analysed, further information remains unavailable.

Figure 2, element 5 represents the mount frame, designed to secure the inlays, the foils and the backing paste. When the iron case (element 6) is either missing or only partially preserved, as in the instances of brooches nos. 1, 4, 11 and 12, the mount frame is visible in its full height. They all exhibit consistent technology and are constructed from several thin sheets of metal, forming a base and cell walls that define the cloisonné compartments. Additionally, bent sheets create the central motif and the side plate, which encloses the construction and is inserted into the iron case. The cell walls often exhibit slight irregularities as their fragile profile is easily deformed. In certain instances, the cell walls are folded over, resulting in a double-walled structure, possibly to strengthen their construction. This is observed on brooches nos. 3 and 5, where the double wall also constitutes the central motif (Figure 3).

In the Harmignies case, the metal sheets of the mount frame comprise predominantly silver alloys, mostly gilded, with three exceptions (brooch pair 11 and brooch 12) in copper alloy and brass. Radiography revealed that in most cases, the base of the mount frame supported only parts of the cell walls and was not fully circular. Instead, thin strips – sometimes perforated – were observed



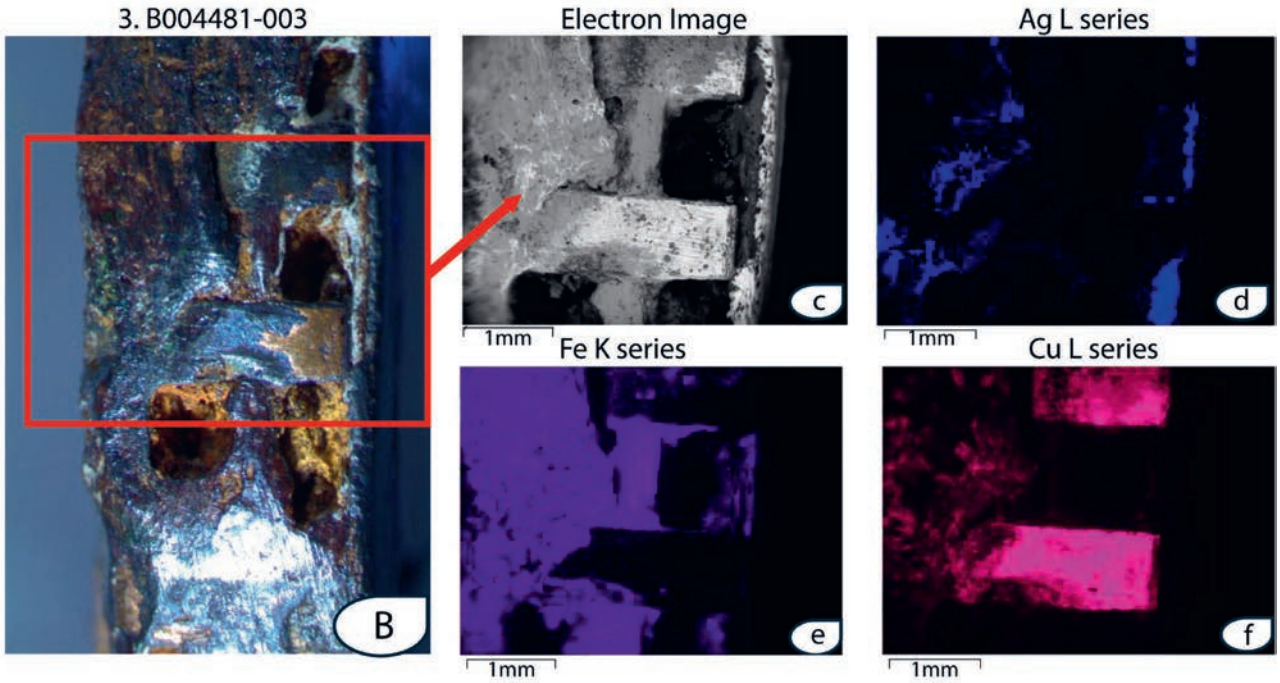


Figure 4. A: Detail of the side of brooch no. 2 (Leica optical microscope image): the jointing wire with traces of triangles is visible underneath the inlays; B: Detail of the side of brooch no. 3: optical microscope view (c), backscattered electron image of the analysed area with SEM-EDX, element distribution patterns of silver (d), iron (e) and copper (f) respectively. The jointing wire seems to be present in the middle of the brooch, where it might have shifted after the iron corroded away.

beneath sections of the cloisons (Figure 3). These strips performed the same function as fully circular bases, albeit with potentially less stability, but they required less material.

Figure 2, elements 6, 7, and 8, represent the side plate, jointing wire and baseplate, which constitute the outer case. The side plate and base plate are approximately 1.5mm thick and confirmed, with XRF, to be made of iron. These components could be joined by welding, similar to the technique used for weapons such as swords (Scott 2009). In addition, a copper alloy ring is present on some of the brooches, often exhibiting traces of characteristic triangles (Figures 3 and 4). This jointing wire might function to securely connect base- and side plate, acting as a solder when heat was locally applied. In one case, brooch no. 13 (Figure 1), two silver rivets were added to keep the different components together.

When still present, the side plates often exhibit decoration consisting of brass or copper alloy wire inlay (Figure 4), hammered in notches engraved in the surface around the perimeter of the plate at regular intervals. In a second variant, in the case of brooches no. 6, the notched side was silver plated and gilded. Although the decoration was executed in different ways, the same visual effect was intended as with the inlay wires. Brooches nos. 7, 8, 11, 12 and 14 remained undecorated.

Figure 2, elements 9, 10 and 11 represent the spiral - and pin holder, and pin, which constitute the fastening

elements of the brooch. They were often only partially preserved, likely due to their needing to withstand the rigours of use and the fact that small, protruding elements are more vulnerable to post-depositional degradation processes. Unfortunately, radiography provided little information about these elements' shape or original surface.

The depicted spiral- and pin reconstruction is based on brooches from Torgny and Grez-Doiceau (Belgium). Nevertheless, certain patterns emerged regarding their material composition and construction techniques. Exclusively constructed from iron, the pin, as the most fragile element of the brooch, is most often lost. The spiral and pin holder, found in conjunction with the pin, exhibit a material composition similar to that of the base plate, in this case, iron. They are consistently attached horizontally to the base plate along a straight line.

Due to the state of preservation of the pin construction, it is unclear, in most cases, how these components were originally joined. Microscopical analysis of brooches nos. 3 and 5 revealed a fine, lighter-coloured rectangular copper line on the base plate, indicating the former position of the now-missing pin holder (Figure 3, brooch 3 and 5). This copper alloy was likely used as a solder to join the component to the base plate. Whilst this use has rarely been attested, Pleiner (2006, 115–20) discusses the presence of copper in archaeological Iron Age metal slag, which he interprets as evidence of copper being used as a soldering material.

A developing repertoire of brooch forms

By the late 6th century, cloisonné brooches had gradually disappeared from graves and were replaced, first by pairs of small filigree disc brooches, described as the "Marché-lepot" type (Graenert 2007, 167), which then evolved into one large filigree disk brooch from MR1 (600/10–630/40 CE). The gradual transition from cloisonné to filigree brooches was exemplified by the pairing of a smaller filigree brooch with a larger cloisonné brooch, demonstrating their contemporality. Some of these newer brooches featured iron base plates, indicating the continuation of certain material use over time. Additionally, these filigree brooches often incorporated backing foils with a waffle pattern, a common characteristic in the cloisonné brooches. Notably, one of the larger filigree disc brooches found at Harmignies, displays notches on its wide projecting edge, reminiscent of iron sides inlaid with metal wire, further suggesting the continuation of certain designs. The transition from cloisonné to filigree brooches thus reflects a development in jewellery design, where one type gradually transformed into the other.

Discussion

By analysing the iron-cased brooches from Harmignies, we identified a remarkable variety of precious and non-precious materials and techniques such as alloying, inlay work, notching, soldering, and stamping. These findings highlight the technical prowess involved in working with different materials and the sophisticated craftsmanship employed.

Regarding technological knowledge, we identified distinct differences and similarities in the material-technical, constructive, and decorative aspects of the items. As documented by Vielitz (2003, 18, 97) the distribution of iron-cased cloisonné brooches, as well as the general cloisonné brooch distribution, extend far beyond the cemetery of Harmignies, indicating that the general and iron-cased design was widespread. A significant feature distinguishing the items under discussion from the rest of the corpus is the iron case surrounding the silver frame with garnet stone inlays or the copper alloy/brass mount frame with glass inlays. Despite their apparent uniformity, each item (or pair) exhibits distinct variations in techniques (e.g., jointing wire with additional triangles or not), decorations (e.g., inlays on the sides or not), and materials (e.g., gilded silver vs. copper alloys, garnet vs. glass).

In terms of materiality, cloisonné brooches incorporate materials from diverse origins. For instance, garnet stones were imported from India and Sri Lanka, while it is likely that the iron had a more local origin, given the presence of iron smelting and smithing sites in Wallonia (van Wersch et al. 2022). Regarding the gold, silver and copper, a valuable avenue for future research would be to determine through chemical analyses whether these materials were recycled or processed as raw materials, an investigation not undertaken in the present study. The use of a multiplicity of materials, blending local and external resources, attests to a rather complex supply chain.

While specific workshop activities remain unidentified based on the Harmignies sample, the consistency in production techniques, such as the implementation of iron cases with metal inlays on the side, the size of the brooches and the use of silver mount frames, suggests the presence of a shared network of knowledge among the artisans who produced these jewels. The complexity of the assembly process and variety of materials used in these pieces, raise questions as to whether the jewels were produced by one artisan who mastered and assembled all different materials and production techniques, by multiple artisans who may have worked within the same workshop each specialising in different aspects of the production process, or by different workshops producing separate parts of a brooch. Combining the working of

iron, presumably by a blacksmith, and the goldsmithing to obtain an iron-cased cloisonné brooch, seems unique and goes against earlier observations of different artisans active in separate workshops as suggested by Hjärter-Holdar et al. (2002). On the other hand, the uniform nature of backing foils possibly suggests that they came from one source that continuously used the same stamping dies. The juxtaposition of different technologies and import of diverse materials in one workshop must have facilitated sharing and exchange of goods, materials, tools, knowledge and ideas.

The knowledge applied to create iron-cased cloisonné brooches likely adapted to the *zeitgeist* as filigree brooches became the preferred style. As observed at Harmignies, these larger disk brooches regularly feature iron baseplates and decoration techniques similar to those of the earlier cloisonné brooches. Thus, continuity in knowledge of decoration techniques may be present, even if the overall look of brooches changed significantly.

Conclusion

This article focused on iron-cased cloisonné brooches with key questions regarding the study of material-technical craftsmanship and possible distinct artisanal practices, focusing on techniques and stylistic choices. Due to the limited size of our sample, drawing definite conclusions remains premature. However, the Harmignies site provides critical insights into Merovingian jewellery production, more specifically of iron-cased brooches, highlighting a complex interplay of different materials, sophisticated craftsmanship, and evolving cultural practices. The continuity and adaptation of production techniques reflect the ingenuity and resourcefulness of early medieval artisans. Whilst certain decoration techniques and structural components, such as the inlay work on the side plates and pin construction, were similar between brooches, other components displayed more diversity, such as the use of thin strips of silver to secure the mount frame, jointing wire, various backing pastes and the use of various inlays made of garnet, glass, metal or amber. Further research will continue to refine our understanding of these complex mixed-material artefacts, contributing to a richer narrative of Early Medieval material culture. One important step will be the detailed investigation of the material composition of the different components and the techniques employed to investigate these brooches' supply chain and assembly process.

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Craft productions in Quentovic: current knowledge

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Inès Leroy 2025. **Craft productions in Quentovic: current knowledge.** *AmS-Skrifter 29,* 73–80, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

To date, little is known about the craft productions in Quentovic. Discovered artefacts leave no doubt, however: in the heart of the settlement along the river Canche, the working of amber, metal, antler and glass is clearly documented from the very first occupation of the site at the end of the 6th century, until it was abandoned around the 10th century. On the southern plateau above the valley, a Carolingian-age potter's workshop was in use during the 9th century, located at the edge of the monastic estate of Saint-Josse. My paper will present the current evidence of these productions, their locations and their integration into the site. It will also raise the question of the involvement of the abbeys established near the *portus* in the exploitation of the resources of the lower Canche valley.

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Key words: Quentovic, *Emporium*, pottery, metal, antler, amber

Introduction

In the Early Middle Ages, Quentovic was a major economic and administrative centre and part of the network of *emporia* that dominated trade from the English Channel to the Baltic. Its emergence was determined by the importance of cross-Channel relations, with the Canche estuary and the ancient roads providing its continental network. Characteristic craft production was concentrated here, and the institutional and economic management of river activities attested to its importance from the 6th to the 10th centuries (cf. Leroy 2023a, 202–22).

The archaeological site of Quentovic, discovered in the French commune of La Calotterie, (hamlet Visemarest) in 1982, is made up of two main centres of occupation (Figure 1). At the bottom of the valley along the river Canche, a settlement existed since the end of the 6th century. It has been documented by several archaeological campaigns in 1980–1990 (Hill 1992; Hill et al. 1990, 1992; Hill and Worthington 2010) and developer-led/commercial archaeology (since 2006) (Cense-Bacquet 2016, 2021; Duvaut-Robine 2015; Routier and Barbet 2010). Between 1984 and 1992, 68 test pits (each from 2 to 4m², 1–2m deep), were dug to assess the extent of the site. At that time, four limited-area sections (each between 50 and 225m², 0.5–2m deep) were partially excavated. It would appear that some of the material from these digs was sieved, but it is not possible to determine exactly which areas or layers were involved. Between 2006 and 2014, three rescue excavations explored larger plots (12.800m², 2500m², 900m², respectively), limited in depth, in preparation of construction projects. The total area explored to date is around 2ha.

Recently, a synthesis of all this data distinguished four main phases of occupation (Leroy 2023a). First, there is a gradual development of the settlement from the end of the 6th century to its peak in the 9th century, followed by its contraction and transformation into a farm during the 10th century. In 1995, a second site was uncovered on the plateau (hamlet La-Fontaine-aux-Linottes) during motorway construction work (Desfossés 1997; Desfossés et al. 1997a, 1997b). This was a large cemetery (more than 650 burials) that had been in use in the 6th and 7th centuries, followed by a ceramic production workshop between the 9th and the first third of the 10th centuries.

In parallel with this newly established archaeological overview, a reflection on the contemporary environment of Quentovic has led to a regressive analysis of the landscape, based on the observation that this site, reputed to be a port, no longer has any connection with the sea (Leroy 2023b). This regressive study of the landscape of the lower Canche valley is based on an integrated spatial analysis of textual, cartographic, archaeological,

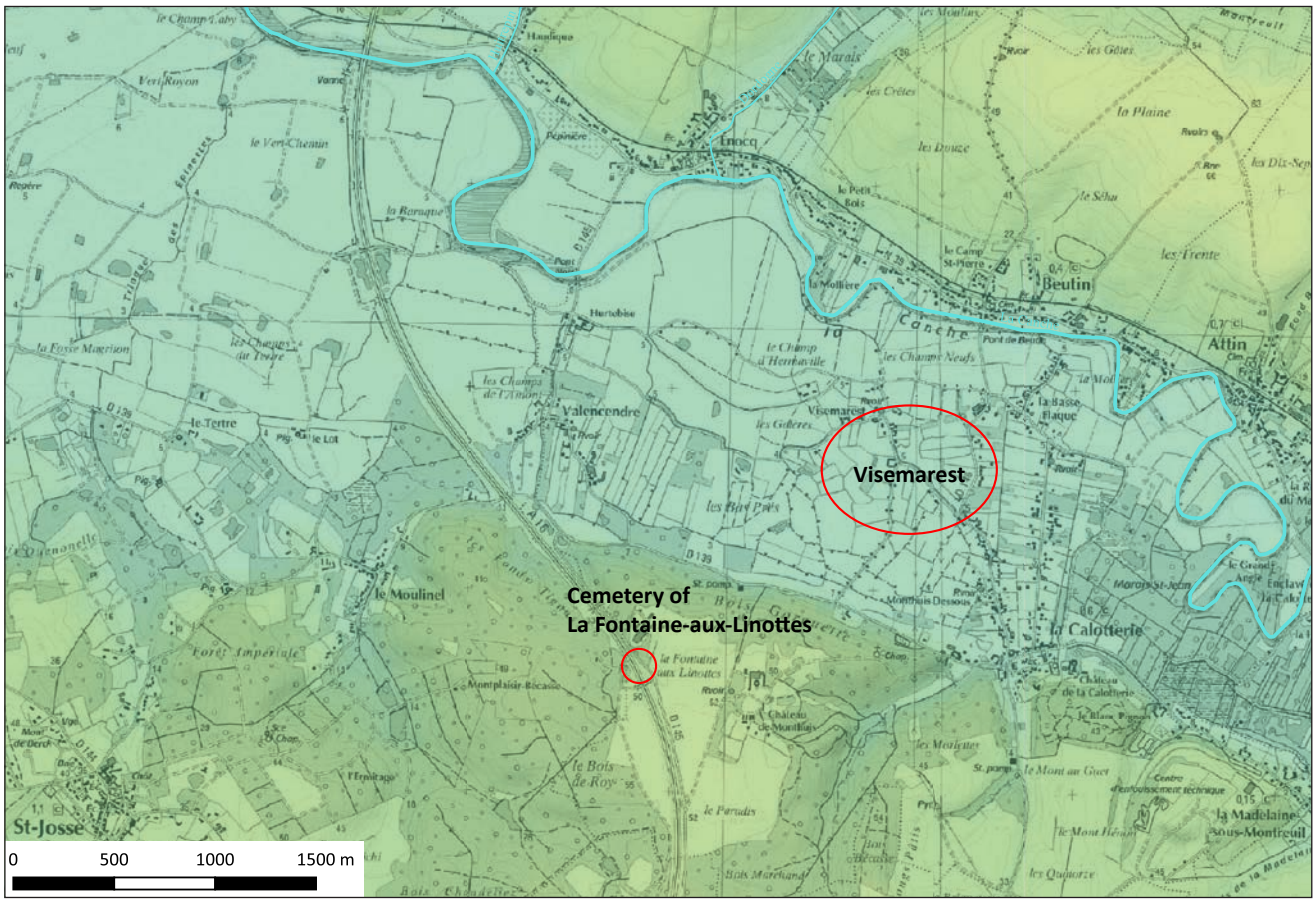

Figure 1. Localisation map (base map: © IGN).

palaeoenvironmental and micro-toponymic data, coupled with digital imagery (aerial photography, satellite images and lidar). It provides a context for the site, raises questions about the occupation and management of the land, and outlines the links to the hinterland and to the Anglo-Saxon, Frisian and Scandinavian worlds. It also lays the foundations for a reflection about the scale of the occupation of the valley, where the roles and relationships between secular and ecclesiastical powers, including those across the Channel, remain to be defined for the early periods.

To date, major efforts still have to be done in the field of archaeological artefacts, as treatment varies greatly depending on the operations concerned and the types of artefacts. Standardisation and/or updating of the few existing studies are essential, and a systematic review of pending files must be carried out. However, despite this incomplete vision, a range of craft practices can be observed or deduced, mainly for the 8th and 9th centuries. In this sense, the main goal of this paper is to provide an overview of our knowledge of these productions, to identify the evidence and to consider the location, chronology and, where appropriate, the phases of the represented production processes.

Crafts production

While little is known about 7th-century workings in Visemarest, a range of craft practices of the 8th and 9th centuries have been identified. Ceramic, textile and glass production as well as bone, metal and amber working are all represented by tools or production waste (Figure 2). The quantity of findings varies according to their nature and the extent of the waste deposits, however. No workshops seem to have been positively identified in the various excavated areas. Rather, the evidence of the large number of test pits (68 test pits, from 2 to 4m²) clearly indicates that these different activities were spread throughout the site. These are activities that traditionally also were practised at other contemporary equivalent sites such as London (Blackmore 2002, 2010, 2012; Cowie and Blackmore 2008, 2012; Fowler and Taylor 2013; Malcolm et al. 2003), York (Hall 2014), Haithabu (v. Carnap-Bornheim and Hilberg 2007; Hilberg 2011, 2018, 2022; Kalmring 2010, 2020a, 2020b; Schietzel 2018) or Ribe (Bencard 1981; Sindbæk 2022; Søvsø 2020).

Textile craft

Although evidence of textile craftmanship is frequently found at sites from the Early Medieval Period, the evi-

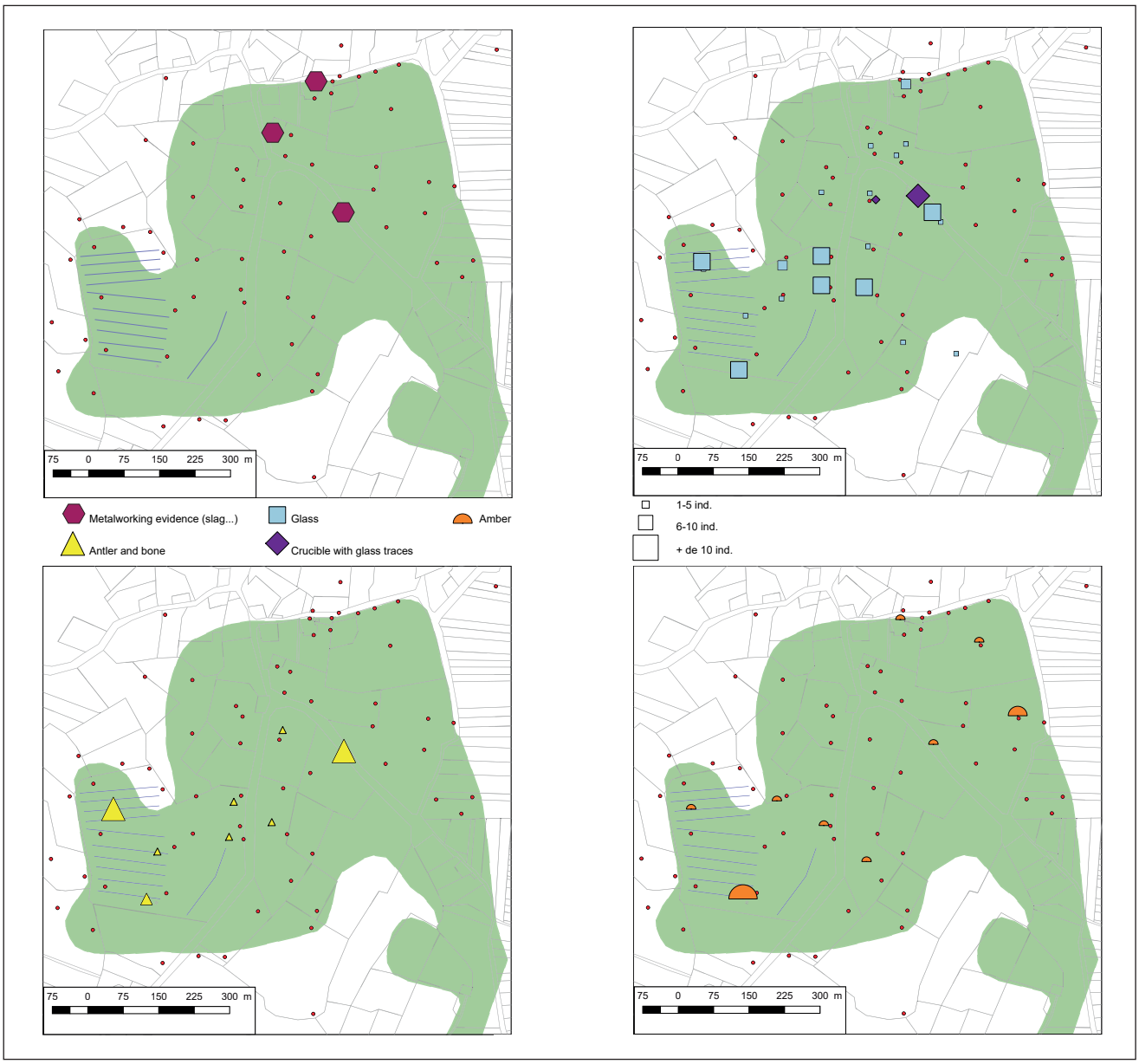

Figure 2. Distribution of different types of artefacts (the symbols indicate the location of test pits or trenches that have yielded artefacts; the extension of the site proposed by David Hill is shown in green shading).

dence it often fairly limited and here represented only by a few artifacts. These objects, found throughout the site, document the preparation of wool, spinning, weaving and sewing.

A large number of sheep bones, which probably were from animals used for the production of wool that had been culled as the quality of the fleece declined, have been discovered (Oueslati 2012; Yvinec 2018; Yvinec et al. 2018). Shears likely were used to shear sheep, while several wide-toothed combs and a possible fragment of a carding comb confirm that the wool was processed (Soulat et al. 2019). There is no palynological evidence of textile plants, mainly because of the poor preservation of pollens in the studied samples. On the other hand, the last excavation revealed remains of hemp, which account for 16% of the cultivated plants in the assemblage of plant macroremains from the Carolingian phase (Preiss 2018). According to the specialist, this indicates that the plant probably was used both for its oleaginous properties and for its textile fibres.

Although the evidence is fairly limited, spinning seems attested to by seven bone and three chalk spindle whorls (Barbet and Routier 2018, 299–300; Soulat 2012, 52–54, 76–80, 83). Weaving is identified by the presence of nine weaver's spindles made of antler, animal bone and stone, three awls and 23 fragments of loom weights; these were hand-crafted from chalky clay. As Jean Soulat has pointed out, they have a circular shape that is not very

common in northern France, but is more common in England between the 6th and 11th centuries (Soulat 2012). Finally, there were five bone needles, a probable indication of sewing.

Metalworking

Evidence of metalworking is also limited (or sparse). However, scrap metal was discovered in the backfill of a ditch (plot AC 277) at the site, dating from the second half of the 7th century (Duvaut-Robine 2019). The bases of forges, slag and scraps of iron cuttings all point to metalworking having taken place near this ditch. Production continued in the 8th and 9th centuries, as evidenced by the metallurgical waste with a total weight of 40kg found in 15 pits (plots AC3p/AC40) (Cense-Bacquet 2021). Again, the waste mainly consists of slag, scrap, metal waste and metal objects, but also of fragments of the walls of a kiln with ventilation holes. Two areas of concentration were observed, but no specific archaeological structures were identified as the bases of forges only were evidenced by waste slags from the bottom of a melting pot, and of the kilns just minor elements from the vault remained. Despite the lack of defined structures the waste slags and vault-remains might indicate a nearby metallurgical activity and forging, especially since a forge requires very little: a fireplace, a container of water, something to serve as an anvil (a stone, a chopping block of wood) and a supply of firewood. No specialist study has been carried out on this waste.

More bases of forges, slag and scraps of iron cuttings were discovered in the 1980s, but still have to be studied. And according to some drawings of artefacts discovered during the same period, copper appears to have been worked here, too. Finally, research needs to be done on objects in connexion with the artefacts of the cemetery, such as the plate of a fibula discovered in the *vicus* that is similar to a complete fibula from the cemetery (Figure 3). Does this plate represent a dismantled object that was meant to be remelted, or was it intended to be used on a new fibula? The question is open.

Glassmaking

Glass was found in small quantities throughout the site. Only six test pits revealed larger concentrations, a phenomenon partly linked to the larger size of the excavation areas (Evison and Heyworth 1990). Most of the finds are fragments of vessels, including bell beakers, cone beakers and palm cups. Six fragments of linen-smoothers and pieces of window glass were also found.

In addition to these objects, production waste (glass paste flows, fragments of furnace walls), eleven crucibles and reticulated rods attest to the glassmaking craft at the site (Cense-Bacquet 2012, vol. 2; Evison and Heyworth 1990). The concentration of this evidence in and around plots AC 3p and AC 40 suggests that there was a workshop located close to these plots, although the exact location cannot be established.

Antler and bone

Bone and antler working is much better represented: a total of 278 cutting scraps from 41 archaeological contexts (mostly unstudied) demonstrate that crafting of these materials took place at the Quentovic site. The occupation level of the 7th century contained a large concentration of worked bone and antler (174 scraps from 10 contexts) including 47 tines, 43 (fragments of) rectangular plates and

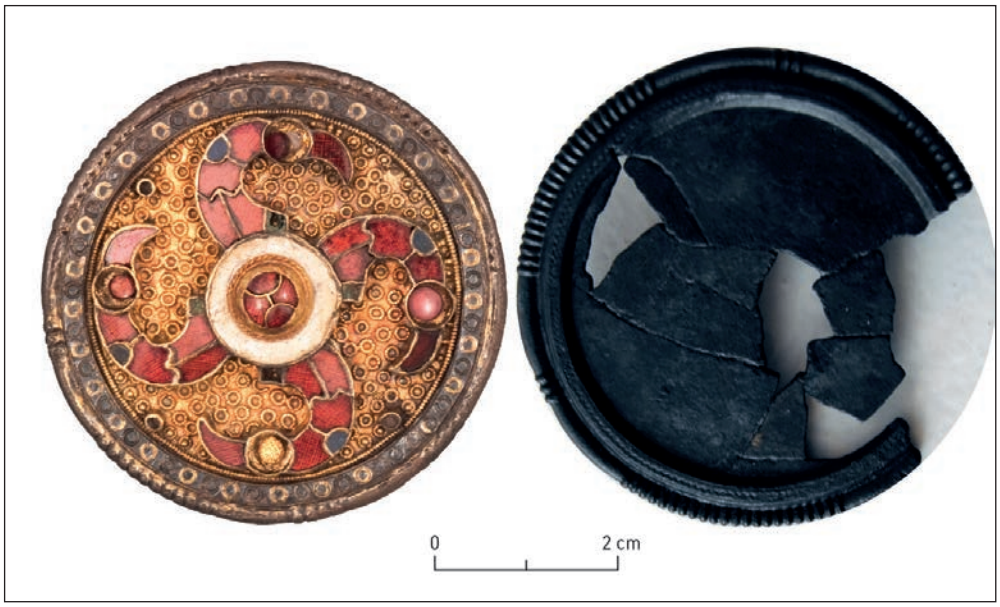

Figure 3. Plate and Faversham-type fibula, cemetery, grave 755. © Musée de Berck-sur-Mer. After Desfossés et al. 1997.

Figure 4. Carolingian ceramic workshop. After Thuillier et al. 2015. The excavation of zone 2/3 revealed several ovens, as well as working and/or residential buildings, a pit house, domestic ovens, a series of ditches and a large number of pits.

tines with squared ends, perhaps used to make stamps for ceramics, as well as other production waste.

Craftsmanship continued in the 8th and 9th centuries, as attested by the discovery of animal remains with toolmarks and several objects (94 from 25 contexts), including 35 combs (Soulat et al. 2019). This corpus of combs, one of the largest in northern France, is typologically very heterogeneous and includes examples of Frisian, Anglo-Saxon and Anglo-Scandinavian types that have never been seen in France before.

Most of these objects and production waste are of antler, but a number of bone artefacts, including a spindle, an amulet, a (knife ?) handle and a spindle whorl, were also discovered (Soulat 2012). The utilisation of ruminant horns is evidenced by the presence of isolated bones and frontal bones with cutting marks. Morphological examination shows that they come mainly from male animals. In general, there are more females than males in animal herds, so the fact that more male remains were found in the archaeological repository implies that the meat supply was not limited to a few nearby herds, but was fairly extensive, i.e., suggesting a wide supply area. A case of ovine polykeratitis has been confirmed, providing rare evidence of sheep brought in from across the Channel. Other animal remains found at the site were pig *fibula* (to make needles), large ox bones (*metacarpus*) and ruminant horns. This collection makes Quentovic one of France's most richly endowed sites with bone artefacts, albeit the quantity is less than from other *emporia*.

Amber craft

Amber working debris was discovered in five test pits and five excavation areas. For the most part, it contains extremely small fragments found during the rare occasions when sieving were carried out. They include two beads and a few partially worked pieces. Two major areas with amber workshops were identified, one in the north of the site and one in the south, in the 7th-century layers. It is therefore tempting to compare these observations to the large number of amber beads (559 beads or its fragments spread over 70 graves) that were discovered in the cemetery of La Fontaine-aux-Linottes, although contemporaneity sites cannot yet be established with any certainty. The small quantities discovered in the *vicus* obviously appears negligible compared to those of the other

emporia, but very little use was made of sieving, which strongly suggests that the smallest fragments were lost.

Carolingian ceramic production

A pottery workshop was partly excavated on the plateau in the hamlet La-Fontaine-aux-Linottes (Desfossés et al. 1997a; Thuillier et al. 2015). It consisted of nine kilns and adjacent circular firing structures associated with buildings on posts and a pit house. Several pits of varying sizes probably were used for extracting clay before being converted into workshop dumps. One of them stands out for its dimensions and likely was a structure dedicated to the preparation or storage of clay. More than 150 postholes were discovered. Five buildings were identified, such as workshop buildings, housings and a granary. About 25.000 fragments of pottery formed the basis for the definition of four types of tempers mainly produced with local clay from the Eocene formation at Saint-Aubin (Bocquet-Liénard and Routier 2016; Thuillier et al. 2015). The large quantity of finds attest to the production of pottery, mainly pots and jugs, some with red painted motifs, from the first half of the 9th to the first third of the 10th century (Thuillier et al. 2015) (Figure 4).

Conclusions

At this stage, the evidence relating to these various crafts is insufficient to assess the scale of production or to establish whether they met local needs or were intended for commerce. It is also difficult to determine the practical importance of these crafts for the site's economy. However, the presence of the Carolingian ceramics workshop in the grounds of the Abbey of Saint-Josse-sur-Mer raises the question of the involvement of religious institutions in this trade and, more broadly, in the organisation and management of the Quentovic site (Leroy 2023b, 199–232).

The aim of this article was to provide an overview of the crafts represented at Quentovic. The preliminary inventory of objects from all campaigns is going to serve as the basis for a systematic continuation of this study in the future in relation to the different phases of occupation that recently have come to light.

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Technology – art – identity. Zoomorphic spurs in the light of metallographic analysis

PAWEŁ SZCZEPANIK AND SŁAWOMIR WADYL

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In the 11th century AD, spurs with zoomorphic decoration, cast from copper alloy, were attributes of elite horsemen. The pair of spurs from grave 42/2009 at an Early-medieval cemetery at Ciepłe, Pomeranian Voivodeship, Poland, are the best-preserved example in Central Europe. Further specimens are known from Lutomiersk, Cerkiewnik, Wrocław, Lubniewice, Kumachevo, and Skegrie. The spur fragments share formal similarities, which suggest that they were made in one place for a narrow circle of individuals belonging to the Early-medieval elite and served as a form of identifier for them. Judging from the finds' geographical distribution, they were probably made on West Slavic territory. The discoveries in neighbouring areas are extremely interesting; perhaps they are evidence of the presence of members of a Slavic elite in these areas? The spurs' rich zoomorphic decoration in the form of serpent/dragon and horse/cattle imagery is in line with reconstructed Slavic cosmological and perhaps eschatological beliefs. However, the imagery can also be interpreted within the context of Scandinavian and Baltic mythology. The similarity of the spurs, indicating replicable technology and alloys, suggested that it might be fruitful to examine selected finds using Scanning Electron Microscopy (SEM) and Energy Dispersive X-ray Spectroscopy (EDS), through which significant differences in the amount of zinc (Zn) were observed. The proportions of the alloys are similar, but were not strictly maintained from object to object.

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Key words: Early Medieval, elite, riding equipment, SEM EDS, alloys, Poland, spurs, metallography

Introduction

Spurs have been known since about 500 BC (Żak and Maćkowiak-Kotkowska 1988, 247–48). They have always served both a practical function – goading the horse – and a symbolic one – broadcasting the status of the wearer. For the culture of the Early-medieval Slavs, they are the oldest material signifiers of membership in the emerging elite (Gossler 2013; Hilczerówna 1956; Kavánová 1976; Kleingärtner 2009; Pedersen 2014; Żak 1959; Żak and Maćkowiak-Kotkowska 1988, 247–48; Wadyl 2018). In a later period, spurs, together with belt and sword, are signs of belonging to the knightly estate (Ackerman 1944; Nadolski 1954, 80). Some of the oldest Slavic spurs are richly decorated (Żak and Maćkowiak-Kotkowska1988). Some Great Moravian (e.g. Mikulčice: Kouřil 2014, 368–72), Scandinavian (e.g. Rød: Vedeler et al. 2019, 54–55), and Pomeranian finds (e.g. Ciepłe: Gardeła et al. 2019a, 139–45) are luxury pieces that have not lost their utility. The use of copper alloys, similar in colour to gold, additionally marked out these spurs as objects reserved for the elite (Gossler 1998, 594–96; Marek 2018, 574–75; Pankiewicz 2023, 260–61).

This paper underlines problems in linking technology, art, and identity in Early-medieval craft objects. We examine 11th-century copper alloy spurs with zoomorphic decoration from several archaeological sites. In literature, spurs of this type are known as "Lutomiersk type spurs", pointing to the site of the first finds, where they first were interpreted as saddle-bow fittings (Gardeła et al. 2019b, 66–76; Jażdżewski 1949, 118–20; Nadolskiet et al. 1959, 57–58).

State of research

The first finds came from graves in Lutomiersk in central Poland. Research at this cemetery began with the discovery of a richly decorated Early-medieval sword and was conducted by German archaeologists during World War II, who, in 1940–41, excavated 15 graves. Their propaganda aim was to find "Viking" objects that would provide "scientific proof" of the idea of Germanic superiority over

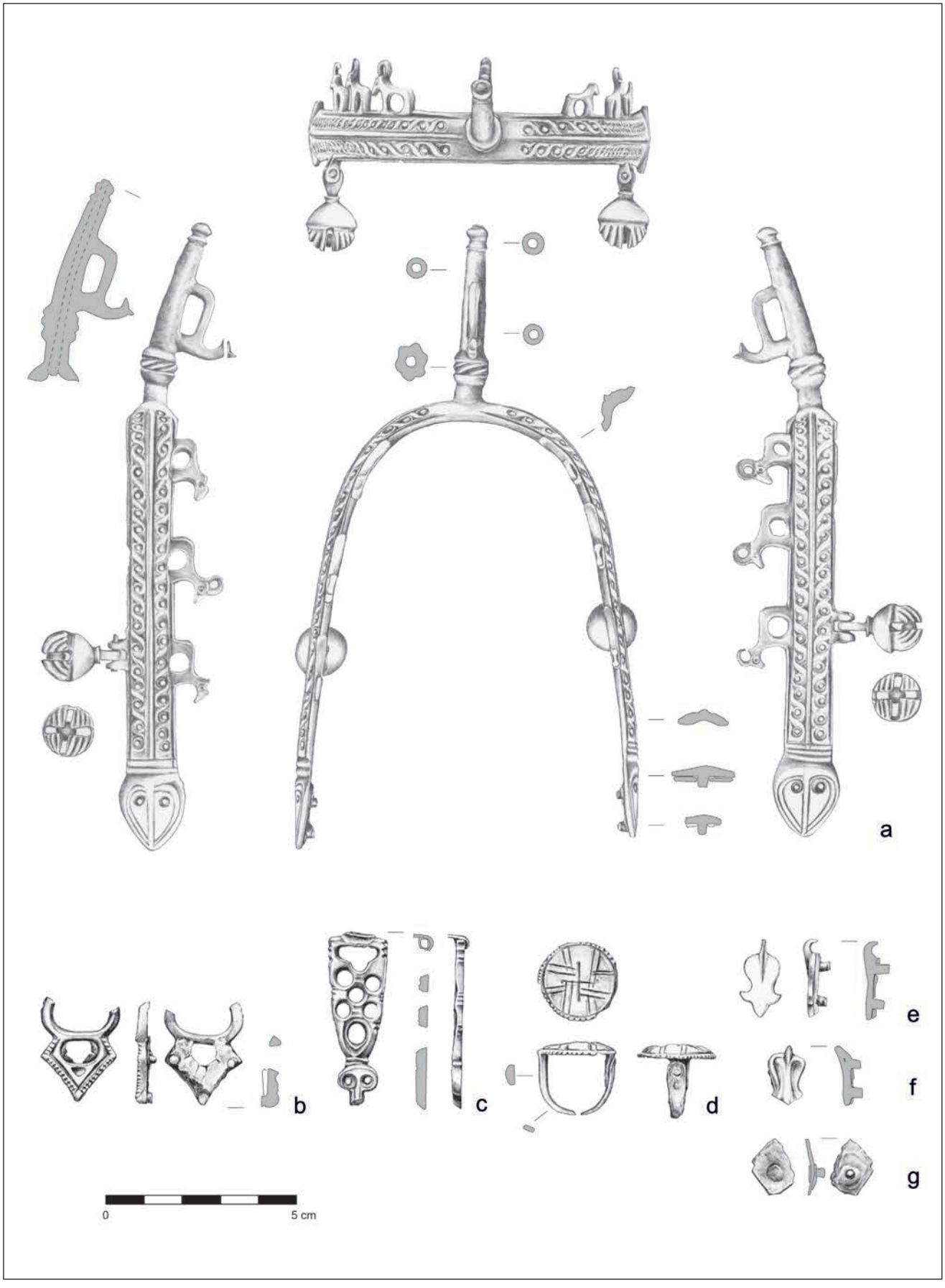

Figure 1. Zoomorphic (right) spur from Ciepłe, grave 42. Drawing K. Odya.

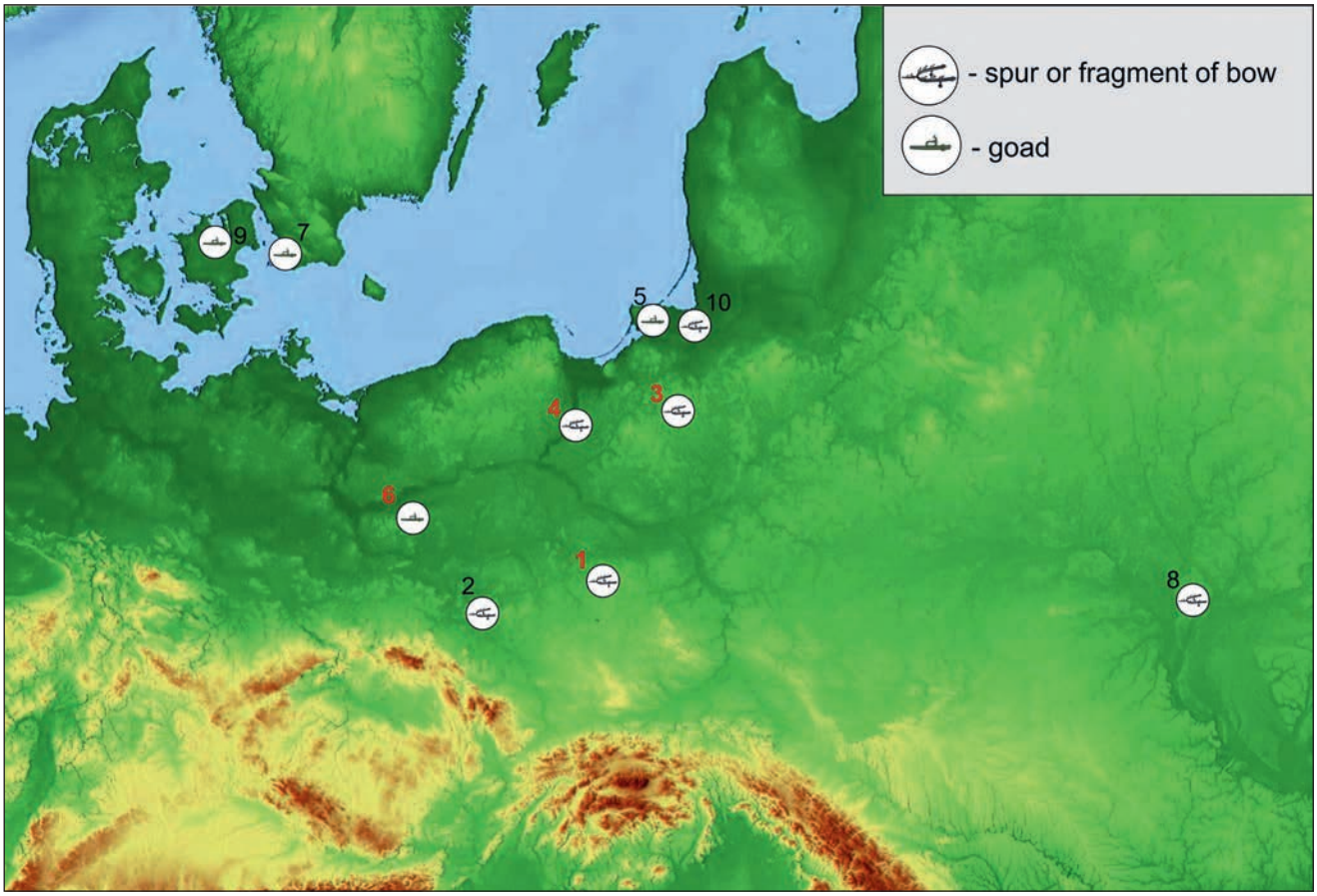

Figure 2. Geographic distribution of zoomorphic spurs and their fragments. Red numbers indicate analysed specimens.

the Early-medieval Slavic population of Poland (Gardeła 2018, 42). The next excavation at Lutomiersk took place in 1949–50 under the direction of Konrad Jażdżewski. The spurs of interest here were discovered during this campaign, when the archaeologists investigated 113 graves, mostly of adult men and women and only a few children. The burials were richly furnished with weapons, riding equipment, jewellery, pottery, and wooden vessels. Despite the prevalent practice of inhumation, the presence of a significant number of cremations within the cemetery suggests that it had been utilised by individuals adhering to traditional pre-Christian eschatology (Rębkowski 2023; Szczepanik 2018; Zoll-Adamikowa 1988). Two graves from the cemetery's first phase (Grygiel 2014; Nadolski et al. 1959) contained copper alloy objects with atypical zoomorphic decoration. Unfortunately, radiocarbon analysis of bones from both graves did not produce results (Grygiel 2014, 733–42).

Grave no. 5 was a large male cremation grave measuring 3.6 by 1.3m and covered by a stone pavement. The cremated remains were located in the eastern part (where in an inhumation grave the head would be expected) with a spearhead with a decorated socket close by; in the centre part lay a set of riding gear consisting of saddle (?), spurs, stirrups, bits, and a bridle, and at the western end was a wooden bucket. The grave also contained an arrowhead (Grygiel 2014, 682–96; Nadolski et al. 1959, 164–65, tab. I).

Grave no. 10 was a male inhumation grave in the central part of the cemetery and measured 4.3 by 2.5m. The pit was lined with stones and covered with three layers of paving stones. The grave goods consisted of riding gear – saddle (?), spurs, stirrups, bits, and a bridle – as well as a fragment of a spearhead, a few iron buckles, a wooden bucket, and an iron fire striker (Grygiel 2014, 682–96, fig. 8; Kempke 2000; Nadolski et al. 1959, 164–65, tab. III).

A breakthrough in the interpretation of Lutomiersk-type fittings was the discovery in 2009 of grave 42 (3.6 x 2.1m) at Ciepłe, a large chamber grave of a mature male. Here, for the first time, the spurs were observed directly on the foot bones of the dead horseman, which led to their old interpretation as parts of saddles being abandoned. In addition to the spurs, the burial contained other types of riding gear (such as stirrups, bits, and bridles), a richly decorated sword (Petersen Type Z), a spearhead, an iron buckle, a wooden bucket, and a touchstone (Ratajczyk 2013), as well as burnt animal bones (Ratajczyk and Wadyl 2019, 596).

The spurs from Ciepłe are the best-preserved ones known to date (Figure 1). Their arms are almost symmetrical and decorated along their entire length with a wave pattern. Three zoomorphic figures with horn-like, circular terminals on their heads are seen standing or walking on each arm, the ends of which, where the rivets are located, are also shaped like animal heads. The straps that originally were riveted to these spurs were richly decorated with a buckle (no tongues survive), two zoomorphic attachments, a circular strap slider with a swastika, and a zoomorphic strap end each; in addition, spherical bells were placed below the animal figures on the bows (spur's arms) that served both functional and aesthetic/symbolic purposes (Gardeła et al. 2019a, 141–44).

The finds from Lutomiersk and Ciepłe are distinctive, but there are others that have been discovered across the territory of today's Poland and beyond (Gardeła and Kajkowski 2020), such as at Cerkiewnik (Ziemlińska-Odoj 1992), Wrocław (Kaźmierczyk and Lasota 1979; Wachowski 2006), Lubniewice (Michalak and Gardeła 2020), Kumachevo in Kaliningrad Oblast (Wadyl and Skvorcov 2018), Shatrovo in Kaliningrad Oblast (pers. comm. Konstantin Skvorcov), as well as at Skegrie in Sweden (Gardeła et al. 2019c; Söderberg 2014), an unknown site in Ukraine (Gardeła and Kajkowski 2023), and recently Herslev on Zealand, Denmark (Gardeła 2023) (Figure 2).

A single workshop? Morphological and SEM EDS analyses

These objects are not identical, but slight differences are noticeable in the size of the arms, the distances between the open work animals, and their shapes. The animals on the spur arms from Ciepłe have solid silhouettes with straight backs, for example, while the corresponding figures at Lutomiersk and Cerkiewnik are more slender. There, the holes under the animals' abdomens cut into the outline of the spur's arm; at Ciepłe, they are placed slightly higher. Also, the spurs from Ciepłe have no additional holes, unlike two spurs from Lutomiersk (one from each of the graves) and the specimen from Ukraine. On the Lutomiersk spurs, these holes, located between the rivets at the ends of the arms, are secondary, cutting into the cast relief decoration of the serpent head. The purpose of the additional holes located on the heads is not entirely clear. The spur from Ukraine has three holes (two on the serpent head, one on the bow), but the lack of data and photographs makes a detailed description of this object difficult. Perhaps the hole on the bow was meant to replace a bell fastening, which would have been located there. Morphological and metric analyses we conducted suggest that the spurs were not cast in reusable half moulds.

Most of the spurs are stray finds (Lubniewice, Kumachevo, Skegrie, Herslev) or simply lost to research (Wrocław, Ukraine). Six more or less complete spur sets have been found in three graves at Lutomiersk and Ciepłe, a partial spur in a grave at Cerkiewnik. The spur parts from Kaliningrad Oblast probably also come from graves. The fragments from Wrocław probably belong to two spurs. Unfortunately, these artefacts are lost (Pankiewicz 2023, 260–61). All the rest, with the exception of the find from Ukraine, are broken-off goads. It is difficult to say whether they were lost during riding or whether they represent horseman's graves in destroyed cemeteries.

Being aware of similarities of the analysed spurs, but noticing certain design differences, we have investigated the metal of some of them. The main part of our examination, and a new step in the study of Lutomiersk-type zoomorphic spurs, is an archaeo-metallurgical analysis. Our basic methods are Scanning Electron Microscopy (SEM) and Energy Dispersive X-Ray Spectroscopy (EDS), a non-destructive combined technique that allows us to determine alloy compositions.

This work was carried out at the Centre of Nanotechnology at Gdańsk University of Technology, using a FEI Quanta FEG scanning microscope at a beam voltage of 30kV, a secondary electron (SE) detector for mapping purposes, and an EDAX Genesis APEX 2i ApolloX SDD detector for the analysis of elemental composition.

We analysed the metal of spurs from Ciepłe, Lutomiersk, Cerkiewnik, and Lubniewice. For Ciepłe, we sampled the end of the arm, the goad and the bell, plus the buckle, the strap slider, and the fitting. We chose the spur from grave 10 at Lutomiersk and sampled the broken animals on the bow and the goad rivet, as well as repair material at the goad. For Cerkiewnik, we analysed the spur and the strap slider, taking samples from the bow, the rivet, and the plate. For Lubniewice, we took samples from the iron core and the brass covering (Figure 3).

In total, we analysed thirteen samples (Table 1). The result was that while all were made of brass (Cu-Zn) with small amounts of tin (Sn) and lead (Pb), there are significant differences in the proportions of zinc to copper (Figure 4). The high percentage of zinc (over 22%) seen at Ciepłe suggests a particular sophistication in the production of the alloy and the spurs themselves. The specimens from Ciepłe are formally similar to the one from Cerkiewnik, but in the latter, the zinc percentage is considerably lower (ca. 17%). The ones from Lutomiersk and Lubniewice are almost identical in their alloys, with zinc at 10–11%. Copper-zinc alloys were popular in the

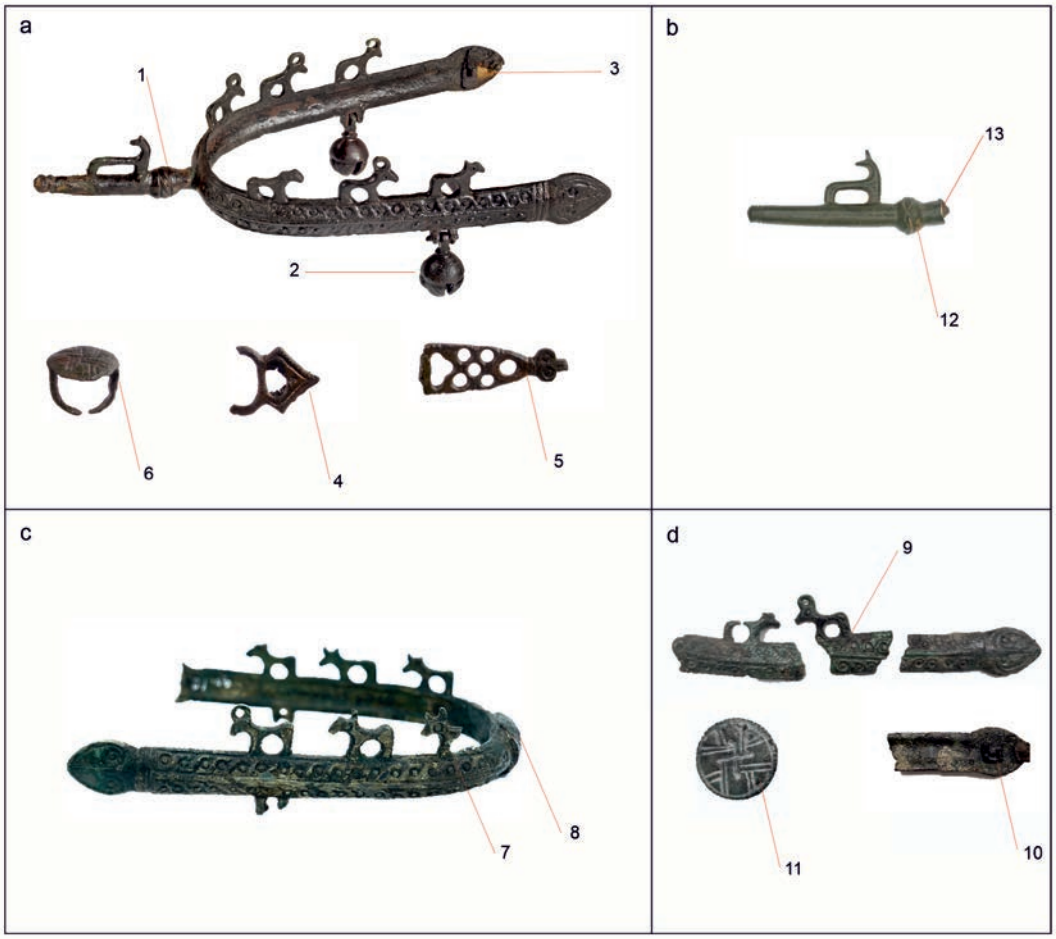

Figure 3. Analysed artefacts and locations of SEM-EDS spot analysis. a: Ciepłe, grave 42; b: Lubniewice, loose find; c: Lutomiersk, grave 10; d: Cerkiewnik, grave 7. Photo: Sławomir Wadyl (b-d) and Joanna Szmit, The Archaeological Museum in Gdańsk (a).

Table 1. Chemical composition of analysed artefacts.

	Site	Artefact	Cu	Al	Mn	Fe	Ni	Zn	As	Ag	Sn	Sb	Pb	Au
1	Ciepłe, grave 42	goad, right spur	73,14	0	0,06	0,15	0,08	22,81	0,59	0,02	2,07	0,04	1,02	0
2	Ciepłe, grave 42	bell, right spur	73,56	0	0,05	0,25	0,08	22,28	0,57	0,03	1,99	0,05	1,09	0
3	Ciepłe, grave 42	bow, right spur	71,78	0	0,06	0,12	0,08	23,25	0,48	0,03	2,95	0,00	0,99	0
4	Ciepłe, grave 42	buckle, right spur	69,85	0,01	0	0,19	0,07	23,31	0	0	1,51	0,03	4,89	0,09
5	Ciepłe, grave 42	strap end	71,44	0,09	0,11	0,29	0	21,64	0,1	0,03	1,67	0	4,53	0
6	Ciepłe, grave 42	strap slide, right spur	74,39	0	0,03	0,12	0,08	21,66	0,60	0,03	2,08	0,02	0,98	0
7	Lutomiersk, grave 10	bow	85,24	0	0	0	0	11,35	0	0	2,36	0	1,05	0
8	Lutomiersk, grave 10	bow, repair	3,88	0	0	0	0	0	0	0	0	0	96,12	0
9	Cerkiewnik, grave 7	bow	79,88	0	0	0	0	17,43	0	0	0,75	0	1,94	0
10	Cerkiewnik, grave 7	rivet	88,34	0	0	3,54	0	2,38	0	0	0	0	5,74	0
11	Cerkiewnik, grave 7	strap slide	86,63	0	0	0	0	11,49	0	0	0,69	0	1,2	0
12	Lubniewice, loose find	goad	85,51	0	0	1,26	0	11,67	0	0	0,83	0	0,73	0
13	Lubniewice, loose find	goad, edge	86,05	0	0	1,21	0	9,96	0	0	1,42	0	1,36	0

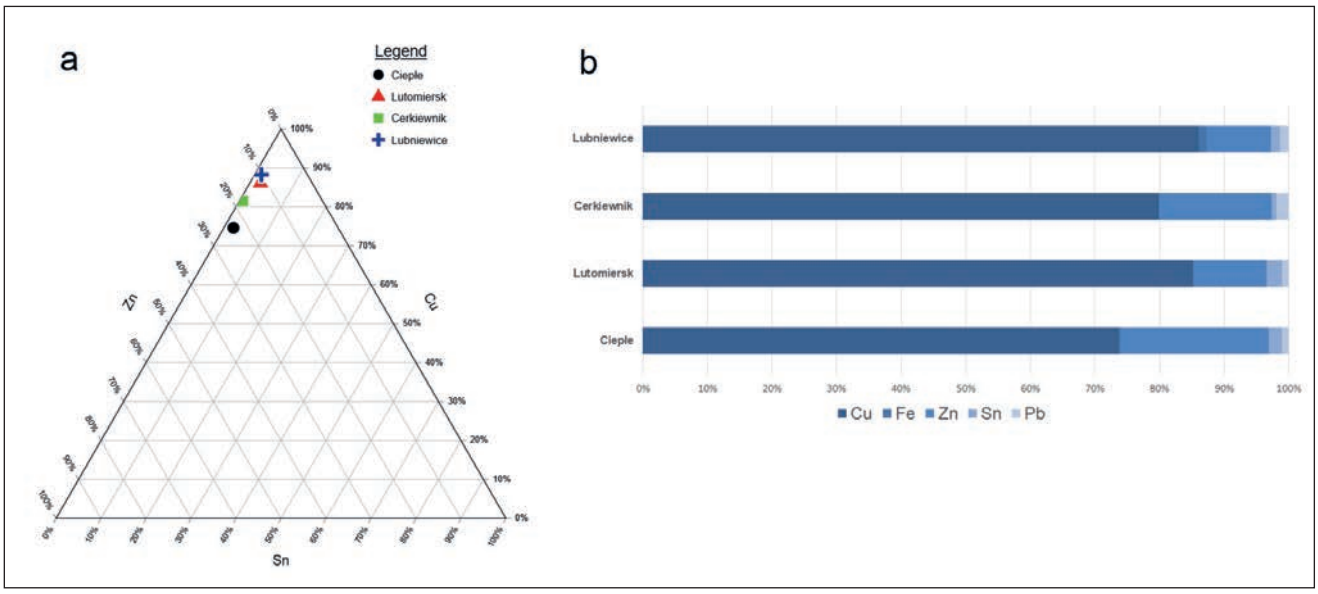

Figure 4. Gibbs phase diagram showing the compositional variation among analysed artefacts (a), and a diagram comparing main components (b).

Early Middle Ages, but there was no known source of pure zinc, making it difficult to produce brass. Minor differences in the percentages of zinc are often attributed to the complex nature of the production of brass, where zinc tends to evaporate. Influential factors are the initial ratio of the metals, temperature control, and the timing of the metallurgical process (Morton 2019).

It seems that the differences in the spurs' alloys are too large to allow for a single recipe: a common, standardised technology and the use of high-quality materials should produce alloys with more consistent Zn/Cu ratios.

Interestingly, the strap buckles and other fittings have a higher ratio of lead of ca. 5%; this had the effect to make the alloy more malleable. The sheet metal on the bow of the spur from Lutomiersk is made of lead instead of brass. This obviously is indicative of a repair and probably one that only was intended to make the spur hold together for the duration of the burial, as a grave good connected with *ars moriendi*: crafts people at the time understood perfectly well that lead was too soft to repair a spur for practical use.

The spur from Lubniewice shows how technologically advanced production was. The goad was made in two stages: in the first step, an iron core was forged and placed in a casting mould; in the second step, molten brass was poured into the mould. The iron core of the goads is also evident in copies from Ciepłe, Skegrie, and Herslev. The product is highly decorative yet strong enough for practical use. These items thus display two separate areas of usage: the first is symbolic and related to funerary rituals; the second is evidence of the technological sophistication and utility of the spurs.

Iconography

There is considerable scholarly literature on both the geographic origin of the zoomorphic spurs (e.g. Gardeła et al. 2019a; Gardeła and Kajkowski 2020; Grygiel 2014; Jażdżewski 1949; Kara 1991; Nadolski et al. 1959; Wachowski 2006; Wołoszyn 2010) and on their iconography and symbolism (Gardeła and Kajkowski 2020; Gardeła et al. 2019a; Szczepanik 2019, 219–48). To our knowledge, Ingo Gabriel (1988) was the first scholar to discuss the spurs in the context of Slavic mythology. He argued that the imagery of the Lutomiersk finds is analogous to that seen on a knife scabbard mount from Oldenburg, Schleswig-Holstein, Germany. The details may be different, but the stylistic similarity is obvious, and the idea of showing a complex zoomorphic and anthropomorphic system relevant to cosmology seems to be evident in both examples (cf. Szczepanik 2017).

The spurs can be interpreted along two main lines. The first interprets them as a schematic representation of Slavic cosmology (Gardeła et al. 2019a, 123–30); the second sees a connection with Slavic eschatology and ideas about the road to the underworld (Szczepanik 2019, 245–48). Unfortunately, we have no Early-medieval written sources describing Slavic cosmology. Instead, we must use later ethnographic sources (e.g. Mianecki 2010; Tomiccy 1975; Tomicki 1976) to infer a *longue durée* mythical structure (Braudel 2009; Lee 2018; cf. Szczepanik 2018, 121–27). Applying these sources and Indo-European comparative mythology to reconstruct a tripartite Slavic vision of the cosmos, we see a) the heavenly sphere belonging to sky gods and sun gods, b) the middle sphere of everyday human life, and c) the underworld with a three-

headed deity, who can also take on the form of a serpent dragon (Gieysztor 2006, 98–130; Szyjewski 2003, 58–65). From reconstructed cosmological myth we know of a battle between the Thunder God and the God of the Underworld (Iwanow and Toporow 1974, 75–103): in West Slavic religion, these deities were most likely named Perun/Svantevit and Veles/Triglav, respectively.

Looking closely at the spurs, we can – with all due caution – recognise some elements from these myths, such as the six small zoomorphic figurines that might represent horses with haloes (Gabriel 1988, 194; Kempke 2000, 391; Szczepanik 2019, 245–46) or horned cattle (Gardeła et al. 2019a, 114–16). In a reconstructed vision of the underworld, according to ethnographic sources, the souls of the dead could take the form of horses (Mianecki 2019) or of cattle (Szyjewski 2003, 54). However, rather than representing souls, the horses with haloes or wreaths depicted on the spurs are more likely intended as *psychopomps* – intermediaries guiding souls between the three realms of the cosmos.

There is a similar problem with the zoomorphic figures on the goads. Here, we are fairly convinced that it is a horse that is depicted, but why is it looking backwards? Some interpretations have seen this as the horse turning around to look at a god seated on its back (Gardeła et al. 2019a, 112–14), but in our opinion, a comparison with other archaeological materials may produce a more convincing idea. One of the most promising would be a horse burial from Pień in Kuyavian-Pomeranian Voivodeship, because here, the neck of the buried horse had quite the same position. Archaeozoologists have suggested that the aim in this had been to obtain easier access to the animal's main blood vessels (Makowiecki and Janeczek 2020), for the process of bleeding the horse to death in a sacrifice. Such a practice would suggest great respect for the horse. Blood sacrifices enabled contact between the worlds of humans and gods (Makowiecki et al. 2022, 13–14, fig. 7). The reading of the ideographic programme is not entirely clear and should not be considered conclusively settled and proven, but rather requires significant further research.

Discussion

The zoomorphic spurs of the 11th century are fine examples of high-level metalworking skill. They combine technology, art, and mythological symbolism in elite horse-riding equipment. They probably were produced on West Slavic territory and chronologically connected with the time of the rise of the First Polish State, but where exactly they were made remains unknown. Some researchers interpret spurs as material markers of membership to the Piast elite, i.e. the first ruling dynasty of Poland (Gardeła and Kajkowski 2020, 8–11). But these finds are distributed over a very large area, and it is difficult to decide with certainty where they came from. Their absence in Greater Poland – the heart of the Piast State – makes us wonder whether it is correct to associate them with the formal state elite. The iconography of the spurs is associated with pre-Christian Slavic beliefs but may also have been understood within the myths and beliefs of elite members of Germanic and Baltic communities. In all three mythological systems, serpents and horses played important roles. It can be assumed that the spurs were made in a single place or workshop, but they were not cast in reusable half moulds. Our metallographic analyses indicate that although all are made of brass, the alloy was not standardised. The spurs from Ciepłe have a composition different from the rest, and the diversity of materials is considerable. While usable, the spurs were quite fragile, as is evidenced by the incompleteness of most specimens and repairs to some of them. The repair seen at Lutomiersk – where a spur was reassembled, but not into any useable state before being placed in a grave – testifies to the high symbolic value of the spurs and to a sophisticated scenario of funeral rituals and eschatological beliefs. A further, more detailed study of all known spurs and their fragments will help confirm the hypothesis as to where they were made.

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Crampons – Late Iron-age everyday items and/or artefacts with sacred meaning?

ANNE-SOFIE GRÄSLUND

Anne-Sofie Gräslund 2025. **Crampons – Late Iron-age everyday items and/or artefacts with sacred meaning?** *AmS-Skrifter 29,* 91–96, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

The question is whether crampons, ordinary artefacts in everyday use on icy roads, also may have had a sacred meaning. The notion that they did is supported by Old Norse literature: in Gísle Sursson's saga, it is mentioned twice that it was customary to bind *helskór* to a dead man's feet. After a description of crampons for horses and people, I have selected Valsgärde and Birka, two well-known burial grounds from the second half of the first millennium in the Mälar valley in eastern Sweden, to study the frequency of crampons and their distribution according to grave type and the sex of the interred. Crampons are rather common and occur in both men's and women's graves and in both inhumations and cremations. An exception seems to be children's graves: in Birka, there probably are at least 80–100 children's inhumations, and only in one of them a crampon has been found. Strangely enough, there are several examples where a dead person was provided with a horse crampon.
Philologist Dag Strömbäck has commented upon the mentioning of *helskór* in Gisli's saga. He points out that translators have misunderstood the significance of the custom and strongly rejects their suggestion that the shoes were supposed to fasten the dead person into the grave and prevent him from returning to the world of the living as a ghost. To Strömbäck, it is obvious that the purpose of *helskór* was to help the deceased persons on their long and arduous journey to the Other World. I find Strömbäck's argumentation strong and sound, and I join his opinion.

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Key words: Crampons for horses and people, *helskór*, Valsgärde, Birka, journey to the Other World, 2nd half of the 1st millennium

Introduction

It is a fascinating thought that ordinary artefacts may have a double meaning, both the obvious one in everyday life and a sacred or ideological one. A good example are the grinding stones which have both a practical use and a symbolic meaning (see Lidström Holmberg 1998; Fendin 2006).

Crampons are small iron objects with spikes that were attached to the underside of the shoes of humans or the hooves of horses by means of leather straps or string. Usually, this was done to keep their wearers from slipping and losing their footing on icy ground, but they also have been described in connection with death and funerals. I will come back to this aspect, but let us first have a quick look at crampons and their frequency.

Horse crampons (Figure 1, cf. Figure 5): U-shaped mounts with a broad irregularly shaped or semicircular base plate (width ca. 3.5–4.5cm) from the underside of which projects a single pyramidal spike. The legs are bent

Figure 1. Horse crampon from Valsgärde, cremation grave 86. Late Viking Age. Photo: Mikael Wallerstedt, Uppsala.

Figure 2. Crampons for shoes/humans, Valsgärde, cremation grave 89. Viking Age. Photo: Mikael Wallerstedt, Uppsala.

when attached to the hooves. A common interpretation is that if the legs (length ca. 5.0–6.5cm) are straight, the crampon has never been used. After consulting with a colleague with knowledge of horses and their gear, I understand that there may be another explanation: when crampons were no longer needed – such as when the ice was gone – they were straightened out, in order to remove them. This is how horseshoe nails are handled today after the change of horseshoes, every 6th to 8th week (e-mail from Anneli Sundkvist PhD 2014-04-09).

Crampons or studs for humans/shoes (Figure 2, cf. Figure 5): these are band-shaped with the legs bent together over the base plate, which has a spike underneath. Usually, they are rather small, just 3–4cm long and 1–2cm wide. They may have been fastened on a wooden stick or a piece of thick leather (Atterman 1935, 153–55). Another method is demonstrated at Tuna in Alsike, Uppland, eastern Sweden, where a woman buried in a boat (grave X) had an iron band, about 10cm long, with three spikes underneath (Arne 1934, tables XV, XXX; Atterman 1935, 154).

In addition, there is also a small number (5 examples) of a triangular type of crampon probably fastened to the shoe heel with a cord or a leather strap. This type, common in the Middle Ages, will not be touched upon here. To study the frequency of crampons, I have chosen two well-known eastern-Swedish cemeteries in the Mälar valley: Valsgärde, pre-Viking (Vendel/Merovingian Period) and Viking Age, and Birka, Viking Age. The numbers are approximate, as small fragments may be difficult to identify.

Valsgärde (Vgde): horse crampons occur in connection with horse skeletons in the Vendel-period boat graves 6, 7 and 8, probably also in Vgde 5, as well as in several of the Viking-age boat graves (for example Vgde 1, 2, 4, 13, Figure 3 and 4) and in the Late Viking-age chamber grave 22 (Figure 4). Concerning cremation graves, the burials mostly consist of cremation layers under some form of external structure, such as a stone setting or a cairn. Horse crampons occur in six (49, 52, 57, 75, 85 and 86), human/shoe crampons in three (89, 95 and 96) and both types in one cremation grave (94) (Arvidsson 1942, 1954, 1977; Munktell 2013; Nordahl 2018).

Birka (Bj; see Figure 5): at least 28 horse crampons are known from 18 horses in inhumation graves as well as 28 examples from 21 cremation graves. Band-shaped shoe crampons were found in 109 graves (50.5% cremations, 49.5% inhumations). Number of sex-determined: 29 male, 32 female, 2 double interments of a man and a woman). It is remarkable that only one of the graves is listed as that of a child (Arbman 1943, 321). In a previous paper (Gräslund 1973), I tried to identify the children's graves

Figure. 3. Skeletons of two horses with crampons at their hooves. Detail of a drawing of boat grave Valsgärde 13, made by Bengt Schönbäck. Museum Gustavianum, Uppsala. Viking Age.

Figure 4. Skeleton of a horse with crampons at three of the hooves. Detail of a drawing of chamber grave Valsgärde 22, made by Bengt Schönbäck. Museum Gustavianum, Uppsala. Late Viking Age.

in Birka's burial grounds, based partly on artefact finds and partly on burial pits shorter than 1.5m. The grave in question, Bj. 846, contains an inhumation, where the deceased child was buried in a nailed coffin about 1.45m long. The deceased was equipped with jewellery consisting of oval brooches, one large and one small round brooch, both gilded, a bronze needle case with needles still in place in textile remains and a bronze-clad iron weight as well as a damaged band-shaped crampon with wooden remains near the place where the child's feet probably had been. Interesting is the inhumation grave Bj. 887 (Figure 6), where the dead person – presumably a woman, judging from the grave goods consisting of 12 glass beads, two of them with gold foil and 10 with silver foil, a knife and a comb – had been equipped with one horse crampon under the right foot and two shoe crampons under the left foot.

It is worth mentioning that Jan Petersen included crampons in his 1951 book *Vikingetidens redskaper*, but only those for horses. He knew of 118 examples in

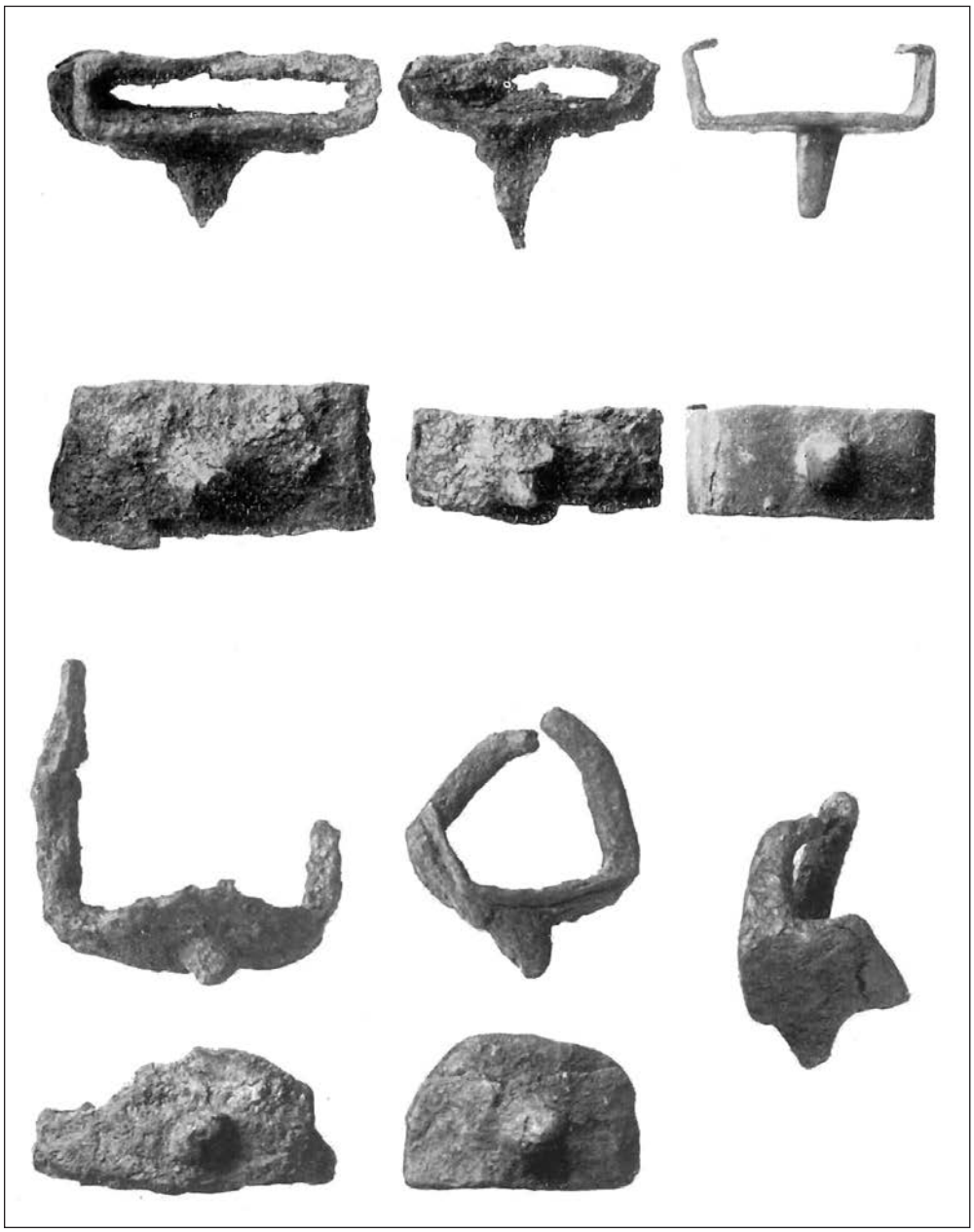

Figure 5. Crampons from various Birka graves (after Arbman 1940, slightly modified by John Ljungkvist). Viking Age. Upper row shoe studs, from left: Bj. 1032 (inhumation grave), Bj. 323, Bj. 385 (both cremation graves). Row 2: the same crampons seen from below. Row 3: horse crampons, from left: Bj. 887 (inhumation grave), Bj. 954 (chamber grave). Row 4: the same crampons seen from below, the one from Bj. 954 also in profile.

Norway, where they are strongly concentrated in the Østlandet region. Even while some of them seem to be band-shaped, he argues that they are too big to be shoe crampons. The only example of possible shoe crampons he knows from Norway comes from a 9th-century male grave in Akershus (Petersen 1951, 62–66).

A possible sacred meaning

More or less contemporarily, two eminent Scandinavian philologists, Anne Holtsmark in Oslo (Holtsmark 1951) and Dag Strömbäck in Uppsala (Strömbäck 1952) proposed the idea that crampons were a materialisation of what in Old Norse literature is referred to as *helskór*: shoes that are used when hiking to the other world. Support for the idea is to be found in Gísli Sursson's saga, one of the Icelandic sagas. Crampons are also mentioned in the *Eyrbyggja saga*, chapter 45, but these obviously are of the triangular type referred to above.

Briefly, the story of Gísli's saga is about the consequences of the secret murder of Véstein Vésteinsson, brother of Gísli's wife Aud, on Gísli's farm, Hóll. The perpetrator is Thorgrím Thorsteinsson, who is married to Gísli's sister and living on the neighbouring farm Sæból. Gísli immediately understands the situation and after some time exacts revenge by secretly killing Thorgrím. The scene in the saga relevant to the question of the meaning of the *helskór* concerns the ceremony accompanying Véstein's interment in a mound (chapter 14): Thorgrím says, "It is the custom to bind *helskór* on dead men on which they are to go to Valhalla, and I will do that with Véstein […]. Nor

can I bind Hel-shoes if these should loosen" (Gisle Sursons saga 1993). In her thorough analysis of the persons and events described in the saga, Anne Holtsmark (1951, 55), merely mentions the custom of binding *helskór* and adds nothing more about it.

Dag Strömbäck believes that the translators of the passage quoted above misunderstood the meaning and rejects their idea that the *helskór* were meant to fasten the dead person into the grave and to prevent his return to the world of the living as a ghost (Strömbäck 1952, 144). Instead, he proposes, the essential thing was to tie the shoes properly over the ankle, so that the crampons could be useful for the deceased on his long and arduous journey to Valhalla (Strömbäck 1952, 142–44). Strömbäck's argumentation seems sound and strong, and I agree with it.

Some Early-medieval wooden coffins found under Saint Lars' church in Linköping contained long rods or staffs, which are interpreted by medievalist Sune Zachrisson as walking sticks for the long and difficult hike to the Other World. In Lund, several 11th- and 12th-century graves contain such staffs as well as, in some cases, the remains of shoes, which led Zachrisson to think of the concept of *helskór* (Zachrisson 1958, 198–200). This is supported by the fact that in Germany, well into modern times, the funeral beer was called *Totenshuh*. Finds of shoes, lasts or models in graves may thus be related to this notion (Gezelius 1959; Strömbäck 1961; Zachrisson 1958).

Swedish folklorist Louise Hagberg, who published a comprehensive book on burial customs in Early Modern Times in Sweden, discusses in detail how the dead body was dressed. Socks, she points out, were extremely important and usually were put on before the onset of rigor mortis (Hagberg 1937/2015, 189–93). This may be reminiscent of the old custom of death shoes and by extension even of *helskór*.

Our ideas of the concept that people in Viking-age Scandinavia may have had of the Other World and the journey there are rather obscure, as there is a lot of contradictory information in Old Norse literature, both in the Eddic poems and elsewhere. One of many important questions that arise, for example, is whether women were allowed to enter Valhalla, Óðin's abode of fallen warriors? Or were they excluded from the Other World?

An interesting suggestion regarding the custom that included boat graves has been proposed recently. From the middle of the Bronze Age and throughout the Iron Age, the ship has been a natural means of travel. This makes it reasonable to understand the notion of a ship and a sea voyage as a metaphorical medium for the deceased's journey to the Other World. The reason for this may well be that on the horizon, the open sea seemingly meets the sky in a way that invites the idea that celestial space will be reached if one will just sail far enough (B. Gräslund 2018, 90–91). Sailing was one way to reach the Other Side, walking there obviously was another. In this context, it is interesting to note that none of the boat graves at Vendel and Valsgärde include crampons for humans, only for horses, although there is the incidence noted above of a crampon for human shoes in the boat grave at Tuna in Alsike.

Conclusion

I find it entirely reasonable that crampons sometimes had a double meaning – that of an everyday aid for walking on icy ground and a sacred meaning as *helskór,* a helpful implement on the difficult hike to the Other World. Obviously, however, the latter was not a widespread custom

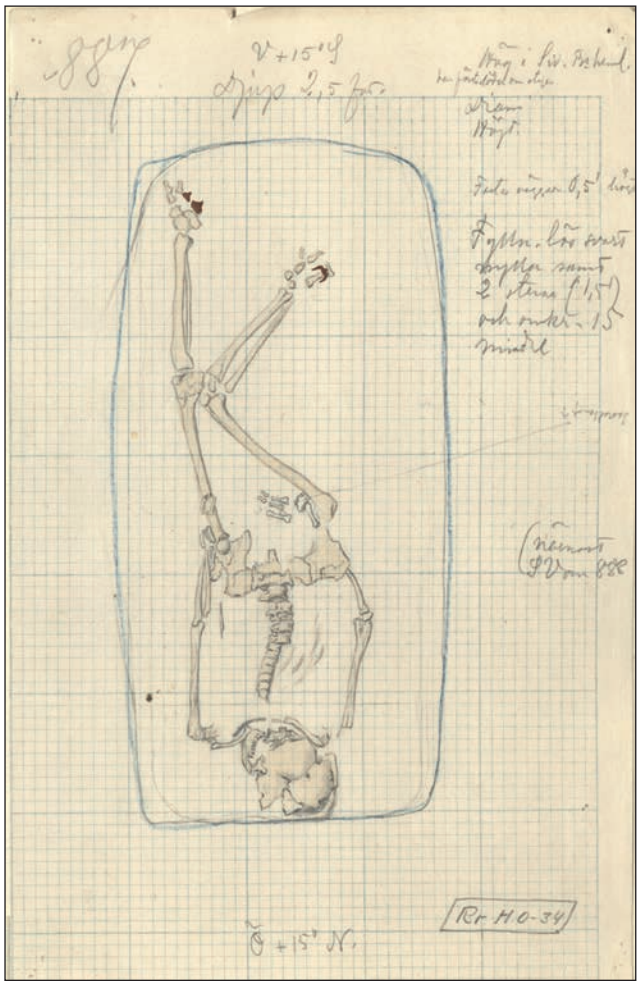

Figure 6. Hjalmar Stolpe's plan of inhumation grave Bj. 887. The deceased person had a horse crampon under the right foot and two shoe studs under the left foot. The crampons are indicated by colour. Museum Gustavianum, Uppsala.

or there should be many more examples, especially band-shaped shoe crampons, among the grave finds. In Birka, for example, only 10% of the graves include crampons. Only one was found in the grave of a child (Bj. 846). In the catalogue, we read: "one band-shaped crampon, damaged, with remains of wood", obviously remains of the shoe sole (Arbman 1943, 321). The suggestion that the child might have been carried to the Other World by an adult is interesting (and in fact found in churchyards from early modern time, where children sometimes are interred in an adult's grave), but there is no evidence for that here. The grave in question is equipped in an usual way, neither richer nor poorer than other children's graves.

Note: Much of the Valsgärde material presented here is unpublished. It is kept in the archive of Museum Gustavianum, Uppsala, and is going to be published by the project Viking Phenomenon, led by Neil Price, John Ljungkvist and Charlotte Hedenstierna Jonson. My warmest thanks to John Ljungkvist for helping me with the illustrations.

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Part II
Knowledges

An unusual treasure find of the 3rd century from Suluc in Dobruja (Romania) with fragments of a Scandinavian snake-head arm ring

DIETER QUAST

Dieter Quast 2025. **An unusual treasure find of the 3rd century from Suluc in Dobruja (Romania) with fragments of a Scandinavian snake-head arm ring.** *AmS-Skrifter 29,* 99–106, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

In 1911, a most remarkable treasure find from the last third of the 3rd century was discovered in Suluc in Dobruja, Romania. It contained four Roman gold coins (Hostilian and Gallienus), the gold head of an emperor's bust, two silver cups of the Leuna Type, a gold crossbow brooch and three gold arm rings. One of them is a snake-head arm ring of Hildebrand's Type C. The treasure from Suluc is extraordinary, as a comparable composition does not exist elsewhere in the eastern part of the Roman Empire. There, deposits of the 3rd century mainly contained coins, and occasionally precious-metal jewellery. Silverware, on the other hand, has been deposited more frequently only since the 4th century. It is therefore possible that the find from Suluc was hidden by a non-resident in the Roman Empire. As some of the objects already were in second- or even third-hand use and obviously were worn as jewellery or as "trophies of war", it is likely that the treasure is connected with the numerous Gothic incursions into the Roman Empire in the second half of the 3rd century.

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Key words: Hoard, "trophies of war", jewellery, Leuna-Type silver cups, gold imperial bust

Introduction

In this article, I present an unusual treasure find that in my opinion is eminently suitable for shedding light on the interconnections between northern and south-eastern Europe in the 3rd century AD. It was found in the Dobruja region in present-day Romania.[1] In the 3rd century, the area belonged to the Roman province of Moesia Inferior and, after AD 282, to the province of Scythia. In Suluc, near the small town of Măcin (administrativ unit /*județul* Tulcea) (Figure 1), a farm worker growing tobacco in 1911 discovered a "silver vase" with some gold objects (Burda 1979, 71, no. 53; Custurea and Talmaţchi 2011, 266, no. 86,II; Diaconu 1983; Gramatopol and Theodorescu 1966, 75, no. 124; Iliescu 1987; Knechtel 1920; Moisil 1911, 1920, 1923).

The complex suffered the same fate as many accidentally discovered hoards of precious metals: some parts remained with the finder, others ended up in private collections, others in museums, in this case mostly in Bucharest (Figure 2). Fortunately, old photos are available of most of the objects that did not make their way into museums (Figure 3), so that the main features of the treasure's composition can be reconstructed. We are particularly indebted to Constantin Moisil, then-director of the Numismatic Cabinet of the Romanian Academy in Bucharest, for his important reports, which were, however, often presented in publications difficult to access (Moisil 1911, 1920, 1923). This probably is why the Suluc treasure was largely forgotten, though some of the objects occasionally were mentioned in regional literature. Ten years ago, the six items in the National History Museum in Bucharest were published very succinctly in an impressive exhibition catalogue (Figure 2), but that did not help the treasure to achieve greater fame (Oanță-Marghitu 2014).

Figure 1. Location of the Suluc site. Graphic: Michael Ober, LEIZA Mainz.

Figure 2. Suluc: the preserved finds from the Muzeul Național de Istorie a României (Bucharest). Collection of the Muzeul Național de Istorie a României, © MNIR 2023, photo: Marius Amarie.

We begin very briefly with the objects that were laid down in Suluc. There are at least four coins: three *aurei* of Gallienus and one of Hostilian (see Quast 2023, 51–53). We cannot go into numismatic details here; it may suffice to say that the coins provide a terminus post quem of AD 266/268. What is of interest is that all coins were perforated; in the case of Hostilian's aureus, the holes had been filled again with gold, only for the coin to be perforated again later at another place. This indicates that the coins were worn as jewellery.

A small, approximately 6cm high gold emperor's bust deserves special attention (Figure 3,6). Unfortunately, its whereabouts are unknown, but there are two old photos and a description. Small gold busts like this are extremely rare, with only three comparative finds known to me. Their mounting in largition bowls as well as the use on military standards are discussed for the emperor busts made of gold or silver (de Pury-Gysel 2017; Künzl 1983; Töpfer 2011, 73–75). The Suluc bust has an eyelet at the top of the head, to which two chain links are attached. It is very likely that this suspension was secondary. Assuming that it is the emperor's head detached from a bust, it could well be regarded as a kind of "trophy" that was worn as a pendant.

Unfortunately, it is not possible on the basis of the photo to determine which Roman emperor is represented in the little head from Suluc. Ernst Künzl, a profound expert on Roman emperor portraits, wrote to me that in his opinion, it most likely is Decius (249–251 AD), who in June 251 fell in battle against the Goths (heterogeneous groups of warriors from large parts of the Barbaric world) at Abrittus (today Razgrad, Bulgaria).

Among the objects unusual in a treasure find from the eastern part of the Roman Empire are the two Leuna-type silver cups (Figure 2,1–2). Although they are a pair, the two examples from Suluc are of different sizes and decoration. Fourteen comparable silver cups are known to date, but they originate exclusively from the west of the Roman Empire and from adjacent *Barbaricum* (Niemeyer 2004). They are dated to the 3rd century, which is supported by glass vessels of similar shape and ornamentation, such as the Eggers 216 and 218 cut-glass cups (Eggers 1951, pl. 15).

Looking more closely at the two silver cups from Suluc, we see that they feature decorative elements that do not exist in this form in the West (which may be due to the fact that so few of these cups are known to date; cf. Quast 2023, 57, fig. 5). The hatched framing of the indentations and the small cones soldered in their centres are striking. But whether the Suluc cups are of eastern production remains unclear and seems rather unlikely: they usually are regarded as products of Gallic workshops that did not find an empire-wide distribution. It thus appears that they found their way into the ground at a place far from their production area.

A gold crossbow brooch (Figure 3,7) of Pröttel's Type 1a dates to the last third of the 3rd century, which fits well with the coins (Pröttel 1988, 349–53, 372, fig. 11; Schierl 2016, 535–36). The two gold arm rings (Figure 2,3–4) and the fragments of a gold necklace (Figure 3,1–2) with a round clasp (Figure 2,5) can also be dated to this period (Oanță-Marghitu 2014; Quast 2023, 59–60, 64).

The Scandinavian snake-head arm ring

The most surprising item from Suluc is merely a fragment, made of gold and about 2cm long, that features a cylindrical middle section decorated with parallel grooves that give the impression of it being wrapped in smooth wire (Figures 2,6,4); the reverse is completely smooth. The upper end is formed by a mushroom-shaped knob, the lower end by a flat semicircular shape (Figure 4,2). The fragment is cast in solid gold and weighs a little less than 10g. So far, it has been interpreted as part of a gold crossbow brooch (Gramatopol and Theodorescu 1966, 75, no. 127; Oanță-Marghitu 2014, 454, no. 104.2), but this seems unlikely to me. The fact that the fragment is solidly cast speaks against such an assumption, because the known gold crossbow brooches are made "hollow" (Drescher 1959, 177–79, fig. 3) and their knobs were not cast with the body, but attached (Boube 1960, 347, fig. 6). Varieties made of bronze or lead, on the other hand, frequently are solidly cast, as shown by faulty castings and moulds (Drescher 1959, 171–77, fig. 1; Mackensen and Schimmer 2013, 285–91, figs. 133–134). The exquisite gold brooches were defined by the high quality of their material and the high level of production and craftsmanship. In comparison, the fragment from Suluc seems almost "clumsy" with its decorations of parallel grooves. It has no equivalent in the numerous known crossbow brooches, regardless of their material (see Pröttel 1988; Quast 2015; Soupault 2003; Steuer 2007; Swift 2000, 13–88).

Based on the shape of the knob, the groove decoration, the size, and the manufacturing technique of the Suluc fragment, a reconstruction other than that of a crossbow brooch can be suggested, viz. that it is the terminal piece of a Scandinavian snake-head arm ring of Hildebrand's Type C or Przybyła's Type 2M (Hildebrand 1873, 28, fig. 9; Przybyła 2021, 25, fig. 18).

The snake-head ring from Kvinnsgröta, Öland, Sweden (Figure 6,1), has the same grooved decoration on the front as the fragment from Suluc (Andersson 1993, 192,

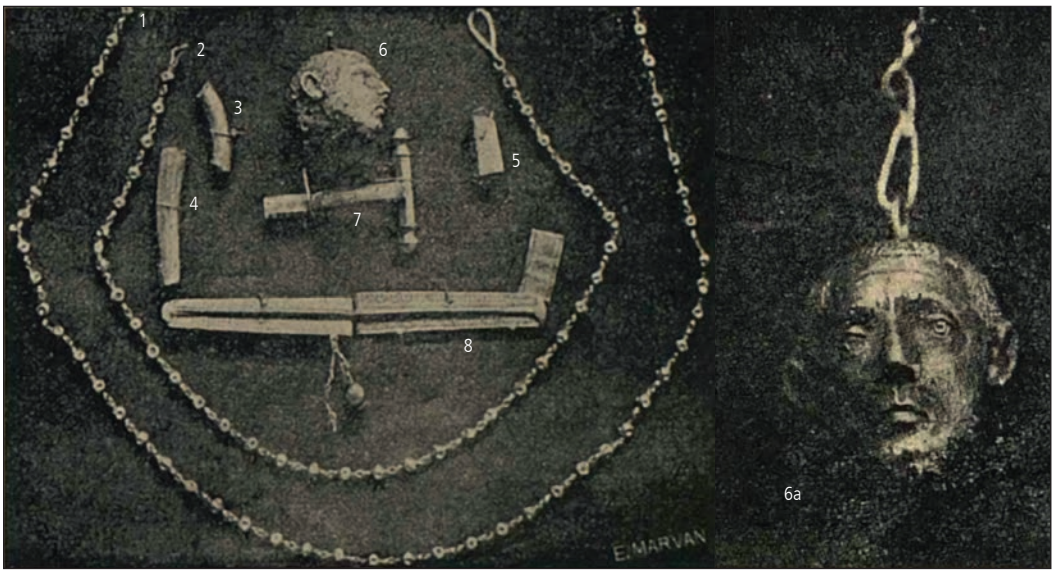

Figure 3. Suluc: old black-and-white photo of the lost finds. After Moisil 1923, 68–69, figs. 4, 5.

Figure 4. Suluc: fragment of a gold Scandinavian snake-head arm ring. 1. Collection of the Muzeul Național de Istorie a României, inv. no. P23483 © MNIR 2023, photo: Marius Amarie. 2. After Gramatopol and Theodorescu 1966, pl. XX,4.

no. 1014, 1995, 73, fig. 50); one of the rings from Skedemosse, also Öland, not only shares this decoration, but also the shape of the button of the Suluc find (Andersson 1993, 189 no. 1003; Hagberg 1967, vol. 1, 52–53, no. F 270, fig. 40, right, pl. 1, top left, vol. 2, 10, fig. 4) (Figure 6,2). Type-C snake-head arm rings mainly are known from Uppland, Öland, and Gotland in Sweden, as well as from Funen and Zealand in Denmark, but there are isolated rings from Central Germany and Poland, as well (Andersson 1995, 70, fig. 47; Przybyła 2021, fig. 2) (Figure 5). The oldest of them date to Period C1b (ca. 210–260 AD), but most rings belong to Period C2 (ca. 260–310 AD) (Andersson 1995, 78–79; Przybyła 2021, figs. 2, 5). Thus, such a ring would chronologically fit well into the treasure from Suluc.

Knowledge of two other gold fragments among the Suluc treasure survives only through an old black-and-white photo. The pieces are described by Constantin Moisil as "two narrow gold blades (probably fragments of a brooch) […] decorated on the edges with geometric figures carved with great skill. They consist of a series of semicircles filled with groups of three beads each" (Moisil 1923, 67, no. 5, fig. 5, author's translation) (Figure 3,8). In the photo, two long rectangular fragments with almost parallel sides can be seen that seem to fit together. There is a clear ridge running down their middles, which is a very characteristic feature of the band-shaped sections of snake-head rings (e.g. Przybyła 2021, figs. 13,8–10, 15, 16–18) (Figure 6). Accordingly, they very well might be two more fragments of the snake-head arm ring. The row of semicircular punch marks on the rim also fits well with this notion as well as the ring's dimensions (Andersson 1995, 183, fig. 201; Przybyła 2021, 10, fig. 4). It is not possible, however, to make a reliable assessment on the basis of the old photo.

Two features speak against this interpretation. On the one hand, there is an apparently smooth rectangular plate on the right edges of the two fragments, approximately at right angles. Secondly, in the photo, three very small semicircular extensions can be seen on the lower edge. To the middle one, two fine little chains are attached, one of which has a gold bead at the end. Both features are unknown in snake-head arm rings, but they might be explained as secondary reworkings, which can also be found on other objects from the treasure of Suluc.

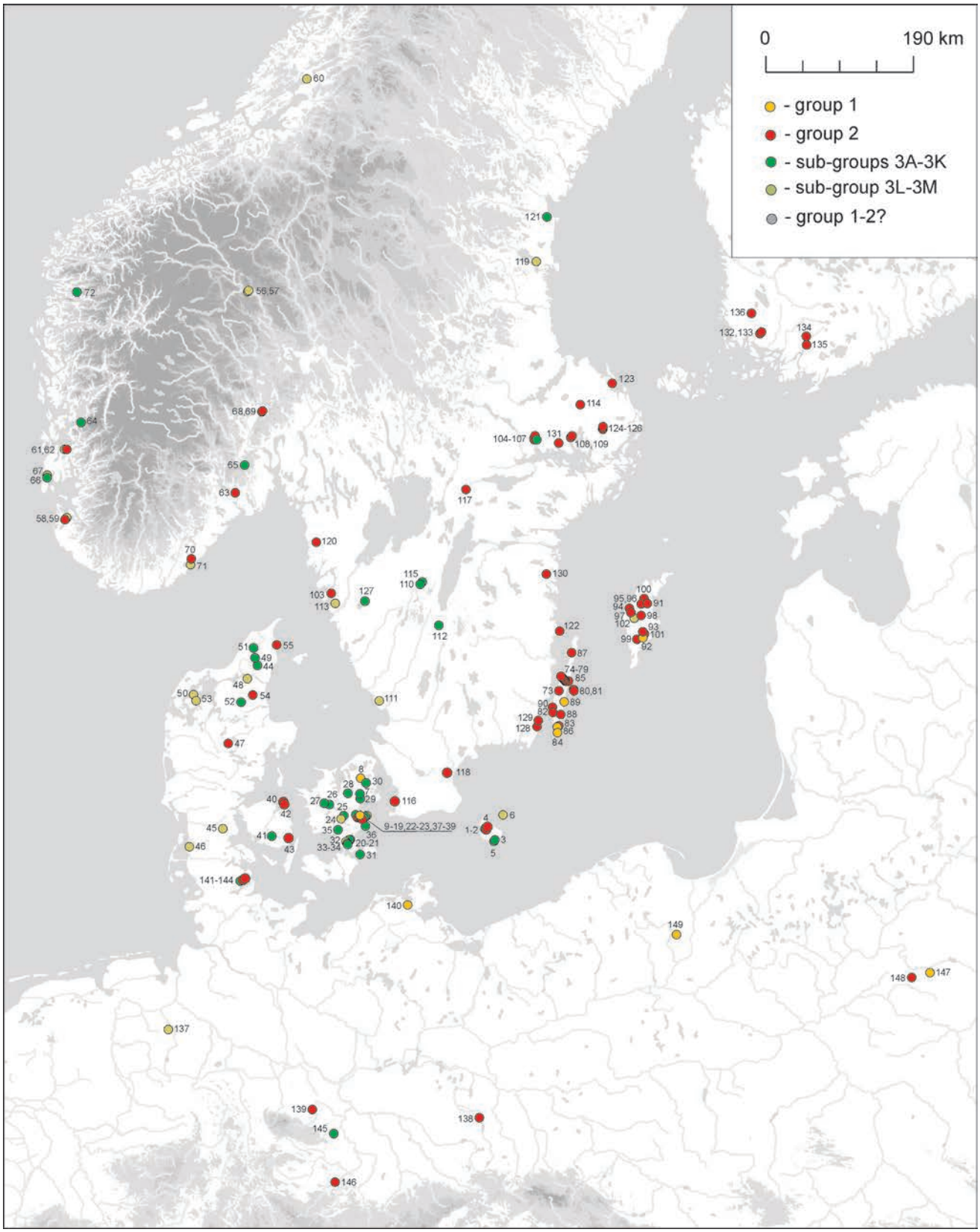

Figure 5. Distribution of the Scandinavian snake-head arm rings (groups 1 and 2) and finger rings (group 3). Suluc is not mapped. After Przybyła 2021, 5, fig. 2. With kind permission by Marzena Przybyła.

The historical context of the find

Finally, I would like to put the treasure find from Suluc into a historical context, beginning with a short preliminary summary. The treasure from Suluc was deposited in the last third of the 3rd century AD. However, it is striking that some of the objects at that time already were in second- or even third-hand use, namely the coins and the small emperor's head and possibly also the Scandinavian snake-head arm ring. The coins and the bust head obviously were worn as jewellery or as "trophies". This was a custom in the Roman Empire, as well, but there, the coins were usually given an opulent setting. A simple perforation as seen on the Suluc coins is mostly found beyond the imperial border.

The treasure from Suluc does not exclusively consist of trophies. The objects originating from distant regions are also striking, such as the Leuna-type silver cups and the gold Scandinavian snake-head arm ring. All this gives the complex a heterogeneous character. The composition of elements from the male and female worlds is equally striking. All objects are of high material value, but some have been reworked and probably were deposited in the ground in fragmentary condition. All in all, the Suluc treasure looks like a collection of loot that was buried by its owner.

It is quite likely (but impossible to prove) that the treasure is connected with the numerous Gothic incursions into the Roman Empire during the second half of the 3rd century. Aleksander Bursche studied the numerous coinages of Decius in *Barbaricum* to determine their distribution to describe the catchment area of the Gothic commander Cniva at the battle of Abrittus in AD 251 (Bursche 2013, pl. 34; Bursche and Myzgin 2020; Quast 2023, 65–68).[2] Perhaps the fragment of the snake-head arm ring from Suluc indicates that there were Scandinavian units active in the Gothic wars as well. Over 30 years ago, Joachim Werner described contacts between Funen and the Černjachov culture in western Ukraine, Moldova, and eastern Romania from the middle of the 3rd to the end of the 4th centuries (Werner 1988; cf. Myzgin 2019). Hoards of snake-head arm rings of Type Hildebrand C on the continent at least suggest Scandinavian activity further south (Figure 5) (Przybyła 2021, 5, fig. 2). An example of this type in south-eastern Europe therefore is not at all surprising.

News of victorious invasions into the Roman Empire during this period must have triggered enormous dynamics. Word of the campaigns, such as those of 238 and 250 AD, spread throughout *Barbaricum* and the area of today's western Ukraine and became a rallying point that attracted warrior groups of different origins with

Figure 6. 1. Snake-head arm rings rings from Kvinnsgröta (Öland, Sweden). Photo: Kalmar läns museum (KLM 28160). 2. Snake-head arm rings from Skedemosse (Öland, Sweden). Photograph: Ulf Bruxe, Statens historiska Museer, Stockholm, SHM 109211; 26239:270, 109211_HST. (CC BY 4.0).

the prospect of success, fame, and booty. For the military commanders, more warriors meant more striking power and thus greater military success, which in turn drew more warriors from *Barbaricum* (for the following, see Quast 2021, 304–6).

Perhaps the situation in Syria and Iraq a little more than 10 years ago is a suitable example for comparison. There, a power vacuum had arisen that various groups sought to exploit for their own ends. The Islamic State ("IS") was particularly successful at times. This made it a centre of attraction for young men from all parts of the world who hoped to find some gains there for which they were willing to risk their lives (Figure 7). This enormous influx in manpower increased the Islamic State's military strength accordingly. The emergence of the Gothic Empire can be explained in a similar way.

Conclusion

The Suluc hoard, discovered in 1911, is very unusual in the Roman Empire due to its composition and probably was deposited by a non-resident. Chronologically, it dates from the period of numerous Gothic incursions into the Roman Empire during the 3rd century. The term "Goths" refers to heterogeneous groups of warriors from large parts of the Barbaric world. The gold ring from Suluc suggests that there were Scandinavians among these groups.

Figure 7. Origin of Islamic State fighters. Map: Michael Ober, LEIZA, Mainz, redrawn from "Spiegel online", Friday 28.11.2014.

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Endnotes

[1]I presented the treasure find in detail in the Festschrift for Michel Kazanski (Quast 2023). In this paper, I will focus on the Scandinavian snake-head arm ring.

[2]Catchment area refers to the area from which the warriors come – and to which they return (with their spoils).

The rosette fibulas and the social strategies of the Late Roman Iron Age

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Torben Trier Christiansen 2025. **The rosette fibulas and the social strategies of the Late Roman Iron Age.** *AmS-Skrifter 29,* 107–116, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

During 2018–2022, the North Jutland Museums excavated large parts of one of three burial grounds near the farm Grønhøjgård southeast of Aalborg, Northern Jutland, Denmark. The graves, their contents, and the site's general character stand out from the region's rich record of contemporary burial grounds, and the rich and varied find material from the site forms the picture of a sacral place that has no exact parallels from Iron-age Denmark. Among the finds from the burial ground are ten rosette fibulas, which, while found in good numbers in many other regions across Denmark, are represented elsewhere only by one to four specimens at their respective locations. This paper presents the fibulas from the Grønhøjgård burial ground and discusses their social significance. It is argued that rosette fibulas may be viewed as a tool of communication that conveyed symbolic meaning on several levels and thus served multiple purposes in a Late-Roman social landscape where the roles of some highborn women were changing markedly.

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Key words: Rosette fibula, Late Roman Iron Age, social strategies, gender archaeology

Introduction

The eye-catching, almost grotesque-looking rosette fibulas naturally have attracted the interest of many researchers over the years and were studied closely by several of them – not least in Denmark, from where more than 90 examples originate (Ethelberg 2000; Lund Hansen 1995; Przybyła 2018; Skjødt 2009). They are not found exclusively, as might be expected, in direct connection to elite environments, but typically they have been recovered individually from scattered rich female graves. In the graves, they usually are located in the chest and shoulder areas, often closely associated with large and complex necklaces, which in several cases seem to have been held in place by the large fibulas rather than having been worn around the neck (Ethelberg 2000, 61; Nielsen 2002, 196). Apart from a few slightly later atypical specimens from Southern Jutland, the Danish rosette fibulas have been used exclusively during one or two generations in the Late Roman phases C1b–C2 (Lund Hansen 1995, 212–13; Skjødt 2009, 153). Without any obvious predecessors, the rosette fibula constitutes a significant new signal in a Scandinavian society undergoing radical changes during the Late Roman Iron Age.

During 2018–2022, archaeologists from the North Jutland Museums excavated major parts of one of three burial grounds near the farm Grønhøjgård on the outskirts of the village of Vaarst in Northern Jutland. The graves, their contents, and the site's general character stand out from the rich record of contemporary burial grounds of the region. The investigation included approximately 105 inhumation graves dated to 200–550 AD and four cremation graves, one of which originates from the last century BC; the other three are undated. Despite evidence of secondary reopening of almost 75% of the graves, several contained remains of lavish furnishings. The burial ground is situated on a small ridge, and in its northernmost part, the largest and best-equipped graves had been placed around a three-aisled building. Cultural layers characterised by large numbers of animal bones and fire-cracked stones found nearby indicate intense ritual feasting in the area, and the special character of the site is underlined further by the recovery of a series of small gold and silver objects deposited in and around the burial ground. In total, the rich and varied find material forms a picture of a sacral site that has no exact parallels from Iron-age Denmark (Christiansen 2021, 2024).

Among the finds from the Grønhøjgård burial ground are four more or less intact rosette fibulas from graves or modern ditches running through graves as well as fragments of at least six more from the plough soil covering the burial ground, presumably originating from ploughed-out graves. Both in terms of numbers and the range of variation of the fibulas, this find material is without parallels. Naturally, it raises intriguing questions regarding the function of the special fibulas and the burial ground. The former is the focus of this paper. An initial presentation of the fibulas from the burial ground and of the regional setting is intended to form a basis for the discussion of the communicative significance of the rosette fibulas and their role in the social strategies of the Late-Roman Scandinavian aristocracy.

The rosette fibulas from the Grønhøjgård burial ground

The rosette fibulas, none of which are completely identical, were included by both Oscar Almgren and Mogens Mackeprang in their early typologies (Almgren 1923; Mackeprang 1943). However, many new finds have paved the way for a more detailed classification of this growing and rather heterogeneous group of fibulas. In recent times, Per Ethelberg and Ulla Lund Hansen have discussed them in connection with their studies of the Skovgårde and Himlingøje burial grounds, respectively (Ethelberg 2000, 51–53; Lund Hansen 1995, 212–13). Ethelberg's work includes a simple division of rosette fibulas into the two main groups of small and large examples and a subdivision of the latter into three variants (Ethelberg 2000, 51–52). A more detailed study of the Danish rosette fibulas and their complex constructions was made by Annagrete Skjødt a few years later. Her visual inspection of the large corpus of Danish fibulas allowed the definition of six basic forms based on various construction elements and techniques (Skjødt 2009). The latest typology has been presented by Marzena Przybyła, who mapped and typologised the rosette fibulas from their entire distribution area – from Norway in the north to the Black Sea in the south. Her classification, which (not surprisingly) shares many details with Skjødt's regional Danish study, includes eight main groups (Przybyła Groups 1–8), most of which are split further into variants according to minor technical or stylistic details (Przybyła 2018, 30–126). Przybyła's typology is the basis for the following.

Because of the extreme fragmentation of the examples from the plough layer at Grønhøjgård, minimum counts of the number of rosette fibulas from this context rely solely on identified bows. The degree of fragmentation also limits further typological determination in several cases, not least because Przybyła's system of classification, designed to cope with the individual character of the rosette fibulas, frequently is based on the sum of several defining criteria rather than individual ones (Przybyła 2018, 30–126).

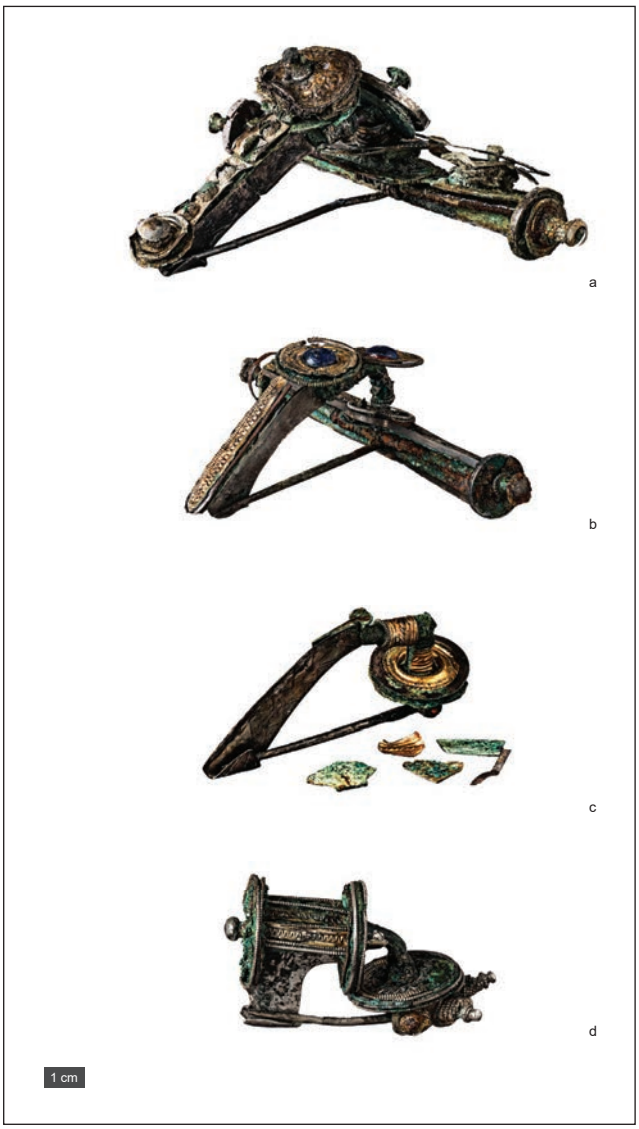

Figure 1. Rosette fibulas found in contexts below ploughing depth at the Grønhøjgård burial ground. a) 7032X2740 – Przybyła 1b; b) 7032X0702 – Przybyła 1a; c) 7032X2114 – Przybyła 1a; d) 7032X0420 – Przybyła 2. Photos: North Jutland Museum.

Three of the four intact or, to some degree, still articulated rosette fibulas from the Grønhøjgård burial ground belong to Przybyła's Group 1 – two (Figures 1b and 1c) to her variant A and one to the Group 1/Variant B category (Figure 1a). At least four of the six fragmented specimens also belong to this group, in which bows made of bronze characterise the fibulas. A fifth may have been of this type as well (Figure 2c). The absence of a hole for

Figure 2. A selection of the fragments of rosette fibulas from modern ditches and the plough soil at the Grønhøjgård burial ground. a) 7032X0043a; b) 7032X2394; c) DIME 59151 d) 7032X0044; e) DIME 59267; f) DIME 59246; g) DIME 59238; h) 7032X0043b; i) 7032X2101; j) DIME 59255; k) 7032X2064; l) 7032X2388; m) DIME 59269; n) 7032X2010; o) 7032X2068; p) 7032X2112. Photos: North Jutland Museums.

the rivet to fasten the rosette to the bow or a rivet cast directly on the bow's knee for this purpose suggests a relation to Group 1. However, the bow made of silver is a feature shared only with one other fibula from Group 1 (Przybyła 2018, 33). Without further details, it is impossible to determine whether this fragment represents a rare Group 1 or a Group 4 fibula. Finally, the two last examples from the Grønhøjgård burial ground are specimens of Group 2 (which comprises only six more fibulas, all found in north-western Denmark): one was discovered from a modern drainage ditch running through a grave and is almost intact (Figure 1d); the other now consists only of a few fragments recovered from the plough soil (Figures 2d–g). A broken-off rectangular bronze plate with small remains of silver foil may represent the poorly preserved remains of a cylinder for a third one of this kind. But the damage sustained during centuries in the plough soil prevents determination, and it has therefore been left out of this account.

Some of the fibulas listed above reveal technical details that are out of the ordinary. The Przybyła Group 1/Variant A fibula X2114 (Figure 1c) presents an interesting new solution on how to attach the silver catch plate to the bronze bow: instead of the usual mounting in the split foot of the bow, the bronze bow had been cast with a short plate onto which the real catch plate was then riveted – a technical process seemingly without parallels. A similar, but slightly different solution is seen in one of the fragmented Group 1 fibulas from the plough soil (Figure 2b): here, the bow presumably had been cast with a catch plate, which subsequently was covered with a sheet of silver foil decorated with geometric engravings. The silver foil was wrapped around the catch plate and fastened with a tubular bronze list along the straight edge. A similar technical detail is known from one other example, from Fibula A found in grave 4 at Nørre Knold, 20 kilometres northwest of Grønhøjgård (Przybyła 2018, figs. 3/4–4, 3/12–9).

The efforts to replace the bronze catch plate or make it appear silver are part of the general pattern characteristic of fibulas of Przybyła's Groups 1 and 2. Typically, the visual parts of the bronze constructions were almost completely covered with decorated sheets of silver foil, most often gilded to increase the impressiveness.

Ornamental details

Even though it is impossible to piece together the fragments from the plough soil, the overall impression is that the rosette fibulas from Grønhøjgård in most respects seem to have been decorated following the general trends in the production of their counterparts in Scandinavia.

Figure 3. Gilded silver foil with anthropomorphic and zoomorphic images from the Grønhøjgård burial ground – presumably covers for pin catches and spring constructions of large rosette fibulas. a) 7032X2068, b) 7032X2112, and c) 7032X0080 & DIME 59156. Photos: North Jutland Museums.

Decorations predominantly were made with pressure techniques in thin silver foil, which often was gilded. Occasionally, the visual effect of the rosettes was enhanced with a circular mounting of glass in the centre, usually blue glass. Furthermore, most fibulas feature engraved lines and/or geometric patterns or a series of punch marks on the catch plate; on some, the engravings even form short runic inscriptions (Imer 2015, cat. nos. Sj 73, NJy 48, SJy 46, SJ 79, Sj 80).

The space restrictions of this paper do not allow a full account of all the ornamental details of the rosette fibulas from Grønhøjgård. Yet, three pieces of decorated silver foil found in the plough soil and in a modern ditch deserve to be mentioned as their motifs never have been

observed on rosette fibulas before, and some have no exact parallels in other contemporary objects.

The first of the pieces (7032X2068) is a small fragment of an approximately 12mm wide band of silver foil (Figure 3a). It is gilded like the rest of the three pieces in focus here, and the surviving end of the band is smoothly rounded. A single string of imitated beads marks its edge, and in the centre is the image of a bird in profile facing left, away from the rounded end. In front of it, at the break, is the tail of a second, apparently identical bird: the complete band probably featured a row of birds. The animal is depicted with two thin and feet-less legs, a long beak on a tiny head, and a short neck on a massive chest that narrows markedly towards the triangular fish-like tail; the body is covered by crosshatching, the tail with lines radiating from the base.

The only other Danish rosette fibula with zoomorphic figures is one from Falkensten on Zealand (Przybyła 2018, fig. 3/39–7). The cover of its spring construction is decorated with a similar string of birds. The animals of the two pieces are not identical, but share the same fundamental outline, and there can be little doubt that they aim to depict birds of the same species, possibly, according to Skjødt, woodcocks (Skjødt 2009, 165). Several other contemporary objects are decorated with birds with the same short neck, massive body, and wide tail (Przybyła 2018, 546–50). Przybyła pointed out that the birds on the fibulas from Jutland are all facing left, whereas the birds from eastern Denmark are looking in the opposite direction. This regional difference is further underlined by minor variations of details – the western birds, including those from Grønhøjgård, have smaller heads and longer beaks, for example (Przybyła 2018, 547–48).

Although it is not often that rounded ends like the one of 7032X2068 are found on the covers of the spring construction (see, however, Przybyła 2018, fig. 3/39–9), it appears plausible to assume that this fragment stems from such a cover. The resemblance to the fibula from Falkensten and the vertical orientation of the string of birds support this assumption.

The second of these pieces is an intact, 9mm wide band of gilded silver with one straight end and one neatly rounded (Figure 3b – 7032X2112). The 55mm long band is decorated along the edge with a line of imitated beads and with a row of human faces, shown *en-face*, with distinct demarcations of the heads' round tops, which are hatched. At one end, the final face is a smaller, triangular head with rounded ears – probably the image of a bear or a wolf. The band was recovered in a modern ditch and probably originally was mounted on rosette fibula 7032X2114, as this was found close by. The ditch must have been dug through a rich female grave. Since a similar, but poorly preserved string of faces is seen on the cover for the catch plate of the intact rosette fibula 7032X2740, it seems likely that 7032X2112 had a similar function. The rounded end of the band suggests, however, that this fibula, unlike 7032X2740, did not include a cover that ended in a roundel. None of the five little faces on 7032X2740 are intact, but they appear almost identical to the ones on the well-preserved piece 7032X2112.

Anthropomorphic images on objects associated with the female sphere are known from some areas on the Baltic Sea, but in western Denmark, the pieces from Grønhøjgård are without parallels (Przybyła 2018, 542). Similar mask-like faces, however, are found on a few Jutish objects from male graves dated to the last phase of the Early Roman Iron Age (B2) and the beginning of the Late Roman Period (Rasmussen 1995, 64–68). Some of the shields among the slightly younger depositions in the war booty sacrifice at Illerup Ådal have been ornamented with similar masks with even finer details, for example. Here, they appear on rivet heads that were facing the enemy (v. Carnap-Bornheim and Ilkjær 1996, tables 63, 121, 135, 145). Slightly different masks are found on the Dejbjerg wagon and on a small selection of predominantly male equipment from Funen, Zealand, and Northern Germany (Rasmussen 1995, 67–69).

The small head of a predatory animal at the end of the row of human faces on 7032X2112 is without obvious relatives in the catalogue of animals on Scandinavian metal works of the Late Roman Iron Age. Still, in Roman mythology, the wolf was an important character, and the different depictions on gold bracteates and other Scandinavian gold objects testify to the significance of both the wolf and the bear in the north in the centuries following the Late Roman Period (Hedeager 1997; Wamers 2009). The terms "wolf" and "bear" also are among the rather few words that have come down to us written in runes of the *Old Futhark* (Imer 2018, 35). The widespread use of bearskins in warrior graves, a tradition followed in at least one of the graves in the Grønhøjgård burial ground, too, further highlights the special role accorded to the bear in Southern Scandinavia, especially in the centuries following the Late Roman Iron Age (Møhl 1977; Nielsen 2005, 37; Wamers 2009). In this context, the image of a predator on a fibula worn (in all probability) by a woman, leaves a strange sense of ambiguity since the wolf and the bear usually are associated with physical strength, endurance, chaos, and prowess in battle – virtues predominantly connected to the male universe. The image's position and size underline the peculiarity even more: the small head was placed so close to the end of the cover

that it must have been covered – at least partly, if not completely – by the rosette on the tip of the fibula's foot – perhaps carrying a message exclusively for the owner of the fibula. In this light, some of the other virtues of the wolf and the bear, such as their cunning, protective, and caring nature, may have been central to the meaning of this particular image.

The third piece is a fragmented, 10mm wide band that originally must have been approximately 60mm long (Figure 3c – 7032X0080 and DIME 59156). It is represented by two pieces recovered from the plough soil. Its ornamentation consists of a horizontal row of women shown in forward-facing position, their hands raised above the shoulders and the legs spread wide with bent knees. They appear naked as the contours of their oversized bosoms and their vaginas are visible. Apart from this, the images are rather crude – details of the women's faces and hair clearly have not been prioritised by the artisan.

The dimensions of the band and the horizontal row of images suggest that this piece also served as a cover for the catch plate of a rosette fibula – probably one ending in a roundel, as otherwise, a bit of the rounded end probably would have been visible on the fragment. Furthermore, the absence of a framing along the edge indicates that the band was held in position by a list – a frequent detail on Danish rosette fibulas (cf. e.g. Przybyła 2018, fig. 3/18).

In a wider chronological perspective, the motif of the bulging female figure, signalling fertility, clearly relates to a concept with historical roots as deep as the Palaeolithic, but the image has no parallels in the silver foil objects of the Late Roman Iron Age (Angeli 1989; National Geographic 2022). Looking at the general character of the figures, the style of a rather crude outline with few details perhaps most closely resembles the man with the sword and the animals on the beaker from Himlingøje (Lund Hansen 1995, pl. 2).

The use of new figures and motifs on rosette fibulas otherwise predominantly connected with the male sphere is interesting, and the presence of three uniquely decorated fibulas at one site is striking.

Production and distribution of rosette fibulas

With the ten newly recovered fibulas from the Grønhøjgård burial ground and three more newcomers from the surrounding region, 93 rosette fibulas are now known from across Denmark. When these are added to Przybyła's 2018 catalogue, the general trends demonstrated by her study are underlined even further (Figure 4): the rosette fibulas of Groups 1 and 2 markedly are concentrated in western Denmark, while the Zealand counterparts of Groups 3 and 4 are found in this region only sporadically.

The striking regionality of distribution, the concentrations in a few regions, and the complexity of the fibulas' construction – and therefore the high levels of skills and materials required to produce them – suggest the existence of a few thriving workshops, most likely centred around elite environments in different parts of the country (Przybyła 2018, 143; Skjødt 2009, 171); the most distinct of which is the region south of the eastern part of the Limfjord in northern Jutland.

Ulla Lund Hansen noted that the rosette fibula from Himlingøje 1949 Grave 2 and one from the Skovgårde burial ground are so similar that they must have come out of the same Zealand workshop (Lund Hansen 1995, 213). This may well be the case. Despite many shared details, every rosette fibula seems to be a unique product – probably designed individually and made directly to the recipient's order (Przybyła 2018, 143), but while the similarities of the fibulas' fundamental construction within each group and of the majority of the decorative silver foils suggest a certain degree of "mass production", the final fabrication of the fibulas possibly was an assembly of a range of modules picked by the client from a broad selection of pre-manufactured parts. Occasionally, the more discerning customers would have demanded something "out of the ordinary": at Grønhøjgård, the different exclusive covers of silver foil decorated with anthropomorphic and zoomorphic figures may represent such products made to accommodate the requests of a particularly picky group of clients.

The ten rosette fibulas found at Grønhøjgård break radically with the more scattered pattern characteristic of the distribution of rosette fibulas elsewhere, where one to two of them are the norm at a single burial ground, with a maximum of up to four in only a few cases (Ethelberg 2000; Przybyła 2018, cat. nos. 350–53). The pronounced concentration of fibulas at Grønhøjgård and the wide range of technical and stylistic solutions applied to their designs indicate the presence of a thriving fine-metal work environment in the area. It seems likely that the skilled artisans at this centre also were the producers of most of the region's other Group 1 fibulas. Two examples from the area south of the eastern end of the Limfjord do not fit this pattern, however (Figure 5). These presumably have come from Zealand workshops. A few other Zealand types of rosette fibulas have been found scattered around Scandinavia outside their main distribution area, as well, with one even as far north as Nord-Trøndelag, Norway (Przybyła 2018, fig. 3/55). As discussed in the

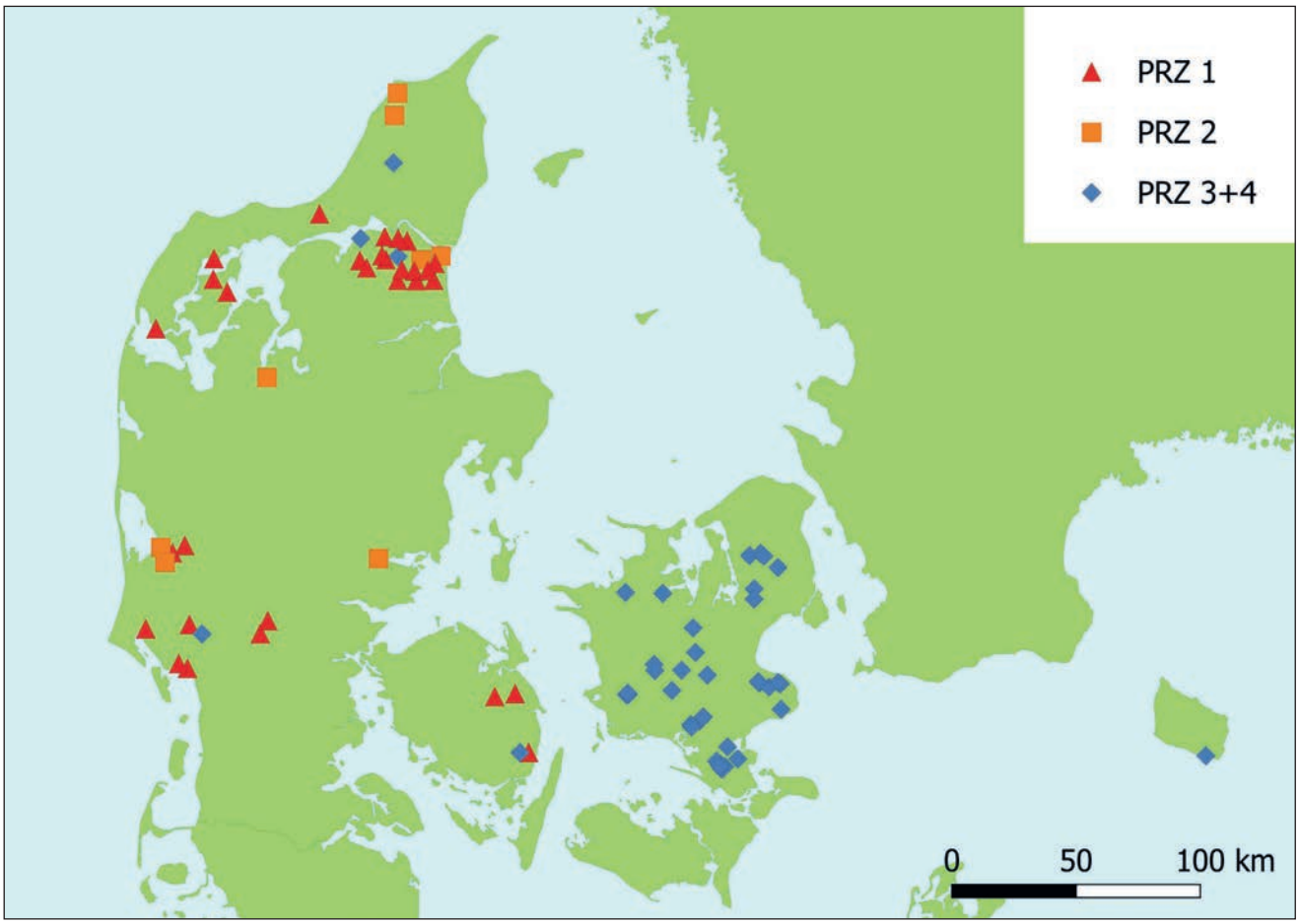

Figure 4. The distribution of the common types of rosette fibulas in Denmark – Przybyła's (Prz) Groups 1–4. Source: Przybyła 2018, with additions.

following, the transfer of the fibulas found far from their origins may well be rooted in exogamy, but in order to understand the role of the rosette fibulas, an investigation of the vast majority that ended up close to where they were produced may prove more promising.

Society and social landscape in 3rd-century Northern Jutland

When looking at the war booty offerings and the Roman imports and other luxurious equipment in the high-status graves of the Late Roman Iron Age, it is sometimes easy to forget that society was agricultural. The presence of war – signalled by war booty offerings and the defence structures, for example – must have shaken the very foundation of the agricultural communities and challenged their stability, which is a cornerstone of farming, where the care for fields and household provisions is a long-term investment. On this background, it is no surprise that there are clear indications of considerable change in rural settlement in Denmark during the Late Roman Iron Age (Hansen 2015; Hedeager 1992; Hvass 1988, 70–75), including the area of the eastern Limfjord. During most of the Early Iron Age, the region was densely populated by people living in hamlets typically comprising about 10 small farms or only few more. They usually were placed no more than 750 to 1500 meters apart on the hills in the undulating landscape. From the late 2nd to the early 3rd centuries, this existing, stable settlement organisation changed significantly, when the old settlements with deep roots, in many cases stretching back to the Late Bronze Age, were abandoned or restructured radically. The farms grew, but the number of units dropped, and the new farms typically were constructed in areas some distance away from the original locations of the Early Iron-age hamlets (Christiansen 2018; Haue 2012, 307–10; Nielsen 2023). The growing find material from the period also indicates the existence of magnate farms, the most spectacular of which was excavated in 2022 at Flødalsminde, only a few hundred meters distance from one of the region's graves containing a rosette-fibula. Here, the remains of a 60-meter-long longhouse from the 3rd century were excavated. This is approximately three times the size of the ordinary

longhouses in this part of the country in the Late Roman Period, and the building is interpreted as the residence of a local magnate (Nielsen 2024). It seems plausible to link the restructuration of settlement and the appearance of oversized magnates' farms to fundamental socio-political organisational changes, probably followed by the reformation of the taxation system (cf. e.g. Hansen 2015; Haue 2012; Hedeager 1992).

The social significance of the rosette fibulas

There can be no doubt that the many societal changes of the Late Roman Iron Age were paralleled by radical changes in ideology. Mads Holst has presented the development as a competition of multiple ideologies and emphasised the significance of the friction between the ideals of the warrior aristocracy and the values of the village community (Holst 2014). This contest must have been an ongoing process of negotiation throughout the Late Roman and Early Germanic Iron Ages. Some small insight into this was provided by recent studies of the development of female dress across Scandinavia, as they suggest that the growth of a new warrior elite and supra-regional military institutions spurred local initiatives to mark more stable ethnic affiliations in the 5th and 6th centuries (Røstad 2021, 313). The rosette fibulas may represent outcomes of earlier stages of these processes of negotiation.

The complexity of the rosette fibulas and their almost vulgar visual expression of wealth indicate that they were born out of a distinct communicative need. From this perspective, it is probably also fair to assume that the fibulas did not bear just one meaning, such as symbolic significance indicated in the fine ornamentations and detailed constructions of zoomorphic and anthropomorphic figures, which must have held special meanings. Though their symbolic language may stay hidden from us, we can, however, trust that the fibulas were not understood in the same way by all spectators. The deviation of the opulent rosette fibulas – which signalled socioeconomic status way above the average – from common-type dress accessories would have been obvious to even a child. In contrast, the subtle technical and stylistic differences between rosette fibulas of Przybyła's Groups 1 and 3, cannot have been obvious to commoners, while to a small part of the upper class, they most likely were very important and significant. Thus, it was paramount for the wearer of a rosette fibula to move in the right social environments and be present at the right events in order to exploit the full communicative potential of the fibula and the fine dress it went with.

On the other hand, rosette fibulas were, no doubt, also important communication tools regularly employed in more modest settings. Many of them ended up in graves associated with settlements dispersed in the agricultural landscape, where they served as eye-catching elements in burial rituals that probably were witnessed by larger groups of local farmers. It is worth noting that rosette fibulas usually were distributed within the areas of their manufacture, so their communicative effect in local communities may well have been central to their function. This does not necessarily contradict the widely cherished hypothesis that rosette fibulas – along with other types of high-status dress accessories and perhaps the women wearing them themselves – were used strategically when alliances were forged with other families from the upper levels of society, both locally and supra-regionally (Przybyła 2018, 586; Skjødt 2009, 171; Storgaard 2003, 114; Straume 1988). Exogamy as well as gift-giving appear to be likely causes for the circulation of some fibulas away from their place of origin. The peculiar distribution of the few non-local rosette fibulas in the various regions of Denmark is worth noting: the Zealand types occur scattered here and there outside of Zealand, whereas none of the Jutish types have been recovered on the island of Zealand so far. This seems to suggest the exercise of aristocratic control that was greater in Zealand than in the neighbouring regions.

Interestingly, the two graves with "foreign" rosette fibulas found in the eastern Limfjord area are less richly equipped than the ones with local types: although in one of them, the number of glass and amber beads is high, that of other types of objects is markedly smaller. It is tempting to interpret this as a sign of lower status and to regard the Zealand fibulas in moderately equipped graves in burial grounds on the outskirts of the centre at Grønhøjgård as relicts of the strategic manoeuvres of a Zealand elite operating to create alliances with families outside the main centre of power in this part of Jutland. However, other backgrounds to the discrepancies in grave inventories cannot be excluded at present. These may also reflect, for example, differing grave rituals connected to the burial of non-local women. One such difference is the absence of spindle whorls in the two graves with Zealand rosette fibulas, which are found in all other graves containing regional rosette fibulas – commonly small, elegant bronze whorls that seem to signal a close connection between the ideals for aristocratic women and fine textile production.

Finally, the appearance of rosette fibulas around AD 200 and the sudden focus on highlighting the special role of some women, rather than men, further suggest that

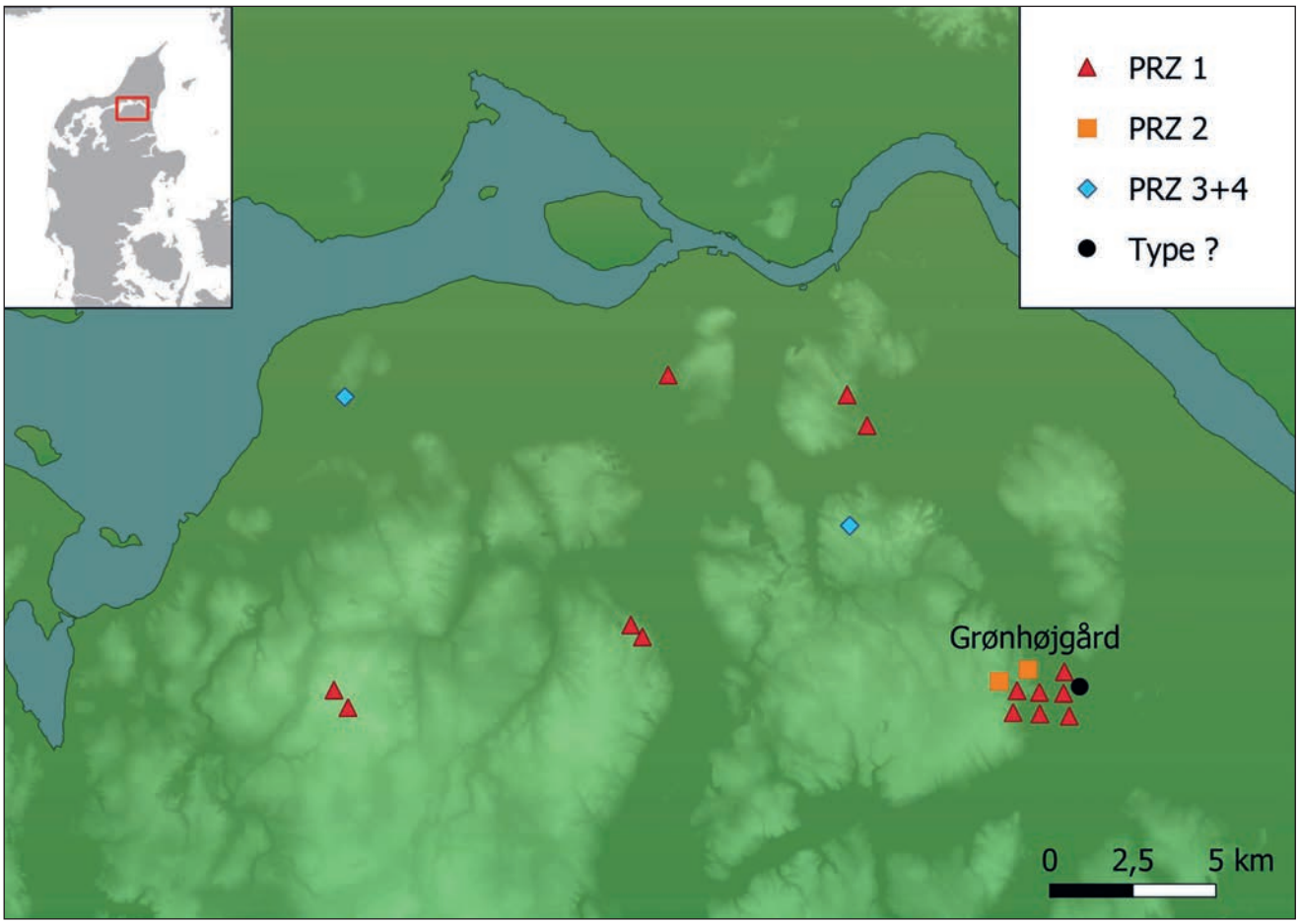

Figure 5. The distribution of the different types of rosette fibulas in the region at the eastern end of the Limfjord. Map by author.

women were now key persons in important social arenas. In this light, the rosette fibula may be viewed as an invention that perhaps served to bridge some of the gap between a new world order with a fixed ruling class forged by military power and the need for stability in the agricultural communities. In essence, it was not merely a signal of the high social status of the bearer to underline the superiority of their spouses in a competitive game with other members of the elite, but also a booster to support highborn women who administered tasks and took positions in the local village communities that previously were held and carried out exclusively by male members of the lineage. This, however, still leaves the distinct concentration of rosette fibulas at Grønhøjgård unexplained. That is a topic in need of further exploration, but considering the general character of all find material from the site, there can be little doubt that this particular burial ground must have functioned in connection with the regional centre of power. It therefore seems likely that the rosette fibula as the new symbol of power spread from there to the surrounding settlements of the region, or at least the idea and symbolic meaning of it did.

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From Wagnijos workshop – or who made the spearheads of type Vennolum in Illerup Ådal?

RASMUS BIRCH IVERSEN

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This paper presents a comparison of Scandinavian spearheads of the Vennolum type using Principal Component Analysis to examine the sustainability of the notion of supra-regionality of weapon typology in early 3rd-century Scandinavia. It shows that the supra-regional similarity as presented in previous scholarly research goes too far: there is, in fact, considerable variation within Vennolum spearheads, and some of these have clear regional tendencies.

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Key words: Illerup Ådal, Scandinavia, Vennolum spearheads, workshops, weapon graves

Introduction

More than 300 spearheads of the Vennolum type were deposited on one singular occasion in a year after 205 CE in a lake then existing at Illerup Ådal, East Jutland, and they stand out as the clearest example of the standardisation of weapon technology in Late Roman-period Scandinavia (Ilkjær 1990a, 95–109, 1990b, pl. 60–113). Paired as they usually were with the equally standardised barbed javelins of type Simris, they exemplify a high level of weapon technology, and in association with shield and sword, they testify to well-exercised armies dominated by infantry (Engström 1992; Ilkjær and Iversen 2009; Iversen 2025). This standardisation, so obvious in the large-scale bog offerings of southern Scandinavia, brought about the suggestion, inspired by passages in Tacitus' *Germania* that said that in times of peace, these kinds of weapons were produced and kept in an *armatorium*, that the weapons from Illerup Ådal and from the contemporaneous site at Vimose had been produced in one centralised workshop (v. Carnap-Bornheim 1992, 50–51; llkjær 2002, 44–47). Somewhat contradictory to these assumptions is the observation that the weapon types from the time around 200 CE occur over large areas and are indeed common to the whole of Scandinavia (Ilkjær 2002, 67). The typological similarities have even been regarded as so "supra-regional" that any assessment of the provenance of the army equipment sacrifices predominantly found in Jutland and on Funen was supposed to be possible only by a comparison of the personal equipment in graves and bog finds (Ilkjær 1993, 375, 2002, 67; Pauli Jensen 2017, 78).

Spearheads of type Vennolum

The type Vennolum was first defined by Jørgen Ilkjær in his survey of the Illerup Ådal bog find and the typology of Roman-period Scandinavian spearheads and javelins (Ilkjær 1976, 126–30, 1990a, 95–109) (Figure 1). Besides cataloguing 316 specimens in Illerup Ådal, all belonging to deposit Site A and dated to the earliest part of the 3rd century CE, he also mapped their presence in the bog finds at Vimose and Illemose and 64 Scandinavian burial sites and studied four examples from present-day Germany as far south as Bavaria and four specimens from Poland (Figure 2a). He named his spearhead type 15 Vennolum after the grave at Vennolum in the Innlandet region of southern Norway.

Shortly after the publication of Ilkjær's typology of spear and javelin heads, Jan Bemmann and Güde Hahne investigated the same weapon material (Bemmann and Hahne 1994). Their initial typological approach was different from Ilkjær's and focussed on the shape of the blade rather than its cross section as primary key characteristic. Consequently, the two typologies are not identical, even though they make use of many of the same

type names. Understandably, Bemmann and Hahne's choice to use the same type designations as Ilkjær, but to alter the definitions, provoked some criticism, as this caused "a chaotic situation" (Ilkjær 2001, 89). On the other hand, new names for almost the same typology would have been equally chaotic and might even have led to accusations of plagiarism. Instead, one should focus on the fact that the same material has been analysed in two independent studies which arrived at very similar results. The differences between the two definitions of the Vennolum type are, as far as they are comparable, minute, possibly reduced to the fact that Bemmann and Hahne allow for a proportionally shorter socket (Bemmann and Hahne 1994, 419–20; Ilkjær 1990a, 95). There are 56 spearheads of the Vennolum type in Bemmann and Hahne's find list (Figure 2b); the apparent concordance with the 64 spearheads in Ilkjær's find list is concealing a considerable disagreement, however (Bemmann and Hahne 1994, 420, note 547).

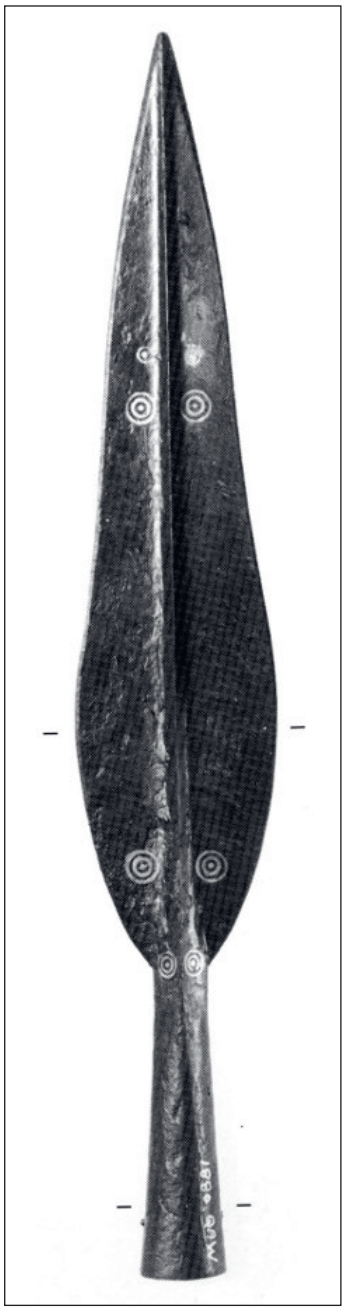

Figure 1. Spearhead QAW from Illerup Ådal. After Ilkjær 1990b, pl. 76.

In general, it would seem that Bemmann and Hahne had the same understanding of the supra-regionality of the Vennolum spearheads as that expressed by Ilkjær: "The almost exact conformity in their individual dimensions of the Norwegian specimens and the Swedish and Danish ones from the bog finds is remarkable" (Bemmann and Hahne 1994, 420, translated by the author). Yet, they singled out 12 specimens as their variant Hamsta, which were shorter and had an outline of the blade that was less curved than the ordinary type Vennolum (Bemman and Hahne 1994, 420). Variant Hamsta had a clear geographical centre of distribution in the Baltic areas of Sweden.

Wagnijo's workshop

Half of the 316 spearheads of the Vennolum type from Illerup Ådal were decorated with carefully chiselled patterns on the blade, and 16 additionally were inlaid with ornaments of precious metals, usually in the shape of concentric rings, commonly on the blade and occasionally on the socket (Ilkjær 1990a, 32, 159–63, 1990b, pl. 60–113, 236–44). Both types of ornaments show that these spearheads were made by skilled craftsmen and, perhaps more importantly, that they were not made in a haste to arm a militia against an imminent threat. The workshop(s) that mass-produced these spearheads must have worked on a professional level on a full-time schedule, yet they were not in a hurry and did not cut corners. Whether the same weapon smiths also supplied their employers' armies with the hundreds of shield bosses, shield handles and javelin heads found in Illerup Ådal is unknown, but all these objects add to the scale and level of Roman-period weapon production.

Two of the spearheads from Illerup Ådal, designated IMZ and INL, bore the runic inscription of the male name **wagnijo**. On the former, it supposedly was stamped, on the latter, it was engraved into the blade (Ilkjær and Lønstrup 1982; Stoklund 1985). In the Vimose find, the same inscription has been found on a spearhead of the slightly later Skiaker type. From a Vennolum-type spearhead from Øvre Stabu in Innlandet, Norway, we know the name **raunijaR** (Ilkjær 2002, 46). Additionally, three names are known from shield handles in Illerup Ådal: **nīþijō**, followed by the verb "tawide", made, and **laguþewa** are found on silver shield handles, and the

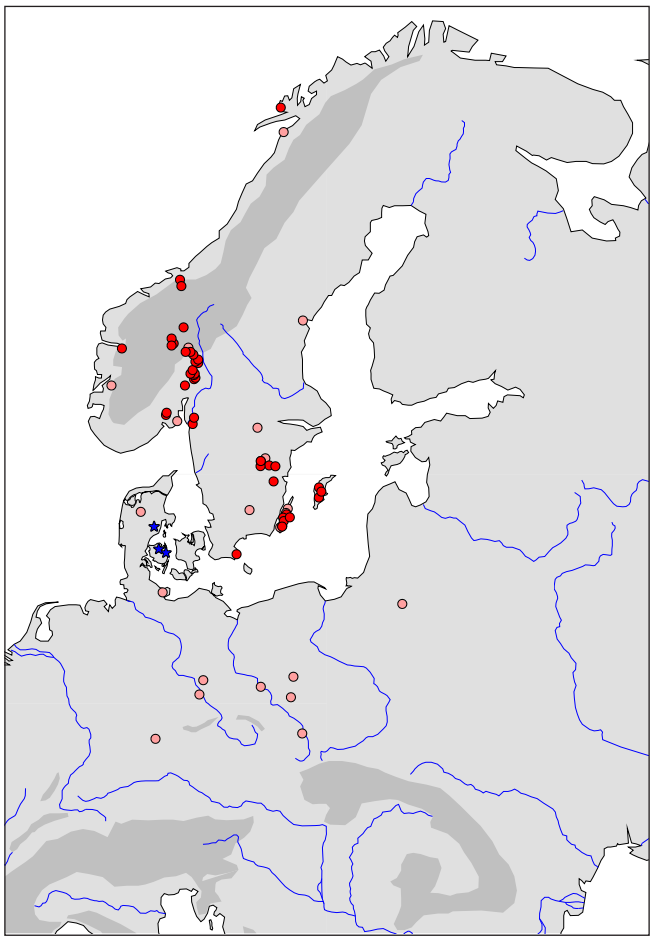

Figure 2a. Distribution map of type 15 Vennolum spearheads according to Ilkjær. Light dots are disputed/ omitted by Bemmann and Hahne. Blue stars: bog finds Illerup Ådal, Vimose and Illemose. After Ilkjær 1990a, table 63.

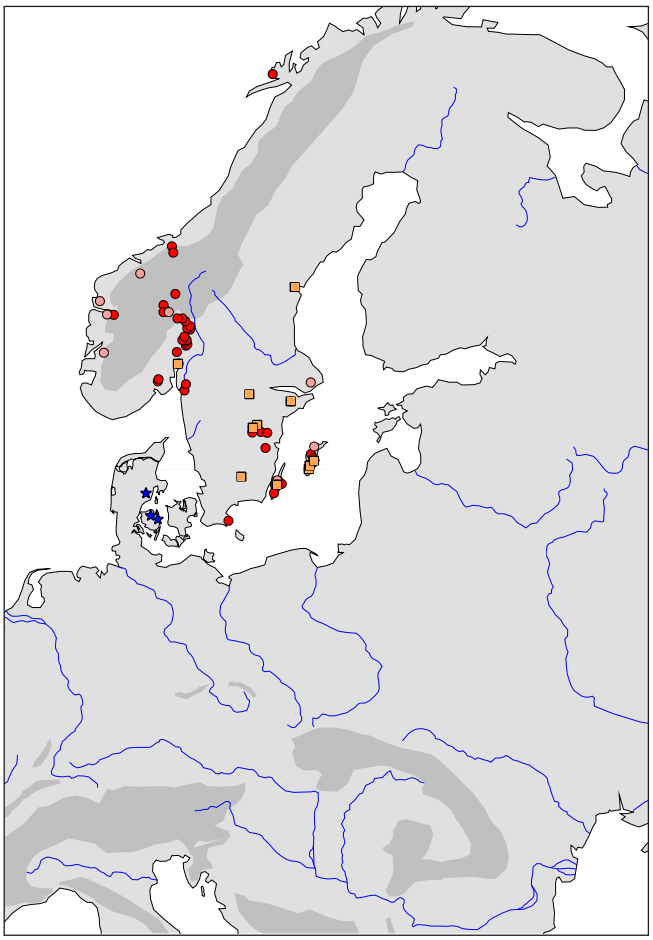

Figure 2b. Distribution map of Vennolum spearheads according to Bemmann and Hahne. Squares are their variant Hamsta. Light dots are disputed/omitted by Ilkjær. Blue stars: bog finds Illerup Ådal, Vimose and Illemose. After Bemmann and Hahne 1994, find list 26 and 27.

name **swarta** on one made of copper alloy. Whether or not these names can be understood as the names of the objects' owners, of the craftsmen who produced them or of the political leaders who had them made is a long and difficult discussion (Ilkjær 2002, 115–21; Stoklund 1985). Although a possibility, the fact that **wagnijo** appears on three spearheads in two separate, almost contemporaneous finds, usually is not considered to be a coincidence, but rather as an indication that **wagnijo** was either the weapon smith or his employer (Ilkjær 2002, 44–47). If so, it is puzzling that **wagnijo** was written on only two of the 316 Vennolum-type spearheads from Illerup Ådal, particularly as one of the inscriptions is considered to be a stamp (Ilkjær and Lønstrup 1982, 49, fig. 2a). However, in his unpublished 2016 master's thesis, Jakob Daa Stridsland claims that both spearheads were engraved onto an etched surface, possibly made by use of animal stomach acid (Stridsland 2015, 2016). This notion would remove the enigma of the failure to mass-produce the wagnijo name stamp on all spearheads (see also Skre 2025, 226).

A Principal Component Analysis (PCA) of Vennolum spearheads

In order to examine the supra-regional character of the Vennolum spearhead type and the single-workshop character of the Illerup Ådal and perhaps Vimose bog finds, well-preserved spearheads classified in literature as type Vennolum were analysed using Principal Component Analysis (PCA). The analysis consists of 293 spearheads from Illerup Ådal (Ilkjær 1990a, tab. 6), six from the Vimose weapon bundle (Ilkjær 1976), and 41 from graves, including three of the four specimens from Germany and the four Polish spearheads that Ilkjær, with some reservation, counts among his type 15 Vennolum (Ilkjær 1990a, 109).

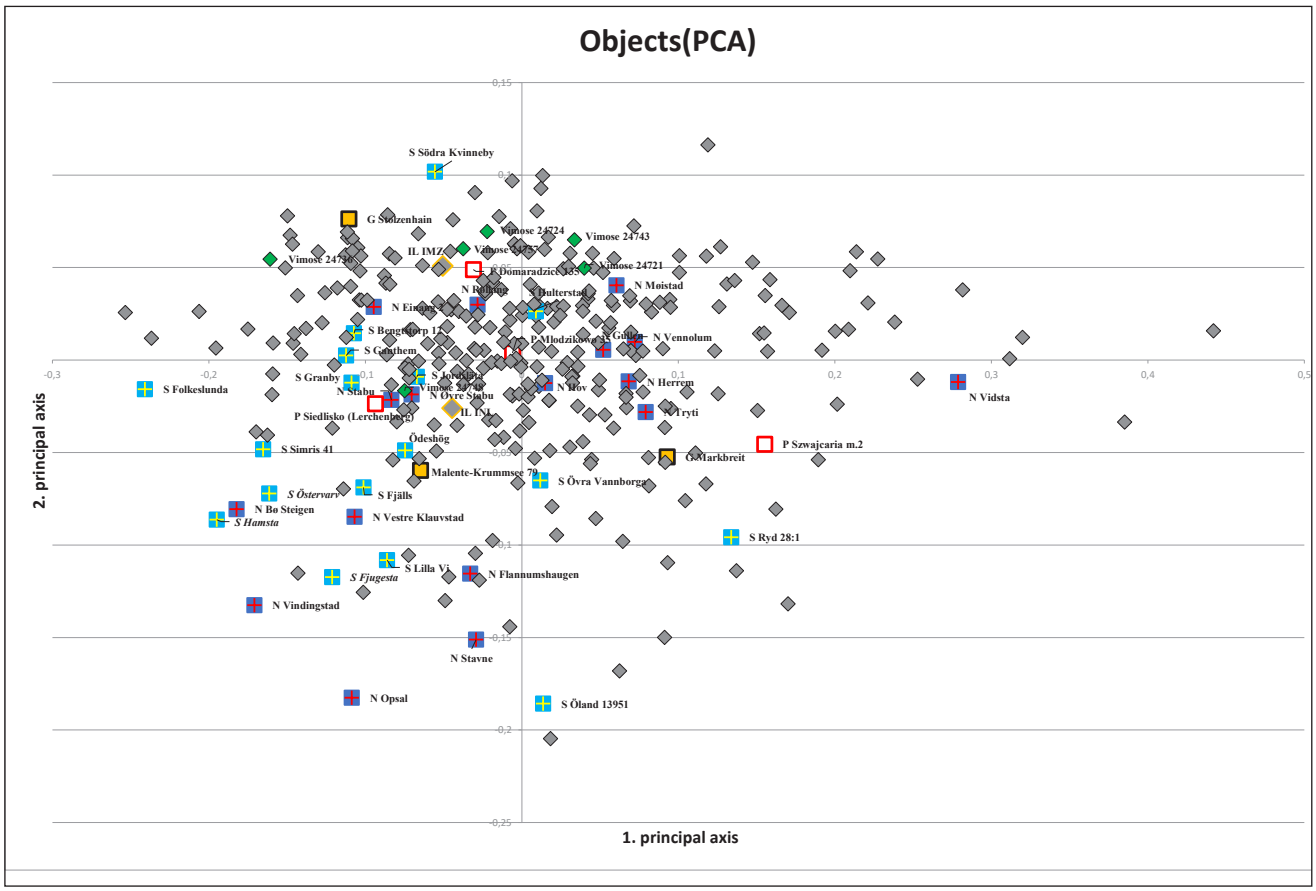

Figure 3. Plot of the 1st and 2nd axes of the PCA of Vennolum-type spearheads. Rhombuses are spearheads from bog finds: grey: Illerup Ådal, green: Vimose. "Wagnijō" spearheads IL IMZ and IL INT are accentuated with a golden frame. Squares are graves. Names in italics (lower left quarter) are spearheads of Bemmann and Hahne's variant Hamsta.

Considering the experience Torsten Madsen (2007) encountered in his analyses of spearheads from Illerup Ådal, secondary measurements were omitted in this analysis, which reduced the variables to five: length (L), length of blade (LB), length of socket (LS), width of blade (W) and distance from the socket to the widest part of the blade (D). This way, it does not matter whether the covariance coefficient or the correlation coefficient are used as bases for the analysis (see Madsen 2007). Both plots and the explanations of their eigenvalues are almost identical; the plot shown, however, is an analysis using the covariance coefficient with an explanation of 71% on the 1st axis and further 19% on the 2nd axis (Figure 3).

The plot shows a dense cluster of grey rhombuses centred around the junction of the x- and y-axes, which represents the typical Vennolum-type spearhead as it appears in Illerup Ådal. Its density is likely to indicate the existence of a workshop. Both spearheads with **wagnijo** inscriptions are within that cluster. There also is a scatter of spearheads from Illerup Ådal all over the diagram. Whether they were produced in the same workshop as well is a matter of debate, but they represent small typological anomalies to the typical Vennolum spearhead from Illerup Ådal.

The six spearheads from Vimose are also located in the Illerup cluster, with five of them, however, at its top. On average, the blade of these five spearheads is five millimetres narrower in width than their counterparts in Illerup Ådal. Perhaps this small difference represents a step towards the development of type Skiaker, which is the dominant type in the early 3rd century deposit in Vimose (Ilkjær 1990a, 118).

If we look at the evidence from the graves, there are several other important observations to be made. The bulk of spearheads from Swedish graves are found in the diagram's third quadrant (lower left side), outside the main Illerup cluster. Among them are three of the spearheads ascribed to Bemmann and Hahne's variant Hamsta (from Östervarv, Fjugesta and Hamsta), but they do not stand out from the remaining spearheads in that area of the plot. Still, Bemmann and Hahne are right when they describe them as relatively small with a longer socket and blade that is less curved than is characteristic for type Vennolum. This also applies, however, to the spearhead

from Folkeslunda, Öland, which is found in the same area of the plot. New analyses show that this variation is slightly later than type Vennolum (Iversen 2025). Other Swedish spearheads of the Vennolum type might have been produced by the same workshop that produced the bulk of the Illerup spearheads. This is especially the case for the Hulterstad spear and perhaps also the Jordsläta spear, both Öland. The scepticism put forward by Bemmann and Hahne towards the latter is thus not supported by the plot of the 1st and 2nd axis of the PCA.

Based on the analysis, the spearheads from Poland cannot be dismissed as belonging to type Vennolum, and the one from grave 35 at Młodzikowo in Greater Poland is located at the absolute centre of the plot, which indicates the highest degree of typicity. It is unlikely, however, that the Vennolum spearheads found in Illerup Ådal were produced in Poland, since this type is not characteristic for contemporaneous Polish weapon graves (Iversen 2025; Kaczanowski 1995).

Similiarly, an origin of production near the find spots of the three German spearheads also is very unlikely; in fact, the reservations expressed by Bemmann and Hahne against this might well be justified. In particular, the Marktbreit spear, which was found in the ditch of a first-century Roman military camp in Bavaria, is suspicious (Wamser 1988). In plots of the 1st and 3rd and 2nd and 3rd axes, respectively (not shown), both Marktbreit and the spearhead from grave 79 at Malente-Krummsee, Schleswig-Holstein, as well as the Polish one from mound 2 at Szwajcaria, Podlaskie Voivodeship, are located outside the cluster that implies typicity. Here we also find the afore-mentioned Jordsläta spearhead, and the Hulterstad spear has moved from the centre to the edge of the plot.

The greatest similarity with the Vennolum-type spearheads from Illerup Ådal is found, however, among 10 out of 17 spearheads from Norway, eight of which have been discovered in the Innlandet region, plus one in Vestland and one in Trøndelag. It is interesting to note that the spearhead from Øvre Stabu – which bears the runic inscription **raunijaR**, supposedly the name of the spear itself or that of another supplier or producer of weapons (Imer 2015, 71) – is situated in the centre of the Illerup cluster in the PCA plot. The eponymous spearhead from Vennolum and that from the Tryti grave, known for the striking similarity between its antler comb and the Illerup Ådal comb designated VGU, are located here, as well (Ilkjær 1994, 380–85). Considered over three PCA plots depicting combinations of all three axes, it is the spearheads from Gullen, Hov and Røllang that most resemble the Illerup Ådal spearheads of the Vennolum type. The Gullen and Røllang spearheads were found with javelins of type 8 Simris, a type that with 306 specimens in Illerup Ådal seems to be paired with the Vennolum spear (Ilkjær 1990a, 197).

Discussion of the result

Does this mean that the spearheads of type 15 Vennolum were manufactured in Norwegian workshops, and that the army whose equipment eventually ended up as sacrifice in Illerup Ådal came from Norway? Based on the evidence of the PCA presented here, Norway is the most likely candidate. But there are at least two reservations: one has to do with time, the other with representativity.

1) Small variations in typology may be caused by time, since types are never static but evolve over time until they appear to have changed into other types. This is not as evident in the bog deposits as in the graves. The reason for this is that the spear heads in the bogs were manufactured within a very short time span. They are synchronous, whereas the spearheads in graves could have been produced at different times over the approximately 30 years that type Vennolum was in use. They are diachronous. Intermediate stages are found, for instance, in Ilkjær's hybrids Vennaker and Skiolum between types Vennolum and Skiaker (Ilkjær 1990a, 120–27). Another example might be the Hamsta variant of the Vennolum type as defined by Bemmann and Hahne.

2) The reader may have noticed the absence in the PCA of Danish Vennolum-type specimens found outside of bog finds. Ilkjær listed the Jutlandic Vaadde spearhead as the only possible example, which, however, is badly preserved and could not be analysed here. Furthermore, weapon graves are relatively rare in Jutland and Denmark in the early 3rd century CE, on Zealand and in the western parts of Sweden, they are even extremely rare in most or all periods, and in Northern Germany, a weapon burial custom that would include furnishings of shield, spear, javelin and sword ceased shortly before 200 CE (Ilkjær 1994, 18; Iversen 2025).

There is then the possibility – brought about by this absence – that the armies whose equipment was found in Illerup Ådal and Vimose were of a more local origin, for instance from somewhere on the Jutlandic Peninsula or from areas immediately to the south of present-day's Denmark. The latter is suggested by the studies of the brooches in Illerup Ådal (Przybyła 2018; Schulte 2011). Absence may again play its part, however, since graves in general, not only those containing weapons, are very rare

in Jutland in the late 2nd and early 3rd centuries CE (phase C1), and hence their brooches have proven difficult to define (Iversen 2021). The contemporaneous Norwegian material is even less defined by its brooches.

On the basis of comb rivets and the composition of comb types, Ilkjær ruled out Zealand as an area of origin for the Illerup army (Ilkjær 1993, 312, 1994, 24). This probably is correct, but he went even further, identified the raw material of 138 combs in Illerup Ådal as elk antler and consequently also ruled out all regions other than the Scandinavian Peninsula, since elks had long been extinct in Denmark (Ilkjær 1993, 313–19, 376–85).

The notion of elk antler as a material supposedly also preferred in Norwegian comb production was almost immediately undermined when Birthe Weber determined the material of combs in most Norwegian grave finds as reindeer antler (Weber 1995). The now precarious position of Ilkjær's provenience studies has been pointed out by scholars dealing with the subject (Pauli Jensen 2017, 78; Rau 2010, 423–24), but his hypothesis may not yet be dismissed. Two points are clear from reading the relevant passages (Ilkjær 1993, 313–19): 1) that Ilkjær performed the analyses himself, and 2) that he did not once consider the possibility of reindeer antler as a raw material for combs. A new analysis of the combs from Illerup Ådal is needed before Ilkjær's hypothesis can be confirmed or dismissed.

Summary and conclusions

The PCA of Vennolum-type spearheads shows that a vast majority of the 316 spearheads from Illerup Ådal are so similar that they may well have been produced in the same workshop. Even though they possibly were made over a relatively short time, careful ornamentation on half of the spearheads show that they were not made in haste. However, a relatively large part of them are located in the PCA plots in a more peripheral position than the bulk of Illerup spearheads. There are two possible explanations for this: 1) They were produced over a longer period of time, leading to typological variation, or 2) more than one workshop supplied the spearheads for the Illerup army, possibly even workshops from different regions.

Compared to 41 Vennolum-type spearheads found in graves, the ones from Illerup have more in common with those found in contemporaneous graves in Norway than in other regions included in the analysis. This would indicate that the Innlandet region or adjacent areas in southern Norway could be the area of origin for the army equipment found in Illerup Ådal and possibly Vimose. However, a certain caution needs to be exercised. In many regions, people did not bury their dead with weapons but still may have been using and producing the same weapon types.

A call for arms could have reached neighbouring and distant parts of Scandinavia, and kinship relations may have made participation in military actions obligatory. This, however, probably does not change the notion that the main part of the Illerup army was recruited in a rather restricted area. This paper is far from closing the subject, but at this point, southern Norway remains the most likely candidate for the place of origin of the Illerup army and its Vennolum-type spearheads.

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Landscape, places of knowledge, and religion on Iron-age Bornholm

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This paper addresses religious knowledge from a landscape perspective and explores different ways knowledge in a past oral society could have been embedded in and circulated through space and materiality. Drawing on Christian Jacob's concept of *lieux de savoir,* the article focuses on the island of Bornholm in the Iron Age, investigating various scales of knowledge transmission. It looks at knowledge in relation to central places, sacral place names, and monumental communication lines, as well as to gold bracteates and gold foil figures. Through the examples, the paper reflects on the production and social distribution of knowledge and differences between open and concealed communication, common knowledge shared by all, and esoteric knowledge passed on in narrowly defined circles.

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Key words: history of knowledge, knowledge transfer, sacral landscapes, *lieux de savoir*, sacral place names

Introduction

How can we understand knowledge in a wider sense and the ways it was produced and circulated in Scandinavian pre-Christian society? Beginning from the premises that in the Iron Age, living in the landscape was a prerequisite for understanding the world, this paper addresses the roles of space and materiality in relation to religious knowledge in what was a predominately oral society. Through the concept of *lieux de savoir* (Jacob 2017), it explores how those concepts played parts in both circulating and controlling knowledge on different levels. As a case study, the paper focuses on the Iron Age of the island of Bornholm.

Pre-Christian Scandinavian religion as a knowledge system

Unlike Christianity, Scandinavian Iron-age religion cannot be characterised as a belief or faith with a rigid and codified dogma. Rather, it was a conglomerate of ideas and practices that were tied to ways of perceiving reality, conceptualising the world present in every aspect of people's lives, and interacting with it on various levels (cf. Bønding 2023, 4; Nordberg 2018, 79). In line with this, this paper considers knowledge in a wider sense, as something encompassing a community's collective understanding and conceptualisation of the world and its history and identity, closely tied to its religious life (Nygaard and Tirosh 2021, 25–29). It is central for our understanding of knowledge transfer in the Iron Age that this was a predominately oral culture. In such societies, ritual behaviour would be a key medium, which depended on specialists that were trained in remembering common narratives and practices, aided by poetic language as well as bodily gestures and movements (Assman 2006, 36–40; Brink 2005, 63, 73; Nygaard and Tirosh 2021, 28). In the lived lives of Iron-age people, some basic understandings and perceptions of the world were probably shared by most. However, we can expect that some areas of knowledge were held within limited circles and shared only between specialists, within households or families, or in particular circumstances (Sundqvist 2020, 757). We are reminded that the word *rune*, now denoting the writing system invented in the Iron Age, is related to a meaning "secret, mystery" or "confidential/whispered conversation" (Bjorvand and Lindemand 2019, 980). Although we do not know if Runic literacy was restricted, the word itself indicates restriction of some esoteric knowledge to certain groups.

In this text, I define religious knowledge as both a basic cosmological and mythological understanding of the world, as well as specialised religious and ritual knowledge, and finally as everyday know-how regarding the conduction of both small- and large-scale rituals and about religious aspects of everyday activities. None of these aspects are easily accessed through archaeology. However, it is a key point in the paper that the production and dissemination of all these kinds of knowledge have a material foundation.

What is a sacral landscape?

The relationship between knowledge and the material reality is interesting for our understanding of the creation of sacral landscapes. However, in Scandinavian research, there seem to be various ways to define and use this term and concept. Some draw on the works of Mircea Eliade about a universal cosmological symbolism (Eliade 1959), where mythological conceptions are seen as lying behind the organisation of sacred places (cf. Hedeager 2001, 506). Other scholars emphasise how religious aspects are particularly evident or concentrated in certain defined sacral areas (cf. Brink 2001, 79–88). While both approaches address aspects of the relations between religion and the material landscape plausibly, I use the term sacral landscape somewhat differently and regard the sacral as a potential inherent in all places (cf. Fabech and Näsman 2013, 54–55). While some sites could be sacral to large communities or held as more imbued with religious meaning than others, the sacral was a latent quality in all lived landscapes that could be activated at different times or at certain events – or relating to various groups, be they defined by age, gender, ethnicity, or social class.

In this view, sacrality is not separate from, but a general aspect of topography in the pre-Christian Scandinavian world. This means that the sacral landscape is not one, but many things, integrated in the lived landscapes of Iron-age people.

Knowledge, landscape, and *lieux de savoir*

Scholarship often addresses pre-Christian oral culture from the perspective of collective memory (Brink 2005; Nygaard and Tirosh 2021). In this perspective, landscape and place – lived in, worked, and transformed through centuries – can be described as archives or palimpsests of practices accumulated over time, connected with both establishing and preserving collective memories (Mitchell 2020). Yet, their role rises beyond that of a mere physical backdrop or repository of memories: places become charged with meaning through experienced and remembered associations to narratives and/or to participation in rituals. When new activities and performances are carried out, the places become part of the reinforcement and circulation of knowledge as well as of the creation of new ways to understand the world.

Inspired by the material, practical, and spatial turn in social sciences and humanities, French historian Christian Jacob has developed the concept of *lieux de savoir* as an approach in the field of the history of knowledge (Jacob 2017; see also Corbellini and Hoogvliet 2021). The French noun *savoir* translates as "body of knowledge", in line with the Scandinavian *kundskab* denoting something that goes beyond mere factual knowledge. Drawing partly on Michel Foucault's notions about the material properties of knowledge and partly on the material turn in social studies of science (Foucault 1969; Latour 1988), Jacob works with an approach that addresses knowledge, its circulation, and its production in relation to place, material, and practices:

> …knowledge does not exist by itself. It is always embedded in artifacts or embodied in individuals, communities, or institutions. More precisely, knowledge is not something immaterial and purely ideal. Moreover, knowledge does not exist without the practices that construct it, fix it, and make its circulation and transmission possible. Knowledge does not exist without the artifacts conveying it. These artifacts could be material objects such as handwritten or printed books, notebooks tablets, oral discourses, instruments, hand-made objects: they could also be gestures and savoir-faire, practices; they could be oral or written statements (Jacob 2017, 86–87).

As an historian, specialising in the Classical periods, Jacob is primarily interested in literary knowledge production and scholarship in the ancient world, but interesting for the present paper is his acknowledgement that material objects or instruments as well as memory specialists, discourses, gestures, or statements can be seen as artefacts that produce and convey knowledge (Jacob 2017, 86–87, 96).

Even if we cannot see the pre-Christian Scandinavian culture of knowledge as scholarly, knowledge and deep understanding were of great importance in pre-Christian society. This is mirrored in Old Norse myths, where the acquisition of information and wisdom is a key theme. Deities, particularly the god Odin, and other beings hunt and compete for higher levels of understanding (cf. Schjødt 2020, 1150–55). In the myths, landscape elements such as mounds, springs, wells, trees, and caves are integrated in narratives about preserving, hiding,

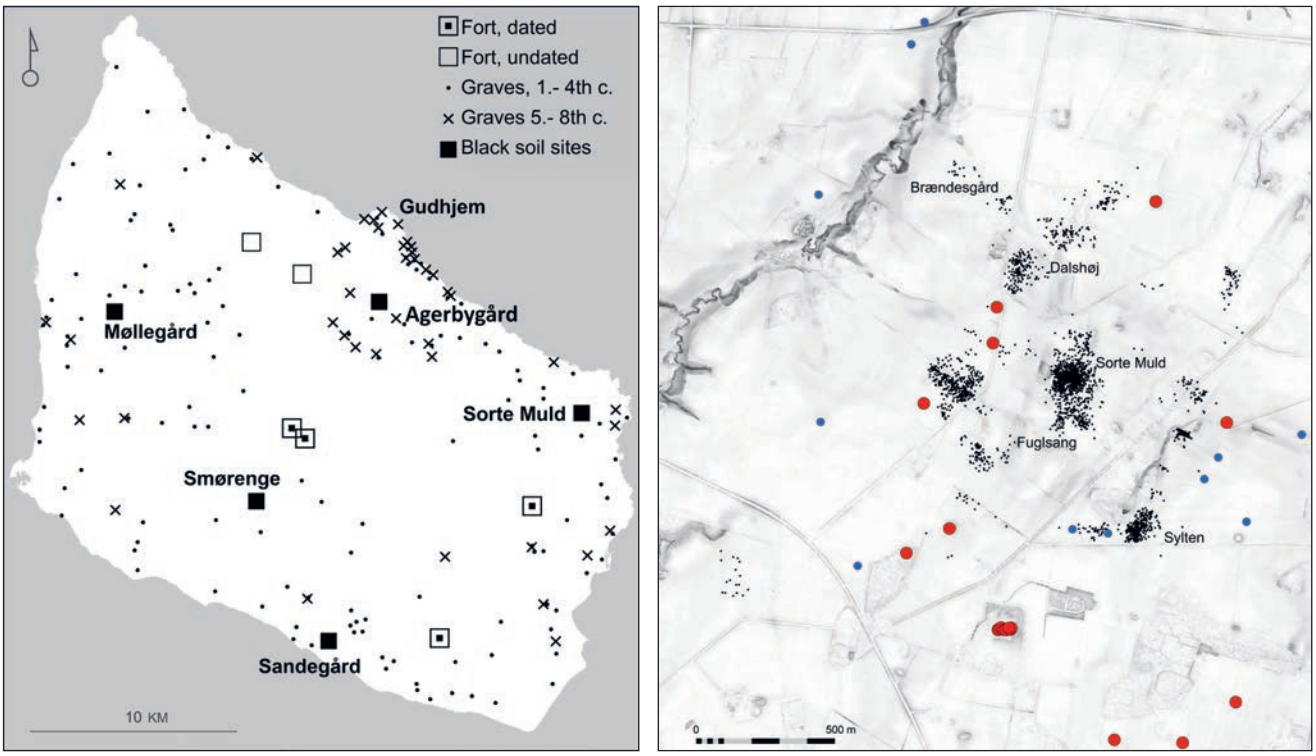

Figure 1a. Selected archaeological site categories on Iron-age Bornholm, b: find distribution in the Sorte Muld settlement complex, red: protected mounds, blue: ploughed-out mounds. Maps by Anders Pihl.

achieving, or extracting knowledge, perhaps echoing the ways spatial settings could be used in staging ritual performances (cf. Brink 2005, 110–13; Egeler 2023). Such a connection may be reflected in the inscription on the 8th-century Snoldelev rune stone from Zealand, Denmark: it references a *þulr*, "speaker", linked to the place name *Salhaugum*, a place name that refers to a monumental landscape – with *sal* denoting a large ceremonial hall and *haugum* meaning "at the mounds". A *þulr*, known from Old Norse literature, probably was a public speaker and ceremonial leader (Brink 2005, 104–6; Sundqvist 2020, 755–57).

Jacob describes four categories of *lieux de savoir*, some more tangible than others (Jacob 2017, 96–98). First are the places where knowledge work takes place, where people and practices related to knowledge are brought together, e.g., universities and libraries, but also places such as Royal courts and workshops on the larger scale. The second category refers more narrowly to the workspace itself, including the writing desk or working table with tools or shelves. The third category, called "inscriptions", identifies knowledge encoded in objects such as texts, images, or maps (see also Moreland 2001). In the fourth category are practices that create, fix, circulate, and preserve knowledge and the positioning of the intellectual craftsperson, both socially and locationally, when they for example create an artefact or text, solve a problem, or build an argument. In the following, I reflect on how these categories of places of knowledge can be identified on Iron-age Bornholm.

The social configuration of Iron-age Bornholm

With its ca. 588km^2, Bornholm is a geographically defined and socially confined space, and as characteristic for islands, it is both isolated from and intricately connected with its surroundings (cf. Grydehøj 2017). Bornholm has an exceptional archaeological record, with some of the major site categories shown in Figure 1a. We see that while burials from the 1st–4th centuries are spread throughout the island, 5th–8th-century burial sites are concentrated near the eastern and western but especially the northern coasts. This change coincides with the abandonment of many Early Iron-age field systems that turned large parts of the island's centre into commons and heathlands (Pihl 2021, 55, 59). In these areas, we find the remains of six prehistoric fortifications, whose relations to the surrounding society are somewhat unclear. Throughout the last 30 years, amateur metal detecting as well as investigations by Margrethe Watt have uncovered large numbers of settlements. Crucially, there are five large and find-rich black-soil settlements: Sorte Muld, Smørenge, Agerbygård, Sandegård, and Møllegård (Watt

2006). They all seem to have their roots in the 1st century BCE and to have been active at least into the beginning of the Viking Age, beyond the structural changes indicated by burial sites and field systems. The black soil sites are spread evenly across the island, perhaps reflecting some sort of regional division.

Sorte Muld and first-generation central places as centres of knowledge and innovation

The largest and wealthiest of Bornholm's black-soil sites is Sorte Muld with a surrounding complex of settlements, known for vast cultural layers (Figure 1b; Adamsen et al. 2009). Together with Gudme on Fyn in Denmark, Uppåkra in Scania, and Helgö in Uppland (both Sweden), Sorte Muld belongs to a small group of Iron-age "first-generation central places" that can be seen as centres of knowledge corresponding with Jacob's first category of *lieux de savoir*. Archaeological evidence reflects that these sites were super-regional centres of power, trade, and technologies (Skre 2020, 219–24, with further references). Importantly, they would also have been places where knowledge was created and circulated, and socially diverse sites functioning for many people on various levels: for example, as places to meet, gather, trade, learn, and participate in political, legal, and religious events. Evidence of a wide range of different craft activities as well as of contacts and impulses from near and far suggest that these places generated creative environments in which new ideas and cross-craft innovation could flourish (cf. Nordberg 2018, 78–81; Pedersen 2020, 408–9; Pesch 2011, 232–36).

It is important to note that apparently, the early central sites were also places of religious innovation, with, for example, evidence of early cult buildings that potentially reflect impacts from the Roman Empire (Sørensen 2022, 91–92). At Sorte Muld, the dynamic religious environment is reflected most clearly in the numerous 6th–8th-century gold foil figures, of which more than 3250 have been found to date (cf. Watt 2019). Most gold foils come from central Sorte Muld, where excavations and preliminary results of advanced geophysical prospections indicate fenced-in houses, of which at least one is interpreted as a cult building (Nielsen and Thorsen 2023).

Resent research on religious festivals in the Ancient Mediterranean points out how intersections of gathering for religious and economic purposes created a special creative interchange of religion, crafts, trade, and politics (Aurigny 2020, 93–95; Kowalzig 2020, 290–96). In Scandinavia, too, similar dynamics could have been at play when people travelled to the major centres to participate in religious events, where they could debate, trade, and exchange information. It is likely that the knowledge that was shared at these places was of both a general character and a more restricted kind (Pesch 2011, 274). Such innovative environments possibly affected not only technological advancement, but also the motifs and their meanings that were adopted into art (Pedersen 2020, 409). We may theorise that the knowledge environments at the first-generation central places played important roles in the development of the Iron-age animal styles and in the invention of runic writing, which spread very rapidly (cf. Imer 2018, 16; Pesch 2011, 270).

Knowledge and the open landscape

About 12 kilometres up the coast from Sorte Muld, there is a present-day fishing village named *Gudhjem* (1547 Gudium). Like the name of the first-generation central site at *Gudme*, *Gudhjem* is one of 11 Scandinavian *gudhem*-place names, formed of an appellative compound with the rather mysterious meaning "home of the gods" (Kousgård Sørensen 1985, 136). On Bornholm, the question presents itself why it was not Sorte Muld that was named "home of the Gods"?

Importantly, the *gudhem*-names may be area names rather than referencing single sites. The landscape around Gudhjem is dramatic, with tall rocks facing the sea. In its hinterland, we find Agerbygård, a black-soil site with rich metal finds dating from the entire 1st millennium CE, located on a high elevation and naturally fortified by two steep river valleys (Figure 2). Around Gudhjem and Agerbygård, there is a striking concentration of burial sites, many still marked with monumental stones. Thus, the designation *Gudhjem* – as "home of the gods" – might be a place name that could be somehow related to these clusters of burial sites.

Anne Nørgård Jørgensen (2011) has suggested that the Gudhjem burial monuments follow ancient roads towards Sorte Muld. This hypothesis is supported by evidence of 1st–4th-century burial sites located close to sunken roads that cross the major rift valleys between Sorte Muld and Agerbygård/Gudhjem. It appears that this route was marked by burial sites as early as the Roman Iron Age, creating a monumental alley that could have acquired a processional function, probably on the occasion of festivals or funerals (cf. Murphy and Nygaard 2023). In this light, the name *Gudhjem* can even represent a sanctuary zone sought out by visitors and inhabitants of Sorte Muld. Agerbygård might be included in this zone. Its name (1746–50 *agere-gd*) is probably based on an original simplex **Ager*, "arable field" possibly in the

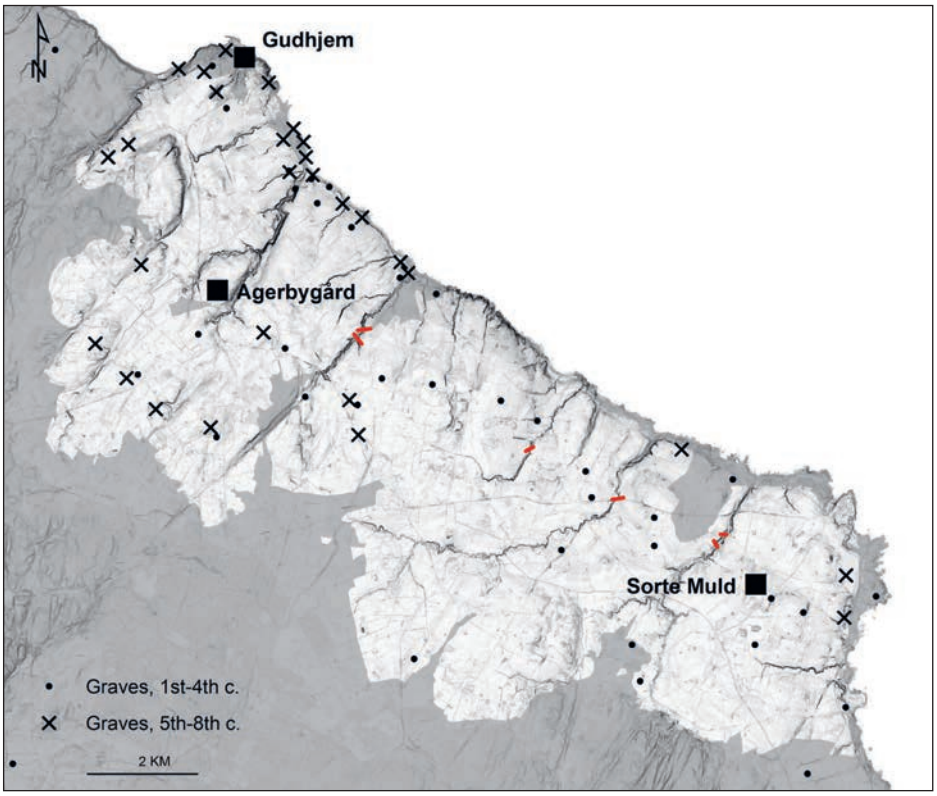

Figure 2. The reconstructed Medieval district of Hænnings herred, north-eastern Bornholm. Red strips mark sunken roads crossing major rift valleys. Map by Anders Pihl.

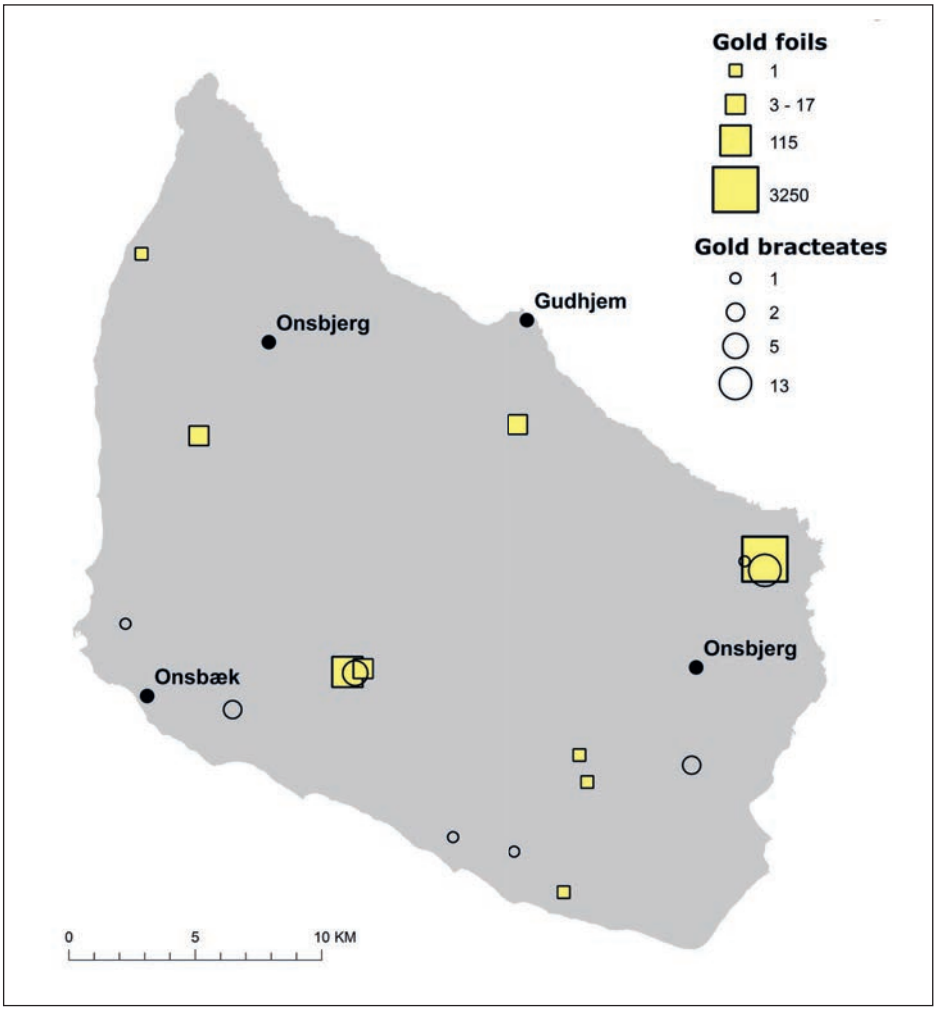

Figure 3. Sacral place names, bracteate finds, and gold foil figure finds on Bornholm. Map by Anders Pihl.

plural (DS 10, 308). Simplex *åker*-names in Sweden and Norway, are considered as potentially referencing ritual sites, possibly of an "official" kind. Further, *åker*-names are often connected with names of larger districts and their thing-sites and are sometimes found close to parish churches (Brink 1990, 358; Vikstrand 2001, 367, 384). This is also seen here, where the magnificent Medieval round church of Østerlars lies immediately next to Agerbygård.

In the 5th–8th centuries, burial sites began to cluster around Agerbygård/Gudhjem, while they are sparse around Sorte Muld (Nørgård Jørgensen 2011, 135). The processional route between these places and its traditional religious status probably made the Gudhjem area a preferred site for burials, which caused it to become a scenic monumental area. From a knowledge perspective, the creation and transmission of place names represent what is universally known and communicated about localities. This means that place names, like monuments, provide insights into conceptualisations of landscapes, and both can be seen as inscriptions on them. But while the creation of monuments might be politically motivated, place names require group consensus and often represent a common understanding of places. In both cases, this creates a constituent that influences the further understanding of the locality and becomes a part of the way a place creates and embeds knowledge (Albris 2014, 49–61; Vikstrand 2001, 19).

Bornholm's late and poorly preserved place name records, including its field names, yield little more information about places that might have been assigned sacral properties. We find three place names that possibly reference the god Odin, none of which, however, were recorded before the post-Medieval period (Figure 3). Two of them represent prominent hills named *Onsbjerg*, "Odin's hill", including one on eastern Bornholm that cannot be localised precisely today (DS 10, 223). The third name is *Onsbæk* on western Bornholm (1676 Oensbeck), "Odin's stream" (DS 10, 25; DSÅ 5, 187). These three names may possibly have been coined post-Christianisation, but they align with known patterns of *Odin*-names in Scandinavia and England (cf. Fellows-Jensen 2022; DSÅ 5, 187).

Bornholm's *Odin*-names are all found in the heathlands or commons created in the Iron Age; they do not relate clearly to any of the island's known central places, nor to sites where gold bracteates and gold foil figures were found. While such finds may yet appear in the future, the picture presented on Bornholm today contradicts the general notion, first introduced by Karl Hauck, that there are close connections between place names referring to Odin and finds of bracteates (cf. Hauck 1980; Pesch 2011, 232–36). Although we clearly see a concentration of bracteates around other sites with *Odin*-names such as *Odense*, "Odin's sanctuary", on Fyn, I believe this alleged relation needs to be revisited; instead, I rather see general connections between bracteate finds, central places, and sacral place names in a broader sense (cf. Pesch 2011, 232–36).

Bracteates: open display and coded messages

Gold bracteates are interesting objects from the perspective of knowledge, as they combine open social communication with hidden and coded messages. Used as elaborate jewellery, the 5th-century bracteates were worn for show, flashing signals about the wearers' social status and political connections (Wicker 2020). Reading and decoding their intricate images, however, required physical proximity and perhaps deeper levels of understanding. An even less accessible knowledge was displayed in the runic inscriptions on some bracteates. Imitations reflect that the artisans sometimes possessed limited runic literacy (Imer and Vasshus 2023). Bracteates can thus be seen as multifaceted artefacts of knowledge, inscribed with both accessible and inaccessible information.

Bracteates turn up on Bornholm in a variety of archaeological contexts (Table 1). I focus here on contexts and traces of handling the bracteates (see Pesch 2011, 251–53, regarding motif groups and their relations). At the Sorte Muld complex, a flawed stamp for a C-bracteate found at the site Sylten 2 reveals that bracteate *production* happened here. However, the largest number of bracteates comes from two depositions buried just outside longhouses at the site Fuglsangager, immediately south of Central Sorte Muld (Figures 1b, 3). One hoard was a magnificent necklace made up of five C-bracteates, looped solidi, and gold beads that had been neatly packed, folded, and rolled into a Roman silver plate. A smaller hoard combined three B- and two C-bracteates with one unlooped solidus (Axboe 2008, 36). Folding and burying removed these objects from function and view, embedding them into the location (cf. also Eriksen 2022, 86), while at the same time, they remained intact and incorporated their "bracteateness" in the deposition.

This differs significantly from stray finds around the Sorte Muld complex (Central Sorte Muld, Brændesgård II, Dalshøj I, Sylten 3, and Sønderhøj), where fragmented folded bracteates as well as fragments of loops and rims represent various degrees of fragmentation that destroyed the objects' identities as bracteates (Table 1, Figure 1b).

At Smørengegård, Bornholm's second-largest settlement complex, fragments of bracteates showed signs of both cutting and melting (Figure 4b); and remarkably, pieces of the same large C-bracteate were found 16 kilometres apart at Rønne and Sandegård, respectively, in the latter case contained in a hoard with solidi, ring-gold, and hack gold (Axboe 2023, 205).

These fragments might represent decommissioned bracteates intended for the crucible (Axboe 2023, 204) and craftspeople transporting scrap gold across landscapes and between sites. However, considering that bracteates were objects inscribed with powerful knowledge, cutting them into small pieces and melting them down could also represent ritual destruction (cf. Reiersen 2018). In order to transform bracteates into bullion gold, could it have been necessary to dissolve both the objects' identity and the knowledge embedded in them?

It seems that on Bornholm, bracteates were more likely to stay intact (even if folded) when deposited in ritual contexts. Guldhullet next to Smørengegård is a small natural spring where finds of relief brooch fragments, glass beads, fibulae, miniatures, sword parts, coins, and animal bones indicate ritual activities from the 2nd century CE into the Viking Age (Nielsen and Watt 2018, 80–81). This also included two A-bracteates from the same die. Both were intact, although one was bent, which could have been caused by the plough. The place is otherwise known for peculiar gold foil figures, most of them female (Nielsen and Watt 2018, 88).

Another type of ritual context may be seen at Bakkegård and Kjølleregård, where bracteates were deposited associated with older burial monuments (Table 1, Figure 4a). The Saltholmgård solidus hoard, placed under a megalith of a Neolithic dolmen, shows that solidi, indeed often found together with bracteates, could be deposited in similar situations (Horsnæs 2013, 128–29).

Table 1. Overview of bracteate finds from Bornholm.

Locality	Context	Number and types	Object/die numbers	Assemblage
Bakkegård (SB 060203-62)	Near BA-burial mound and EIA cremation cemetery	1 C-bracteate	2999, IK19	Single find
Brændesgård II, Sorte Muld (SB 060403-175)	Settlement, Sorte Muld complex	Loop, fragment	DNF 165/98	Detector site
Dalshøj I, Sorte Muld (SB 060403-135)	Settlement, Sorte Muld complex	2 loop fragments, 1 rim fragment, 1 B-bracteate fragment	C47256-57, C59486, C59356, IK685	Detector site circular pendant, hack gold
Fuglsang/Sorte Muld II (SB 060403-93)	Settlement, Sorte Muld Complex Two hoards outside houses	Hoard 1: 5 C-bracteates. Hoard 2: 3 B-bracteates, 2 C-bracteates.	Hoard 1: C34952-56, 1 IK592, 4 IK593 Hoard 2: C35138-42, 3 IK595, 2 IK596	Hoard 1: Roman silver plate, gold beads, circular pendants, solidi. Hoard 2: solidus Valentinian 3.
Gadegård (SB 060201-127)	Settlement, near large Iron Age cemetery, St. Kannikegård	2 C-bracteates, 1 intact, 1 fragment, inscription ota	C35178, DNF 1/94 Same die, IK578	Detector site
Guldhul (SB 060305-554)	By spring/ritual site near Smørenge	2 A-bracteates	C37909-10 Same die, IK 628	Detector site
Kjøllergård (SB 060303-110)	Small mound near three cairns, 100 m. from Vellensså river	2 C-bracteates with runes, 1 in 2 fragments.	C5366, C37581 Same die, IK95	Gold finger ring, hack gold
Near Rønne (SB 060304-9)	Found by children after ploughing, 1829. Precise location unknown	Originally 2 fragments, very large bracteate, same as Sandegård C341	MMLIII, IK324	Single find
Sandegård (SB 060205-33)	Settlement	Fragment of large bracteate, same as Near Rønne MMLIII	C 341, IK324	Hoard with 2 solidi, ring-gold and hack gold
Smørengegård (SB 060305-144)	Settlement (BMR 766)	1 small cut fragment, C-bracteate	C36013, IK606	Detector site
Smørengegård (SB 060305-144)	Settlement (BMR 766)	1 melted fragment	Uncertain type, C59098, IK724	Detector site
Smørengegård East (SB 060305-70)	Settlement (BMR 1469)	Small fragment of B-bracteate	BMR 1469 x1158-1191, IK 727	Detector site
Sorte Muld (SB 060403-93)	Central settlement, Sorte Muld Complex	1 C-bracteate	DNF 28/88, IK 397	Detector site
Sylten 2, Sorte Muld (SB 060403-74)	Settlement. Sorte Muld Complex	1, folded C-bracteate, failed production	DNF 63/89 IK570	Detector site
Sylten 3, Sorte Muld (SB 060403-193)	Settlement, Sorte Muld Complex	C-bracteate, fragment	BMR 1716x70-74, IK751	Detector site
Sønderhøj, Sorte Muld (SB 060403-169)	Settlement, Sorte Muld Complex	C-bracteate, folded fragment	BMR 802x296-334, IK725	Detector site

While the bracteates themselves carry encoded knowledge, these depositions near monuments emphasise the historicity of a place by inserting the objects in the landscape as new inscriptions.

Meanings assigned to bracteates may have been subject to change between production, distribution, use phases, and depositions. When bracteates found their ways into hoards in the ground intact, the knowledge assigned to them was concealed or redirected, whereas when they were destroyed, their messages became dissolved, even if their medium itself remained recognisable as bracteate fragments.

Gold foil figures, access and exchange between sites

Gold foil figures are very different from gold bracteates if we think about them in terms of knowledge and its transfer. Given their small size, they did not have the same quality of ostentation (although a few that were fashioned with loops may have been worn as amulets). From a knowledge perspective, key traits to emphasise about gold foil figures are their tininess and fragility, the details in their motifs and the anthropomorphic figures' emphasis on poses and gestures, the high numbers in which they sometimes were found, and the fact that often, they were folded, crumbled, scratched, perforated, or furnished with extra ornaments (Figure 5c; cf. Back Danielsson 2013; Eriksen 2022, 73–76; see also Pesch in this volume).

The miniature size meant that gold foils were not visible from afar, and even up close, their details can be hard to discern. Lotte Hedeager has discussed this deliberate "near invisibility" and linked it to the blind eye of Odin (Hedeager 2015). Whoever their communication was directed towards, it has been remarked how gold foils embody a high level of knowledge about details of dress and gestures (Back Danielsson 2013; Watt 2019, 44–46). Both were recognisable from real-life experiences and used as clear signals of social roles or ritual procedures, be they narrative, legal, religious, or social. It is an interesting contrast that while exaggerated poses could be a tool for performing rituals to large crowds in open spaces, gold foils can only be observed up close. The first requirement to accessing and understanding the gold foil figures was not a question of decoding the motifs, but of getting close enough to even see them. In this light, it is important to note how the gold foils are often found in relation to ceremonial buildings at elite sites (Watt 2019, 37–38), which were spaces that were confined and possibly not accessible at all times and to everyone. On Bornholm, finds of gold foil figures mainly derive from the black-soil sites (Figure 3). Preliminary results of geophysical prospections performed by ZAMG (Zentralanstalt für Meteorologie und Geodynamik), Vienna, at Agerbygård and Smørenge showed that at both sites, detector finds of gold foils were concentrated in the topsoil around central buildings (Albris et al. forthcoming). This indicates that the communication of gold foil figures was exclusive to the elites or at least not aimed at a larger audience. They could have worked on more personal or inter-personal levels. The great numbers and variations found at Sorte Muld suggest that gold foils were used on many occasions, potentially reaching many people, but not at the same time.

As centres of knowledge and innovation, the central places would be nexuses for the transfer of information and inspiration between geographical areas and social groups (Nordberg 2018, 78–81). Die links between gold foil figures can be seen as a proxy for such circulation between sites and regions (Figure 5). Sorte Muld is the absolute hub of gold foil stamp types, linked to the other early central sites at Uppåkra, Helgö, and Gudme–Lundeborg, but also to a network *within* Bornholm (Watt 2019, 49–50, 61). Even though we do not know whether it was craftspeople, dies, or the foils that moved around, the die links reveal a general interconnectedness between sites and communities on multiple levels (see also Eriksen 2022, 83).

Despite these connections, there are indications that a partiality for some motif groups was place specific, which encourages us to think about differences between sites, their status, and associations with certain rituals. While single male figures dominate at Sorte Muld and Uppåkra, Gudme–Lundeborg only has double figure dies, as do most Norwegian localities (Watt 2019, 37, 40). Guldhullet with more than 100 foils deposited in a wetland context seems to be an exception from a norm on Bornholm, where gold foils are mostly associated with ritual buildings (Nielsen and Watt 2018, 86–88): there, female motifs, often depicted naked, were clearly favoured. At Agerbygård, with at least eight stamp identities with Sorte Muld finds, there was a preference for a motif showing men and women with arms hanging and feet pointing down, which is also well known at Sorte Muld (Figure 4c; Nielsen and Watt 2018, 66, 70). These site-specific preferences could be key to understanding the use of gold foil figures and the characteristics of the sites where they are found.

Like bracteates, gold foil figures can be interpreted both as "inscriptions" (objects encoded with knowledge) and as tools for making "inscriptions" at particular sites.

Figure 4. Examples of bracteates and gold foils figures, a: the Kjøllergård bracteate with illegible runes, photo: Lennart Larsen, CC-BY-SA, b: melted bracteate fragment from Smørengegård, photo: Anne Vad Christiansen, CC-BY-SA, c: gold foil figures from Agerbygård, photo: René Laursen, Bornholms Museum.

Representing that which is difficult to see and often connected with secluded places, gold foil figures and their associated activities must be seen as related to a level of restricted knowledge.

Concluding remarks

Beginning from Jacob's concept of *lieux de savoir*, this text has explored various examples of the ways transfer and control of knowledge could happen in Iron-age society, using objects, landscapes, and rituals as tools and media. Discussing where knowledge is created, contained, or shared can help us to identify the different dimensions and flows of knowledge across time and space; this also allows us to think about the social distribution of information and levels of exoteric and esoteric knowledge.

One thing this text has not addressed is the distinction between public and private and whether this concept pair is meaningful in relation to a pre-Christian society, such as in the difference between "official cult practices" tied to central places and the more secluded worship taking place at individual farmsteads (Nordberg 2018, 81, 83). However, even if a public–private dichotomy may be a useful tool to work with, the material presented here suggests that we should rather think about various scopes of knowledge communities across Iron-age society and about when and to whom communication was inclusive versus exclusive (Jacob 2017, 89).

We can expect a common knowledge of how to act in the landscape, such as recognising places of meaning and the correct contexts for certain practices. The examples here have shown how shared religious knowledge linked to topography and burial monuments could be transmitted through movement and speech and how it also seems to have acted on smaller or secluded scales. While landscapes can mediate an understanding of the world that may have appeared given and shared by all, they could also embed knowledge in more subtle ways and be used

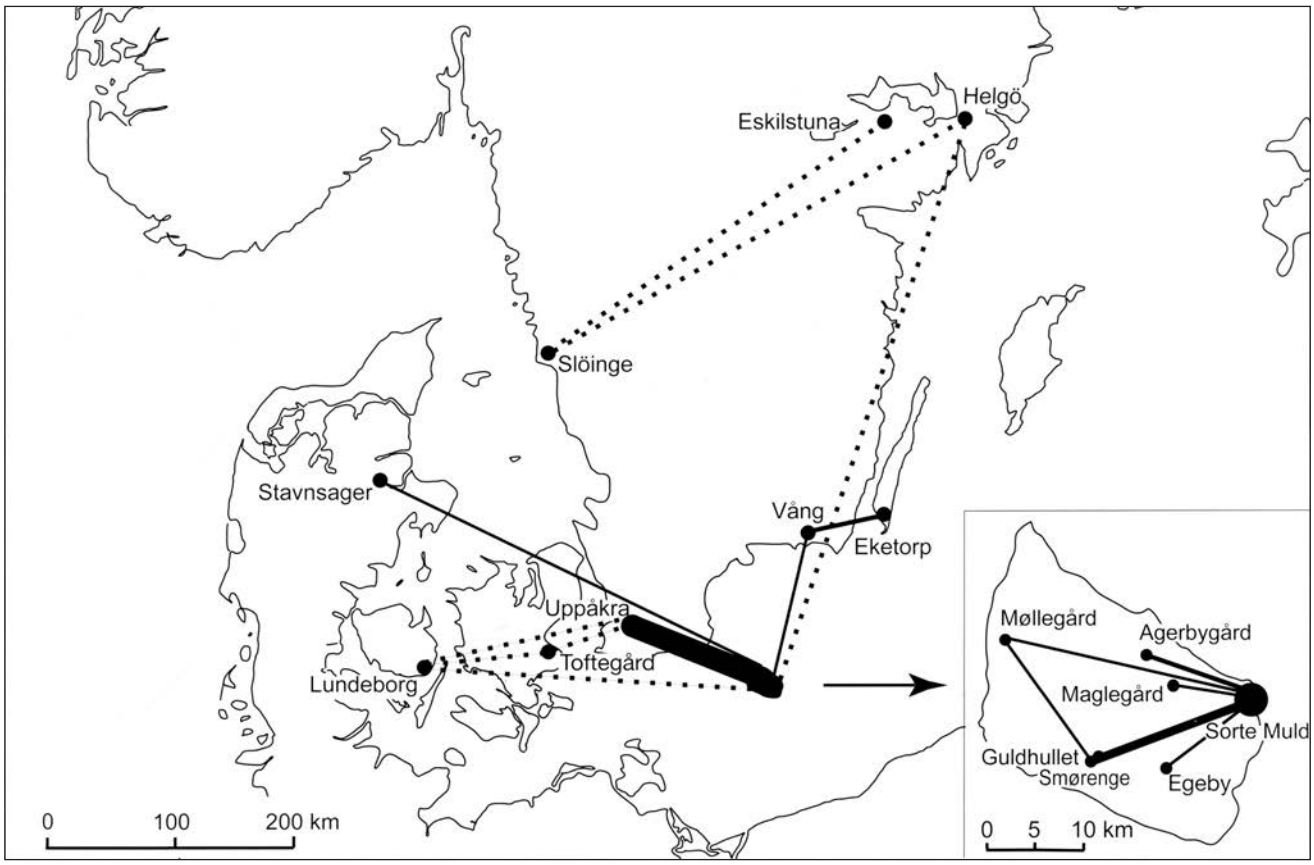

Figure 5. Die links between find places of gold foil figures. After Watt 2019, reproduced with permission.

to seclude or embed information that only few were acquainted with or had access to.

Both bracteates and gold foil figures incorporated several layers of knowledge, and both types of objects related to the central "knowledge hubs", with Sorte Muld at the top. At the central places, some aspects of religious life involved the whole society, such as participation in large communal rituals. At the same time, both groups of objects discussed here, bracteates and gold foils, each in their own way, were used for encoding or even hiding information, which could result in the exclusion of some festival attendees.

In conclusion, the concept of *lieux de savoir* can be a helpful tool for discussing both transmission and restriction of knowledge in relation to landscape and materiality in the oral society of pre-Christian Scandinavia.

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The Bergkamen warrior: a Scandinavian-influenced late 7th-century AD high-status burial in Westphalia?

EVA CICHY AND ULRICH LEHMANN

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The 2011 discovery of an Early-medieval cemetery in Bergkamen, featuring notably the burial of a man with rich grave goods, highlights extensive cultural contacts during this period. The presence of multiple shields, unusual in Merovingian-period burials, but well-known from Vendel-period graves in Scandinavia, hints at dueling practices or high-status burial customs that apparently had come to be known to the man buried in Westphalia. The grave's rich inventory and the inclusion of items typically reserved for the upper social echelons suggest that the individual held a significant rank within his society, potentially as a leader or a warrior of high repute. This grave provides valuable insights into the funeral practices and social structures of Early-medieval Germany, particularly in the Westphalian region.

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Introduction

In 2011, remains of an Early-medieval cemetery were discovered on a hillside slightly sloping south towards the small river Seseke at Bergkamen in western Westphalia, Germany. The graves included the burials of a child, a woman, and a man (see Cichy and Aeissen 2012; Cichy and Lehmann 2023). Due to its numerous objects that indicate extensive cultural contacts, the latter (Grave 1) will be examined in more detail below. This burial, located not far from other significant archaeological sites in Westphalia, contained unique items, including a spatha, a seax, and three shields, which suggest high social status and possibly military leadership. Detailed analysis of the grave goods, especially the weaponry and belt fittings, indicates sophisticated craftsmanship and connections beyond the local region, possibly linking them to southern German or Scandinavian traditions.

The male grave

The male grave (Figure 1) was a chamber tomb in west-east orientation and with a base area of 2.4m x 1.8m. The wood of the chamber walls was partially visible as dark lines in the ground. Similar discolorations in the north-east corner and centrally in front of the east wall likely are remnants of the floor planking made of parallel boards. Floor planks are well-documented in the region on the left side of the river Rhine (Koch 1996, 731), such as in the cemetery of Soest (Westphalia), 30km to the east (Peters 2011, 21–22). As in the graves at Soest, no remains of a coffin were recognised in Bergkamen (Peters 2011, 22). To the south, the grave chamber had an irregular shape, possibly due to the chamber's collapse on this side.

In the center of the grave was an oval disturbance, approximately 0.5m x 0.3m in size. Since neither weapons nor elements of the two belt fittings are missing, this is unlikely to be a grave-robber's shaft.

Some bone remains and the "shadow" of the corpse suggest that the deceased had been placed in the center of the chamber with his head to the west. This positioning predominates in the chamber graves of the cemetery in Dortmund-Asseln, about 9km to the south, and is likely for two graves at Bocholt-Lankern (Hernö 2007, 34),

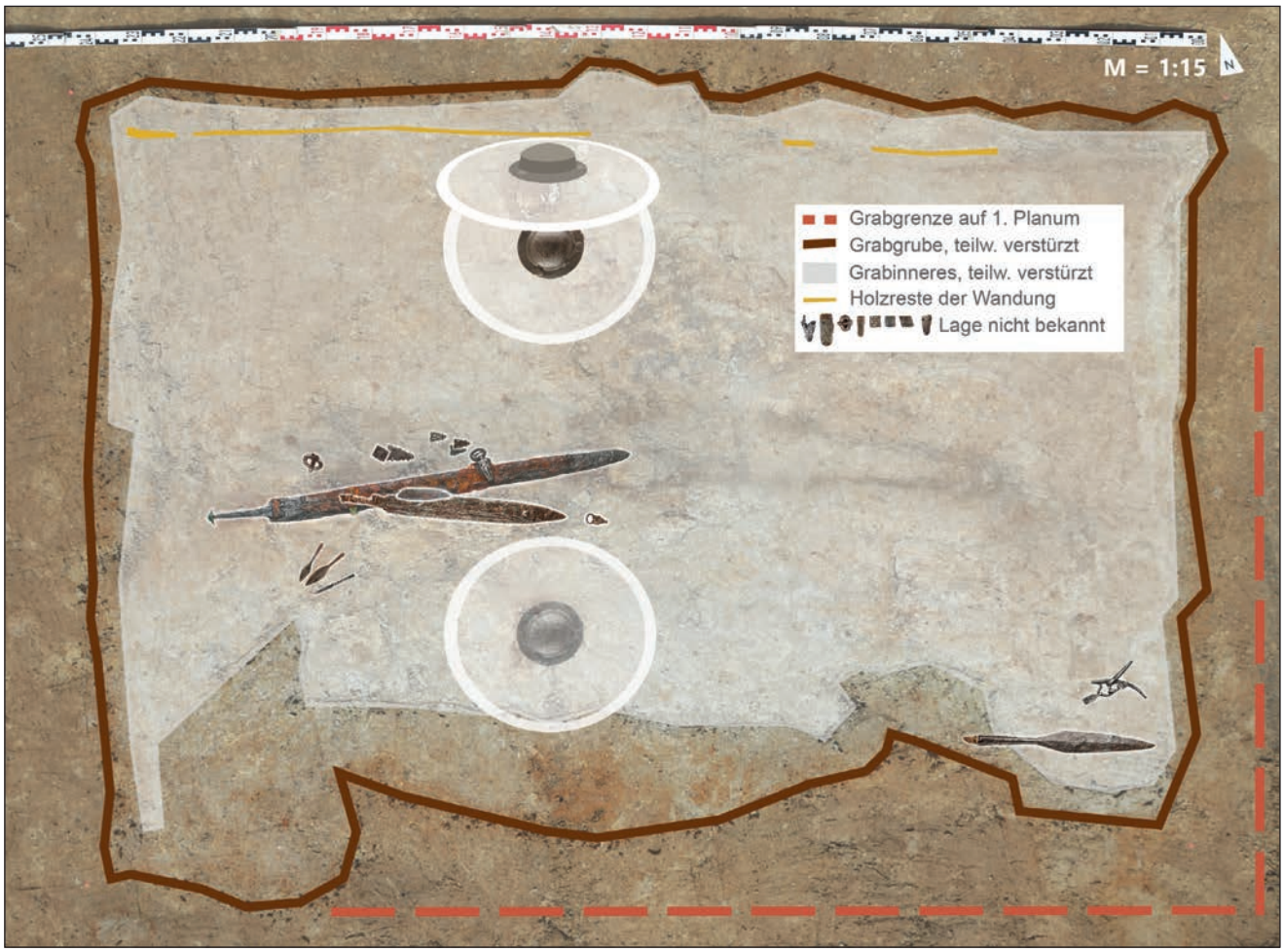

Figure 1. Grave 1, level 1 with grave goods (the position of the belt components is shown schematically due to block excavation. Graphic: LWL-Archäologie für Westfalen/H. Menne.

while in the Franconian area, it is rather unusual (Sicherl 2011, 22, note 53).

In the centre of the area indicated by the "corpse shadow" as the head and torso of the body, lay a spatha, a seax, and small knife. The burial also contained two belt sets, some of the buckles and fittings of which were found on or attached to the weapons, others lay next to them (Figure 1). Several objects were recovered together with the spatha and seax, but their exact relative position was not documented; the same applies to two stray finds (Figure 1) (see also Ankner-Dörr et al. 2013).

Finds

Seax

The iron seax has a length of 48cm, of which 38cm are the blade (Figure 2, 6). The width of the blade is 5cm, and the back bends towards the tip. Parallel to the back, two grooves, 3 and 4mm wide respectively, follow the bend near the tip. It is a heavy broad seax of Type Sax 2.2, which, on the basis of Rhenish parallels, belongs to the chronological Phases of the Lower Rhine area 6 to 9 (580/590 to ca. 710 AD) with a focus on the end of Phases 7 and 8 (640–670/680 AD) (Müssemeier et al. 2003, 44–46; cf. Westphal 2002, 180–83). However, comparative finds in the Westphalian area, especially in terms of blade width, barely reach the dimensions of the piece from Bergkamen.

Of the organic scabbard, the pointed tip (Figure 2, 7) features small and densly placed undecorated bronze rivets with lentil-shaped heads (diameter ca. 0.4cm). These hollow rivets are characteristic for the youngest type and were always used on the scabbards of broad seaxes (Koch 1982, 38). They are assigned to the Rhenish Type Sax 4.6 and dated to Phase 8 (640/650–670/680 AD). Only two chronologically relevant examples are known from the Rhineland area (Müssemeier et al. 2003, 47).

Spatha

The completely preserved spatha has a total length of 91.0cm (Figure 3), of which the blade accounts for 78.2cm. The blade is broken several times and slightly bent in the lower area due to soil pressure. One of the two

Figure 2. Grave goods from Grave 1. Photos and graphic: LWL-Archäologie für Westfalen/H. Menne, A. Müller.

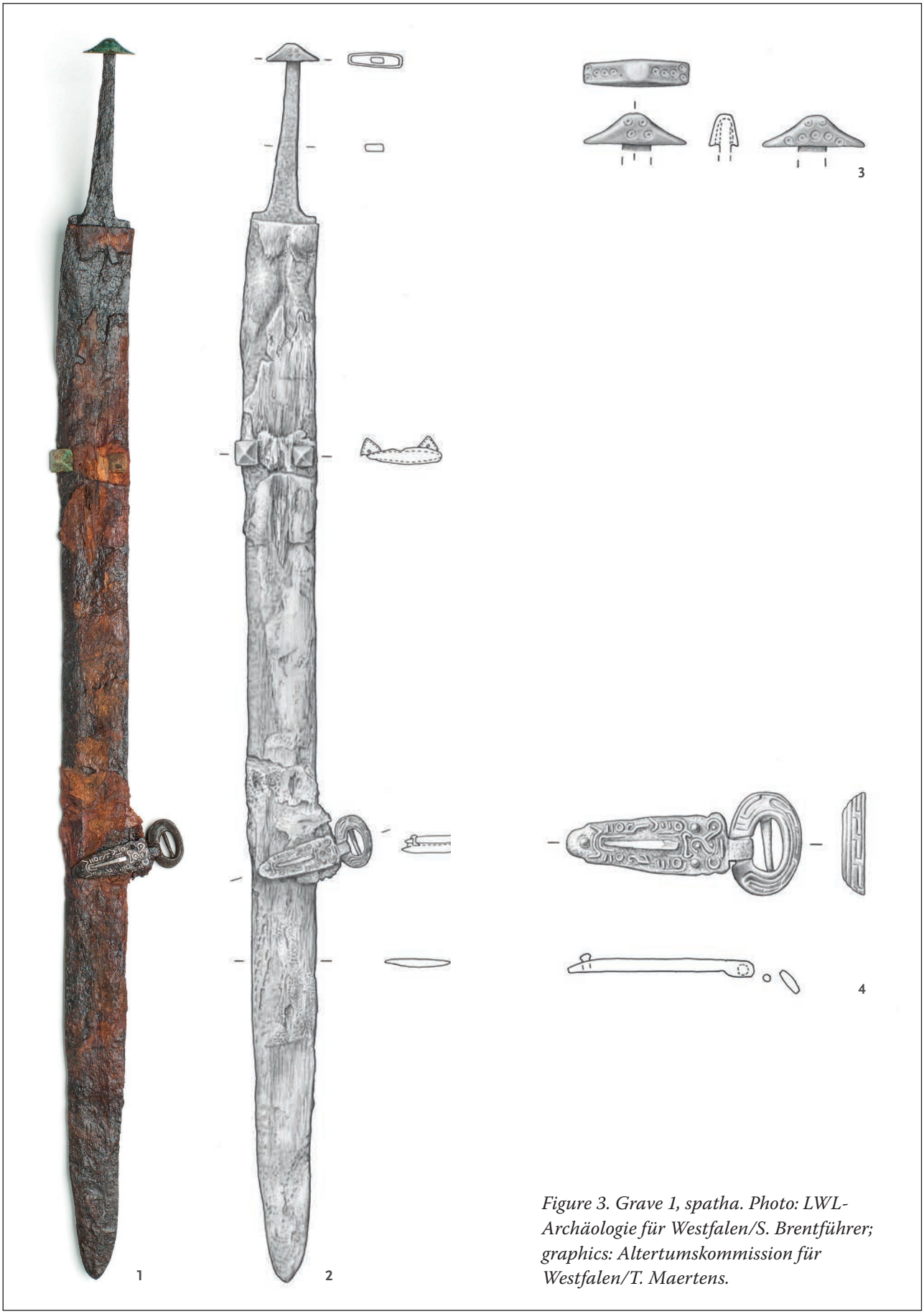

Figure 3. Grave 1, spatha. Photo: LWL-Archäologie für Westfalen/S. Brentführer; graphics: Altertumskommission für Westfalen/T. Maertens.

pyramid mounts of the suspension and the loop fitting of the strap still was attached to the blade. The spatha was extensively examined microscopically, with conventional radiography and 3-D X-ray computed tomography as part of a research project on double-edged swords of the Early Middle Ages from Westphalia (Lehmann 2016).

From the organic remains on the blade, the construction of the scabbard can be deduced. It consisted of two arched sheets of wood, probably made of beech (determined by Ursula Tegtmeier, Laboratory for Archaeobotany at the University of Cologne), which were lined on the inside with goat skin (determined by Sylvia Mitschke, Curt-Engelhorn-Center Archaeometry Mannheim). The usually ever-present leather covering on the outside (Lehmann 2007, 130–31) is missing, but the CT images suggest a leather cuff in the upper third of the scabbard at the level of the wooden belt loop, of which slight remains have survived. Instead, the wooden shells were covered by a plain weave fabric, which was most clearly visible under the loop fitting.

The spatha was carried by means of a two-point suspension system (Christlein 1971, 24, fig. 7, 3; Lüppes 2010; Marti 1995, 91, fig. 8b, 108, fig. 31; Menghin 1983, 150, fig. 90, 1; Neuffer 1972, 34–35, figs. 6–7). The belt loop and the weapon belt fittings consistently indicate a strap width of 1.3cm. The paired bronze pyramid mounts were located on both sides of the belt loop. A system with two straps in the scabbard's upper area, similar to the spatha from Grave 4 in Altdorf (Switzerland) from the second half of the 7th century, is likely (see Marti 1995, esp. 88–92). The lower point of the suspension is marked by the loop fitting, which is attached to the wooden sheet with a small nail. The tip of this nail is bent on the inside, so the loop must have been mounted before the two wooden sheets were joined together.

The spatha's pyramid-shaped pommel is made of non-ferrous metal, decorated on both sides with embossed circular "eyes", and riveted to the tip of the tang. All other elements of the handle were made of unspecified organic materials.

The blade is pattern-welded and has a complex structure (8 composite rods in 2 layers each). In the middle part, fields of parallel lines and semicircular patterns were visible (Lehmann 2016, 384–85, pl. 30, 2–3). The multi-part construction and the uniformly flawless workmanship indicate a work of superior craftsmanship, though not of the highest quality (Lehmann 2016, 316).

The dating is based on the trapezoidal pommel and the pyramid mounts. The former (Figure 3, 3) represents a shape of pommel that was common during the 6th century, is assigned to the Type Spa7E in the Lower Rhenish chronology, and dated to Phases 5 and 6 (ca. 565 to 610/620 AD) (Müssemeier et al. 2003, 44). Trapezoidal pommels made of non-ferrous metal have a relatively long duration, according to Wilfried Menghin, and can be classified no more precisely than in his Groups B–E (480 to ca. 650) (Menghin 1983, 136, 137, fig. 77). The second reference point is provided by the pyramid mounts with a flat bar on the back made of non-ferrous metal, which on the Lower Rhine are assigned to Type Spa2B and thus to Phases 5–7 (ca. 565 to 640/650) (Müssemeier et al. 2003, 42–43). In southern Germany, they are also documented in younger find combinations of Koch's Phase 8 (Koch 1977, 47, 128–29 [Grave 622, pl. 167]). In Westphalia, pyramid-shaped mounts are only known from the spatha from Raesfeld-Erle (Lammersmann 1927, 27), but these are now lost. Three further, unpublished bronze single finds with flat bars on the back come from Warendorf-Einen, Marsberg-Giershagen, and Neuenkirchen. Based on this data, the spatha should be dated to the roughly 100-year period from about 570 to 670 AD.

Belt fittings

Spatha belt Type Civezzano

The components of the spatha belt that are preserved in situ on the scabbard can be clearly assigned to it: a loop fitting (Figure 3, 4) and two pyramid mounts (Figures 3, 1–2). A comparison with complete sets of this type (see Lüppes 2010, fig. 1) shows that at least nine further objects should be assigned to the belt as well: the larger main buckle of the main strap (Figure 4, 8), the associated tongue (Figure 4, 1), as well as a rectangular fitting (Figure 4, 5) and a slider (Figure 4, 4), which were attached to the main strap. A second slider (Figure 4, 7) should also belong to the main strap due to its nearly identical dimensions, although then a slider for the secondary strap would be missing. A diamond-shaped fitting (Figure 4, 6) connected the main and secondary straps. From the secondary strap, a tongue (Figure 4, 3), another buckle (Figure 4, 9), and a fitting (Figure 4, 2) are preserved.

All components feature the characteristic and widely documented decoration of abstract animal representations combined with geometric ornaments that are typical for the Civezzano Type. Spatha belts of this type are found mainly in southern Germany in the Alamannic and Bavarian settlement areas (see Peters 2011, fig. 72; Schwarz 2004, fig. 3 with list of find sites 1; Walter 2008, 171, note 564). Production sites in these areas are subject of discussion, just as the possibility of an origin further south, in central/northern Italy, or in the Merovingian-Franconian regions to the west (see e.g. Peters 2011, 97–99, Schwarz 2004, 68–71).

Figure 4. The fittings of the spatha belt from Grave 1. Photos: LWL-Archäologie für Westfalen/H. Menne.

Figure 5. Belt set components from Grave 1. Photos and graphics: LWL-Archäologie für Westfalen/H. Menne, A. Müller.

The widths of the main and secondary straps, at 2.3cm and 1.3cm respectively, match those of the comparison pieces from the south (Lüppes 2010, 561, tables 1–2). That the strap width probably was standardised and that the decoration was very similar is used as indicative of a "workshopcircle". However, in contrast to the sets from southern Germany, which regularly feature cross-shaped inlays, there is no decoration on the rivets from Bergkamen. The design, which otherwise corresponds in every detail to some southern German sets, makes a local imitation appear rather unlikely.

Complete sets are rare even in the main distribution area of the type. The ensemble from Bergkamen can only be matched to two almost complete sets from graves in Xanten Cathedral, Kreis Wesel, which is outside the actual distribution area (Müssemeier et al. 2003, 20–21; Siegmund 1998, 32, pl. 246). The Rhineland finds summarised under Type Spa1C are dated to Phases 7 and 8 (610/620 to 670/680 AD) (Müssemeier et al. 2003, 42). From Westphalia, only single finds have been reported from Soest (Peters 2011, 97–99 with map fig. 72) and Lünen-Wethmar (Lehnemann 2008, 51–52).

Fittings of the waist belt

The fragments of several iron belt fittings, which appear to be silver-plated, can be attributed to a belt set consisting of a large fitting, a counter fitting, and three small triangular fittings. All these pieces feature three rivets and profiled edges, meaning that their shapes basically follow the pairs of animal heads inlaid on the edges. Conventional X-ray images and an X-ray CT analysis of the square strap slider (Figure 4, 4) and two waist belt fittings (Figures 5, 2–3) have shown that the apparent silver plating was not genuine, however. Instead, twisted silver wires had been pressed flat into a roughened substrate and then polished over, which made the seams between individual wires invisible to the naked eye (see Gussmann 1994, 146–47). Additionally, all fittings feature inlays of non-ferrous metal wires. These were inlaid into pre-made grooves, at a deeper level than the silver overlays, which probably were also present on all three associated small triangular fittings with identical pattern (Figures 5, 3–5).

These fittings represent a development of the three-part sets found west of the Rhine, forming a clear contrast to the fashion of contemporaneous multi-part sets.

It has been suggested that the elaborately designed waist belts served as insignia of office or rank, akin to the ancient *cingulum militiae* (Fehr 1999, 110–11). The fittings generally can be aligned with Berthie Bilo-Trenteseau's Group II, characterised by an animal depiction without a border around the central field and by a great variety of edge decorations (Bilo-Trenteseau 1970, 256–60, 269, distribution map C). She proposes dating the fittings with this kind of decoration to the second half of the 7th century (Bilo-Trenteseau 1970, 263). Accordingly, the Rhenish examples summarised under Type S-Gür 4.7 are classified into Phase 8 (640/650–670/680) (Müssemeier et al. 2003, 21, based on Siegmund 1998, 32 [Gür 4.7]).

Good comparisons for the set can be found in the graves of Nijmegen-Lent, Province of Gelderland, Netherlands, including small triangular fitting plates very similar to the Bergkamen pieces (van Es and Hulst 1991, 121, 133) that date from 630 to 670 AD, with a possible continuation to the end of the 7th century (van Es and Hulst 1991, 120–21).

A little distance away from the other belt components, the bronze buckle with a fixed fitting (Figures 5, 6) was found at approximately hip level. Ursula Koch compiled various functions for buckles of this type, as a belt buckle, a pouch closure, or as part of a spatha suspension (Koch 1977, 77).

Arrowheads, lancehead, and bridle fragment

To the south of the swords lay a group of three arrowheads of different styles, and in the southeast corner of the grave, an iron lancehead of Type S-Lan 2.5 (Müssemeier et al. 2003, 49–50) was discovered sticking diagonally in the grave pit wall (Figure 2, 4). This method of deposition is common (Hinz 1969, 23) and also evidenced, for example, in the nearby cemetery at Dortmund-Asseln-West (Sicherl 2011, 32). In the Rhineland, this type is documented for Phases 7 to 9 (610/620 to ca. 710). In the same corner of the grave, the fragment of an iron curb bit with a simple outer loop of Oexle's Form I was found (Oexle 1992, 35–47) (Figure 2, 5). This placement in the grave also has been documented in Pflaumheim, Cologne-Müngersdorf, and Basel-Bernerring (Switzerland), although generally, the horse gear was laid on the right side of the deceased (Oexle 1992, 8–9). The type is known from grave contexts of the early 5th to (rarely) the later 7th centuries (Oexle 1992, 44); the youngest known specimens come from the Lower Rhine and the Netherlands.

Shields

Particularly unusual among the grave goods, is the inclusion of three shields: one shield boss was found to the right, two to the left of the deceased, each at about the level of the torso, with the two shields in the northern half of the grave likely stacked on top of each other as the bosses were only 0.1m apart, with one slightly lower than the other (cf. Figure 1). The shield bosses vary in size, from 14.8cm (Figure 2, 3) to almost 20cm in diameter (Figure 2, 2). The two better-preserved shield bosses, which feature steep collars and flat domes and lack spike knobs, can be assigned to Type Sbu5A, which in the Rhineland is documented for Phases 6 to 9 (580/590 to ca. 710) (Müssemeier et al. 2003, 52–53).

Burials with several shields: geographical considerations

The inclusion of multiple shields in a Merovingian-period burial is unusual in all regions adjacent to the Rhineland, but it is documented in some of the rich Vendel-period boat graves in central Sweden. But even there, this custom is an exception. In Scandinavia at this time, a complete set of weapons, including a two-edged sword, sax, shield and lance, still was common in central Sweden and on Gotland, but is no longer found in Norwegian graves and on Bornholm and was moreover rare in graves in southwestern Germany (Jørgensen and Nørgård Jørgensen 1997, 101, fig. 92, 104, fig. 99; Nørgård Jørgensen 1999, 146).

But in Valsgärde near Gamla Uppsala (Sweden), Graves 5 (660–700/710) and 6 (660–700/710; Ljungkvist 2008, 13–18) and 7 (580/590; Gräslund and Ljungkvist 2011, 125) each featured three shields as grave goods (Arwidsson 1942, 43, 1977, 33), likewise most probably the grave of Ultuna (Arwidsson 1942, 44, note 4; Hildebrand and Hildebrand 1873, 1). Whether three also were included in the grave Vendel XI is unclear: Hjalmar Stolpe describes two (Stolpe and Arne 1927, 40), whereas Gretha Arwidsson points to the number of strap fittings, which may indicate three shields (Arwidsson 1942, 44 with note 4). Shields in groups of three are also depicted on contemporaneous helmets (Arwidsson 1983, 77). Finally, two shields are found in the burials Valsgärde 8 and 13 (Arwidsson 1983, 73) and outside Scandinavia in a southern English grave in Taplow in Buckinghamshire (Stevens 1884, 64, pl. 2, fig. 1).

Hjalmar Falk mentions several shields that were available to a fighter: "It seems to be an old custom in the north to assign a second to each of the fighters in a duel, who held their shield and replaced the worn shields [...] with new ones" (Falk 1914, 150; our translation; see also Arwidsson 1942, 44). Shield bearers have been mentioned since at least the 6th century in the service of Lombardic or Ostrogothic kings and they held additional shields

ready in battle to replace damaged ones (Falk 1914, 151). The Ostrogothic king Teja used three shields during the battle at Vesuvius in AD 553 (Arwidsson 1942, 44). While the number three might seem to have been chosen arbitrarily, Arwidsson emphasises that the trio of shields in the grave Valsgärde 6 is no coincidence: "as far as we know, there was an old practice in the north according to which each fighter in a duel had the right to use up 3 shields" (Arwidsson 1942, 44; our translation). This refers to the Icelandic *Kormak's Saga*, which likely was written down in the 13th century (Arwidsson 1983, 73) and which in chapter 10 describes the rules of the holmgang, including the shields of the combatants: "Each gets 3 shields, but once these are used up, the combatants must step back onto the hide, even if they had moved away from it earlier, and defend themselves there with their weapons alone" (Böldl et al. 2011, 81; our translation). In the account of a fight (chapter 12), it is stated again that "each received three shields" (Böldl et al. 2011, 90; our translation). According to Arwidsson, "[t]he presence of three shields in warrior-graves [...] suggests that duelling may go back at least to the Vendel period" (Arwidsson 1983, 73).

While it is tempting to discern in the "three-shield burials" specific indications of duelling practices that, according to later written sources, were common in Scandinavia, several aspects argue against such an interpretation. As the graves Valsgärde 8 and 13 each feature "only" two shields, it is clear that the number three was not strictly set in the Vendel Period. Also, the objects occasionally represent different values: the shields I and III from Valsgärde 6, for example, feature numerous metal fittings and richly decorated bosses and were deposited together, while shield II is significantly simpler in construction and was separated from them in the grave (Arwidsson 1942, 24, 35–41, pl. 6–11, 44; cf. Valsgärde 5) (thanks are due to John Ljungkvist, Uppsala University, for this and further important information on the shields from Valsgärde, by email, 03. March 2022). Such a separation of the shields also can be observed in the burial at Bergkamen (see above), though due to poor preservation, no statements can be made about different qualities of the objects. Were the more elaborately crafted shields even intended for combat, or were they merely prestige objects? Not only regarding shields, but the grave goods in Vendel-period boat graves in general, there is a discussion whether they represented the personal gear of the deceased or whether the grave goods were selected from a collective stockpile of equipment stored for this purpose (Odebäck 2021, 36, 189).

Multiple shields in a grave also are found in the Viking-age burials of the 9th and especially the 10th centuries, in Norway, for example, they occur in 74 of about 3400 graves. Like the Vendel-period comparisons, these graves almost always featured rich equipment (Grieg 1947, 19–23). With regard to the graves of the "Norwegian-western area", Heiko Steuer discusses the possibility that, since multiple shield bosses often are associated with a boat burial, the majority of shields does not represent the gear of one man, but rather a ship's equipment (Steuer 1970, 378). The shields, he suggests, expressed a commander's "'military authority' over several warriors" or the status of a leader (Steuer 1970, 378; our translation). Given that there were 64 shields in the ship at Gokstad, 28 and 8 examples, respectively, in the two ship graves at Myklebostad, and 21 shield bosses in the boat grave on the Ile de Groix (Brittany, France), the argument is plausible. Most graves, however, feature significantly fewer (mostly two or three, very rarely four) shield bosses (Grieg 1947, 19–23).

Is it a coincidence that several shields were placed in the Bergkamen grave, or could it be possible that the custom expressed in the richly equipped Scandinavian burials was known to the man buried there or his descendants? Steuer points out that the "common lifestyle with the central role of the martial aspect of existence spread out customs and objects throughout Europe" and that this also reflected the mobility of the time (Steuer 1987, 190; our translation). He paints the picture of an elite in the army made up of high-ranking warriors "from the most diverse [...] tribes of Germanic peoples […] who were paid with gold, weapons, and land, but who not only constantly stayed in the king's vicinity, but also returned to live on their large estates, where they were buried, if they had not died on a war campaign far away" (Steuer 1987, 190; our translation). It can be assumed that "in that mobile era, warriors from the North could serve in the Merovingian Empire, and that the men in such warrior retinues could come from the most diverse areas of origin" (Steuer 1987, 221; our translation).

There is concrete evidence for the relationships between the emerging Scandinavian warrior aristocracies and the Merovingians in the archaeological finds of northern European graves since the 6th century, particularly in weapon equipment and riding gear (Arrhenius 1983, 64–66; Ljungkvist 2009, 43, 46; Nørgård Jørgensen 1999, 174).

Egon Wamers describes the individuals buried in the Vendel-/Merovingian-period graves at Vendel and Valsgärde as "sub-royal", high-ranking mounted warriors who were employed as administrators and assumes "that this Nordic warrior elite served in high positions in the South, as *clibanarii/cataphracts* and probably in the

bodyguard of a ruler" (Wamers 2018, 233; our translation).

Regarding southern Germany, Koch points to grave finds that suggest the service of "Norsemen as warriors and retinue leaders in the Frankish Empire" (Koch 1999, 183–87; our translation). In this context, reference should also be made to the shield from the Rhenish grave at Morken (Rhein-Erft-Kreis) that has long been considered a Scandinavian product (Arrhenius 1983, 45). The Scandinavian influence in the South, however, ends simultaneously with the decline of the Austrasian royal house at the beginning of the 7th century (Koch 1999, 192; Schmauder 2018, 205), essentially during a time when the individual buried in Bergkamen might still have been a child.

On the other hand, some Early-medieval graves in present-day Westphalia show strong connections to the Frankish Empire. The owners of the two ring-swords found in Grave 61 at Bad Wünnenberg-Fürstenberg and Grave 13 at Beckum II probably had joined Frankish armies (see Lehmann 2016, esp. 295–96), as pommel rings were issued only to high-ranking warriors in the royal retinue (Steuer 1987, 222). The connections are also evident in other grave goods of the deceased at Beckum, which, according to Vera Brieske, appear to be "extraordinarily Frankish" (Brieske 2011, 127; our translation). In the case of the richly furnished women's graves at Soest, which are very similar in terms of grave construction, Daniel Peters observes an "actively maintained participation in the polyethnic political construct of the Frankish Merovingian Empire" and calls the dead "Frankish", "regardless of an actual geographical or even biological origin" (Peters 2011, 182; our translation).

The extraordinary association of objects (spatha set plus shields) may suggest that the individual buried in Bergkamen came into contact with warriors from other regions, perhaps as a mercenary, and in this way became acquainted with the customs of a northern European warrior aristocracy. The Bergkamen spatha set alone indicates a certain mobility, which Frank Siegmund also postulates for the individual buried in Grave B22 in Xanten I: based on the spiral-inlaid belt set and parts of a belt set of the Civezzano type in that grave, he assumes that this individual either spent part of his life in southern Germany or originated from there (Siegmund 1998, 240–41).

Tomb form and grave goods as expressions of social role and status

The dating of the burial primarily is based on the silver-plated fittings of the waist belt, which are classified as belonging to the second half of the 7th century. The combination of broad seax, bi-chrome-inlaid and silver-plated belt buckles and fittings, as well as lanceheads with narrow, leaf-shaped blades and closed sockets is also considered quite typical for the Middle Rhine area of Phase JMIIB (670/680–710/720) (Saal 2014, 385, fig. 123). The spatha possibly was an older piece that had been used for some time before it was deposited in the ground. The burial at Bergkamen is the only grave in Westphalia that reliably contained a spatha from the period of the middle or the second half of the 7th century (Lehmann 2016, 84). It is also one of the few Westphalian examples of a burial from this period that was furnished with rich grave goods (Grünewald 2005, 76).

The construction of a chamber tomb – with its disproportionate size and the considerable amount of labor and expense involved – suggests that special care was taken. The elaborate burial structures are an expression of the need for representation of a high-ranking class of society; it seems to have been an accepted norm that chamber tombs were reserved for members of the upper classes. The effort involved in tomb construction usually is reflected in an assortment of high-quality grave goods (Peters 2011, 154, 164), as is evident in the male Bergkamen grave.

Rainer Christlein's (Christlein 1966, 89–92, 1975, 1978, 20) seminal system for the comparative assessment of the composition and value of Early-medieval grave goods still is largely recognised and forms the basis of our interpretation. Criticisms include points that are also relevant for the classification of the Bergkamen grave, such as considerations of regional peculiarities, changes in the grave goods custom over time, that grave goods were interpreted solely as expressions of individual wealth, and that variations in the furnishings only represented certain age groups (see Brather 2005, 159; Burzler 2000, 120–27, 2002, 322; Döhrer 2011, 9–11).

According to Bernhard Sicherl, members of a landowning class in Westphalia did not have the same access to prestige goods as Franks and Alemanni. The relative lack of such valuable goods can be explained, he states, by a less comprehensive integration of the elites in northwestern Germany into the Frankish rule and its distribution networks (Sicherl 2011, 159–60).

The rarity value or exclusivity (see also Burzler 2000, 100) of certain prestige goods in the northwestern German context is, however, insufficiently considered in a slightly modified adoption of Christlein's model: a nearly complete spatha set of the Civezzano type is likely to be evaluated differently in Westphalia than in a southern German grave.

Furthermore, Anke Burzler points out that regarding the grave goods "quantity is complemented by quality, by taking into account the workmanship, including decoration, exclusivity, and rarity value" (Burzler 2000, 100). Accordingly, as previously indicated, a nearly complete spatha set of the Civezzano type in Westphalia is to be weighed differently in quality than a similar find in a southern German grave. The warrior buried in Bergkamen can thus be associated with a group of people who took on leadership roles within society.

Burzler further argues that "ideas seem to influence the selection of grave goods that serve to document the lifestyle and the reputation of the individual or family" (Burzler 2000, 100). Following Arwidsson's explanations that the inclusion of three shields in graves may be related to Early-medieval duelling rules (Arwidsson 1983, 73), the inclusion of three shields in the Bergkamen grave similarly could express certain notions or rules that the warrior had learned abroad and brought home with him, and that shaped his lifestyle.

Conclusion

The Bergkamen grave discussed here occupies a special position: not only does it feature an extensive, comparatively rich set of grave goods, it is also the only known grave in Westphalia that included a spatha from the mid-7th century (Lehmann 2016, 84).

Based on his grave goods, the man buried in a chamber grave probably had been a mounted warrior of high social status and considerable mobility. He learned and adapted foreign customs and practices. Among the comprehensive and high-quality grave goods of the warrior, who by Westphalian standards was remarkably well-equipped with a spatha belt with a complete set of fittings of the Civezzano type and a silver-plated waist belt, the grave is distinguished particularly by the addition of three shields.

This probably identifies him as a military leader (cf. Steuer 1970, 377–78), whose status was to be given special emphasis by this highly unusual combination of grave goods, which makes this burial unique in the region.

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The Raven's Eye. Stylistic references to sight and vision as symbols of knowledge and power

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In many cultures throughout history, eye symbolism has a special function in connection with religion, mythology, and superstition. In some mythologies, eyes are linked to birds and their ability to be omnipresent and gather information. In Old Norse written sources, strong, piercing eyes can symbolise power, masculinity, and royal descent, and there is a special eye symbolism associated with the knowledge and esoteric insight that surrounds the one-eyedness of the main god Odin. In this paper, decorative rivets on high-status metal objects from the 5th to 8th centuries AD are interpreted as a stylistic imitation of the characteristic eyes of ravens. The paper takes a closer look at the use of these rivets in relation to eye symbolism in the Scandinavian archaeological material and iconography from the period ca. 200 to 700 AD, drawing further on personal names referring to eyes and ravens and the relations to Old Norse mythology. We suggest that the raven-eye rivets can be seen as representations of Odin's all-seeing eye and thus his quasi-physical presence, as a way of animating objects, or as symbols of esoteric knowledge. They are therefore interpreted as stylistic traits that were a part of a power symbolism of the elite.

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Key words: animal style, eye symbolism, iconography, military elite, Odin cult, Old Norse mythology, power symbolism, raven, Style II, personal names

Introduction

Ornamentation with zoomorphic imagery on high-status metal objects from the 5th to 8th centuries AD includes a very special decoration adorning splendid weapons and jewellery. These are the hemispherical rivets with a fluted rim along their edge that seem disproportionally large and functionally almost inexplicable (Figure 1c). This feature – being both a decorative and, we believe, a symbolic element – is interpreted here as a stylistic imitation of the characteristic eye of corvid birds, i.e. a hemispherical shape with a fluted rim along the edge (Figure 1a–b). These rivets shaped like raven eyes are found especially on objects of the military elite, such as lances, shields, swords, and belt equipment of the period 200–700 AD, as well as button-on-bow fibulae; their high point is seen in the period 520/30–680 AD, coinciding with a time when the military elite became particularly significant in northern Europe (i.e. parts of modern-day England, Denmark, Norway, Sweden, Germany, and other parts of the northern Continent), and we find them in the richly equipped weapon graves and other contemporary contexts (Nørgård Jørgensen 1999, 90–95).

One of the earliest examples are eye-like inlays of round and domed blue glass designed with fluted metal edges. The blue glass has a particularly strong meaning, which may also have been relevant in the Iron Age (Sode 1996, 62–63). One remarkable specimen is the belt set from the largest deposit (phase 2) of the weapon offering site at Ejsbøl Mose near Haderslev in south Jutland, Denmark, that was dated to around 300 AD and belonged to the absolute top military elite (Figure 2a) (Nørgård Jørgensen and Andersen 2014, 154–61). Patrix dies for raven-eye rivets appear in Late Iron-age and Viking-age localities such as Hedeby (Schleswig-Holstein, Germany)

as well as Lejre, Tissø, Melbygård, and Kærby (all Zealand, Denmark). An example found at the magnate's farm at Tissø dates from the early part of the Late Germanic Iron Age (Figure 2d).

Lance heads as raven imitations

The most striking and thought-provoking use of raven-eye rivets is when they are placed on the socket of a lance head, transforming it into the imitation of a bird (Figure 2b): the blade is its beak, the socket is the head, and the raven-eye rivets are of course the eyes (Nørgård Jørgensen 1999, 90). This creates a brilliant construction where weapon merges with bird, which could represent the idea of the weapon embodying a raven attacking the enemy. This in turn opens the possibility that these lances were regarded as animated objects – something that has also been discussed in relation to Iron-age inscribed lance heads (Sundqvist 2009, 309, see also Lund 2017 and Pearce 2013, 60). A mid-3rd-century example from a weapon grave at Mos Gård, Stenkyrka parish, Gotland in Sweden, even features eye-like decorations along with the inscription (Snædal 2017, 9–15).

The raven-eye rivets are attached to lances of early Late Germanic Iron-age types (Nørgård Jørgensen 1991/1999 Type L1 and L3d, from Phases I–II, i.e. 520/30–610/20 AD). A good example is the lance from Kobbeå grave 1, Østerherred on Bornholm, Denmark (Figure 2b) (Nørgård Jørgensen 1991, 213). The burial belongs to the top-rank military elite. This lance type is also found in both Norway and Sweden, and there is among others an example from Niederstotzingen (grave 9) in southern Germany (Paulsen 1967, Taf. 17).

The latest find known to us of a raven-eye lance head was unearthed in 2021 at Sorte Muld, near Svaneke in eastern Bornholm, in an area with animal bones and weapon deposits (Field 8) just below the central part of the huge settlement and cult complex (Figure 2c) (Lund Hansen et al. forthcoming). Sorte Muld includes more than 20 different settlements, and several raven-eye rivets have been found in the area by metal detectorists. All in all, 70 lances have been found at this site over time and all in the central cult area (Iversen 2009, 77). However, this is the first one found with attached raven-eye rivets; it is of Type L1, which belongs to the period 520/30–560/70 AD (Nørgård Jørgensen 1999, 88–90). The lance was intentionally rendered useless – like most weapon sacrifice finds both at Sorte Muld and elsewhere. Interestingly, during the destruction, the point of the lance was rolled up, so that the blade now creates the effect of a curled beak, a characteristic usually associated in iconography with the eagle. Such a transformation reminds us how eagles and ravens are closely connected to each other in Old Norse literature and visual art (Oehrl 2020, 33–35; Pesch 2015, 382–88).

The ravens as Odin's extended eyes in Old Norse mythology

In many religions, connections can be found between birds as messengers and the all-seeing eyes or vision of deities (e.g., Gardella and Krute 2024; Warburton 2018).

Figure 1. a. Raven (Corvus corax), length 65–70cm, wingspan 120–150cm; black plumage, black feet, strong bill. b. The characteristic raven eye. c. Sutton Hoo belt buckle with three distinctive 'raven-eye symbols'; two of them surrounded by Style II bird's heads. Photos: a–b. Nature Guide, Denmark. c. British Museum.

In Old Norse mythology, Odin, the king of the gods, is described as omniscient and always on a quest for knowledge (Schjødt 2020, 1150–55). Odin had an intricate relationship with his two ravens Huginn and Muninn, which is described in several texts, such as the Eddic poem *Grímnismál* as well as in Snorri Sturluson's *Gylfaginning and Heimskringla* (Mitchell 2018). Snorri informs us that the ravens sat on Odin's shoulders and that they were sent out at early dawn to gather information from all over the world and bring it back to him. Some of Odin's by-names refer to this relationship, such as "Hrafnaguð" or "Hrafnáss", both meaning "raven god" (Nordberg 2004, 140; Sundqvist 2009, 304).

Although it is a debated issue, scholarship generally relates the names Huginn and Muninn to *hugr*, "thought", and *muna*, "to remember" (Mitchell 2018, 455; Nordberg 2004, 141). If this is correct, the ravens represent two different aspects of the mind: active thinking and memory, respectively. They might thus be interpreted as extensions of Odin's own consciousness. In *Grímnismál*, Odin states that he worries for Huginn's return, but that he fears even more for Muninn, which indicates that the capacity to remember and thus to contextualise information is seen as the most crucial mental capability (Mitchell 2018, 455; Nordberg 2004, 141).

The Old Norse myths are known from texts written down between the 12th and 14th centuries and told through a Medieval Christian lens. Therefore, we need to be careful if we use the texts as an interpretative framework for phenomena that are centuries older, which means that often, our suggestions for interpretations can mainly be hypothetical (Hedeager 2011, 22–24; Sundqvist 2009, 302). Bearing this in mind, we suggest that the "raven lances" could be seen as an embodiment of the idea of Odin's presence in the shape of a raven. A similar notion has been suggested for the very common 7th/8th-century bird/

Figure 2. a. Belt fitting from Ejsbøl II, ca. 300 AD, with blue glass in the 'raven eye'. b. Lance head with raven-eye rivets from the rich weapon grave Kobbeå 1, Østre Herred, Bornholm, ca. 550–600 AD. c. Lance head with raven-eyes from Sorte Muld, Østre Herred, Bornholm, Field 8-2021. d. Patrix for raven-eyes found in the older part of the Tissø site, ca. 600 AD. Photos and drawings: a. Haderslev Museum. b. Anne Nørgård Jørgensen. c. Bornholm Museum. d. Josefine F. Bican.

raven brooches that often feature a mask motif on their backs. It is important, however, to note that the placement of staring eyes in such a manner may be interpreted in multiple ways and is also related to general preferences in iconography for depicting stylised human-animal transformations (Figure 5c) (cf. Helmbrecht 2013, 12–14).

The connection between Odin and the ravens is related to his need for knowledge and information, but equally to his association with death and battle. Often seen on or near battlefields, eating the corpses of dead warriors, ravens, along with wolves and eagles, formed a triad of "beasts of battle" that are linked to Odin in Old Norse and Anglo-Saxon literature (Jesch 2002). Furthermore, a 13th-century Icelandic text called the *Third Grammatical Treatise* relates how Huginn flew to the hanged while Muninn flew to the corpses (see Mitchell 2018, 456–58, for further references), which reminds us of Odin's self-hanging sacrifice and possible connection with real-life hanging sacrifices. The ravens were thus part of Odin's strategies to gather knowledge and information, which also included talking to the embalmed head of the wise Mímir, waking up the dead, and sitting under hanged men. The character of the insight sought by Odin was therefore a level of esoteric knowledge from other worlds or from a liminal area between the realms of the dead and the living. If we consider the raven-eye rivets placed on weapons in this context, the eyes do not only observe what goes on in battle and politics, they also gaze into the world of the dead.

The purpose of the raven-eye rivets may be understood in many ways. They can be seen as a way of allowing the deity to monitor the doings of warriors and to impact the course of a battle. Such an understanding can be related to beliefs in Odin selecting warriors from the battlefield for an afterlife in his hall, or about his granting success and victory in battle (Nordberg 2004, 139). While acting as "spy cams" or messengers between the god, humans, and other worlds, the appearance of ravens on the battlefield could also be regarded as representing the god's real presence among humans. Certain other objects also seem to have been endowed with this notion. Another example of raven-related props believed to embody the god's presence on the battlefield is found in accounts about Viking-age raven-banners. These flags would become animated, waving their ravens' wings as a sign of Odin's support, presaging good fortune and victory (Nordberg 2004, 139). In connection with the "raven lance", it may be relevant that in many sagas, Odin appears on the battlefield and uses his lance as an implement to select which of the fighting men will fall.

However, the perceived transformation of the lance into a raven may hold further implications that could be connected to ideas about the slain enemy warriors as a sacrifice to Odin: firstly, Odin is generally associated with lances and lance-related rituals, and there seems to have been a tradition for dedicating the enemy warriors to Odin by the war leader flinging a lance over the opponent's army at the beginning of a battle (Nordberg 2004, 108–12). The "lance raven" would then be a twofold symbolic embodiment of the god, both bird and weapon, flying over the enemy army. Secondly, in Old Norse poetry, there is a recurring motif of the successful warrior as provider of carrion for the beasts of battle, and battle kennings (poetical metaphors) would use the motif of feeding the wolves, ravens, and/or eagles as a paraphrase for "killing men in battle" (Jesch 2002, 262–65; Oehrl 2020, 34). According to Nordberg, feeding the ravens, eagles, and wolves – all of which were associated with Odin – could be seen as a way of sacrificing the enemy warriors to the god (Nordberg 2004, 142–43); when the ravens ate the fallen on the battlefield, it was a sign of Odin accepting the sacrifice. Thus, killing a warrior with a "raven lance" might be regarded as enforcing this sacrificial mechanism, as the "lance raven" devoured the enemy.

Eye symbolism and material culture

While the "raven lances" can be considered in the context of the connection between ravens, battlefields, lances, and Odin, the raven-eye rivets are also found on many other types of objects, though here, they should probably be understood in a wider context. Eyes and ocular effects play a prominent role in Scandinavian iconography and animal art, where eyes are often enlarged and emphasised by the choice of certain materials or colourings. Several scholars, such as Howard Williams (2011), Ing-Marie Back Danielsson (2007), and Elisabeth Arwill-Nordbladh (2012, 2014) have noted that exaggerated eyes are a general trait of Germanic animal art in depictions of both anthropomorphic and zoomorphic figures as well as of monstrous creatures.

Siv Kristoffersen's research has shown that transforming images revolve around eyes in the creation of animal and mask motifs as early as in Style I (Kristoffersen 2017). Back Danielsson and Williams both note that enlarged eyes are something we see in the images of both gold foil figures and gold bracteates (Back Danielsson 2007, 78, 102; Williams 2011, 103). Willams also underlined how the theme of sight and vision plays a key role in the object assembly from the 7th-century burial at Sutton Hoo (Suffolk, England) and suggests that "ocular qualities" were particularly emphasised in burials and other ritual

Figure 3. a. Shield boss with large raven-eye rivets from Vendel grave XII, Uppland, Sweden. b. Sword hilt from Bildsø, West Zealand, Denmark, with eight raven-eye rivets. c. The magnificent buckle buckle from Åker, Hedmark, Norway, with bird heads with raven eyes. Photos and drawings: a. Stolpe 1912, pl. XXXIII. b. Danish National Museum and Anne Nørgård Jørgensen. c. Kirsten Helgeland, Kulturhistorisk Museum, Oslo.

contexts (Nugent and Williams 2012; Williams 2011). Furthermore, Neil Price and Paul Mortimer have advanced the idea that intentional visual effects were lain into the representation of the eyes on the Sutton Hoo helmet, to make one eye appear darker than the other (Price and Mortimer 2014).

Once we start noticing the raven-eye rivets, they suddenly appear everywhere. The splendid sword from Bildsø, western Zealand, Denmark for example, has eight "raven eyes" that decorate the heads of the rivets that hold together the upper and lower parts of the sword hilt (Figure 3b). The sword dates from ca. 650 AD and has belonged to the top military elite in the western Zealand area. It was found in 1866 by workers digging a ditch near the banks of the drained Lake Bildsø. Unfortunately, we have no further information regarding the find context.

Another group of objects, Germanic Iron-age shield bosses, can also be richly decorated. The hemispherical boss is surrounded by a collar that is attached to the shield's wood by means of five strong rivets (Figure 3a). Those collar rivets belonging to a specific type SBA can be regarded as raven-eye rivets (Nørgård Jørgensen 1999, 78–80). These rivets are for example seen on the shields from Vendel grave XII in Uppland in Central Sweden dating from around 600 AD, and the late 6th-century shield found in Vendel grave XI (Stolpe 1912, pl. XXVIII, 1–2).

On the splendid buckle from the assemblage found at the farm Åker in Hedmark, Norway, we see a man flanked by animals (Røstad 2020) (Figure 3c). Often interpreted as eagles, these birds nonetheless seem to have the characteristic corvid eye rivets. As mentioned above for the "raven lance" head from Sorte Muld, it is often difficult to distinguish ravens from eagles in Scandinavian art of the 5th to 8th centuries, as the two species seem to overlap and merge in both iconography and meaning (Pesch 2015, 382–88). Indeed, this is acknowledged in poetry, where in the poem *Hrafnsmál*, for example, the raven is called *arnar eiðbróðir*, "the eagle's oath-sworn brother" (Jesch 2002, 265). With the Åker find, we are again in the absolute top military level, with parts of a magnificent sword with a ring knob (denoting a member of the retinue) (Nørgård Jørgensen 1999, 158–60, 2001, 103).

Edward James has a fine definition of what characterises the military elite in the early Middle Ages (James 1997, 19). It is a militarised society

> … in which there is no clear distinction between soldier and civilian, nor between military officer and government official; where the head of the state is also commander-in-chief of the army; where all adult free men have the right to carry weapons; where a certain group or class of people (normally the aristocracy) is expected, by reason of birth to

> participate in the army; where the education of young thus often involves military element; where the symbolism of warfare and weaponry is prominent in official and private life, and the warlike and heroic virtues are glorified; and where warfare is a predominant government expenditure and/or major source of economic profit (James 1997, 19).

It is in this sphere that we must understand the symbols used by the retinues of the Germanic Iron-age military elite.

Raven-eye rivets in iconography

Although occurring in different contexts, we believe that the rimmed-eye decorations particularly refer to the raven's eye, as this is a feature particular for the raven among other corvid species. How important these symbols were on weapons can be gleamed from the pictorial frieze on the helmet from the rich boat grave at Vendel (grave XIV) in Uppland from the later part of the 6th century (Figure 4b) (Stolpe 1912, pl. XLII, 1), the high point of the use of raven-eye rivets on the military elite's splendid weapons. It shows five warriors wearing bird-crested helmets and carrying a ring-knobbed sword, which indicates that they are members of the *hird*/retinue (Steuer 1989, 107). All also carry lances with the large decorative raven-eye rivets on the socket that we know from the real-life objects described above. No other types of large rivets on lance heads are known – with the exception of rare examples on "bear rivet lances" (one from By in Steinkjer, Trøndelag, Norway, no. T1269) and one from Vendel XII in Sweden (Stolpe 1912, pl. XXXIV, 5). Thus, it can only be raven-eye rivets that are depicted on the frieze from Vendel XIV.

The attentive observer will be able to see that the sword scabbard of the warrior in the middle has three "wraps" (Figure 4b). This fitting is probably made of solid gold like the ones we know from Gudme on Funen, Denmark. The scabbards of the two warriors on the left have fittings with two "wraps", while those on the right have none. The illustration by Stolpe (1912, pl. XLII, 1) must be considered very accurate and clearly depicts a ranking order that is remarkably strict. There is no doubt that these details were considered important and significant – for the one who made the frieze, the one who wore it on the helmet, and for those who saw it and were impressed by it.

The raven-eye rivets do not always imply a transformation of the object as is supposed in the case of the "raven lance", but their presence may nonetheless mean that the objects were understood as animated or "seeing" (Williams 2011, 104). In this light, the prominence of bright, piercing eyes as symbols of power or noble descent is an interesting perspective.

Bright shining eyes, kingship, and one-eyedness

In several heroic tales recorded both in Old Norse sagas and by Saxo Grammaticus, strong, piercing eyes described as shining and even vibrating or pulsating, are a motif that often reveals the noble, royal, or even divine descent of certain individuals, both men and women (Kroesen 1985). Some hero-warrior characters are described as having eyes so powerful that they have to cover them to prevent scaring others or even doing harm to them. The eyes are thus mirrors that reveal an "other-worldly" quality of these particular super-human individuals. On this background, Eldar Heide has suggested that in some descriptions, these sharp eyes should be understood as actual weapons (Heide 2000). It seems likely that a part of the runic inscription on the bracteate Nebenstedt I, Niedersachsen, Germany (IK128b) should be interpreted in this light: it reads **glïaugiz**, which probably is a name or byname, translated *Gliaugiz*, "the one with shining eyes" (Figure 5d) (Düwel and Nowak 2011, 434–38; Peterson 2004, 8), and it may be referring to a powerful person of special descent, reflecting the force of their gaze (see also Sundqvist 2009, 305). This reminds us once again of Odin. As stated by Anette Lassen: "one of Óðinn's heiti is Báleygr, the fire-eyed. The eye, that Óðinn still has, is powerful: with his gaze Óðinn can frighten his enemies,

Figure 4. a. Helmet decoration from Vendel, grave I. b. Helmet decoration from Vendel, grave XIV a. After Stolpe 1912, pl. VI, 1. b. After Stolpe 1912, pl. XLII, 1.

blind or deafen them in the struggle, and stop weapons in the air" (Lassen 2000, 225).

As bright eyes are a key feature of heroes and rulers alike, this is a characteristic that links this high-status group with Odin as a deity. The motif on the Nebenstedt bracteate is a (naked?) man with large hands, posing or dancing. Floating around him are eight round symbols in the exact same shape as his enlarged eye. Could this be a ruler, perhaps personifying Odin? The recently presented interpretation of the inscription on the bracteate X13 from Vindelev in Jutland, Denmark, "he is Odin's man", indicates that the images on the bracteates may be portraying figures related to and/or representing the deity (Imer and Vasshus 2023).

A special eye symbolism related to knowledge and esoteric insight surrounds the one-eyedness of Odin, who pledged one of his eyes to Mímir to achieve wisdom (Lassen 2000; 2003). Lassen has argued that Mímir was connected to the underworld and to feminine, chaotic forces and that through sacrificing one eye, Odin gained a capacity to look out from the underworld, allowing him vision in both worlds (2000, 224–25).

This paper is not about one-eyedness, but it should be noted here that there is an ongoing discussion about the dissimilarity between the two eyes in a single face on various objects and iconographies. Researchers such as Arwill-Nordbladh (2014), Price and Mortimer (2014), and Arrhenius and Freij (1992) have discussed whether one eye on some images were deliberately rendered different than the other, either as a part of the original design or as a secondary treatment. This has been discussed for example regarding the imagery of the Sutton Hoo helmet (Price and Mortimer 2014), the horned and dancing figure on one of the Torslunda plates (Arrhenius and Freij 1992), a figure on the Högom textiles (Nockert 1991), and some figurines (Arwill-Nordbladh 2014). While an intentional difference between the eyes of a single figure is quite difficult to prove, as wear or damage to objects may have happened through time, Arwill-Nordbladh (2014, 90) has pointed out that there are so many instances of dissimilar eyes that it must be seen as a pattern.

We can add a possible example of such a difference that has hitherto gone unnoticed: a gilded copper-alloy clasp from Zealand features the so-called "eagle-boar-wolf constellation", arranged symmetrically on both sides of a bearded human face (Figure 5a). This is a recurring motif in Style II that researchers have also related to Odin or royalty (e.g., Høilund Nielsen 2001, 474, see also Wamers 2009). Recently, close-up photography of the clasp at the National Museum in Copenhagen, Denmark, revealed differences between the eyes of the anthropomorphic face (Figure 5a–b). In contrast to the copper alloy eye rivets of the animal heads, which were not gilded, the perforated eyes of the male face were originally both conical and gilded on the inside, however the man's right eye seems to have been treated secondarily and now appears cylindrical, darker and slightly larger. Preliminary observations by Michelle Taube at the National Museum's scientific department indicate some residue on the inside, requiring further analyses. The special treatment of one eye does not necessarily mean that the image depicts the god Odin, but the emphasis on eyes and their expressions in these objects and images seems clear.

Individuals possessing special insight

Basically, we can point to an intricate relation between strong eyes, royalty, divinity, and Odin in the written sources and indirectly in objects and iconography, as well (see Düwel and Oehrl 2017, 97–98). In relation to Odin, the eye symbolism is further closely connected to his obsessive and eternal quest for knowledge. Perhaps we should generally see eye symbolism and ocular effects in images and on objects as a way of expressing the possession of or access to special (esoteric?) wisdom and insight?

One of the special skills acquired by Odin was knowledge about runes. In Iron-age inscriptions, the art of writing runes is related to the designation *erilaz*. It is not yet clear what the term *erilaz* actually described, but it seems to refer to individuals associated with knowledge about runes and with religious as well as military leadership and high rank (though not necessarily kingship or rulership) (see discussions referenced in Sundqvist 2009, 301–2). One of these is commemorated on the Järsberg rune stone from Värmland, Sweden, that points towards a connection between the raven, the military elite, and esoteric knowledge: in translation, the inscription reads, "(Le)ubaz[?] I am called, Raven I am called, I the eril wrote the runes." While the first personal name is obscure, it is clear that the person calls himself **harabanaz**, "Raven", and that he claims to be an *erilaz* and to be the one who wrote the runes.

Olof Sundqvist connects this inscription and the term *erilaz* in general to Odin, partly because of the Järsberg identification with the raven, partly on the basis of associations with lances (Sundqvist 2009, 306–9). He also emphasises the formula "I am called", used both in the context of *erilaz* inscriptions and in poetic passages concerning Odin (Sundqvist 2009, 303). The dating of the Järsberg stone to around 520/30–560/70 AD (Imer 2011, 170–96), is particularly interesting seen in relation to the subject of this paper, touching on links between eye and raven symbolism, esoteric knowledge,

Figure 5. Various ocular effects on Germanic Iron-age objects. a. Gilded eagle-boar-wolf clasp C5480 from Zealand. b. Close-up showing the different eyes on the centrally placed bearded mask/face c. Bird brooches, likely ravens, from various sites on Bornholm with masks and eyes on their backs and wings. d. The Nebenstedt bracteate. Photos: a–b. Rikke Søgaard, Danish National Museum. c. Arnold Mikkelsen, Danish National Museum. d. Morten Axboe.

the military elite, and mythological symbolism in the 5th–8th centuries AD.

To conclude

Odin was not only an all-powerful god, he was also a god of war and considered the god of kings and the aristocracy (Figure 4a), associated in particular with wisdom and the search for knowledge (Hedeager 2011, 7–11; Schjødt 2020). His ravens represent an aspect of this quest, working as his extended eyes and gathering information and intelligence for him. We have argued that the raven-eye rivets and eye symbolism in animal art and on weaponry could be related to this conceptual framework.

If Huginn and Muninn were extensions of Odin's mind and gaze, attaching their eyes symbolically on military objects, might be considered as creating an extension of Odin's vision. If interpreted more broadly, they simply were a part of the ever-present eye-theme. In this conceptualisation, religious ideas and warrior ideology go hand in hand. We are aware that there is a lively discussion about the origin and development of Odin as a deity and that while some scholars argue that this figure has deep roots, others believe he was introduced in Scandinavian religion sometime around the 4th–5th centuries (see Schjødt 2019 for further discussion and references). Is it conceivable that Odin-related beliefs can be followed indirectly in the archaeological objects? If so, this would point to a date of this form of expression of the Odin cult to the latter part of the Early Iron Age (Late Roman Period) into the Late Germanic Iron Age (ca. 200–650/700 AD). The images known today that could be interpreted as depicting Odin date from the late 6th century and beginning of the 7th century AD (Stolpe 1912, pl. VI, 1) (Figure 4a), and as we have seen, Odin seems to be mentioned on a 5th century bracteate (Imer and Vasshus 2023).

Most of the raven-eye rivets are found on objects belonging to Style II and are associated with aristocracy and wealth. It is documented all over the world that styles follow dynasties, and the animal styles in parts of Scandinavia probably do, too. The transition from Style I to II could therefore be a sign of a dynastic shift (cf. Hedeager 2000, 129; Høilund Nielsen 1998; and Wamers 2009, 153–54, for a critical view).

It is not new information that the animal styles might be linked to elements of Old Norse mythology. However, the imitated raven-eyes give us a glimpse of the imaginary world that belonged to the elite, strengthening the assumption that the Odin cult was indeed closely connected to the aristocracy of the time. Furthermore, it is highly likely that craftsmen were aware of symbolism and mythology and that they were surrounded by a consensus of knowledge that influenced and determined the design of status objects for a special social group in a very large geographical area.

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On the iconography of the gold foil figures from Hauge

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The 16 gold foil figures from Hauge depict a man and a woman embracing each other. This scene is very common on Scandinavian gold foils of the Merovingian Period and often is interpreted as a pair of gods or as a wedding rite. What particularly distinguishes the find from Hauge is a staff or plant stem that the woman seems to be holding in her hand. In this paper, I will explore the meaning of this plant, which can also be seen on other Iron- and Viking-age pictorial representations and, against the background of a very rich literary and runic tradition, can be understood as an *allium* plant, a leek. Since antiquity as well as in the north, this plant has been attributed magical powers and healing properties and was associated with fertility and sexuality.

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Introduction

On the occasion of the 74th Sachsensymposion, the former logo of the Museum of Archaeology, Stavanger, a human couple with a plant-like object, adopted from the gold foil figures from nearby Hauge, was chosen by the organising committee as conference logo. Consequently, it seemed appropriate to take a closer look at the meaning of this motif. In this paper, I will explore the meaning of the depicted plant, which can also be seen in other Iron- and Viking-age pictorial representations and, against the background of a very rich literary and runic tradition, can be understood as an *allium* plant, a leek.

The gold foil figures were found at the famous Iron-age grave mound complex of Hauge farm (*Tinghaugplatået*) in the district of Jæren, Klepp municipality, in Norway, about 25km south of Stavanger. This extraordinary complex (Kristoffersen et al. 2014) includes the well-known *Krosshaug* Migration-period burial mound, a court site (*tunanlegg*), and other monuments. According to Gabriel Gustafson (1900, 1), who presented the find in 1899, the gold foils were discovered in 1897, in close proximity to *Tinghaugen*, during cultivation work by the farmer of this land, since then, they have been kept at the University Museum of Bergen (B5392). In total, 16 gold foils from eight different stamps have been found. They all depict the same motif – a man and a woman standing face to face and touching each other with their hands. These are the only gold foil figures known from the county of Rogaland so far (Oehrl 2024; Tangen 2010, 30–32, 108–13).

Scandinavian gold foil figures – the couple motif

The tiny gold foil figures (*gullgubber*) are found only in Scandinavia, about 3600 pieces from about 50 different locations (Hauck 1992; Pesch and Helmbrecht 2019). Most of them come from Denmark, with over 2600 from Sorte Muld on Bornholm alone. There are only relatively few finds from Norway, about 50 from a handful of places. The majority of gold foil figures probably originate from the Merovingian Period (ca. 500–700s AD) and come from Iron-age central places, often from hall buildings. It is likely that the Tinghaug complex in Hauge must also be regarded as such a local centre of power (Grimm 2010, 138–39; Kristoffersen et al. 2014; Sundqvist 2014). In the halls, the *gullgubber* presumably were deposited ritually and used as a kind of sacrificial money or temple currency – like votive plaques in temples in the

Roman Empire (Hauck 1992, 529–30, 1994, 1998; Sundqvist 2019, 372–75; Watt 1992, 224). Some scholars have even pointed out possible iconographic parallels between the gold foil figures and Roman votive plaques, which depict the Roman deities they were offered to (Hauck 1993, 1994, 1998; Oehrl 2019a).

Common motifs on the gold foil figures are men in caftan-like robes and women in dresses and cloaks, occasionally holding staffs or drinking vessels, and human couples, probably lovers embracing each other. This latter motif is associated by many scholars with Old Norse mythology (Oehrl 2019a; Sundqvist 2019) and interpreted as the fertility god Freyr and his marriage to the giantess Gerðr. In the 13th century, both Snorri Sturlusson (*Gylfaginning* ch. 37; Faulkes 2005, 30–31; transl. of Snorri's *Edda*: Faulkes 1987) and the *Edda* poem *Skírnismál* (Neckel and Kuhn 1985, 69–76; transl. of the *Poetic Edda*: Dronke 1969–2011) give a detailed account of this myth. It is unclear, however, how old this story is and whether or not the Old Icelandic texts have an ancient origin, preserving a pre-Christian myth. There are good reasons to assume that *Skírnismál* was influenced by continental courtly love poetry and composed only around AD 1200 (Bibire 1986, 38; von See et al. 1997, 61–65, 67). Anne Heinrichs (1997) regards *Skírnismál* as a Christian mockery that ridicules the pagan god Freyr as a lovesick fool. Thus, the common interpretation of the couple motif as Freyr and Gerðr remains uncertain. More likely it depicts the marriage between the twins and fertility gods Freyr and Freyja, a myth that is not known in detail, but seems to have ancient origins (Hauck 1998, 322; von See et al. 1997, 61).

The Hauge motif and its parallels

There are hundreds of gold foil figures depicting a human couple. What is special about the iconography of the Hauge figures is that on five of them, the woman holds a staff in her hand that resembles a plant (Figure 1). Three further examples of this motive are kept in the National Museum Copenhagen in Denmark (NM8680–8681; Tangen 2010, 124, nos. 1–3), which appear to be identical to those from Hauge, including the plant in the woman's hand. It is likely that they originally are from Norway as well (Tinghaug?). A detail on a fragment from Hov (Vingrom, Lillehammer, Innlandet county) possibly also corresponds to the plant-like staff from Hauge; here, the woman herself is not preserved, only her male counterpart, and of the plant only one of its drooping leaves is discernible (C38680; Tangen 2010, 106, no. 2).

The object in the woman's hand has been described as a (magic) staff, a twig, a branch, or a kind of plant

Figure 1. Gold foil figure from Hauge. After Gustafson 1900.

(Gardeła 2016, 125; Helmbrecht 2011, 126–27; Oehrl 2019a, 399; Tangen 2010, 72; Watt 2012, 242), and even as a dragon or serpent (Johansen 1996, 86). The long stem, which bends slightly at the bottom, ends in a stump-like or bulbous thickening directly below the woman's hand. At the top, the stem splits into two curling, tendril-like projections that hang down on both sides. The most obvious assumption is that the image represents a stylised plant with bulb, stem, and longish leaves. What kind of plant we are dealing with and what significance it has is hard to say. However, we can approach an interpretation by including iconographic parallels on the one hand and Old Norse plant lore on the other.

The Mammen Horse Collar

Of particular note is the horse collar from the rich 10th-century chamber grave in Mammen in Jutland, Denmark (Iversen et al. 1991). It is richly decorated with gold platelets (Schmidt-Lornsen 1986; 1991) that include the depiction of a woman in a long dress holding a staff in her hand (Figure 2a), which has been interpreted as a kind of rod, the magic staff of a sorceress (*vǫlva*), a bishop's crosier, or a plant (Gardeła 2016, 132; Graham-Campbell 1980, 146; Helmbrecht 2011, 126–27; Klindt-Jensen and Wilson 1980, 100; Oehrl 2019a, 399; Schmidt-Lornsen 1986, 301–2; Watt 2012, 242). It has a long stem with leaves that stick out and hang down from the top and a tuber or bulb at its bottom; even the small root hairs hanging from the tuber are depicted. The plant, obviously the same as depicted on the gold foil figures, looks much like a member of the onion family (*allium*).

This was already observed by Jutta Schmidt-Lornsen (1986, 300–2, 1991, 265; cf. Oehrl 2019a, 399), who pointed

Figure 2. a) Gold mount from the Mammen horse collar. After Schmidt-Lornsen 1986. b) Stone cross fragment in Kirk Michael, Isle of Man. After Kermode 1994.

out the special significance accorded to onion plants in Old Norse mythology (*laukr*), where it was considered a powerful healing plant and symbol of regeneration. The gold mount right next to the woman shows a snake-like monster swallowing a humanoid figure, which, according to Schmidt-Lornsen, refers to the death of Óðinn, who was devoured by the wolf Fenrir at *ragnarǫkr* (Schmidt-Lornsen 1986, 300, cf. 1994, 176–78). The woman with the plant indicates, Schmidt-Lornsen suggested, the return of life after the catastrophe. This appears plausible as the apocalyptic vision of *Vǫluspá* (stanza 4; Neckel and Kuhn 1985, 1) praises the "green leek" (*grœnom lauki*) as the first life to be growing in the newly created world. Margrethe Watt (2012, 242–43) also recognised the connection between Hauge and Mammen and suggested that the mythical *laukr* could be depicted on the gold foil figures from Hauge as well – an approach that I intend to develop further here.

The Jurby Stone Cross

The same plant occurs on two 10th-century carved stone slabs from the Isle of Man. These memorial stones are often decorated with figurative representations and go back to local traditions, but are strongly influenced by Scandinavian art (Kermode 1994; Wilson 2018). In addition to numerous Christian motifs and hunting scenes, there are a few figures that are connected to Old Norse mythology (Margeson 1983; Steinforth 2021).

The Jurby fragment MM 125 shows a long-haired woman in a long trailing dress, who is holding in her hand a plant with a long stem, two curling leaves hanging down from the top, and "hairs" at the stem's lower end that look like roots (Figure 2b) (Kermode 1994, appendix B, 18–19; Wilson 2018, 115–17, 163). A similar woman is carved on a stone fragment in Kirk Michael, also in the Isle of Man (MM 123; Kermode 1994, 185–87, pl. XLVIII), but both the woman's head and the upper part of the plant are broken off. The latter was interpreted as a rod, a magic staff, an uprooted sapling, a branch, or a small tree (Gardeła 2016, 132; Kermode 1994, appendix B, 18; Wilson 2018, 116). However, it appears obvious that it represents the same *allium* plant as that on the gold foils from Hauge and the Mammen horse collar. The same plant symbolism is present here, and the stones in

the Isle of Man strongly indicate that the plant belongs to the female sphere.

The Auzon Casket

The famous, richly decorated walrus ivory casket from Auzon (Dép. Haute-Loire, France) was produced in the early 8th century or around AD 700 in an ecclesiastical setting in North England as a receptacle for jewellery, books, or relics. Apart from carvings depicting the story of Wayland the Smith and the Adoration of the Magi on the front side and a story about Wayland's brother, the master archer Egill, on the lid, there also are runic inscriptions and images of the Roman foundation fathers Romulus and Remus on the left panel as well as Titus' conquest of Jerusalem on the back (see e.g. Becker 1973; Schwab 2009; Webster 2012).

The right panel is kept in the Bargello, Florence, Italy, and while several suggestions have been presented, its mysterious images and inscriptions remain enigmatic in many respects (references: Oehrl 2021, fn. 3). Of interest in the present context is the figure on the left edge of the panel, sitting on a small hill or stone (Figure 3a). It has a human body but small wings and a long neck with a horse's head, and it is holding an elongated object in its hand. A warrior with shield, helmet, and lance stands in front of this creature, as if being welcomed by it. The object in the creature's hand looks like a plant with a long, slightly curved stem that terminates in a thickening at the bottom and several oblong, hanging leaves at the top, almost reminiscent of a palm tree. It resembles the plants of Hauge, Mammen, and Jurby and therefore can tentatively be interpreted as an *allium* plant. It has been suggested that the armed man might be understood as a fallen warrior who is received in the afterlife by the seated, otherworldly hybrid being (Becker 1973, 39–41; Krause 1959). Its plant could then be understood as a powerful healing plant and a symbol of regeneration and resurrection.

The Tjängvide Picture Stone and the Medallions from Aneby and Inderøy

That a plant plays a role in the welcome of the fallen heroes could be confirmed by the Gotland picture stones. The journey to the afterlife is the central topic in the iconography of the stones (Oehrl 2020). Since the 8th century, these monuments frequently depict the ship of the dead and, according to stories told in 9th-century skaldic poetry, the fallen hero approaching *Valhǫll* on horseback and being welcomed by a valkyrie with a drinking vessel.

The stone GP 5 Alskog Tjängvide I shows the dead hero on the eight-legged steed *Sleipnir*, i.e. the horse of

Figure 3. a) Detail of the right panel of Franks casket. After Becker 1973. b) Detail of the picture stone Alskog Tjängvide I. After Lindqvist 1941–42.

his host, the god Óðinn, father of the slain. He heads towards a simplified hall building, i.e. *Valhǫll*. A corpse is depicted above, a dog is running ahead of him, and directly in front of the hall, there is a valkyrie receiving a warrior and handing over a drinking ladle. The horseman himself is greeted by another valkyrie who is holding a drinking horn from which liquid spills out, and an elongated object with two branch-like extensions (Figure 3b). The overflowing horn is a common motif in Roman art (*cornucopia*) and represents exuberant abundance and vitality. In Old Norse poetry, providing the dead with drink seems to be central to their postmortal existence, as if it was only the drink that brought them back to life (Weber 1973; Zimmermann 2006).

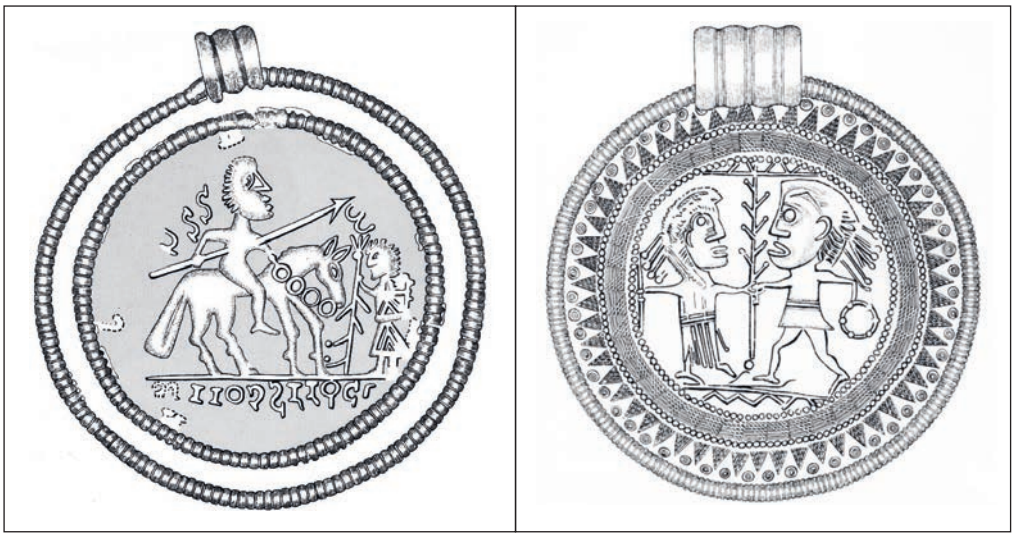

Figure 4. a) Gold medallion from Aneby. After Hauck et al. 1985–89. b) Gold medallion from Inderøy. After Hauck et al. 1985–89.

The other object in the valkyrie's hand is difficult to determine; Sune Lindqvist (1941–42 vol. II, 16) thought it was a key, while others see it as a plant, a twig, or a branch (Oehrl 2019b, 20, 2020, 128; Watt 2012, 241). Since the overflowing horn has Roman models, it seems plausible that this object traces back to depictions of palm branches in depictions of the emperor's welcome (*adventus*) in the Roman Empire. This adoption seems to have taken place early on, as suggested by Migration-period imitations of gold medallions that depict a figure welcoming a man with a twig-like plant (IK 14 Aneby-M and IK 86 Inderøy-M/Vika) (Figures 4a–b).

A plant in the valkyrie's hand could conclusively be harmonised with both the iconographic context and the literary record – valkyries know the healing powers of plants. In the *Edda* poem *Sigrdrífumál* (stanza 8; Neckel and Kuhn 1985, 191), composed in the 12th century, the valkyrie Sigrdrífa teaches the hero Sigurðr to use leek (*laukr*) as an antidote for poisoned drinks. As Gunter Müller (1976) pointed out, valkyries have not only ordinary medical knowledge, including the use of botanical remedies, but also the ability to heal mortal wounds and bring the fallen back to life.

This is particularly evident in the myth of the everlasting battle *Hjaðningavíg*, where Hildr brings the fallen back to life again and again. The 9th-century *Ragnarsdrápa* (stanza 9) calls Hildr *bœti-Þrúðr dreyrugra benja* – "Thrud [a valkyrie's name] who heals bloody wounds" (Faulkes 1998, 73 [251]). Saxo Grammaticus writes in *Gesta Danorum* (V, 9) that she awakens the fallen with magic songs (Olrik and Ræder 1931, 134). In the Eddic poem *Helgakviða Hundingsbana* II, stanza 29 (Neckel and Kuhn 1985, 155), the valkyrie Sigrun says to Helgi "I would gladly call the dead back to life with magic if I could rest in your arms."

Thus, it seems plausible that the valkyrie on the Tjängvide stone is holding both a horn of plenty containing the vitalising drink and a healing plant (*laukr*), not only to greet the dead man, but to heal his deadly wounds and awaken him. This already might have been the idea behind the *adventus* imitations from Aneby and Inderøy.

There may also be a sexual component in the Tjängvide motif. Gro Steinsland (1994a, 147–49, 1997, 104–9) and Lotte Hedeager (2011, 109–12) stated that the horseman's upright triangular sword pommel is reminiscent of a phallus (critical: Oehrl 2019b, 29–30). A phallic representation actually fits in well with the context of the *cornucopia* and the healing plant as symbols of regeneration. In fact, in skaldic poetry, *sverð* can mean both "sword" or "penis" (Fritzner 1886–1973, s. v. sverð 2), and the idea that erotic activities take place in the afterlife is attested in Old Norse literature (Steinsland 1994a, 144). With this notion, another perspective becomes apparent – the plants of the *allium* family are not only regarded as healing plants, but also, like hardly any other plant, as aphrodisiac and sexual symbols (see below).

The Uppåkra Patrix

Remarkably, a woman very similar to the one on the picture stone from Gotland appears on a patrix for the production of gold foil figures at Uppåkra (U 4469; Watt 1999, 180–81, 186–87, figs. 3:17, 5, 6, 2004, fig. 36, 2012, 238–41). The patrix depicts a woman holding an overflowing drinking horn in one hand and a two-fingered, branch-like object in the other (Figure 5). Are those gold foil figures to be regarded as representations of valkyries as well, equipped with the symbols of her vitalising and death-defeating powers? Should therefore the woman with the *allium* plant on the gold foil figures from Hauge also be addressed as a valkyrie, who receives a dead man,

embraces him lovingly, and offers him the symbols of eternal life and eternal lust? It is possible that this is the idea behind the couple motifs on the Scandinavian gold foil figures in general.

The power of the leek – literary tradition

It is not least the extraordinary significance of *laukr* in Old Norse tradition that favours my interpretations and should therefore be outlined here – mainly based on the work of Wilhelm Heizmann (1987, 1992, 1993, 1995, 2011, 2021, 2023). There is a general philological consensus that the Old Norse term *laukr* refers to *allium* plants (like leek, onion, and garlic) in general. According to Jens Heimdahl (2022), however, *laukr* might also refer to a wider spectrum of other plants with onion-like bulbs and tubers, such as tuber oatgrass and dropwort, which have a well-known record of being used in burials. However, there is also archaeological evidence of the use of leeks – in a Late-Roman woman's grave in Vellensby on Bornholm, where an amulet capsule was discovered that contained pieces of a wild species of *allium*, probably sand leek (Karg et al. 2014); another amulet capsule containing leek was found in a woman's grave from about AD 650 in Nørre Sandegård, Bornholm (Hald et al. 2015).

Of the many ideas associated with plants of the *allium* family in different cultures from ancient to modern periods, some main areas can be identified: firstly, *allium* plants are among the most important *apotropaia* of all; they are used to ward off demons and serve as protection against evil forces and diseases of all kinds. Secondly, they always have been associated with sexuality and virility and seen as promoting female fertility and stimulating libido in both sexes. Lastly, *allium* has been regarded as having healing properties. The practice of using leek as remedy for poisonings can be traced back throughout medieval and ancient medicine to the famous Greek physician Pedanios Dioscorides in the 1st century AD (Wellmann 1907, 152). Even the most famous of all magical herbs, Homer's *moly* – which was given to Odysseus by the god Mercury and protected him from the sorcery of Kirke, and which is praised by Pliny as the most potent protection against magic and all poisons – has been interpreted as a type of leek. This interpretation already occurs in antiquity and appears in medieval botanical literature as well as the Norwegian *svartebøker*. The medical efficaciousness of *allium* has even been proven scientifically (Heizmann 2011, 123, 572–73).

These complexes are also well documented in Old Norse tradition (Olsen 1917, 660–62; Olsen and Shetelig 1909), and no plant is mentioned more often in Old Norse literature than *laukr* (Heizmann 2021, 109–11). Several

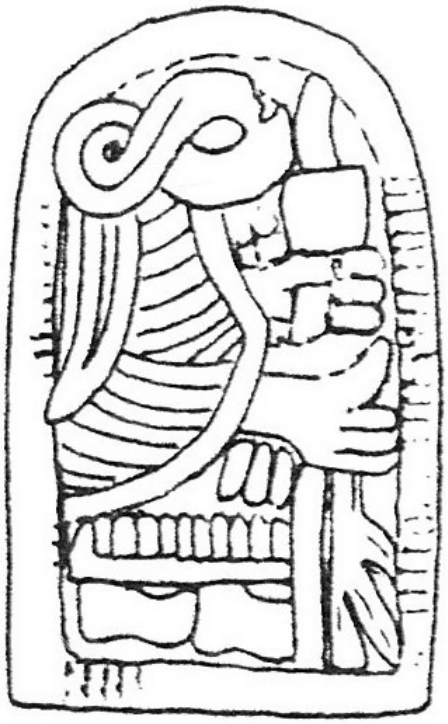

Figure 5. Bronze patrix from Uppåkra. After Watt 1999.

texts claim, for example, that *laukr* is a kind of "wonder food" that can keep a person alive without any other nourishment (e.g. *Ragnars saga loðbrókar* and *Dámusta saga* – Heizmann 2021, 125). In skaldic poetry, *laukr* can designate a man as strong, firm, tall, and aggressive. It symbolises male virility and sexuality, almost as a penis metaphor (Heizmann 2023; Meissner 1921, 266, 268).

The preservative power of *laukr* and its strong sexual aspect are combined in the *Vǫlsa þáttr* in *Flateyjarbók* (14th century). It tells about a severed horse penis called *Vǫlsi* that was preserved with "leek and linen" and worshipped on a farm in northern Norway (Faulkes 2007, 49–61; see also Düwel and Heizmann 2021, 1–29). The penis is passed around the members of the household, and everyone recites a verse about it, with the lady of the house saying: "You are enlarged, *Vǫlsi*, and taken up, provided with linen and supported by leek. May Maurnir [god of the household] receive this offering!" Klaus Düwel argued that this story does not preserve pagan cult practice, but rather ridicules it from a Christian perspective. Heizmann, however, refers to a series of well-documented, astonishingly similar cults from other cultures that match the *Vǫlsi* cult and thus makes it appear authentic.

As mentioned above, in the 10th-century poem *Vǫluspá*, the "green leek" is praised as the first plant to grow on the new earth, as representative of the mythical beginning of all life. It therefore seems that an inherent potency of primordial growth was ascribed to this plant. These ideas also carried over into Christian tradition – in *Pétrsdrápa* (stanza 8; David McDougall in Clunies Ross

2008, 803), a 14th-century skaldic song of praise to the apostle Peter, the hymn is said to be "widely coated with leek of life" (*laukr lífs*).

Interestingly, *laukr* is closely associated with the female sphere, as well. It is the women who have knowledge of the power of plants, a feature that was seen as so characteristic that a number of *kenningar* for "woman" is constructed with the term *laukr*, e.g. *lofðungr lauks* "the lord of the leek" and *Lofn lauka* "the Lofn [goddess] of leeks" (Meissner 1929, 401, 418).

The immense significance of leek in Old Norse tradition supports the interpretations of the iconographic material presented above. Its strong sexual connotation and its connection to the domain of women, the "goddesses of the leek", fit in perfectly with the Hauge motif. However, I have to mention that Steinsland (1994a–b; 1997), in the context of her thesis of the holy wedding (*hieros gamos*) as a central part of ancient Scandinavian ruler ideology and afterlife religion, has interpreted the plant on the Hauge foils as *angelica*. She points out that in the 13th-century *Olafs saga Tryggvasonar*, the king gives his wife an *angelica* stem as a (little-appreciated) gift. In my opinion, this interpretation is less convincing – *angelica* looks very different from leek, and the significance of *angelica* in Old Norse literature is not comparable to that of *laukr*. The episode in *Olafs saga* does not seem to refer to an ancient tradition. But can the Old Norse ideas of *laukr* be transferred to earlier periods? That this is indeed the case is proven by runic tradition.

The older runic tradition

The inscription on a 4th-century meat knife made of bone from Fløksand in Nordhordland, Vestland county, Norway (KJ 37; Heizmann 1992, 1995, 2021, 91–104; Olsen and Shetelig 1909) – **linalaukaRf** *lina laukaR* (followed by an f-rune) – probably proves that the ideas connected with leek and linen as mentioned in the *Vǫlsa þáttr* played a role much earlier.

A number of inscriptions on Migration-period gold bracteates (ca. AD 450–550) contain the sequence **laukaR**, as for instance on IK 26 Börringe-C (Denmark). Bracteates can be regarded as amulets, similar to Greco-Roman amulets with magic inscriptions (Düwel in Heizmann and Axboe 2011, 475–523). There are various kinds of magical words on bracteates that invoke divine powers for protection (Heizmann 2011). The most common is **alu** "defence" (or "beer"?), others are **ota "**terror" and **laþu** "invocation". The **laukaR** inscriptions are to be understood in this sense – as a magical formula that protects the amulet's wearer against demons, illness, and other harm, and promises prosperity. A conclusive example is IK 166 Skrydstrup-B (Denmark), where the word **laukaR** not only is placed next to the word **alu** and the depiction of a god overcoming a predator, but also next to a deer trampling down two serpents – an ancient symbol of regeneration and resurrection (Heizmann 2011, 563–67).

If we follow Karl Hauck's interpretation, the complex of healing and regeneration is the main theme in the iconography of the C-bracteates (Hauck in Heizmann and Axboe 2011; Heizmann 2007, 2011, 561–71, 2012). In Hauck's view, the god Odin/Wodan can be seen depicted on them, healing the injured horse of his son Baldr, as recorded in the Carolingian-period *Second Merseburg Charm*. The role of Odin as a divine healer who knows the properties of plants is well documented, e.g. in the Old English *Nine Herbs Charm*. As Hauck and Heizmann show convincingly, based on an almost overwhelming wealth of evidence, leeks have played an outstanding role in horse medicine since antiquity, through the Middle Ages and into modern times. It can therefore be no coincidence that the sequence **laukaR** frequently appears on the C-bracteates, often in close connection with the horse image.

There also are inscriptions, such as IK 249 Unknown Find Spot-C (Denmark), that merely repeat the l-rune several times in a row. The inscription on the 5th-century meat knife from Gjersvik in Sunnhordland, Vestland county, Norway (KJ 38), contains a row of ten l-runes (Heizmann 2021). For the understanding of such inscriptions, it is important to know that each runic character had not only a phonetic value, but also a name and a corresponding conceptual value, which in the case of the l-rune was *laukaR*. It is likely that such a series of leek runes had a magical function with the purpose of potentiating the word's power.

Conclusion

The fact that an *allium* plant is depicted on the gold foils from Hauge opens up new possibilities for the interpretation of the couple motif. Perhaps the divine couple Freyr and Freyja is depicted, with the "leek" as their attribute and insignia, symbolising their power to grant or withhold fertility; and it is possible that people sacrificed the gold foils in order to ask these gods for fertility, perhaps on the occasion of a wedding. Otherwise, the human couples themselves could be depicted, performing a wedding ritual to increase sexual desire and fertility. Or does the couple represent a dead man who is awakened by a valkyrie, greeted as a lover in the afterlife, and received with the healing, aphrodisiac leek? Were those gold foils usually sacrificed on the occasion of a death and prayers

offered to the gods for a good and pleasurable reception in the afterlife and the resurrection of the deceased? I do not dare decide in favour of one option. Much remains in the dark. However, the iconographic sources discussed in this paper provide an important contribution to the interpretation of the couple motif, to the iconography of the gold foil figures in general, and not least to the study of the leek phenomenon in Early-medieval northern Europe.

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Abbreviations

GP + no. = *Gotlandic Picture Stones. The Online Edition.* https://www.gotlandicpicturestones.se/

IK + no. = Hauck et al. 1985–1989

KJ + no. = Krause and Jankuhn 1966

Technologies on display. The Storhaug ship burial

HÅKON REIERSEN

Håkon Reiersen 2025. **Technologies on display. The Storhaug ship burial.** *AmS-Skrifter 29,* 171–180, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

Ship burials were grand events in Late Iron-age society. Great efforts were invested to make a spectacle in memory of the deceased ruler and to promote the new ones. The Storhaug ship burial (CE 779) near Avaldsnes in south-western Norway is an early example of this royal burial tradition. The article examines the various components in the Storhaug burial to highlight the technologies on display. While many types of technologies in contemporary society seem to be represented, a conscious selection of elements is assumed. In the article, practices related to food production and mound construction are explored as examples of the display and demonstration of technologies. The focus is on how these technologies reflected the social renegotiations of the roles of the king and society. It is suggested that the broad range of food production technologies represented is related to the king's role as guarantor of food security and that the construction of a complex monument mirrored society's ability and willingness to invest great efforts in building structures for its leadership.

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Key words: Kingship, 8th century, burial rituals, food production, mound construction

Renegotiations in high-status burials

When leaders in prehistoric hierarchical societies died, it created a special, intermediary situation, in which relations between the elites, their allies and the community had to be transformed or renegotiated (Oestigaard and Goldhahn 2006). A significant part of this transaction process took place during the funerary rituals. Among the examples used by Terje Oestigaard and Joakim Goldhahn was the "princely" burial at Hochdorf in Germany, a richly furnished burial of the 6th century BCE in a wooden chamber covered by a large mound. The burial assemblage probably was formed in two phases of rituals (Olivier 1999, 128–29, in Oestigaard and Goldhahn 2006, 45). The first of these included feasting and banquets and took several weeks, during which the burial chamber remained open. In the second phase, the large mound was constructed over a longer period. Oestigaard and Goldhahn (2006, 45) assume that the first phase was of greater importance for the social renegotiations, although it is likely that there still was room for this throughout the period of mound construction.

The Scandinavian ship burials of the Merovingian (CE 550–800) and Viking (CE 800–1050) Periods reflect similar intermediary situations after the death of communities' leaders, where funerary rituals of comparable complexity were necessary to legitimise and renegotiate social structures. With regards to the famous Oseberg ship burial (CE 834) in south-eastern Norway, Terje Gansum proposed that half of the ship and the chamber served as an open stage for rituals for a period of time before the mound was raised (Gansum 2004, 171–74). This hypothesis has proven very influential for the "performance turn" in Viking-age mortuary archaeology (Price 2022, 65).

Among recent contributions in this field of research is Grete B. Bukkemoen's (2021) work on how practices related to food serving and food processing were performed in burial rituals throughout the first millennium CE, as well as Rebecca Cannell's (2021) study of how materials in ship burial mounds might have been selected to create connections between the surrounding landscape and the performative scene of the burial.

Inspired by these works, this paper aims to explore how roles and responsibilities between leaders and society might have been performed and renegotiated in the Storhaug ship burial (CE 779) near Avaldsnes in south-western Norway (Figure 1). The grave is interpreted as that of a regional king (Bill 2020; Opedal 2010). While

Figure 1. The location of the Storhaug, Salhushaug and Grønhaug ship burials near Avaldsnes, strategically situated along the Karmsund strait. Areas with fishery station sites and the bone midden at Hemnes are also indicated. Map by Christopher F. Kvæstad, Stavanger Maritime Museum.

it seems unlikely that all activities related to social negotiations left archaeological traces, the large material complex available from this ship burial might provide an opportunity to identify such practices. Approaching the reproduction of social structures partly as material statements traceable in the archaeological record, the focus is on the deposition of food-related objects in the burial chamber and on the mound construction process. The hypothesis is that the display of objects and practices related to the *technologies* of both food production and mound construction were important and interrelated elements in the renegotiation of social relations when leadership changed.

The Storhaug ship burial

Close to 50m in diameter and built on a slope to appear 9m high when seen from the sea (Figure 2), Storhaug was one of the largest known burial mounds in Norway (Nicolaysen 1862–66, 348). Digging in the mound's northern part was reported as early as the first half of the 19th century, and after the sale of the property in 1886, the new landowners decided to remove it (Reiersen et al. 2023, 89). At the centre in the northern half, parts of a ship as well as gaming pieces of glass and amber, glass beads, a gold arm ring and a fishing line sinker were found. The removal work was halted until archaeologist Anders Lorange excavated central parts of the southern half in 1887 (Lorange 1888).

Partly due to previous digging disturbing the mound as well as to the documented collapse of the burial chamber, preservation conditions were poor for several types of organic material. Merely bits of the 20m long burial ship were found, there were few remains of textiles, and a horse jaw was the only osteological find. Nevertheless,

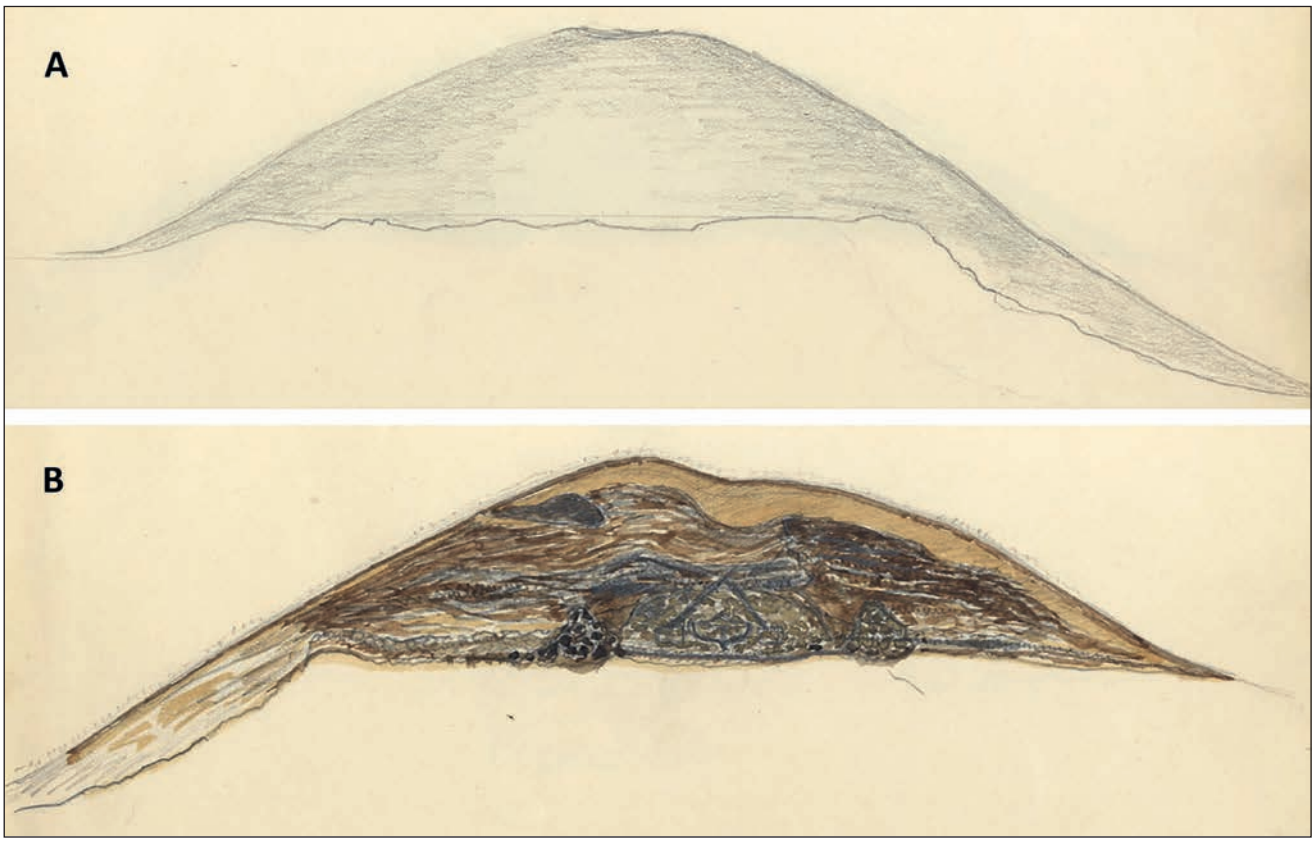

Figure 2. Anders Lorange's drawings of the Storhaug mound before the excavation in 1887. A: mound seen from the south, B: section seen from the north. Built on the edge of a plateau, from the sea the monument appeared twice as tall as it in fact was. The section drawing clearly shows the stratigraphy of the mound. Chamber and ship are, however, sketched with far too small dimensions. The chamber's wooden walls were supported by outer stone walls, and the ship was almost as wide as the room in between. Scanned by the University Museum of Bergen. Used with permission.

the material complex recovered by Lorange (1888) was impressive, as it included weapons, blacksmith tools, kitchen utensils, agricultural implements, a variety of wooden tools, parts of a sled, boats and a large ship. It is the only known ship burial in Norway that had not been reopened in the centuries following the burial and hence the only ship burial in the country from which were recovered status markers such as swords or a gold arm ring (Bill 2020, 366). The latter being the only example to date found in a burial among the thousands of Late Iron-age (CE 550–1050) graves known in Norway.

In relation to the astonishing Oseberg and Gokstad burials (Brøgger et al. 1917; Nicolaysen 1882), preservation was poor. Lorange died only a year after the excavation, leaving the finds only partially catalogued. Consequently, Storhaug never received the same attention as its counterparts in eastern Norway. In recent decades, however, it was re-introduced into the discourse on ship burials (Bill 2020; Bonde and Stylegar 2009, 2016; Cannell 2021; Opedal 1998; 2010). Of special importance were Arnfrid Opedal's (1998, 43–63) re-examination of the burial complex and the dendrochronological datings of the ship to CE 770 and of the burial to CE 779 (Bonde and Stylegar 2009), which established it among the earliest ship burials in Norway (Paasche 2024, tab. 1).

To gain more information about the Storhaug mound, the damaged site was revisited in 2022 with a combination of ground-penetrating radar (GPR) survey and four small excavation trenches (Reiersen et al. 2023, fig. 9). The GPR survey identified a yet unexcavated boat of 5–6m in the periphery of the mound. A well-preserved part of this boat had been found in 1974 during water pipe trenching (Reiersen et al. 2023, 92–94). In addition, the northern outline of the burial ship was determined by GPR, which corresponded closely to a sketch made by Lorange (cf. Reiersen et al. 2023, figs. 4, 11–12). This allowed the georeferencing of old field documentation, making possible the first attempt of a plan drawing of Storhaug that showed the reconstructed structure and object distribution (Figure 3). The plan drawing provides an important key for a new understanding of the burial sequence.

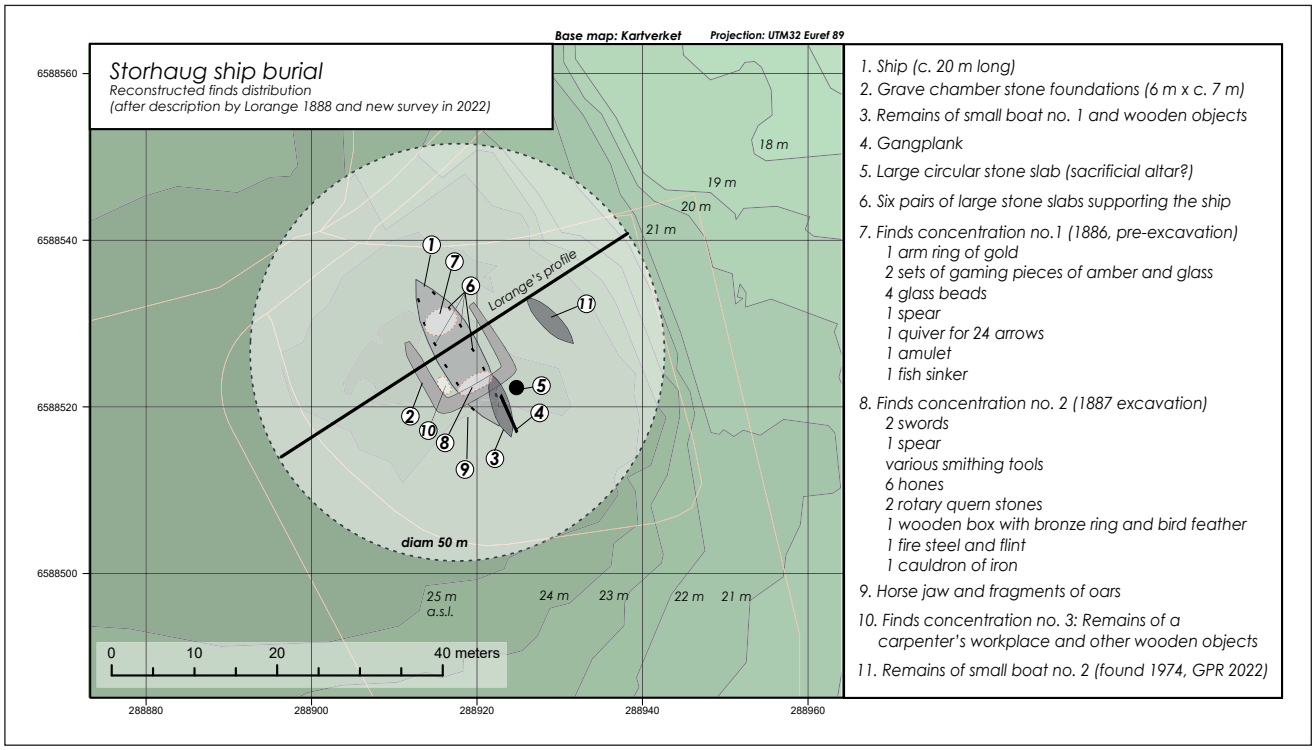

Figure 3. Tentative plan drawing of the Storhaug ship burial, with a reconstructed distribution of most of the objects based on Lorange's (1888) article and field documentation. Few of the wooden objects are specifically mapped here, including the sled parts, stretcher and ard shares mentioned in the text. Modified after an illustration by Theo Gil, Museum of Archaeology, University of Stavanger.

Technologies on display?

An important feature of ship burials like Storhaug, Oseberg and Gokstad is the inclusion not only of the burial ship, personal equipment and animal remains, but the integration of a broader range of means of transport and everyday tools reflecting the technological complex of society (see e.g. the overview in Grieg 1928 of the Oseberg material complex). The term "technology" is derived from Greek *techne*, meaning "knowledge, skill" (Dobres and Hoffman 1994, 232). For the purpose of this article, it is defined as the practical skills needed for human survival by producing food, clothes, houses, and tools, managing to stay safe, move around, communicate and cooperate.

Marcia-Anne Dobres and Christopher R. Hoffman point out that technology and production are intimately linked to social practices: "Through the activities and social relations involved in material production, people create things. These processes of material production and their end products, in turn, become material and symbolic structures through which the world is perceived and responded to" (Dobres and Hoffman 1994, 215, with reference to Moore 1986). In this perspective, ordinary day-to-day technological activities work and might be studied as an integral part of social reproduction (Dobres and Hoffman 1994, 212, 216, 221):

> The creation of technology, the form that it takes, and the manner of its subsequent deployment, serve as a powerful media through which people reproduce some of their basic categories of their social and material world. For that same reason, traditions of making and using might also serve as a point of departure in the negotiation of new relations and new meanings (Edmonds 1990, 56–57, quoted in Dobres and Hoffman 1994, 226).

As stated in the introduction, this article aims to identify material traces of technologies present in the Storhaug ship burial and investigate whether these might be interpreted in the context of social renegotiation between elite groups and society. In the preserved material complex from Storhaug, there are objects that are related to a wide range of technologies (Lorange 1888; Opedal 1998, 40–66; 2010, 260–61), including food production, metallurgy, weaponry, transport, woodcraft and engineering as well as imported and exported resources. It is obvious that transport-related features played a central role in the burial rituals at Storhaug, an aspect which will be discussed in a later article. Here, the focus is on two separate fields of technology: food-related technologies and construction technologies. Following the two-phase division seen in the Hochdorf burial rituals, the first theme brings

us to the open chamber and the display of food production technologies, the second to the complex processes of the overall mound construction. Although the assumed Storhaug king and his successor might have ruled over a larger region in western Norway (Opedal 2010), the primary geographical scope of this article is the landscape surrounding Storhaug with local societies assumed to be intimately linked to the kings (cf. Figure 1). The material complex in the burial is compared to the larger corpus of Late Iron-age artefact types in Norway (Petersen 1951) and especially to that of the slightly later Oseberg ship burial (Brøgger et al. 1917; Grieg 1928).

The display of food production technologies

Although the complete sequence of the construction of the Storhaug mound is presented below, a short introduction to the first part of this process is needed to situate the burial chamber. In what was to be the centre of the mound, a large ship was positioned, with the bow pointing south (Figure 3). In the middle of the ship, a chamber was then raised with three stone walls documented in the 1887 excavation. Lorange (1888, 9) noted that the fourth wall might had been removed by earlier digging in the mound. However, it is just as likely that one side was an open doorway, as is seen in building types from the period, such as boathouses and courtyard sites (Grimm 2006; Iversen 2018). The chamber presumably was made of wood with outer stone walls (Opedal 1998, 42), with the assumed opening towards the north and the ship's stern. If the transport of objects into the open chamber was part of the public ritual, participants would have been able to observe which items were brought to the burial chamber.

Figure 4. Pear-shaped fishing line sinker of soapstone, 11cm long and weighing 650 grams (B4438/e). Photo: Svein Skare, University Museum of Bergen. Photo has been modified. Licence: CC BY-SA 4.0.

Objects for food production were given a prominent place. The fishing line sinker (Figure 4) was found not far from the gold ring and imported gaming pieces (Figure 3, point 7). Further south, the two stones of a rotary quern were found on a shelf in the chamber's southern wall, next to weapons and blacksmith tools (Figure 3, point 8). An iron cauldron for preparing food stood at the foot of the shelf. Although a skeleton did not survive, Lorange assumed that the body had been lying or sitting close to this wall, near these objects (Lorange 1888, 9).

Not far from the shelf, outside the ship yet still inside the chamber, a collection of wooden material was found (cf. Lorange's sketch in Opedal 1998, 20; Figure 3, point 10), among them two dozen wooden nails from a sled, on average 30cm long (Lorange 1888, 8), and two objects of about the same size that in 2023 were identified as ard shares. The sinker, the rotary quern, the cauldron and the ard shares thus probably all were found in the chamber. Opedal (1998, 59–60) wondered what practical objects like the sinker were doing in a royal burial. However, once they are seen as representing the crucial importance of food production technologies in society – of fishing, ploughing, grinding and cooking – "activating" them in a public ritual makes good sense. The question then remains whether this is a special object assemblage related to high-status contexts like ship burials, or if it is found more commonly in burials.

To facilitate a general understanding of how often such objects are found in Late Iron-age burials, a short review is provided here, based on Jan Petersen's (1951) overview of tools in Norwegian Viking-age graves. Though not frequent, sinkers are known from burials, and mainly male graves (Petersen 1951, 275). Representing other types of fishing gear, three fishing hooks were part of the Gokstad find complex (Nicolaysen 1882, 48). Rotary querns are rather rare in graves. The trend is that they are more often found in male than female burials. However, rotary querns were found in female contexts both at Oseberg and Hopperstad. In Petersen's overview, six of twelve rotary quern finds originate from boat and ship burials (Petersen 1951, 439–40). Iron cauldrons are a more common find category, although represented only in 2.7% of the burials examined by Petersen (1951, 378–79). The Oseberg grave is unique in having three preserved iron caldrons (cf. Bukkemoen 2021, appendix, 16–27). The objects related to food production in Storhaug thus seem not to reflect a common find combination, and the similarities with the Oseberg assemblage is interesting.

This also holds true for the two ard shares from Storhaug, which represent an extraordinary find. In Norway, wooden ard shares so far were known only from bog

deposits in the western part of the country, assumed to be of Early Iron-age date (Zachrisson 2018, 692–98). The Storhaug ards (Figure 5a) are of a similar type (cf. Glob 1951, figs. 79, 86), and so is a similar object found among the unclassified material from the plundering of the chamber at Oseberg (Figure 5b) (Grieg 1928, 271). Described as arrow-shaped, it has the same pointy terminal as the Storhaug ards, corresponding to contemporary ard share mounts made of iron (Figure 5c) (Petersen 1951, figs. 98–99), and although the broad shape of the shaft differs from Early Iron-age specimens, it most likely can be interpreted as an ard share (although see Pedersen 2017, 118).

It is possible that a re-examination of wooden tools from other burial finds may produce additional Late Iron-age ards (e.g. C27077/c from Raknehaugen, resembling Glob 1951, fig. 83). Ard share mounts made of iron commonly are found in hoards and in Merovingian- and early Viking-age burials, mainly in eastern Norway (Petersen 1951, 175–80). Chronologically, the wooden ard shares from Storhaug and Oseberg fit this pattern. Although fishing gear is not present in the Oseberg burial, the cauldrons, the rotary quern and the ard share compare well with the objects for food production selected for Storhaug. Sigurd Grieg (1928, 232) noted the peculiarity that the Oseberg burial lacked other agricultural tools commonly found in burials, like scythes and sickles, and the same is also true for Storhaug.

In the Merovingian and Viking Periods, according to Bukkemoen (2021, 199), "food surfaced as a resource for leadership". This is reflected by changes in how culinary practices were performed in burials from the Early (500 BCE–CE 550) to the Late Iron Age (CE 550–1050). While burials from the early phase typically included vessels for the serving of food, in the late Iron Age, there was a shift to items related to cooking and food preparation (Bukkemoen 2021, 108–9, 114). Bukkemoen (2021, 178–82) relates this change to a movement of activities from public open spaces to more private spaces indoors and possibly to the control of food production by the elite. The importance of making food clearly is demonstrated in the Oseberg ship burial, where there was a separate kitchen area (Bukkemoen 2021, 113). Skaldic poems often portray the king as patron of food production and fertility (Opedal 1998, 100–1). Hákon Jarl's first year as king (CE 976), for instance, was remembered as a time of great prosperity, exemplified by successful crops and good herring fishery (Enoksen and Sørensen 2020, 17). The display of objects for food production that were brought to the burial chamber might have symbolically celebrated the king as a guarantor of food.

In the regional context of south-western Norway, it is reasonable to suppose that food safety had special significance after the severe impact of the 6th-century climate crisis and the following cooling period (Westling 2024). Pollen analyses from the closest surroundings of Storhaug indicate a reorganisation of food production strategies after the crisis (Prøsch-Danielsen et al. 2024, 15). While the analyses from the bottom stratigraphy in Storhaug show that crops still were harvested nearby, the analysis of the wider area suggests that the percentage of grassland increased, and crop plants decreased, possibly as the agriculture began to rely more on animal husbandry. At Hemnes, 20km south of Storhaug (Figure 1), a contemporary bone midden found near a possible trading site (Nærøy and Hemdorff 2018), suggests that alongside livestock (cattle, sheep, pig), fish resources were important (cod, common ling, saithe, wolf fish, herring) (Perdicaris 2000). Specialised Late Iron-age fishery stations (Norw. *fjæremannstufter*) in western Norway indicate organised fisheries in this period (Johannessen 1998). Similar sites are clustered in the district around Storhaug (Figure 1), on the islands of Karmøy, Utsira, Røvær and Bokn (Enoksen and Sørensen 2020). It seems likely that this extensive activity was organised by kings. For the people gathering to mourn the dead king in an unstable political situation and waiting for new rulership and order, it might thus have been a stabilising and calming experience to witness objects of food production being brought into the chamber.

Technologies for constructing chamber and mound

If the objects brought into the burial chamber expressed some of the roles of kingship and obligations associated with the deceased king and his successor, it is possible that the complex building of the monument was something that in turn reflected the obligations of society. It was the most labour- and resource-intensive part of the burial rituals and made a lasting visual impression in the landscape. It involved a range of different skills that might be considered construction technologies, including coordination, material logistics, stone masonry, carpentry and engineering. Following Lorange and Opedal, several researchers have investigated how Storhaug was constructed (Cannell 2021, 372–74; Gansum 2004, 175–76; Prøsch-Danielsen et al. 2024, 12–15; Reiersen et al. 2023, 101–3). The recovered section drawing by Lorange (Figure 2), the reconstructed plan drawing (Figure 3), stratigraphic observations and pollen analyses contribute to our understanding of the construction sequence, but several scenarios are possible.

Figure 5. A: Arrow-shaped ard share from Storhaug, ca. 45cm long, similar to Early Iron-age types (B4468/unnumbered). Photo: Massimiliano Ditta. B: Arrow-shaped wooden object from Oseberg (C55000/55), 42cm long. After Grieg (1928, fig. 166). C: Types of iron mounts of ard shares from eastern Norway (C29517, C22720/m); the right one matches A, the left one corresponds to B but is larger. Photos: Olav Heggø / Maria Malherbes Jensen, Museum of Cultural History, University of Oslo. Photos have been modified. Licence: CC BY-SA 4.0.

While the mound construction probably included several unintended and ad hoc features, major parts of the workflow must have been carefully planned. First, the location was determined. The main aim of the choice probably was to make a visual statement to the passersby by placing the mound on a plateau near a strategic point close to the sea traffic. However, such a place might also have been practical due to logistics, as many of the materials, obviously including ship and boats, could have been transported to the site across the water. Based on the section drawing, it appears that the topsoil at the site was removed before the ditch or depression was dug that the ship was to be placed in (Cannell 2021, 374; Opedal 1998, 18–19). The ship, boats and other items would most likely have been transported to the beach and then, in an organised effort by human and animal power, pulled up to the plateau ca. 25m above sea level. Positioned in the ditch in what would be the centre of the mound, the ship was stabilised by large stone slabs standing in pairs on each side of the ship. The two boats also were placed in their appropriate places.

With the ship in place, work on the chamber could begin. As is seen in the plan drawing (Figure 3), the ship seems to have been cut in two by the stone foundations. While carpenters carried out this modification to the ship, other workers started building the one-metre-high stone walls. As is noted by Gansum (2004, 175–76), with the stone chamber outside and across the ship, the ship itself was integrated into the construction of the mound. The stern at this time protruded from the stone walls. Inside the chamber, but outside the ship, near the southern stone wall, Lorange found chips of pine wood. He interpreted this as evidence of the work site of the carpenters while they were raising the chamber, with wooden

planks on the inside of the stone walls (Opedal 1998, 21, 42). This type of timber building with outer stone walls mirrored the main regional house type of the Early Iron Age, surviving into the Late Iron Age in the construction of boathouses (cf. Lorange 1888, 9). This style of house building referred to deep local building traditions and know-how. After the chamber was finished and the ship modified, the outside of the ship was covered with moss (Opedal 1998, 19). While stones for the chamber might have been collected nearby, the large circular stone slab, ca. 1.5m in diameter (Figure 3, point 5), probably was transported from a greater distance. Placed on boulders near the ship's bow, it most likely was prepared to be a kind of altar (Shetelig 1912, 227).

We do not know how long the ship and chamber remained in the open or when the building of the mound was begun. Part of a stretcher, presumably made in connection with the burial, was dendrochronologically dated to May–June in CE 779 (Bonde and Stylegar 2009, 161). From macrofossil analyses, botanist Jens Holmboe suggested that the neighbouring Salhushaug mound and the Oseberg mound both were built in August–September (Holmboe 1917, 205; Reiersen 2024, 24). Based on stratigraphy, Gansum (2004, 171–74) interpreted the construction of the Oseberg mound as a process, with the mound remaining unfinished and available for rituals for a longer period. It is possible that the Storhaug rituals were started in the summer and early autumn during the sailing season, but that the construction of the mound had to wait until after the harvest. A rough estimate of 5000m^3 for the volume of the mound has been made based on a diameter of 40m (Ringstad 1986, tab. 8 no. 31). Applying a work estimate of 1m^3 per day per person, 80 people would have worked here for two months; as the mound was wider, 100 people seem a better guess. This provides some idea of the scale of the work site.

The construction of the mound started with turf blocks. The cutting of turf was an essential technology, as peat probably was an important heat source in this woodless area. Some of the turves were transported from a distance, as pollen analyses show clear differences between the heather turf of the bottom layers and the grass turf layers above (Prøsch-Danielsen et al. 2024, 15). They were placed upside down in horizontal layers. Lorange encountered vertical poles in the mound, probably related to the measuring and planning of dimensions (Opedal 1998, 16). The choice of a site on the slope down from the plateau reflects a conscious, well-planned strategy to make the mound appear larger from the sea.

Once it had achieved a height that covered the chamber, the construction was halted, and a large bonfire was built directly on top of it. This seems ritually motivated, as a part of the collective effort to construct the mound, and perhaps also to ritually seal the chamber. The charcoal layer from the bonfire was up to 1m thick, indicating that a vast amount of wood had been burnt. As pollen analyses show that the area around Storhaug was largely deforested (Prøsch-Danielsen et al. 2024, fig. 10), making such a large bonfire was not straightforward. While firewood might have been transported to the site on sea, the question is if it were brought specifically for the bonfire or whether objects previously used in the burial sequence were used in a ritual burning. After the bonfire, construction was resumed, and various types of soils and materials were brought to the site and integrated in the burial mound (Cannell 2021, 372–74). The finished burial mound was a monument both of the king and of the shared abilities of society to raise such a structure.

Ship burials as negotiations between leaders and society

No other archaeological burial complex has provided such deep and colourful insights into Viking-age society as ship burials. They presumably were the funerals for leaders, where new leaders-to-be were deeply involved in the planning and execution of the different aspects of the associated rituals. Ship burials were grand social events – spectacles that perhaps might be compared to military parades, agricultural fairs and craft exhibitions. Amongst the mourning for the dead leader, these events were collective achievements showcasing the complexity of society and displaying its technological level, among other things. In these events, the social order was presented and renegotiated.

Throughout this article, the Storhaug ship burial has been approached to see how and why various technologies were displayed and integrated into the burial. My point of departure was Oestigaard and Goldhahn's (2006) interpretation of prehistoric elite funerary rituals as transactions. The intentional selection of grave goods and the construction of burial monuments happened within a context of reproducing, or renegotiating, the social order. Seeing this perspective as highly relevant for understanding the inclusion of the various technologies of society in a royal burial like Storhaug, it was assumed that this burial complex had the potential to reveal archaeological traces of such renegotiations. The ship burial rituals were occasions where roles and responsibilities were transferred from the dead king to the next, and where relationships between king and society were renegotiated. Seen in this light, the renegotiations could be reflected in the display and integration of food

production technologies entering the burial chamber and the demonstration of construction technologies in the landscape.

Everyday objects might refer to the socially embedded technological practices they are a product of (Dobres and Hoffman 1994). If a soapstone sinker is a material reference both to the role of the king in organising fisheries and to the importance of fish in the regional diet, it makes sense that such a mundane object is integrated in a royal burial. By burying the dead king with items representing fishing, ploughing, grinding and cooking, the new leaders highlighted the existing link between kingship and successful subsistence. At the same time, the new leaders ensured the populace that they would take on the same responsibilities. The same might also apply to the other types of technologies represented in the burial. Items referring to, for instance, military, metallurgy and transport were actively put on display to underline the vital role of kings in organising these technological building blocks of society.

Whether burial monuments were built for elites or not, they tend to be complicated structures that often are interpreted as great communal achievements (e.g. Sæbø 2024). In the case of Storhaug, it is fair to assume that it was built to commemorate a king, just like the later Oseberg ship burial probably was made for a queen (or queens) (Pedersen 2017).

Through the construction of the chamber and mound and by the integration of the ship in this construction, the society's ability – and commitment – to invest great material and human resources to make large constructions for the leaders were displayed. The grand spectacle that was the Storhaug ship burial then appears to have been a well-orchestrated celebration and renegotiation of the social order. As the theme discussed in this article unlocks only a limited part of the potential of the Storhaug burial, it is hoped that future research will shed more light on the material complex, landscape settings, rituals and the sociopolitical context.

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Viking Man, Viking women: the IoM 2018 oval brooches and the end of the myth of men-only warrior groups settling in the Isle of Man

DIRK H. STEINFORTH

This paper is dedicated to the memory of
Ryan Foster, a colleague and a friend,
and one of the nicest blokes one could ever hope to meet.

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Oval brooches are considered one of the most diagnostic elements of female Viking costume, and they frequently are used to indicate that Scandinavian women accompanied their seafaring menfolk when settling new lands. But while they were known in virtually every other area of Scandinavian settlement in the British Isles, they were missing entirely in the Isle of Man, which presumably was conquered and settled by Hiberno-Vikings after about 870. Their conspicuous absence – and general lack of securely sexed female burials among the Viking graves in Man – gave rise to the assumption that those settlers were all-male groups of warriors, who subsequently married local Christian women, and this formed the basis for far-reaching conclusions regarding the early Viking Age in the Island. This long-lived notion was challenged in 2015, and in December 2018, the discovery of two oval brooches in the Isle of Man confirmed the doubts about the previous conclusions regarding the nature of interethnic social contact on late 9th-century Man. This paper presents the currently unpublished Manx oval brooches, considers the now-obsolete former interpretations and the objections to them, and discusses the impact of this single new discovery on the scholarly perception of early Viking-age Manx history.

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Key words: burials, Isle of Man, oval brooches, settlement, sex and gender, Vikings, women

Introduction

Viking-age objects that are considered to belong characteristically to the female sphere ("female objects") frequently were and are used to identify the burials of Scandinavian women, both at home and abroad – oval brooches in particular. But while known in virtually every other Scandinavian settlement area in the British Isles, oval brooches and other reliable indicators of the presence of women were lacking entirely in the graves in the Isle of Man, a little island in the middle of the Irish Sea that was settled by Hiberno-Vikings after about 870 (Steinforth 2015b, 2018) and that is famous for its rich Viking-age archaeology.[1] By way of an explanation for this vexing discrepancy, the absence of female burials in the archaeological record gave rise to the hypothesis that in Man, the Viking settlers did not bring their womenfolk along from their Scandinavian homelands. Instead, it was supposed that they were men-only warrior groups, who subsequently married local Christian women, who eventually were buried according to Christian traditions, without identifying objects. This assumption in turn formed the basis for far-reaching conclusions regarding the early Viking settlement in the Island, particularly concerning continuity of burial customs, conversion by the pagan Vikings to Manx Christianity, social coexistence of the two ethnic groups, and even the date of the Vikings' initial arrival in Man (e.g. Graham-Campbell 1995, 76–78, 1998, 177 (see below); cf. Steinforth 2015b, 307–14, 345–49, 2015c).

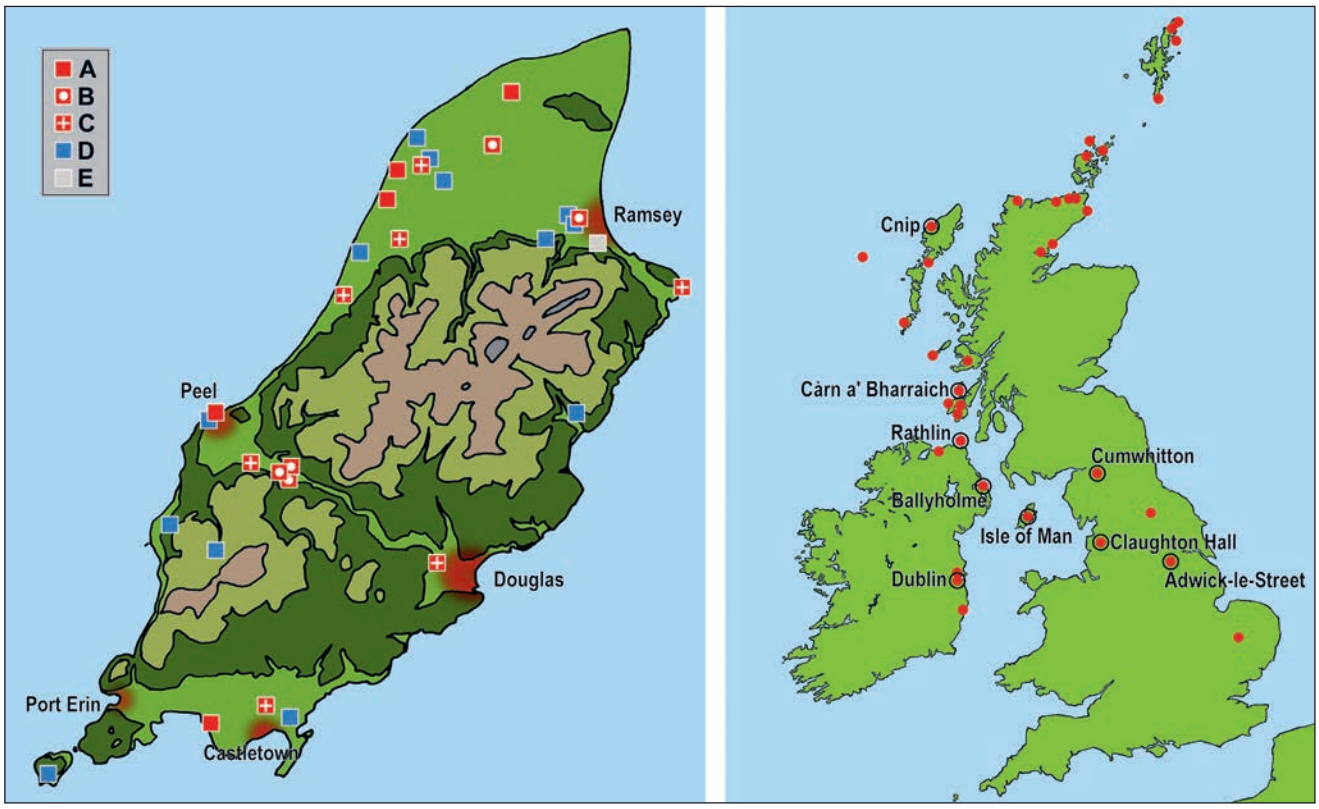

Figure 1. (1) Sites with Viking burials in the Isle of Man: A: verified; B: probable; C: plausible/possible; D: questionable; E: cenotaph. Graphics by the author. (2) Sites with oval brooches in Britain and Ireland, with places mentioned in the text. Graphics by the author; after Norstein 2020, figs. 38, 40–41.

This notion and many of the arguments based on it were challenged in 2015 on methodological grounds (Steinforth 2015b), before the discovery of two oval brooches in the Isle of Man in late 2018 changed the situation profoundly, rendered the myth of the all-men bands of settlers obsolete, and put former inferences into question.

The Manx oval brooches are as yet unpublished. While they clearly demonstrate why negative proof is a shaky ground to found hypotheses on, it needs to be investigated how deep the impact of this single new discovery really is on early Viking-age Manx history and how reliable their evidence actually can be for answering the question for the presence of Scandinavian women in the Island. This paper considers earlier research, interpretations, and conclusions and takes a look at other sites with oval brooches to evaluate the actual significance of the assembly of objects found in 2018.

Figure 2. Reconstruction of a Viking woman wearing oval brooches. Photo by the author; reproduced courtesy of Museum of Archaeology, University of Stavanger.

Conventions and conclusions: grave-goods and sexing of the Manx Viking burials

Traditionally, there are about 37 established – and ostensible – Viking graves in the Isle of Man (cf. Redmond

2007, 86–91; Steinforth 2015a; 2015b, 157–207; Figure 1.1), which contained a remarkably rich assemblage of grave goods, including weapons, riding equipment, tools, knives, everyday items, buckles, mounts, coins, and jewellery, such as beads, dress pins, or silver ornaments. Among these finds are swords and spears, which identify almost twenty contexts as the graves of men – according to the conventional method of artefact-based gendering.

In stark contrast, objects that were regarded as typically female were missing entirely, such as spindle whorls, and jewellery exclusively associated with women: as most significant was regarded the absence of oval brooches, which are very specific, easily recognisable, characteristically Scandinavian, and diagnostically female.

Oval brooches are dome-shaped pieces of jewellery commonly made of copper-alloy, often decorated with a variety of depictions of stylised animals, sometimes gilded and with silver wire and ornamental bosses (cf. e.g. Norstein 2020; Petersen 1928). Some are single-shelled, others have a plain inner shell, over which another shell with openwork decoration was placed. The earliest, simple forms were in use as early as the 6th century. They usually were worn in pairs to fasten a woman's strap-dress, often with a string of beads and/or pendants between them (Figure 2). Their exact social significance is not entirely clear, but they certainly were not for everyone: it has been claimed that they were status symbols of well-to-do women, that they were worn by married women only, and/or that they were part of a woman's "best" dress for festivals and other social events (cf. e.g. Jesch 1991, 15; Kershaw 2013, 96; Paterson 2021, 318; contra: Speed et al. 2004, 86). They were quite common in Scandinavia and also brought to other territories of Scandinavian settlement: whether in Eastern Europe, the Danelag, Orkney, or Ireland, oval brooches were found wherever Vikings settled (Figure 1.2) – with the vexing exception of the Isle of Man, even though that small island is particularly rich in Viking-age archaeology.

In the absence of any other specifically female objects in Man, there remained only the possibility of beads indicating the burials of three Viking-age women (cf. Wilson 2008, 50). By far most of the Island's beads are concentrated in the magnificent necklace of the so-called Pagan Lady of Peel and two more mid 10th-century graves on St Patrick's Isle, German parish (Freke 2002, 339–62), with only few more found at St John's, German parish (excavated ca. 1848: Barnwell 1868, 103, table 22) and Cronk yn Howe, Lezayre parish (excavated 1928: Bruce and Cubbon 1930, 277, 305–06). But while there can be no doubt that the Pagan Lady was a woman, the beads from the other contexts were not associated with human remains and very few other items (if any), so the characterisation as female burials was not founded on reliable evidence from the beginning.

In the face of the remarkably numerous (male) Viking graves for such a small island as Man, the intriguing shortage of female burials required an explanation. It was explained by researchers by the conclusion that the absence of female objects must have been caused by the complete absence of Scandinavian women themselves and that the Vikings, when they arrived in the Isle of Man in the later 9th century, were exclusively male groups of settlers, who married local Christian women (e.g. Cubbon 1983, 19; Graham-Campbell 1995, 76; Graham-Campbell and Batey 2002, 111; Ritchie 1996, 27, 42; Wilson 2008, 87; Manx National Heritage 2021).

The idea of intermarriage between the groups rather than Scandinavian women coming to Man seemingly was suggested and supported by the evidence of the mid-/late 10th-century Manx Crosses: several of their inscriptions record direct family relationships and marriages between persons with Celtic and Norse names, respectively; this process of ethnic merging could have begun in the early 900s (e.g. Steinforth 2015b, 287–89; Wilson 2008, 77).

The reasoning, its various aspects, and the far-reaching inferences drawn from it are best summarised by James Graham-Campbell (1998, 117; my italics):

> It is a striking fact that among the relatively numerous pagan Norse graves in Man, there is no burial of a woman with Scandinavian oval brooches. This has inevitably given rise to the hypothesis that the Norse settlement of Man was accompanied by intermarriage with the native Christian women, which would also account for there being persons with Celtic names mentioned in the Norse runic inscriptions on some of the tenth-century Christian memorial stones. But *if* intermarriage is also to be taken as the explanation of the conversion of the pagan Norse in Man, then one would expect it to have been the second generation who would have been brought up as Christians. The implication is, therefore, that the main period of pagan burial in Man was confined to the first third of the tenth century, with memorial stones being commissioned to commemorate the Christian dead from the 930s onwards, leading to the conclusion that the initial settlement cannot have taken place much before about 900.

Despite the well-founded cautionary "if" in this elaborate chain of arguments – a caveat that was widely ignored in later research – the assumption of the "men-only parties" of early Vikings in Man became a silently accepted scholarly consensus. There are, however, several reasons to disagree with this, both regarding the supposedly atypical ratio of female furnished burials against male ones and the absence of the evidential oval brooches in

Man, when they are found in virtually every other Viking colony. As the notion of "all-male" groups of Viking settlers in Man relied on an inadmissible generalisation, it was flawed from the beginning.

Recalculating the numbers, reassessing the evidence

Of the postulated thirty-seven Viking burials in Man, no fewer than twelve sites and contexts are so poorly documented or indeed as yet unexcavated that it is unwise to classify them as "burials" and/or "Viking" in the first place, let alone speculate about the sex or gender of anyone presumably interred there. Of the remaining twenty-five more-or-less firmly established Viking graves, five more cases were so badly preserved that neither sexing nor gendering was possible; therefore, these also cannot be counted either way (Steinforth 2015b, 345–46). In fact, anthropological and/or genetic sexing was successfully conducted in only two cases – the male warrior at Balladoole and the Pagan Lady of Peel (Symonds et al. 2014).

After this elimination, there remain 17 Viking-age burials and contexts in Man that reasonably can be classified as male. And if, for the sake of argument, we accepted beads as reliable indicators of a woman's grave and take their number as a hypothetical "two", the ratio of male and female burials in the Island is 8:1.[2] In Dublin, for example, the ratio of male and female Viking burials is about 10:1 (cf. Ó Floinn 1998, 142), and in north-western England (Cumbria and Lancashire), only three graves containing oval brooches are known against thirteen male burials (cf. Edwards 1998, 8–22; Redmond 2007, 91–121; Richards 2004, 192–212). These comparative figures show that the situation in Man was not at all unusual and did not, in fact, require a special explanation.[3]

Additionally, it is difficult to see why an imbalance between the numbers of male and female Vikings in the archaeological records of Britain and Ireland should be surprising in the first place. It has been pointed out by Dawn Hadley (2006, 261; cf. MacLeod 2011, 339–40), for example, that the members of Viking raiding parties and groups of settlers probably were indeed predominantly male and that this is rather to be expected. In fact, she proceeded, there is no reason to assume that there were no women at all present on such occasions just because positive proof of them is lacking in any given area. Looked at from another angle, it would have been a good idea for young Vikings on the lookout for dynastically and economically advantageous matches to marry local heiresses, which "would greatly facilitate the peaceful acquisition of land and wealth" (Freke 1990, 111). Marriage policies like this would surely have integrated them quickly into local power structures and enabled them to take part in politics. But again, this by no way means that *everyone* of the settlers followed this strategy.

As regards the oval brooches, it should have been quite obvious that the absence in Man of any supposedly diagnostic group of objects ought not to be overrated. Despite the Island's richness in Viking-age archaeological material, hardly any group is represented in statistically relevant numbers, so the shortage or absence of any other could easily be attributed to the '"accident of discovery and excavation" before using this rarity as the basis of consequential conclusions.

And finding oval brooches by no means is a common occurrence in the British Isles (Figure 1.2): there are currently only five sites featuring oval brooches in England, for example, and the brooches found in 2004 by metal detectorists in Cumwhitton, Cumbria, were the first to be discovered in England since 1867 (e.g. Norstein 2020, 177–83; Watson et al. 2011, 46–51). After this, a very early example of Type Rygh 640 came to light on the island of Rathlin, Northern Ireland, in 2018 (Gilmore and Alexander 2022, 170–71). Obviously, a rarity of oval brooches in any of the Viking colonies in the British Isles is quite a common feature, not an exception (cf. e.g. MacLeod 2011; Steinforth 2015b, 307–09, 346–47).

A single new discovery as game-changer: oval brooches found in the Isle of Man

In December 2018, the question about the significance of the lack of oval brooches in the Isle of Man suddenly became moot, when metal detectorists John Crowe and Craig Evans found the Island's first oval brooches at an as-yet-undisclosed place, along with a glass bead and a bronze buckle.

A follow-up excavation of the site commissioned by Manx National Heritage (MNH) and carried out by York Archaeological Trust (YAT) added a bronze strap-end (possibly belonging to the same belt as the buckle found earlier) and what could be a bronze needle-case to the roster of objects. No human remains and no grave context were discovered. In July 2020, the assemblage was declared Treasure, and after cleaning, x-ray photography, and conservation by MNH and YAT, it is now on display in the Viking Gallery of the Manx Museum in Douglas (Figure 3). As of September 2025, the brooches and other objects are unpublished, and publicly available information is scarce about the details of their discovery, their background, and indeed even their exact dimensions. Any particulars given here were obtained from online sites reporting on the brooches (cf. e.g. Manx National

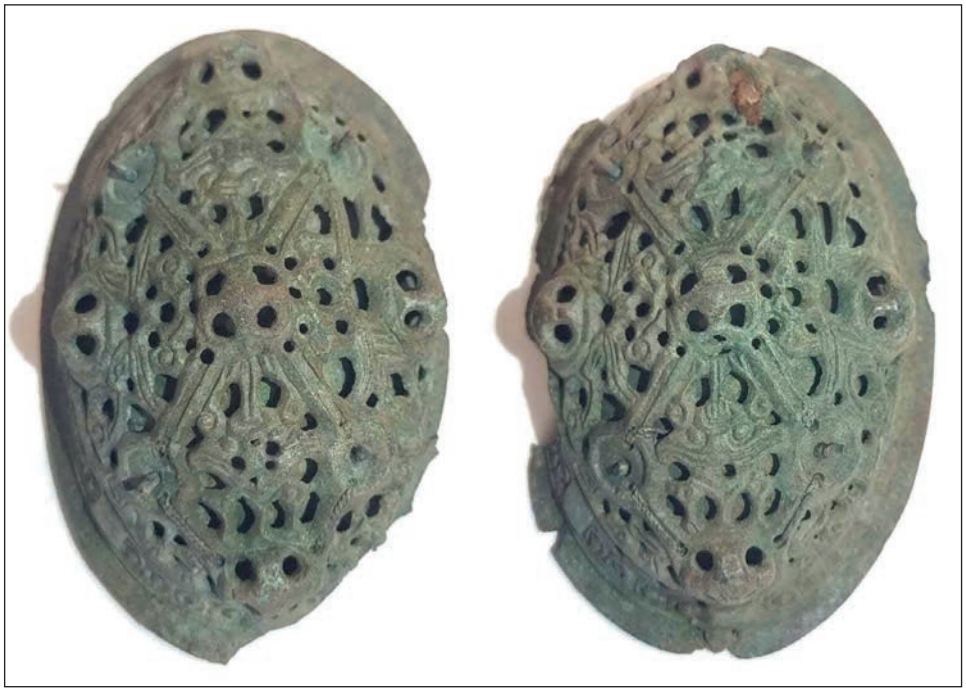

Figure 3. The IoM 2018 oval brooches found in the Isle of Man, on display in the Manx Museum, Douglas. © Ben Harding, Altrincham; reproduced with kind permission.

Heritage 2021; Artnet News 2021; The i Paper 2021) and information very kindly provided by Manx National Heritage. There is no official designation of the brooches yet; so for want of anything better, they are going to be called the "IoM 2018 oval brooches" here.

The bronze buckle (with its grooved bow) and the strap-end (with its ring-and-dot decoration) probably are part of a belt made in Britain and are of common-enough Insular design, possibly of early/mid 10th-century date (cf. e.g. Steinforth 2015a, 52, fig. 59.4–6). Less is known yet about the bead – other than that it is of dark blue glass with white and yellow decorations and regarded as Irish-made – and the supposed bronze needle-case.

In contrast, the two richly decorated oval brooches are very Scandinavian in character. They measure 103 x 78 x 37mm and 104 x 65 x 45mm, respectively, are made of bronze, decorated with silver wire, and possibly were gilded originally. On each of the Manx brooches, there are five fixed bosses, as is common for this type of brooch and four free decorative bosses, the latter of which are now missing, with only their rivets remaining. The open-work outer shell features images of antithetical birds and channels along which double strands of silver wire were running (only remnants of which survive). These characteristics classify both brooches as of types Petersen 51, Jansson 51F, and Rygh 652 (Jansson 1985, 67–83; Petersen 1928, 59–67, fig. 51; Rygh 1885), which is the most common type of oval brooches in Scandinavia and dates to the late 9th and particularly the 10th centuries. There are very similar brooches from both Scandinavia and Britain (e.g. Kershaw 2013, 96–100).

Figure 4. Head and shoulder section of the female burial at Adwick-le-Street, South Yorkshire, England, with the oval brooches found in functionally correct position. © Greg Speed, Ecus Ltd.; reproduced with kind permission.

In the absence of academic publication, short Internet articles mention the discovery of the brooches in the Isle of Man, with one very originally now dubbing it the "Isle of Wo-Man" and proclaiming that the brooches "suggest the presence of female Vikings" and that they "have historians question the long-held beliefs that only male Vikings settled on the island" (Artnet News 2021).

As pointed out above, the oval brooches were, in fact, not absolutely necessary to challenge the belief in all-men groups of Viking settlers and to assume, despite a lack of positive evidence, the presence of Viking women as well. But now that there are oval brooches in Man, what is the real significance of this fact? Are they really unequivocal evidence of Scandinavian Viking women in the Island? A look at other sites with oval brooches in the British Isles provides answers to these questions.

The evidence of other burials with oval brooches

At Adwick-le-Street in South Yorkshire, England, the assemblage of objects in a grave uncovered in 2001 – two Petersen 37 oval brooches, knife, key, and bronze bowl – might be described as having a somewhat feminine character (Speed et al. 2004; cf. Norstein 2020, 51–52, 219–22); particularly, as the brooches were found lying on the skeleton's collar bones, which strongly indicates that they were worn at burial in a functionally accurate position as part of a woman's dress (Figure 4). Osteological examination shows that the buried person likely was female, and isotope analysis suggests that she probably grew up in Norway (Speed et al. 2004, 59–75, figs. 4–7). Thus here, there is a true example of a Scandinavian Viking woman and her oval brooches buried in Britain.

Another example of this appears to be represented by the skeleton with a Rygh 640 oval brooch (and an Irish-made mount) excavated in 2018 on Rathlin, Co. Antrim, Northern Ireland. Studies show that the buried person was an elderly woman, and isotope analyses indicate that she was raised in a cold, non-coastal area in Scandinavia. The ^{14}C values of her bones cover the mid 7th- to late 8th-century range and overlap the date of the specifically Norwegian oval brooch in the late eighth century (Gilmore and Alexander 2022, 11–21, 44–45). If this dating can be accepted, this might be the burial of a pre-Viking-age Scandinavian woman in Ireland, possibly pre-dating the earliest recorded Viking raid on Rathlin in 795 (cf. *Annals of Ulster*: MacAirt and MacNiocaill 1983, 250–51).

Another burial context was encountered in 1979 at Cnip in the Isle of Lewis in Scotland, where a Viking-age burial contained two Petersen 51 oval brooches and a rich variety of other objects, among them a great number of coloured glass beads, a comb, a knife, a needle case, a whetstone, a sickle, and a ring-headed pin, but no weapons; again, the brooches were found in a functionally correct position. Examination of the bones indicates that the buried person was a woman, and the overtly Scandinavian character of the burial (which included textile remains of worsted diamond twill, which was very common in Viking-age Scandinavia) makes it tempting to think of her as Norwegian, too (Welander et al. 1987; cf. Norstein 2020, 263–66). Strontium and oxygen isotope analyses show, however, that she was not born in Norway, nor in the Western and Northern Islands or western seaboard of Britain; instead, she probably had her origins in the "eastern or upland regions of Scotland [or] northern England" (Montgomery et al. 2014, 64). Thus, she might have been the daughter of a Scandinavian who lived in those parts at the time of her birth, before they (or she) relocated to the Outer Hebrides. Alternatively, she could have been a native of northeast Britain who married a Viking, followed him to Lewis, and eventually was buried according to her husband's traditions – being turned into, as it were, a Viking woman in the archaeological record. Either way, whether she was Viking by birth or by marriage, we shall never know (on oval brooches as indicators of Scandinavian identity, cf. e.g. Kershaw 2013, 156, 177–78; Norstein 2020, 199–201).

In a burial excavated as early as 1913 at Càrn a' Bharraich on the island of Oronsay, Scotland, a pair of Berdal-Style oval brooches were found associated with shears, a bone needle-case, and an Irish-made knobbed ring-pin (Grieve 1914, 275–77; cf. Grieg 1940, 42–44; Norstein 2020, 273–74). Again, this looks like a female burial, but there are no scientific analyses that could confirm this assumption, and there also is no indication of the (?) woman's geographical origins. The oval brooches seem to point towards Scandinavia just as the pin points towards Ireland. While due to the distinctly Scandinavian character of the oval brooches it might be reasonable and justifiable to think of the buried person as a Viking woman, it should be kept in mind that there can be no certainty about her ethnic background and biography without a well-documented and well-analysed context.

And then there are the two brooches amateurishly dug up by roadmen clearing a low mound near Claughton Hall in Lancashire, England, in 1822, in unclear association with other objects that included, among other things, a sword, a spear-head, a Bronze-age stone axe-head, and a now-lost ceramic pot of cremated remains. The Petersen 51 brooches were placed back-to-back, "joined together and forming a kind of oval box […] containing a small

Figure 5. The "brooch box" found in a burrow at Claughton Hall, Lancashire, England, and its contents. After Jones 1849.

ornamented fibula, two beads, one of blue, the other of red-coloured paste, and molar tooth" (Jones 1849, 74; cf. Edwards 1969; 1989, 14–17; Norstein 2020, 93–94, 218–19; Figure 5). As no human remains were analysed, the assembly is highly ambivalent – and it might appear reasonable to assume that the objects could constitute the double burial of a man, represented by the weapons, and a woman, represented by the brooches. Either way, the latter obviously had not been worn at burial, but were arranged with a distinct purpose in mind.

That oval brooches were positioned in graves in a way that was not functionally accurate, but nonetheless deliberate, and even the function as a container is not at all unique: the two brooches discovered in 1903 at Ballyholme, Co. Down, Northern Ireland, lay in the ground with "the hollow sides face to face" (Cochrane and Smith 1906, 74; cf. Norstein 2020, 94–95, 224–25), but there is no report that this "box" also contained any objects. Ashes and burnt bones were placed in one of the two Rygh 652 oval brooches in Barrow 77 in Kaupang, Vestfold, Norway, which thus was utilised as an urn, but a box-like construction is not mentioned here (Blindheim et al. 1981, 75, 205). Finally, there is one context in Langeid, Setesdal, Norway, that – just as the Claughton Hall grave – is interpreted as the (inhumation) burial of a man and the (cremation) burial of a woman, since it contained, among other objects, both a sword and two oval brooches (Wenn 2016, 94–104).

While an independent secondary burial of a woman next to an earlier male grave possibly could be a solution for the Claughton Hall complex, Ben Edwards (1998, 15) rather convincingly explained the "brooch box" and its contents in the immediate context of the weapons grave and as a token of a lost wife buried in a man's grave. He surmises that the assemblage represented "some kind of memento if [the lady to whom they belonged] had been buried elsewhere", and adds that "if such an interpretation seems to conjure up the figure of an unexpectedly sentimental Viking, then perhaps we are getting a little nearer to remembering that the subjects of archaeology were people like ourselves, variable in character and behaviour".

And this is a profound statement that research tends to forget when looking for patterns and connections in ancient behaviour; that individuals and even small groups of people certainly did not always act and react in the same manner as their neighbours near and far. Archaeology is dealing with humans, who may have followed laws, requirements, customs, or fashions, but just as often acted as individuals – particularly on foreign shores – and dressed the way they liked, independent of their homeland's traditions. People acted according to necessity and used easily available local wares rather than waiting for imported ones, or even adopted the styles of their Insular spouses and in-laws entirely, out of merely aesthetic reasons or to pander to a Scandinavian-dominated elite, or possibly for various other reasons. Neither ethnic identity nor sex is *always* expressed in material culture and burial custom, much less in a way that we may unambiguously understand and identify today.

Conclusion

Some of the examples presented here have demonstrated that state-of-the-art scientific analyses have established that in fact there have been Scandinavian-born women living in the Viking colonies in the British Isles, who were then buried there accompanied by their oval brooches. Without such modern verification techniques, research traditionally has to be quite content with designating burials as "male" or "female" by the characteristics of the objects in them as well as, albeit more reluctantly, assigning ethnic affiliations due to the objects' typological classification. Both methods have serious flaws that call for some caution. In the case of the IoM 2018 finds, not even the character as a grave is certain.

Given the lack of details known and published to date, however, we need to keep an open mind to the fact that the IoM 2018 assemblage might represent various circumstances other than the burial of a Scandinavian-born woman, such as the grave of a local woman buried with the Scandinavian jewellery of her Viking husband's traditions, or a deposit by a husband in memory of a wife buried far away. Even the old hypothesis of Viking settlers marrying local women is not refuted by the new find.

Having said this, however, it cannot be gainsaid that this type of brooches was as exclusively and diagnostically female as Scandinavian and that the assemblage – even in the absence of human remains to be analysed for the sex and origin of their owner – distinctly has the feel of the late-pagan burial custom of Insular Vikings, which puts the find neatly in the same context as the late 9th-/ early 10th- century male (and unsexed) burials known not only in Man, but in Insular Britain and Ireland as well. Consequently, it is not unreasonable to accept the brooches and other objects – as a working hypothesis and subject to further, specialised research – as indicators of Viking women in the Isle of Man.

Even without final certainty, the fact that at last, oval brooches have been found in Man is of great importance for the study of the Island's Viking Age. The complete lack of evidence for the presence of Scandinavian women has led to the idea that the Viking settlement in the Isle of Man was different: in contrast to other colonies in the Irish Sea area, this thesis concluded, Viking settlers came to Man as men-only groups and married local women instead of bringing their own. This difference could not be explained satisfactorily, but nevertheless was used as basis for far-reaching conclusions.

After the discovery of the IoM 2018 assemblage, this myth should firmly be buried with all the consequences this has regarding the varying conclusions drawn from it. The presence of the oval brooches supports the objections outlined above that were based on a critical evaluation of the current sexing and gendering of the Manx Viking burials and their ostensibly unusual gender ratio and which affect the conception of both the date and manner of Vikings' initial presence in the Island.

While intermarriage no doubt took place, the evidence all the more now suggests that both Scandinavian men and women settled in the Island and that there is no reason to assume that the lack of Scandinavian women and the intermarriage between Manx women and Viking settlers can be taken as having facilitated pagan Vikings' conversion. Instead of a comparatively late date of arrival around the year 900 and a smooth social and cultural merging between the two ethnic groups as hinted at by Graham-Campbell above, an earlier date around 870 and a more warlike manner now appear more probable (cf. Steinforth 2015b, 300–80; 2015c). Rather than setting the Island apart by their absence, the Manx oval brooches serve as a reminder that the Viking settlements in the Irish Sea area – in Ireland, particularly Dublin, in the Isle of Man, and along the north-western coast of England and possibly beyond – in all probability were connected and even related (cf. Steinforth 2018).

At this time, it must be hoped that the brooches and other objects of the IoM 2018 assembly are going to be studied intensively and that in the future, the results of these analyses may shed some more light and detail on this extraordinary find as well as on the question of Viking women on Viking Man.

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Endnotes

[1] Considering the ongoing discussion whether the "correct" usage of the word "Viking" limits it to Early-medieval raiders or traders outside their native Scandinavia, this paper uses the term as a generalising label for all aspects regarding these Scandinavians' origin, culture, and activities, both at home and abroad, and particularly for the presumably heterogeneous Viking group that conquered and settled the Isle of Man (cf. Downham 2009, esp. 140, n. 4; Steinforth 2015b, 11–14). This paper also differentiates between "sex(ing)" and "gender(ing)", as the former referring to a person's biological sex as assigned at birth (male or female), which archaeologically is determined by anthropological, osteological, or genetic analyses of the skeleton; the latter is defined as the cultural, social, and/or psychological aspects of being of a sex that are attributed to a dead person by their grave goods that are considered gender-specific, by regarding weapons, for example, as indicating male burials, jewellery and domestic tools (e.g. spindle-whorls) as suggesting female burials (e.g. Jesch 1991, 13–14).

[2] These numbers include the seven burials of St Patrick's Isle, which date to the mid 10th-century and thus are too late to inform about the gender composition of the initial settlers in Man. If they are removed from the calculation, the ratio among late 9th-/early 10th-century Viking graves is 7:1.

[3] In Scandinavia, women account for a larger part in the gender ratio than in the British Isles: in Vestfold in Norway, for example, they on average made up about 34% in 9th-century and 13% in 10th-century cemeteries (Stylegar 2007, 82, fig. 5.12). Given the difference in general living conditions, in the impact of foreign influences, and in the availability of Scandinavian-made wares at home and in the British and Irish colonies, this variation is no surprise (cf. Kershaw 2013, 97).

Part III
Sustainability

Household ecology, gender and funerary rites in the 4th or 5th century AD: The evidence of the Tune inscription

JOHN HINES

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The Tune runestone is a funerary memorial, first recorded in 1627, at which date it had been incorporated into the stone wall enclosing the churchyard of the parish of Tune, near Sarpsborg in Østfold. Its earlier history has to be reconstructed, and while there is evidence that provides clues to its earliest contexts, the date at which the inscription was made is difficult to pin down. Linguistic features of the inscription and the way it has been laid out on the stone are characteristic of very early runestones from Norway, but even so it could be either of the Late Roman Iron Age or the early Migration Period. In any case, the inscription clearly documents important facets of the social and economic circumstances in which it was made. Those show how valuable it will be when scholarship and science advance to the point at which they can locate the memorial stone in a more precise historical context.

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Key words: bread, kinship, memorial, Migration Period, Roman Iron Age, runes, settlement archaeology, social relations, Tune runestone, Østfold

Østfold in the Iron Age

The eastern side of the Oslofjord is not recorded as having been called Østfold, the "east land", before the 16th century, even though Vestfold on the opposite side of the Viken inlet is explicitly recorded under that name as early as the 9th century (Pedersen et al. 2003, 387–89). Snorri Sturluson's *Heimskringla* shows that an earlier name for the region including Østfold was *Vingulmǫrk* (Pedersen et al. 2003, 399–428). Old Norse *vingull* means "fescue" (*Festuca Spp.*) and *mǫrk* a border-territory, implying that the region was perceived as a large borderland characterized by a type of grass that is especially characteristic of good pasture for grazing livestock and haymaking for winter feed (Steinshamn et al. 2016). The name was presumably coined to denote what this region's most important economic resource was at that time.

Topographically, Østfold is a non-mountainous region, defined primarily by three major features. The Oslofjord is geologically a rift valley, bounded by outcrops of tectonically produced granite. Of younger geological date is the glacial edge moraine known as Raet, which runs across Scandinavia from along the south coast of Norway, across the Oslofjord and on through Sweden to Finland: a surface feature that in connexion with alluviation and isostatic sea-level change has produced considerable areas of good arable land in the region (Figure 1). Cutting through Raet just before debouching into the Oslofjord is the mighty Glomma river, draining a massive area of eastern and central Norway known as The Uplands (*Opplandene*).

Geographically within the context of Scandinavia as a whole, and chronologically in the comparably wide perspective of the last two millennia of Scandinavian prehistory (ca. 1000 BC – AD 1000), Østfold is curiously distinctive. That is not a matter of absolute uniqueness, but rather one of sharing developments in turn with different neighbouring regions while sometimes following a chronological trajectory that was peculiarly local. Through the Bronze Age and the earlier parts of the Iron Age, this eastern area of the Oslofjord tends to predominate in archaeological overviews in a way that implies it materially to have been thriving, accumulating riches and cultural

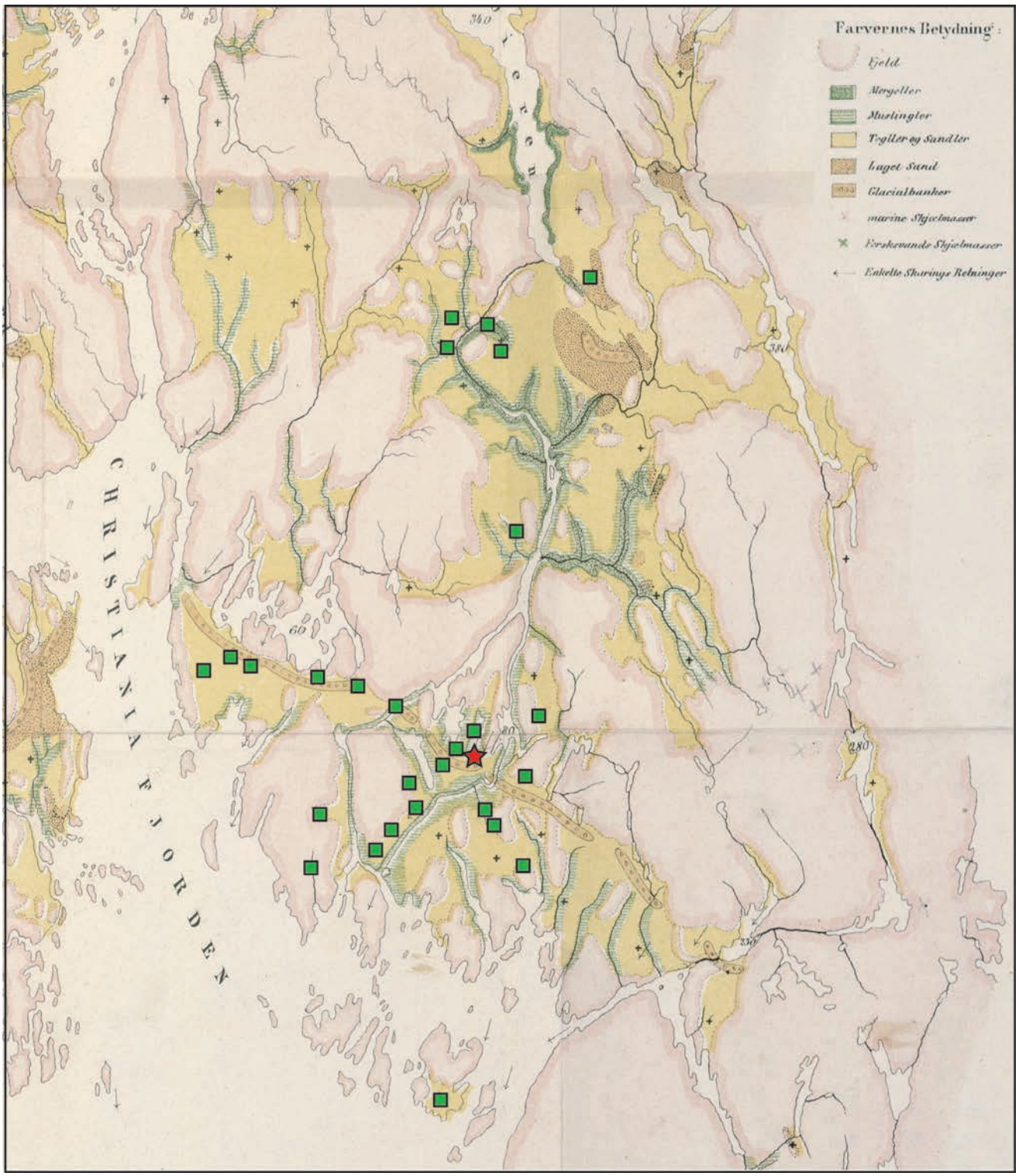
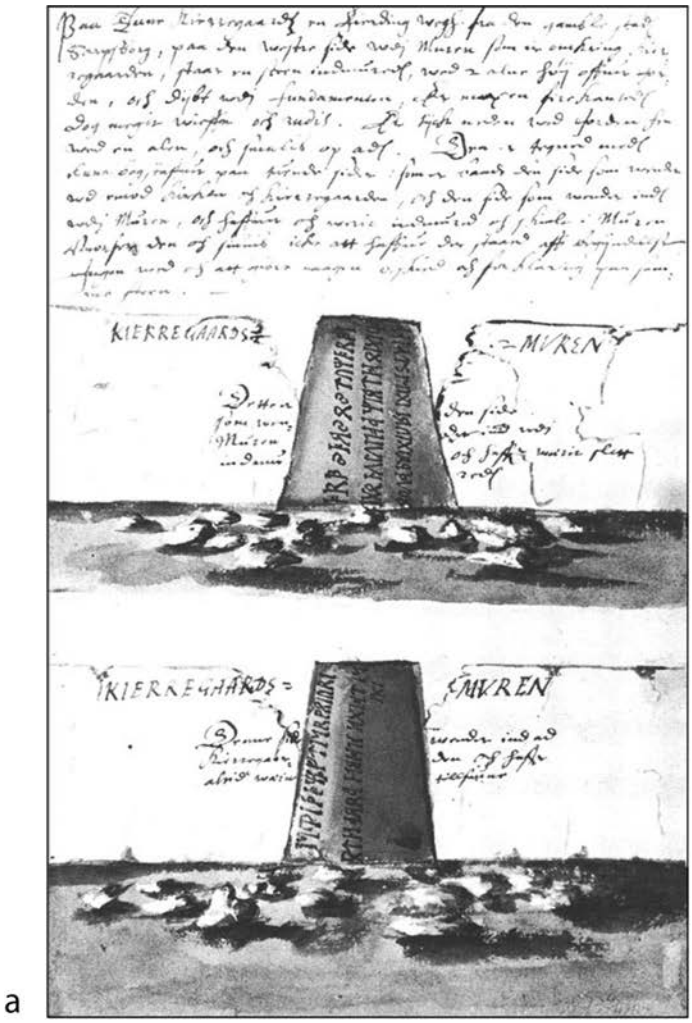


Figure 1. The Østfold area showing Raet and other glacial geological deposits mapped by Theodor Kjerulf (1859). The key reads, from the top: Fell; Marls; Shell; Brickearth and Sandy clay; Laid sand; Morraines; Marine shell; Freshwater shell; The direction of individual cuts. Red star: Tune; green squares: Iron-age settlement sites.



a

b

Figure 2 a. Peder Alfssøn's drawing of the Tune runestone in the churchyard wall, 1627; b. A sketch plan of the old church at Tune indicating that the tower was raised over a large mound, by Ludwig Klüwer, 1823. After Grimm and Stylegar 2017, fig. 3d.

weight. Østfold together with the neighbouring region of Bohuslän to the south, itself part of the Kingdom of Norway before being conquered and appropriated by the Swedish Crown in 1658, far outstrip any other such area in the quantity of primarily Bronze-age rock art, which itself expresses an intimate relationship with the coast and the importance of navigation (Nimura 2016, esp. 85–93; Vogt 2012). In the pre-Roman Iron Age towards the end of the first millennium BC, Østfold is practically the only part of Norway where substantial burial grounds are recorded (Solberg 2000, 40–42; Wangen 2009): typically unfurnished cremations, sometimes with cinerary urns, or overlain or ringed by placed stones.

In recent years, modern excavation and dating methods have also produced a remarkable surge in the number of identified settlement sites within Østfold, mostly from the period of the Late Bronze Age to the Migration Period, around the middle of the Scandinavian Iron Age (Gjerpe 2023). Lars Erik Gjerpe's study combines a great deal of empirical evidence with theoretical evaluations to construct a detailed and complex long-term model for the whole of the south-eastern quarter of Norway known as Østlandet. The most salient features for the present study include, unsurprisingly, a division of the whole of this area into southern and northern halves in terms of internal consistency and mutual difference, the southern half comprising Østfold, Akershus and Vestfold. Nonetheless there are also some clear differences between the eastern and western sides of the Oslofjord, produced by architectural details such as the presence/absence of two-aisled buildings or gable posts, and predominant building-alignments, but most strikingly in respect of a much earlier introduction of site-continuity, raising successive buildings at effectively the same spot and the detectable repair and rebuilding of structures, in Østfold than anywhere else. The known Iron-age settlement sites of Østfold are found in the two separate zones with good agricultural land, one around Eidsberg in the north and the other immediately south of the Raet ridge (see Figure 1). A well-published site in the latter zone is at Missingen, not far from Tune (Bårdseth 2009; Bårdseth and Sandvik 2007; Maixner 2015). There is a clear majority of these sites in that more southerly zone, due in part to the volume of recent development in and around the

municipalities of Sarpsborg and Fredrikstad, but still direct evidence of the wealth of archaeological remains here.

Missingen is a major farm of the Roman Iron Age, of the character that is regularly labelled a "magnate" seat. The continuing display of elevated wealth and power in Østfold in the first three centuries AD is also well represented by pre-eminent cemeteries, now with some furnished graves with high-value and exclusive grave goods: the most fully studied of these are Hunn in Fredrikstad and Storedal in Skjeberg (Bøe 1927; Petersen 1916; Resi 1986; Stylegar 2008). Bergljot Solberg identified the elite graves of Roman Iron-age Østfold with a "rank-group" 3 in Lund Hansen's scheme of territories dominated by elites with far-reaching contact networks, both across southern Scandinavia and at the highest level between Scandinavia and the Roman Empire, although there are grave-assemblages that seem rather to be characteristic of Lund Hansen's higher Status 2-*Gräber*/*Zentrum vom* Typ 2 (Lund Hansen 1995, 374–84; Solberg 2000, 94–96). Whichever, this implies a satellite relationship between the elite group in Østfold and the nearest supra-regional power-centre in Sjælland. But the latter group's dominance began to wane by phase C3, the 4th century, when likewise the distinctly wealthy graves of the 3rd century and earlier in Østfold disappear. This new phase coincides with the earliest plausible horizon in which the Tune inscription was made (see the following section).

It is striking that Migration-period farmhouses in Østfold also appear fairly moderate in dimensions (Gjerpe 2023, 93–96). But the overall number of settlements remains steady; there is nothing to imply a dramatic social and economic collapse leading up and into the Migration Period here (Loftsgarden and Solheim 2023; Ødegaard et al. 2023). Ingunn M. Røstad's analyses of Norway focussed on the Migration Period consistently reveal the emergence of centres of innovation and gravity away from Østfold, which sits rather on the edge of distributional ranges (Røstad 2021, 77–215). And yet there are still special finds, particularly in the northern agrarian zone, such as the cremation in a Vestland cauldron also containing form B1iv wrist-clasps at Østby in Rakkestad (Dahlin Hauken 2005, 75 and pl. Ia), and the unique, apparently imitative, glass vessel deposited in an inhumation grave along with a gold ring at Langset in Trøgstad (Straume 2011, 424 and Taf. 1.1–3), both of the 5th century; and from around the middle of the 6th century the exceptional gold hoard found at Sletner, Eidsberg (Bøe 1922, 7–11). The contrast in character between the southern and northern farming zones of Østfold in the Migration Period merits more detailed investigation, but that is not a task for the present context; nor do we need to do more than note a further change of direction and orientation for Østfold in the following Merovingian Period (late 6th–8th centuries) (Røstad 2021, 215–46).

The name of Tune parish is eponymous with the first of the great Norwegian Viking ship-graves excavated, the Tune-ship (the burial chamber dendro-dated AD 905–910: Bonde and Christensen 1993); not quite at the same site as the church and runestone but a few kilometres away at the farm of Nedre Haugen, where not only was the presence of the barrow emphasized by the farm-name (*haugen* = "the burial mound") but local traditions of "the ship-mound" (*båthaugen*) credibly show unbroken local memory from the 10th century (Schetelig 1917). There is no doubt, then, of the long-term focal importance of the Tune district. The parish-name itself, from the plural genitive and dative forms *túna* and *túnum* ("of, to or at the townships"), is one that consistently represents major Iron-age estate centres, usually royal, and must also have been created by the 10th century. Other names in the district point to further secular and religious communal fora: Lekevoll, Tingvoll, Vesten, reflexes of standardized Old Norse *leika-vǫllr*, *þing-vǫllr* and *vé-steinn* ("gamesfield", "assembly-field" and "shrine-rock") (Vikstrand 2023: note Vikstrand's relatively sceptical assessment of other suggested ancient "sacral" place-names in the vicinity). Thus whatever its precise chronological context, the Tune runestone represents one of many stages in the evolution and continual reconstruction of a major social centre in a firmly rooted and well-sustained agrarian and maritime zone.

The Tune runestone: dating

Tune church is now on the edge of the city of Sarpsborg, towards the south of Østfold. The church was rebuilt in the 1860s, but earlier records show that the tower of its medieval predecessor had been located over a major barrow, close to where the runestone was incorporated into the churchyard wall (Figure 2; Grimm and Stylegar 2017). From the end of the 1860s there is a hair-raising account published by Anders Lorange of whistle-stop excavations entrusted to a student in his very early twenties in the context of the widespread destruction of archaeological monuments for farming. This report includes a description of the area around Tune, seen one winter, as being occupied by "an innumerable quantity of ancient monuments" including hundreds of barrows, cairns, stone-settings, standing stones and rock-carvings, "not yet," he poignantly noted, "reached by the plough" (Lorange 1869, 82: translated; cf. Grimm and Stylegar 2017, fig. 3c). Nearly all of this has since disappeared. Archaeologically recovered grave finds from sites around Tune

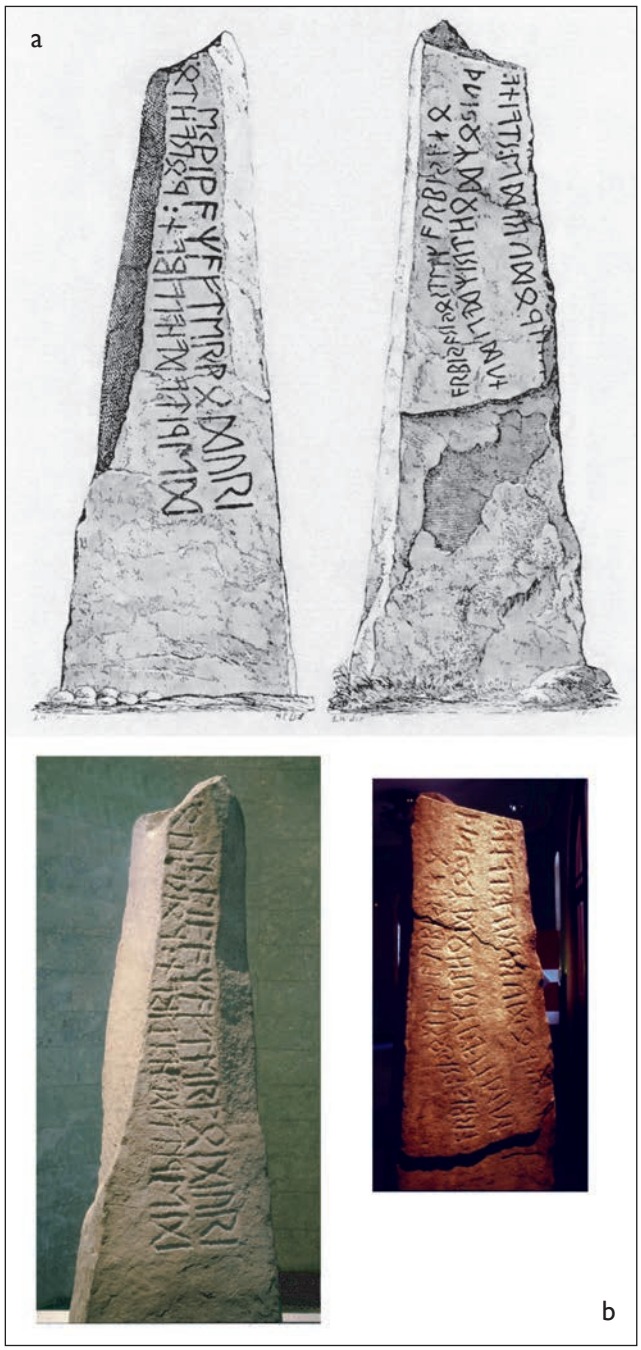


Figure 3. The Tune runestone. a. Engraving by Ludwig Wimmer published in Bugge 1891. b. Photographs from the Runische Schriftlichkeit database (www2). Left: Side A; Right: Side B.

are dominated by finds of the Merovingian and Viking Periods of the 7th to 10th centuries AD, not of the period of the runic inscription (Pedersen et al. 2003, 304–7, 320–24 and 338–45).

The date of the Tune stone has to be determined, as best we can, between the disciplines of Comparative Philology and Archaeology. The former is a long-established branch of historical linguistics through which prehistoric phases of development within language can be reconstructed, primarily with reference to sequenced sound-changes in the phonological system. This allows us to place runic inscriptions in a relative-chronological order. That perspective can be combined with artefactual and contextual archaeological evidence to identify, amongst other things, an early Norwegian runestone phase around the 3rd to 5th centuries AD (Spurkland 2005, 20–45; see below on a possibly even earlier inscribed stone from Svingerud, Hole, Buskerud). A runestone that is an inscribed natural boulder from Stenstad, Gjerpen, Telemark, is directly associable with female grave goods — a cruciform brooch, a wooden bucket and sherds of a bucket-shaped pot — that date the burial to around the middle of the 5th century (Undset 1878, 16–20). Its inscription **igijonhalaz** may be translated as "Ingijō's stone", and Ingijō is a feminine name. This inscription also has a linguistic detail that is matched in the Tune inscription, the preservation of the second *a* in the noun **halaz** (technically, the "thematic" vowel of the inflectional endings), which places these texts in the "pre-Syncope" phase (Nielsen 2000, 77–79, 84–105; Seip 1955, 19–27). At least a dozen, possibly twenty, further runestones from Norway and a few from Sweden are of similar age (Palm 1992, 69–70). On the whole the implementation of syncope seems to be a feature of the Merovingian Period in Norway, but there are some slightly earlier signs of the process, of which a particularly relevant example is on the mid-6th-century tiny Eikeland (Rogaland) relief brooch, where **wiz** is plausibly identified as a reduced form of the personal name **wiwaz** of Tune (Nielsen 2000, 259 and n.34; Spurkland 2005, 25–27). More useful, though, for a precise relative chronology of the Tune inscription is to compare and contrast its verb **worahto** (1st person singular, "made") with **wurte** and **orte** (3rd pers. sg., "made") on a C-bracteate from Tjurkö, Karlskrona k., Blekinge, Sweden, datable around the turn of the 5th to the 6th century, and a runestone from By, Sigdal, Buskerud, respectively. The Tune inscription retains the consonant cluster *-rht-* in this verb, leading to the insertion of a so-called *svarabhakti* or parasite vowel *a*, while the latter two have dropped the *h* (Seip 1955, 28), and By further appears to show the later dropping of initial *w-* before back vowels characteristic of proto-Old Norse (whence *orð*, *ord* vs. *word*; *Óðinn* vs. *Wotan*; *úlfr*, *ulv* vs. *wolf*, etc.) (Nielsen 2000, 257 and 264–65: note that the By runestone is damaged, and its limited legibility creates important uncertainties).

There are parallels in the layout of several of these texts too, not least a strong tendency to have vertical lines of text on the early runestones (Figure 3). But it is the linguistic criteria from which we can infer that the Tune stone should be no later than the 5th century. Spurkland

(2005, 35–42) assigned it to the 5th century, which is the earlier Migration Period. But the discovery of redeposited broken runestone fragments in a cremation cemetery context radiocarbon-dated between the 1st and the mid-3rd century AD at Hole, north of the Tyrifjord (Solheim et al. 2025; Zilmer and Vasshus 2023), means that it could well date from the Late Roman Iron Age and be 4th- or even 3rd-century. Hans Frede Nielsen (2000, 279–87) was comfortable with a dating of the Tune inscription within the 200-year bracket of ca. AD 250–450, and that is both sound, and as good as we can currently achieve.

The Tune inscription: interpretation

The inscription is in five lines, two and three respectively on opposite faces of the stone (Sides A and B: Figure 3). The inscription is nicely legible on the whole, although a small part of the inscribed surface has flaked off, frustratingly removing the beginning of the first line on Side B, and it is likely that the top of the stone has also broken off, removing the end of line A2 (Knirk 2011). Peder Alfssøn's sketch of 1627 (Figure 2a) shows line B1 as complete, with four runes before what is identifiable with what still remains. But what he has drawn there makes no sense, and indicates a short runic sequence going in the opposite direction and upside-down compared with the remainder of the line. It seems that he imaginatively "restored" the missing section here. There is complete and entirely reliable consensus over the order in which the sides and lines are to be read. A critical factor behind the layout of the text is that it contains two discrete sentences: the first Side A lines 1–2 and Side B line 1; the second Side B lines 2–3. The layout of the text is essentially boustrophedon: the successive lines of the first sentence on Side A and those of the second sentence on Side B are to be read in opposite directions, left-to-right or right-to-left. In the vertical lines of text, the top of the runes is to the right in the first sentence but to the left in the second sentence.

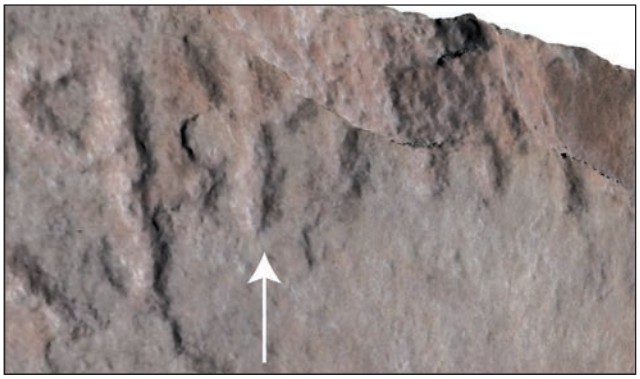


Figure 4. The apparent rune **z** *at the beginning of the surviving portion of line B1 (arrowed): screenshot from www1.*

Transliterations of runes are conventionally given in bold, with the diacritic ‿ marking a "bind-rune" (consecutive runes ligatured) and square brackets definite lacunae in the text. All three of the bind-runes in this inscription involve the rune **a** conjoined with a preceding rune which has a full vertical stave at the edge preceding it. In the following, largely undisputed, transliteration of the inscription, the five short dashes at the start of line B1 represent the bases of five vertical staves that are still visible — four of them very clearly; a fifth, however, vestigial at best.

A1 **ekwiwazafter·woduri**
A2 **dewitad‿a‿h‿alaiban:worahto·[**
B1 **-----]z:woduride:staina:**
B2 **þrijozdohtriz‿dalidun**
B3 **arbijasijostezarbijano**

Turned into an edited version with word division, this can be given as the following two sentences:

Ek Wiwaz after Woduride witandahalaiban worahto —z Woduride staina.
Þrijoz dohtriz dalidun arbija, sijostez arbijano.

The insertion of an *n* before **d‿a** in **witad‿a** (A2) is fully consistent with a regular runic practice of omitting nasal consonants at the beginning of consonant clusters, and gives good lexical sense, as we shall see. Notwithstanding a more recent thorough reinterpretation by Thórhallur Eythórsson (2012), which is particularly strong as an overview of earlier proposals, in practical terms the most efficient way of summarizing the argument from this point onwards appears to me to be to refer to Terje Spurkland's English version of his preferred interpretation of the text (Spurkland 2005, 35–42), which divides what I have described as the single first sentence into two. Spurkland followed the painstaking study of Ottar Grønvik (1981) closely:

I, Wiwaz, in memory of Woduridaz the master of the household, made [these runes]. [I entrusted] *to Woduridaz the stone.*
Three daughters arranged the funeral feast, the dearest/most devoted/most divine of heirs.

To reconstruct the first sentence of Spurkland's reading, virtually all scholars from Sophus Bugge (1891, 1–44) onwards have postulated that a direct object to the verb **worahto**, very probably the noun "runes" (***runoz**), must have been in a section that has broken off at the end of

line A2. It appears likely but not certain that the top of a rune stave following the final o of worahto can be seen here. But otherwise all of the lines of text respect the top of the stone as it is now, and all of them end with complete words; grammatically, as we shall see, there is no need to emend the text in that way. Spurkland then followed Grønvik (1981, 168–75) in creating a conjoined clause to occupy line 1 of Side B by introducing a new finite verb in the lost section at the beginning of that line – postulating falh, "entrusted". However the rune z at the end of this line-initial sequence, read by Wimmer and Bugge in the 19th century, is still tolerably clear (Figure 4; see also www1).1 These three lines are linked by the persistent alliteration of stressed words starting with w-: **wiwaz, woduride, witadahalaiban, worahto, woduride**. In a further discussion published in 1903 as "Corrections and Additions" to his 1891 edition, Bugge (1903, 510–23, esp. 517–23) revised the interpretation he had previously proposed, namely that Side B had been added to the stone later. He now foregrounded the case for reading lines A1–A2 and B1 as one sentence, albeit with two main clauses and still conjecturing a lost second main verb. Although not explained very clearly, his implied position seems to be that **after** in A1 is identified as the preposition "after", and the word ***aftez** hypothesized for the beginning of B1 the adverb, Old Norse *aftr*, *aptr*, supposedly with a sense of "afterwards", modifying the second main verb concurrently hypothesized for the end of A2. **woduride** in B1 is then an indirect object marked by the dative case: *I, Wiwaz, made [runes] after Woduridaz…; [and raised afterwards] for Woduridaz a stone*.

Without conjecturing quite substantial lost segments, however, the first three lines as they stand, with their consistent alliteration, have the structure of a perfect simple sentence: subject (*I, Wiwaz*: pronoun and personal name, nominative singular) – transitive verb (*made*: first person singular preterite) – direct object (*stone*: accusative singular). In between, Woduridaz is named twice, with the name in the dative case on both occasions. One could imagine that was done for the honorand's name to appear on both sides of the stone. However a key assumption determining *all* reconstructions from Per A. Munch (1857) onwards has been that the phrase *after Woduride witandahalaiban* is a standard memorial formula: "after/in memory of this person" (overview in Grønvik 1981, 79–122). This, however, attributes to a Late Roman Iron-age or early Migration-period inscription what are in reality the formulaic conventions of 9th-century and later, Viking-period parallels; the solitary earlier occurrence of the preposition "after" with a personal name in Scandinavia is on the Istaby stone from the small and curiously discrete Blekinge runestone group datable around the beginning of the 7th century (Birkmann 1995, 114–42). In all of these later cases, moreover, the preposition "after" governs the accusative case, not the dative. In literary Old Norse from several centuries later, *eptir* with the dative case specifically indicates a temporal sequence: "following after." As this semantic detail can be traced in all of the early Germanic languages, one may infer that it should apply to the Tune inscription as well.

Profoundly significant in the adverbial phrase beginning *after Woduride* is the compound noun written **witadahalaiban**. The now-accepted analysis and interpretation of this as a present participle *witand-*, "watching, knowing", and the noun *hlaifa-*, "loaf, bread", was proposed by Otto von Friesen in 1900. Bugge (1903, 511–12) rapidly acknowledged this to be "insightful and appealing" but rejected it because of the lack of appropriate structural parallels in the lexicon, and because – for reasons I struggle to comprehend – he regarded it as an inappropriate term to signify "master of the household". Semantically if not structurally, it is markedly close to the Old English pair *hlaford* and *hlafdige*, modern "lord" and "lady", from **hlāf-weard* and **hlāf-dige*, "loaf-guardian" and "loaf-kneader". Carl Marstrander (1930, 333–35) definitively endorsed von Friesen's proposal, however, and it has retained consensus acceptance status since then.

Be it as a grandiose creative image or a technical social term of its age, if **witadahalaiban** is in direct apposition to the name **woduride** that directly precedes it, it must be inflected in the dative singular. Germanic **hlaifaz*, however, would there have the same **-e** ending as **woduride**. The present participle conversely *would* regularly have *-an* in the masculine dative singular (Syrett 1994, 137–41 and 233–36), so the form on the Tune stone could be explained through this compound carrying the morphology of its first element, the participle, rather than of the second, the noun that participle governs, as its inflected ending (Thórhallur Eythórsson 2012, 10). If so, the **a** between **witad** and **halaiban** can simply be viewed as a compositional, linking vowel, which appears unexceptionable as a hypothesis but was regarded as reductive by Martin Syrett (1994, 235–36).

Nielsen (2000, 174) emphasized the unusual verb-object order of the elements in this compound, and many scholars have stressed the extent to which element-order in this inscription is adapted to an alliterative and rhythmical prosody that could motivate the placement of *witanda* at the beginning of the word (Marold 2012, esp. 75–78; Schulte 2023). Von Friesen (1900) and Syrett (1994, 233) noted a few similar compounds in later Norse literature (cf. Carr 1939, 170–74), but those are occasional

hapax legomena and typically flippant and scurrilous epithet-nicknames, inflected and used as weak ("definite") adjectives: e.g. *kastanrassi*, "blasting-arse"; *hengjankjapta*, "hanging-jaw". Old English literature frequently uses compounds of noun + present participle, albeit in that order: e.g. *brimlīðend*, *healsittend*, *randhæbbend*, "seafaring", "hall-sitting", "shield-holding". In these cases it is always the participle, the second element, that inflects according to sentence syntax. Together with a handful of Vedic Sanskrit and Greek comparanda these demonstrate that this structure was well-rooted as a mode of word-formation in these languages (Burrow 1973, 216), but not that **witad͡ah͡alaiban** represents an ancient and persistent Indo-European lexical type to be parsed according to predetermined rules.

A realistic although not unproblematic possibility is to see **witad͡a** as the masculine nominative singular to be read in apposition to the immediately preceding masculine nominative singular personal name **wiwaz**. What might be problematic in that case is explaining why the root **hlaifa-* (never a common lexeme in recorded Old Norse) should still be inflected as the oblique form (i.e. accusative, genitive or dative singular) of an *n*-stem or "weak" noun when subordinate to this verbal element. There is an *n*-stem noun derived from **hlaifaz* found in the Gothic and Old High German *gahlaiba*/*gileipo*: etymologically "messmate", but used in the sense of "companion", "colleague". This is the lexeme that Bugge continued to believe was the most likely explanation of **h͡alaiban**, although he recognized the problem of the elusive prefix *ga-*/*gi-* (Bugge 1891,16–19, 1903, 511–12). In an Ostrogothic Italian charter of the mid-6th century written in Latin and Gothic, practically the same word also occurs in the dative plural in the phrase *miþ gehlaibaim unsaraim*, "with our fellows", in this case in a variant inflected according to the paradigm of an *a*-stem adjective used substantively (Werde ed. 1913, 277–79). It is speculative to suggest that **witad͡ah͡alaiban** is inflected in agreement with **wiwaz** in the Tune inscription, i.e. with first lexical element of the compound also masculine nominative singular, but not a matter of special pleading contrary to all philological propriety. It attributes definite meaning to the final **a** of **witad͡a** to interpret what was said (here in a clearer Modern English word-order) as: *I Wiwaz, loaf-master after Woduridaz, made [for] Woduridaz [the] stone*. Moreover this nicely resolves the enigma of why Woduridaz is named twice in close succession, without massive emendatory supplementation to produce separate clauses.

Lines B2 and B3 contain another sentence, with a variant structure, starting with a subject noun phrase **þrijoz dohtriz**, "three daughters", a preterite verb inflected in the plural **d͡alidun**, which can be interpreted as something close to "made perfect", and a direct object noun **arbija**, "the funeralia". The final two words say something more about these three daughters as subject, with an adjective in the nominative plural **sijostez**, or some suggest **asijostez**, and a noun in the genitive plural linked to it, **arbijano**. Here, it is what the words are and what they mean which is the challenge. **þrijoz dohtriz** is unproblematic, and so largely is **arbija**, which is identifiable with the Old Norse neuter *a*-stem noun *erfi*, defined by Richard Cleasby and Guðbrandur Vigfússon (rev. ed. 1957) as "a wake, funeral feast". The complexity of what actually those rites could comprise is of course something archaeologists have long emphasized. The verb **d͡alidun** appears to be derived from the adjective that has the form *dæll* in Old Norse, *deall* in Old English, which means "proper", "fitting", and so would indicate "they did it all properly", "they made it fitting". Spurkland's English translation "arranged" perhaps does not quite convey a sufficient sense of approval and commendation (in Norwegian he translated this just as *forberedte*, "prepared"). Grønvik's *gjorde…hyggelig*, "made things nice", is surely too light (Grønvik 1981, 180–81; Spurkland 2001, 50, 2005, 39–40). Thórhallur Eythórsson (2012, 14–18) prefers to emend the verb to *dailidun*, "shared" and interprets the verb phrase with **arbija** as "shared the inheritance". That makes plausible sense in the context, albeit prosaically. Reasons for demurring at this proposal are the emendation of the verb, presupposing the omission of the letter *i* from a diphthong that is correctly represented in **h͡alaiban** and **staina**, and interpreting **arbija** as "inheritance", for which the regular Old Norse noun was *erfð*: from the same root, but a feminine noun of a relatively common type with a dental consonantal suffix.

dohtriz and **d͡alidun** alliterate on d-; after that **arbija** and **arbijano** not only alliterate on a- but show effective word-play, taking the same root *arbij-* in different senses marked by different inflectional paradigms. In respect of **arbija**, it is unfortunate that a standard term for funeral rites in Norwegian is *gravøl*, literally "grave-ale", because **arbija**, which Spurkland translated as "funeral feast", contains no explicit reference to food and drink. On the final word, the inflectional ending **-ano** shows we have an *n*-stem noun, which Spurkland translated as "the heirs", *arvingene*, although Grønvik argued insistently that it should only be understood as *de etterlatte*, "those left behind/still living" (Grønvik 1981, 176–84; cf. Spurkland 2001, 50, 2005, 39–40). Indo-European evidence for the original sense of the term, in particular the Greek cognate *orphanós*, "the surviving child of deceased parents", offers significant support for Grønvik's position. The

recorded words for "heir" in Old Norse and Old English, *erfingi* and *erfeweard* respectively, show the creation of further derivatives of this root to meet that need. Conversely, Spurkland's translation is supported by parallel *n*-stem nouns in Gothic and Old High German, of which the very similar Gothic *arbja* (masc.) and *arbjō* (fem.) are chronologically most relevant. In the Gothic New Testament these are used unambiguously, usually with the verb *waírþan*, "to become", to translate forms of the biblical Greek verb *klēronoméō*: "to take an allotted share of something" (masc. nom. sg. in Mark 10, 17; Luke 10, 25; masc. acc. pl. Galatians 3, 39 and 5, 21; fem. nom. sg. in I Corinthians 15, 50). Grønvik was nonetheless justified in arguing that to translate the term as "heirs" without relevant notes risks importing later ideas of property and inheritance, such as *oðal*-right. "Successor" is etymologically sounder and more judicious in its implications.

What stands in between these two words is perhaps the most argued-over segment. Bugge suggested that **sijostez** was a slip for **si*b*jostez**, with **si*b*jostez arbijano** meaning "the nearest surviving kin": Old Norse *sif* is a feminine noun meaning "kinship" (Bugge 1891, 30–35). Thórhallur Eythórsson has suggested an interpretation of **sijostez** that gives exactly the same meaning but with a different, very elaborately constructed, etymology (Thórhallur Eythórsson 2012, 18–19, 21–26, 2013; Mees 2013). In 1930, conversely, Marstrander had introduced the idea that the **a** at the end of **arbija** could also be read as an **a** at the start of a word **asijostez** (Marstrander 1930, 315–21). As orthographic practice that is plausible for a runic inscription, and it would give us three words alliterating on *a-*. He suggested this word referred to the *áss*, "god", and meant "most divine". In what sense these three daughters might be "most divine" or "godlike" we should have to imagine, and also how they could have that quality without anything of the sort being noted in respect of Woduridaz, implicitly their father. A linguistic problem with this proposition is that the suggested second *a*, the initial vowel of **ans-*, should be nasalized and so qualitatively different from the *a* at the end of *arbija*. Moreover **ans-* is a root that has a feminine derivative formed with the Germanic suffix **-unijō*, giving Old Norse *ásynja*, and formally likely to be a term of great antiquity. Why would that not appear in referring to the three women (although see immediately below on the apparently masculine ending **-ez**)? The eddic poem *Fafnismál* had to use or coin a different adjective meaning "*áss*-descended/of *áss*-kin" in presenting the heterogeneous descent of the Norns, at the end of an introductory section to the poem in which genealogy and fate are the dominant theme:

Sumar ero áskungar
sumar álfkungar,
sumar dœtr Dvalins.
"Some are of áss-kin, some of elf-kin,
some daughters of Dvalinn [= of dwarf-kin]"

(*Fafnismál* st. 13: Neckel/Kühn ed. 1962, 182. Note that the verse is also quoted in Snorri's *Gylfaginning*, and the principal manuscripts of that text show some uncertainty over the adjective, implying its unfamiliarity.)

Those are problems, although perhaps not conclusive reasons to dismiss Marstrander's suggestion. We can, though, reject Grønvik's idea of an otherwise unattested adjective *āsija-* ("loving"/"beloved") related to the noun *ást* and hence "the loveliest, or most loving, of descedants" (Grønvik 1981, 180–4). That is a made-up word, with no explanation for the absence of the otherwise consistent *t* from the root. Evidence for the alleged occurrence of a related word on the Eikeland brooch is highly problematic: there, a clearly intelligible sentence *I, Wiz, for Wiwja, inscribe runes* is followed by four further runes **a s n** and **i**. Of those, **a** continues on naturally from **runoz** but the **s** and particularly the **n** are reversed from how they usually appear, and one would normally read the final three graphs as a retrograde sequence **ins**. Reading *asni* here is possible, but then claiming that it means "to the beloved" is pure guesswork.[2] Bugge's suggestion that **sijostez** is a misspelling for **si*b*jostez** is also conjectural, but it is no worse and arguably a better conjecture than any proposed alternative. In the "Ur-Nordic" language and its runic inscriptions, the sequence **ij** occurs very frequently, and that could explain why the inscriber cut a familiar sequence of graphs and missed out the spirant **b** that should have stood between these runes. However we interpret the word, a curious point is that the inflectional ending **-ez** is what we would expect of the masculine gender, rather than feminine **-az**. That can be explained through *arbija* being grammatically a masculine noun irrespective of which sex it refers to. The Gothic feminine *arbjō* occurs just once, in a figurative construction in apposition to the feminine abstract noun *riurei*, "ruination, corruption/corruptibility", itself translating the Greek feminine *phthorá*. This is no evidence for a general Germanic distribution of masculine and feminine variants of that noun.

An overview

The Tune inscription is written in an ancient pre-Norse form of the language of Scandinavia and is incomplete. All suggested interpretations of it must involve conjectures. In English translation, the new suggestion made here can be put as:

I, Wiwaz, loaf-master after Woduridaz, made [—] *for Woduridaz a stone.*
Three daughters provided fitting funeralia, the nearest in kin of the successors.

This has been carefully assessed, and may be claimed both to be valid and to have some real strengths in respect of specific problems.

However poetic in its alliterative style the Tune inscription is, **witad͡ah͡alaiban**, "loaf-master", was not just an artistic epithet for Woduridaz but denoted a position which Wiwaz succeeded to after him. That is the only relationship between these two men declared, though something may have been added in the short lost section between the end of A2 and at the start of B1. Spurkland (2005, 41–42) inferred that Wiwaz must be Woduridaz's paternal grandson — so the three daughters would be his aunts (cf. also Grønvik 1994). Maybe. But why not a husband of one of the daughters? Or a guardian to whom the daughters became wards — which would imply none of them had a living husband? All of these are *possible*. In a patrilineal and androcentric society, for a man to die leaving only daughters creates particular opportunities for a redistribution of positions of power.

As Grethe Bukkemoen has discussed, the concept of the loaf-keeper foregrounds the significance of bread, which a range of archaeological evidence, especially the development and distribution of rotary querns, shows to have made a breakthrough as a key foodstuff across Norway and Sweden from the 2nd and 3rd centuries AD onwards (Bergström 2007; Bukkemoen 2021; cf. Hansson 1996; Dahlin Hauken 2018; Zachrisson 2014). The Tune runestone, which might be as late as the 5th century, marks that transformation as a completed change not a change in progress. This is no less significant evidence for emphasizing the outcome of this development. Meanwhile, making the reasonable assumption that proper funeralia without some element of communal sharing of food and drink are virtually inconceivable, the sequencing of the compound noun *witanda-halaiban* and the phrase *þrijoz dohtriz dalidun arbija* may perfectly capture and reflect the emphasis on the *serving* of food as a cultural practice confirming social cohesion in the Late Roman Iron Age and Migration Period that Bukkemoen identified, contrasted with the foregrounding of food *preparation* in the Merovingian and Viking Periods (Bukkemoen 2021, 169–200; *contra* Thórhallur Eythórsson 2013, 16).

The language of the Tune inscription was able to describe (and promote) a well-ordered culture with regular succession in human and community life. But the chances of life can always mean that situations are neither predictable nor simple. Relationships and practices then have to be adapted to fix matters. Røstad's study shows how, towards the end of the Migration Period, Østfold was drawn back into southern Norwegian cultural zones, which implies a shared sense of identity and eventually some political assimilation as well (Røstad 2021, esp. 262–77; cf. Gudesen 1980, esp. 129–40). Her focus on women's dress-accessories allowed her to postulate exogamy as one of the practical means of achieving this within and between the territories involved. The scenario depicted by the Tune runestone as reconstructed here is one in which men could grasp opportunities to move into existing households too. What Wiwaz did on the Tune runestone was to describe a situation that appears highly conventional, and was portrayed as a story of continuity. But he did so to show that he was now the top man.

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www2: http://www.runesdb.de/ (acc. 15 June 2024).

Endnotes

[1] In the 1990s, Grønvik temporarily retracted his suggestion of **h** for the first legible rune line B1 and reverted to **z**, only to turn back to **h** once again a few years later (Grønvik 1994; 1998).

[2] Grønvik (1992) subsequently argued that a sequence **asini** on the newly discovered Malt runestone from Jutland was a further example of this lexeme. He has been followed in this by no other scholar who has attempted to interpret this admittedly highly challenging inscription (see especially Heltoft 2017).

Iron Age Norway – an inverted pear-shaped society against the state?

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Lars Erik Gjerpe 2025. **Iron Age Norway – an inverted pear-shaped society against the state?** *AmS-Skrifter 29,* 205–212, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

The unification of Norway is a central theme for historians and archaeologists alike. Despite increasing hierarchization, the emergence of local power centers, and the gradual development of larger political entities from the Roman Period, Norway was not unified until the end of the Viking Age at the earliest. In my opinion, the absence of a state is the key political characteristic of Iron Age society. Therefore, I replace the commonly raised question "what caused the unification of Norway?" with the related, but different "how did Western Scandinavia remain stateless for so long?" Inspired by anarchist theory and social anthropological works, I will emphasize the importance of identity politics and present a model that takes into account numerous contemporary high-status environments.

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Key words: Viking Age, state formation, politics, anti-state, identity politics

Introduction

According to written sources the unification of Western Scandinavia started ca. AD 870 and was probably completed by ca. 1100, then Norway developed into a state ca. 1300 (Dørum and Holberg 2017, 11–41; Glørstad 2010; Helle 1974; Krag 2000, 44–80; Myhre 2015; Skre 2017). Archaeologists seeking the prerequisites for state formation in the centuries leading up to the Viking Age (800–1050) often point to the control of ideology, economy, military and politics, the emergence of local power centres at strategic points, and continually larger and more hierarchical regional political entities (Iversen 2004; Myhre 2015; Røstad 2020; Skre 1998, 2001, 2007b, 2020; Storli 2006, for a general view on power, see Mann 1986). The emphasis on the political organization that eventually led to a hierarchic society, a kingdom, and finally a state has dominated the view of Iron Age (500 BC–AD 1050) politics. However, in recent years such studies have been criticized for using a simplified retrogressive method, placing too much trust in historical sources from the Middle Ages (AD 1050–1537), taking hereditary ownership of land for granted, and having a too simplified view on power and control (Fallgren 2024; Gjerpe 2017, 2023; Glørstad 2010; Grønnesby 2019; Lund et al. 2022). Despite the fact that large parts of Europe became states in the wake of the Roman Empire, the most significant political characteristic of Iron Age society in what later became Norway is the absence of a state (Gjerpe 2017, 2023). In this paper I will challenge the traditional elite hierarchy model, wherein estates are formed, power aggregated, and chiefdoms developed into states (Crumley 1995). Therefore, I replace the commonly used question, "what caused the unification of Norway, and when did it happen?", with the related, but different, "why and how did Iron Age Western Scandinavia remain stateless?"

I would also like to point out a shortcoming in many works that deal with the political organisation in Viking Age Scandinavia. Large burial mounds, in general, have been a topic in the discussion about the development of the kingdom. Still the Oseberg burial mound in Vestfold, with its impressive dimensions and contents, is rarely incorporated into models that focus on political power and elites (Moen 2011; Pedersen 2008, 2023, 2025). To me, it is simple: if this spectacular burial monument cannot be incorporated into a political model, it is evident that the model must be replaced (but see Wamers 1995, 2002 for a model that incorporates Oseberg). In the following I will present new perspectives on Iron Age society and an

alternative social model, concluding with a brief case study from Vestfold.

Cost and benefits of living in a state

Most readers probably prefer to live in a state, exchanging income for a judicial system, police, and defence, and even willingly pay to live in a welfare state. However, this is not universal. Pierre Clastres (1989) considered states as failed stateless societies, not an evolutionary improvement, and there are plenty of examples of people resisting state formation (see examples discussed by e.g. Graeber and Wengrow 2021; Grønnesby 2019; Scott 2009). To explore why Western Scandinavia remained stateless for so long, despite what seems like increasing concentrations of power and wealth, I will focus on willingness, premises, and the ability to prevent the emergence of the state, and present a model for a stateless society without centralized power – in other words, resilient against kingdom and state.

The state is characterized by its centrality, wherein a ruler governs their subjects, defined either socially or geographically. This authority is underpinned by a claimed monopoly on both physical and symbolic violence, as well as an asserted right to extract a surplus (Opedal 2005; Weber 2000). What can loosely be defined as state power, including the ability to command obedience, is a central if not an exclusive part of a state. The Norwegian king's power as well as incomes were relatively small in the early Middle Ages, and Norway was not a state, and of course not a welfare state (Bagge 2000, 1996; Dørum 2006; Orning 2005). Still, kings and states have some common traits. Both demand submission and services and seize surplus in exchange for (often intangible) goods and protection, and often act as guarantors against social upheavals. However, a monopoly on violence was not important for Iron Age rulers (Dørum and Holberg 2017, 40–41). A user-friendly or utilitarian definition of an Early Medieval Scandinavian kingdom applicable here could thus be: That a person or institution claims the right to demand surplus (produce or service) from all residents in a geographically defined area and to use violence to support this claim, and that this right is accepted by most of the population, which in return get protection. Some claim that collecting tribute from clients in exchange for preventing damage is the main business idea for organized crime as well as rulers and states (Tilly 1985). To Émile Dürkheim, on the other hand, the state has a moral function (Neumann 2020). The stronger the state is, the more it protects or emancipates individuals from despotic institutions like families and guilds. Norbert Elias emphasises that the state domesticates us by forming our habitus into a less explosive, and thus less violent one (Elias 1994). This is illustrated by a distinct difference within Viking Age Scandinavia: the appearance of more violence in stateless Norway than in the more state-like Denmark (Bill et al. 2024). Ingunn M. Røstad (2021, 286) notes that, "The development of intensified material articulation of regional grouping upon a foundation of older 'tribal' affiliation may indicate that ethnic and/or cultural identity turned into a factor of political power." If the state is defined by centrality, a claimed monopoly on the right to collect surplus, and to support this claim by violence, and providing a more docile-tempered inhabitants with a common identity, then resistance to state formation might be understood as identity politics as well as wealth distribution: Who are we, or rather, what kind of people do we *want* to be?

Opposition to the state formations may thus be found in different, possibly overlapping groups: those who must pay tribute and tax, those (in charge of institutions) who lose power, and those whose identities are under threat (Fukuyama 2018). Some of those who complain about the price for protection charged by the state are anarchists. Could anarchy theory help us understand the Iron Age politico-social organization and explain why Eastern Norway stayed stateless at least until the tenth century, while large parts of Europe failed in the wake of the Roman Empire?

Anarchy and Iron Age Norway

Anarchy is a socio-political system, as opposed to the everyday use of the word anarchy does not mean chaos, neither does it refer to a world without order or an egalitarian society without oppression (Angelbeck and Grier 2012; Borake 2019; kok 2020). Further, anarchy may cover widely dispersed ideologies from anarcho-capitalism, which favors free-market economy and private institutions, to anarcho-collectivism where private ownership is abolished (Geloso and Leeson 2020). What all anarchic ideologies have in common is the value placed on autonomy, the decentralization of power, networks, communal decision-making, communal activity, justified leaders, the absence of durable formal authorities, and above all, the abolition of the state.

One example of a stateless, even anti-state, society with anarchic traits is Zomia (Scott 2009). This stateless mountainous region of mainland Southeast Asia, surrounded by states for centuries, was a magnet for people fleeing from the state. Mountainous or inaccessible areas, many with soil, climate, and/or topography poorly suited to large-scale cereal farming, often served as zones of refuge from the state (Grønnesby 2019, 107–11; Scott 2009,

129–33, 170–72). The rugged mountain area of Zomia, where roads were destroyed in the rainy season, was not subjected to state control until machine guns and helicopters made military conquest possible. When discussing how the people of Zomia kept the state at bay, James C. Scott (2009, 127–28) points out that: "their agricultural practice, their social organization, their governance structures, their legends, and their cultural organization in general bear strong traces of state-evading or state-distancing practices."

Geir Grønnesby (2019) and Lars Erik Gjerpe (2017, 2023) have, from different standpoints, argued that land was a public good and that settlement was relatively mobile in Early Iron Age (500 BC–AD 550) Mid- and South-Eastern Norway. Grønnesby employs the term "unbound sedentism" to characterize a settlement pattern that hindered concentration of landed property and the forming of estates. On this basis, they developed models for Iron Age society with anarchic or heterarchical traits that radically break with existing research on Iron Age Norway. Further, both agree that settlements gradually lost mobility, and that land became private property during the Late Iron Age (AD 550–1050).

Against this background I will explore some of the state-evading practices of the Iron Age society and how concentrations of ideological, economic, military, and political sources of power were counteracted (Mann 1986). Honor and reluctance to subordination were central values in Viking Age society (Hanisch 2002; Meulengracht Sørensen 1995) and economy, and military and political power were embedded in this. Religion was of course an important ideological factor. Norse religion lacked dogmatism; its core was rooted in rituals rather than personal beliefs, which meant it did not have the intellectual oversight of a priesthood (Steinsland 2005, 32). It was then hard to monopolize a certain interpretation of the religion, and difficult to use religion to control people. Regardless, religion is a powerful political tool, as the arguably sacral kingship demonstrates (Steinsland 2000). While literacy in the form of text and writing skills are a characteristic of, and essential for, organizing states (Scott 2009, 220–37), orality or the absence of literacy was an integrated part of Iron Age Scandinavia (Bagge 2000, 96–97), as runes are suitable for short messages, but not for longer narratives, preaching, accounting, or bureaucracy. Orality effectively hinders bureaucracy and is more democratic, because the ability to tell and listen to stories is almost always more widespread than the ability to read and write. Moreover, the notion of "original" holds no significance in storytelling – the stories are not frozen in time but change with the activity of the storyteller and the listeners.

The Norse religion and orality are elements of a stateless society, but the core is the lack of central authority that maintains personal security or assists in retaining property. Therefore, honor and violence are often integrated, in the sense that allowing someone to infringe upon your honor without consequence results in being perceived as defenseless, which in turn leads to further infringements (Hanisch 2002; Meulengracht Sørensen 1995). Several Viking Age stories tell of resistance to submission, and how this resistance was part of an identity under threat. According to the Saga of St. Olaf, Asbjørn offered to serve as *konungs ármaðr*, a significant servant in the king's administration, but fully reliant on the king and thus obeying and serving in a completely different manner than a nobleman (Iversen 1997, 168–79). His relatives then told him that he would bring shame upon them and himself by becoming the king's thrall. According to legend, the reason for migrating to Iceland was that a group of men could not tolerate the restrictions on their freedom brought about by the kingship of Harald Fairhair (Ólason 1989, 281).

Power in the Iron Age was based on personal qualities such as prestige, legitimate genealogy, honour, and wealth, while military power relied on the support of a retinue and the strength of the warrior. As opposed to a soldier, the warrior does not accept subordination, thus making it challenging to build a power base based solely on warriors. As Guy Halsall (2003, 113) has noted:

> Viking forces were fluid, made up of different bands under the leadership of particular warriors, joining forces for the duration of particular campaigns or campaigning seasons, or until they agreed to part company. Given that Viking bands, their composition and their internal relationships were transient, there was no necessary long-term relationship between them and an employer. Viking leaders wanted paying promptly, and in good coin too, and that did not stop them from changing sides if they were offered a higher sum.

In other words, an Iron Age warrior was not a reliable, trustworthy or enduring source of power. Asbjørn's story also points to the conflict of loyalty between kin and the Germanic war-bands or retinue (Green 1998, 55, 66, 102). Tension between different elites and between elites and "common people" results in unstable or precarious power dynamics, thereby hindering individuals from usurping power (Arnold 2021; Barth 2008). Feuds and violence are not only products of a stateless society; they also help maintain a stateless condition. Aversion to powerful leaders had deep roots. Tacitus highlighted the limited power of leaders in Germanic society: "But the kings do not have unlimited power without restriction..." (Rives 1999, 80). Also, according to Tacitus the "leading

men" made decisions in minor matters, while everyone participated in making decisions in matters of greater importance, as the Germanics lacked formal leadership in peacetime (Grønnesby 2019, 99). In absence of formal institutions, decisions were not made by voting but through consensus, meaning that no one opposes decisions (Barth 2008). However, during periods of war, an esteemed warrior among the aristocracy could be chosen as war leader, as the well-known story of Arminius illustrates. He defeated the Roman army in the Teutoburg forest in AD 9 and attempted to acquire roman-like power among his own people. When his military skills were no longer needed, his attempts to accumulate power were not tolerated, and he was killed by members of his tribe (Hedeager and Tvarnø 2001, 100). King Ingjald in Uppsala encountered a similar fate when he sought to consolidate power (Norr 1998, 72, 221). These murders bear resemblance to collective, unanimous choices rather than the deeds of a solitary murderer or a pretender with ambitions for the throne. These narratives have a common theme in that they highlight that the rulers acted on the behalf of "others", possessed no official authority, and could be removed by these others if they believed that the duty was not being carried out adequately. In anarchist models, "justified leaders" are emphasized as part of society's defense against the state and state formation. Such leaders are described in anthropological literature, where they do not make decisions on behalf of the community, but instead convey the consensus of the tribe. In other words, the leader is powerless (Gjerpe 2023). Instead, the leader is respected for his/her wisdom and articulates the consensus of the group. In return (s)he gains prestige. But (s)he is tolerated, not obeyed, and the power of a leader can be defined as the power to organize those who voluntarily follow the leader. Control over major organizations or areas, or power to compel people to do anything they oppose, is outside their scope. Consequently, people could not amass power and establish kingship. However, they could still become leaders, as the next passage will demonstrate.

The inverted pear-shaped society

After having presented central values in Iron Age Norway, I will now introduce the societal framework I believe they operated within. Wayne Suttles' (1958) "The inverted pear-shaped society"-model is based on studies of the Coast Salish, a society rigged to counter concentration of power and state formation (Angelbeck and Grier 2012). It differs from the social stratification pyramid, even if Suttle identifies different classes (in the sense "people with access to the same means"). On top are the *Leaders*, defined as "an impermanent set of adult males with greater wealth and prestige". They spring from the largest class, the *Good people*: "whole lineages strongly linked by tradition to village sites and natural resources, possessing wealth (due to spirit powers and ritual knowledge), inherited privileges, and 'advice,' and producing leaders" (Suttle 1958:504).

Social mobility was low in the inverted pear-shaped society, except between the good people and leaders. It was hard to become leader unless born to the right parents, genealogy was as important in the Salish' social system as it was in the Scandinavian Iron Age (Suttle 1958). The leaders in Suttons's model are echoed in Beowulf, where:

> the term *þiudans* (*þēoden* in Beowulf) occurs numerous times to characterize kings and members of royal lineages. The term does not seem to signify a distinct type of ruler, though, but occurs as one of numerous laudatory epithets for prominent men, some of which are kings (Skre 2020, 201).

Then there is the smaller class Suttle calls *Worthless people* and the even smaller class of *slaves*. Several things separate Suttles model from the traditional social pyramid; it is noteworthy that the *Good people* is the most numerous class and that the leaders are impermanent and recruited among the Good people, who compete to become leaders, and that the two lower classes does not generate a large surplus (Suttle 1958:501–2). By building on Suttles model and his descriptions of Salish culture, I will suggest a way in which power and different elements of a society relate to each other in what might be described as an heterarchical way in a smaller but well known part of Viking Age Scandinavia (Moore and González-Álvarez 2021, 127).

Good people and leaders in Viking Age Vestfold

Vestfold possesses at least three ship burials, numerous grave monuments, a marketplace, and a town from the Viking Age, despite its relatively small size of just over 2,000 square kilometers, with 20 percent of it being cultivated land. The ship burials of Oseberg (AD 834), Gokstad (ca. AD 900) (Bonde and Stylegar 2016), and Borre (early 900s) (Myhre 2015) are all situated along the coast, with a mere 9 kilometers as the crow flies from Borre to Oseberg, and approximately 22 kilometers from Oseberg to Gokstad. Add to this the monumental cairns at Mølen in southwestern Vestfold (Løken 1977), the Kaupang town-like settlement with large cemeteries (Skre 2007a), and Heimdalsjordet, a marketplace close to the Gokstad burial (Bill and Rødsrud 2017), there is at least five or six "elite places" in the small Vestfold area (Figure 1).

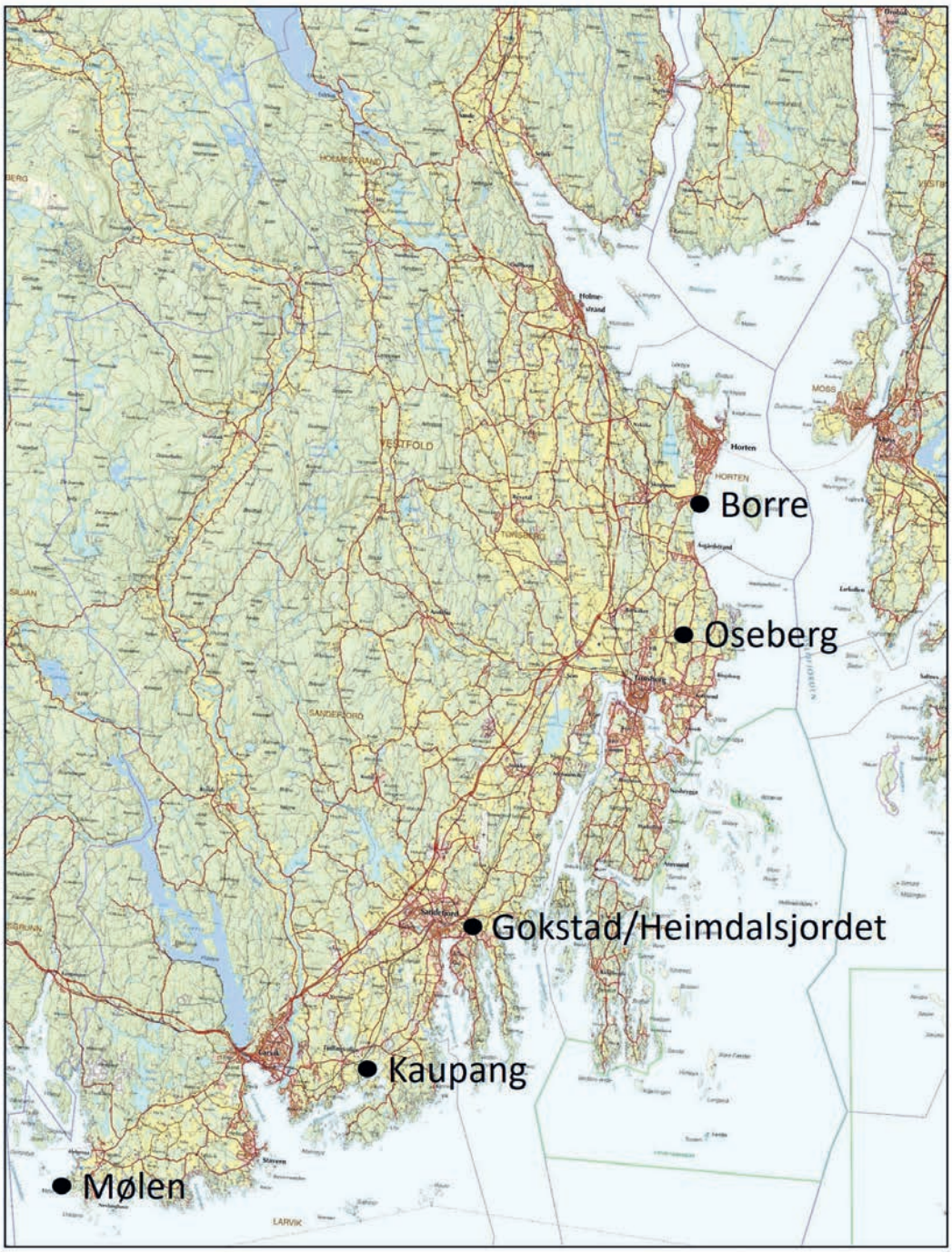

Figure 1. Central sites mentioned in the text. Basemap: Kartverket.

The Borre cemetery, with several large mounds from the Merovingian Period and the Viking Age, and possibly Mølen, stand out as being important for centuries, and are possibly the monuments of a dynasty (Løken 1977; Myhre 2015). Kaupang and its cemeteries were in use ca. 800–950, while the Gokstad and Oseberg mounds are solitary large mounds, even if Gokstad lies close to a contemporary marketplace and graves (Bill and Rødsrud 2017; Pedersen and Pilø 2007; Stylegar 2007). In addition to these "very rich" monuments over what may be interpreted as *Leaders*, many "rich" monuments over what may represent *Good people* have been excavated in Vestfold (Figure 2). The graves are found in various contexts, some solitary, others in smaller or larger cemeteries spanning a limited period (Gjerpe 2005), some cemeteries span the early as well as the Late Iron Age (Østmo 2005). Boat graves, equestrian graves, chamber graves, graves with weapons, smith's equipment, jewellery, gold, imported objects, or graves impressive due to large monuments are regarded as memorials of the *Good people* (Myhre 2015; Sjøvold 1944). The 33 inhumation boat graves from Vestfold, exclusive of the Kaupang cemetery, demonstrates the richness of the material (Bill and Rødsrud 2013; Gjerpe 2005; Gollwitzer 2012; McGraw 2022;

Müller-Wille 1970; Ulriksen 1999). Further, a large number of graves with swords – possibly numbering ca. 200 in 1980 – illustrates the large number of well-equipped graves in Vestfold (Hernæs 1985).

All in all, the three ship burials, the large cemeteries, Kaupang and Heimdalsjordet do not fit within current hierarchical models, and Oseberg is often omitted. Egon Wamers included Oseberg in a model of Danish rulership, but omitted Kaupang and other "elite places", while Unn Pedersen and Marianne Moen among others have pointed out that there is a powerful person in the Oseberg burial but have so far not developed a model that explains the other monumental burials in Vestfold or Kaupang and Heimdalsjordet. I also find the large quantity of second-tier graves and the few "humble" graves hard to explain withing the existing hierarchical models. On the other hand, this fits quite well with the inverted pear-shaped model, where leadership is unstable, and the lowest classes are the smallest.

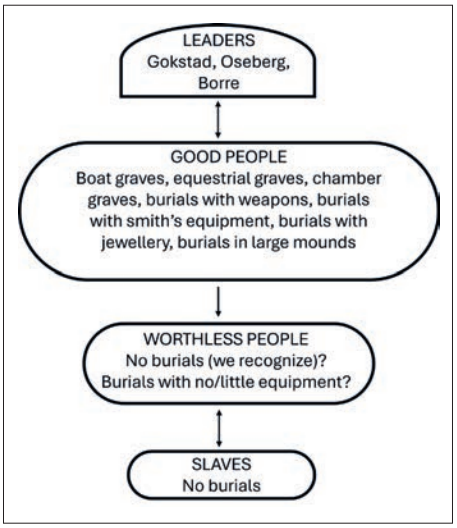

Figure 2. Viking Age burials related to Suttles' (1958) inverted pear-shaped society-model.

Conclusion

I have argued that anarchist theory and a model inspired by social anthropology studies of stateless societies contributes to explaining why Norway was united into one kingdom relatively late, despite the (claimed) presence of many prerequisites for state formation from the Roman Period onwards. I have emphasized that ideological resistance rooted in both identity politics, the reluctance to subordinate oneself, distribution politics, the reluctance to give up income, resulted in a social organization that resisted state formation. The inverted pear-shaped model clearly deviates from the societal pyramid, where a small minority is supported by a broader base. The *Good people* constitute the majority, who compete to be leaders. The *Good people* of the Viking Age are represented by the many rich graves, while those who won the competition and became *Leaders* are buried in the very rich graves – for example the Oseberg ship burial. A power distribution which makes the accumulation of wealth and power difficult, is central to the model. Consequently, stable concentrations of power that expand and eventually form a kingdom were hard to establish and maintain. Contrary to the pyramid-shaped elite-hierarchy models, and in line with case studies of the Oseberg burial, the inverted pear-shaped model allows the Oseberg ship burial to be acknowledged as a manifestation of power. Further, it explains why there are so many rich burials – they do not represent an upper class or a fixed level in a hierarchical organisation, but the general populace. It also explains why there are several very rich graves and powerful centres in the small landscape of Vestfold, and how society's defence against the state prevented them from expanding. Moreover, it takes into consideration potential new evidence of very rich graves, if a so far unknown ship burial is excavated in Vestfold, it would strengthen rather than weaken the model. However, the defence against the state broke down when, among other things, a new ideology influenced by Christianity made submission socially accepted and the inheritance of land became common.

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Sustainable energy and archaeology

PERNILLE KRUSE

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The number of linear projects such as transmission lines, pipelines, and roads and cables within solar parks increases rapidly due to changing needs for sustainable energy and energy infrastructure. While the supervision of trenches is undoubtedly valuable, this type of archaeology also holds certain restraints, and the results are not necessarily comparable to systematically excavated sites. According to the current recommendations of the Danish Agency of Culture and Palaces, the solar parks need not be systematically examined, but it is argued here, that they pose an immanent threat to our cultural landscapes. Due to the increasing number of such projects, it is becoming increasingly urgent to address certain methodological problems and to increase the awareness of potential threats to the archaeological remains.

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Key words: Linear projects, trial trenches, solar parks, developer-funded archaeology

Introduction

The theme of the 74th International Sachsensymposion in Stavanger was "Technologies – Knowledges – Sustainability: Crafting Societies in the first millennium CE". The focus of this article is broadly speaking sustainability, however not related to the 1st millennium but to our present-day society. This article aims to address some of the consequences which sustainable energy has for archaeology in terms of methods, results, and research. The political wish to support the development towards sustainable energy has led to a large number of projects involving solar and wind energy, biofuels etc. The energy crisis resulting from the Russian-Ukrainian war has accelerated the process away from fossil fuel sources towards sustainable alternatives. Consequently, the Museum Sønderjylland, Denmark, has carried out an increasing number of projects involving in particular large-scale solar parks and underground power cables. In order to illustrate this process, I have drawn together the information from the projects involving sustainable energy which the Museum Sønderjylland has carried out between 2018 and 2023.

Figure 1. Map showing Denmark (without the island of Bornholm). The area covered by Museum Sønderjylland is marked with a red contour. Map by author.

Study area

The Museum Sønderjylland in southern Denmark is responsible for the protection of the cultural heritage and

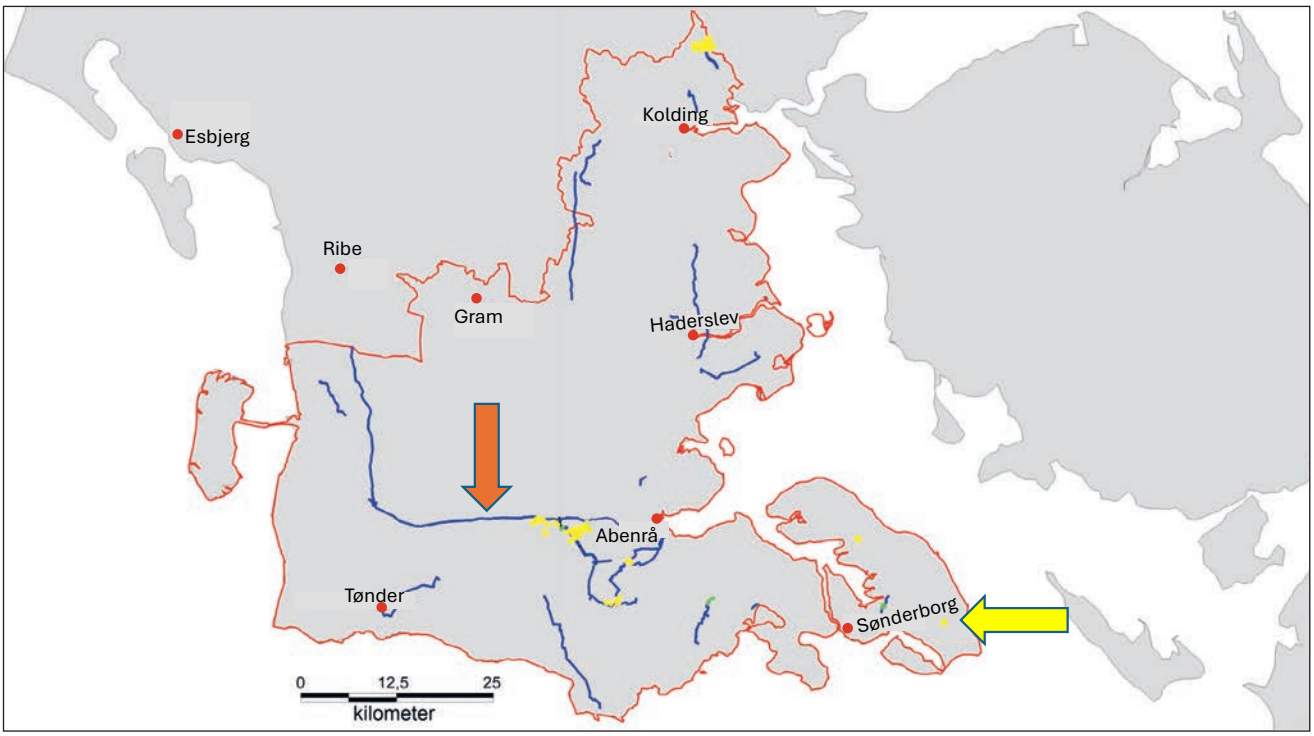

Figure 2. Map of southern Jutland showing the projects related to sustainable energy carried out between 2018 and 2023. Green = bio energy plants; turquoise = hydroenergy plants; yellow = solar parks; blue = transmission lines and pipelines. Sites discussed in more detail are highlighted with arrows: red arrow = Bredebro–Kassø, yellow arrow = Stevning Solcellepark. Map by author.

for carrying out the necessary archaeological excavations within the municipalities of Tønder, Sønderborg, Aabenraa, Haderslev, and Kolding, covering an area of 4041km^2 corresponding to approximately 10% of Denmark (Figure 1). Since 2002, all archaeological surveys and excavations which must be carried out in advance of construction or other development are developer-funded. This financial regulation has meant that more excavations have been carried out compared to the situation before 2002, and in this way the current Museum Legislation ensures that valuable knowledge about our common cultural heritage is professionally excavated and secured before the building or construction activities take place. Close to 100% of the archaeological excavations carried out by the Museum Sønderjylland are developer-funded rescue excavations (Ethelberg and Madsen 2012).

Bio energy and hydrogen plants

Bio energy or hydrogen plants are, archaeologically and methodologically speaking, straight forward to deal with. The areas within which they are constructed are examined systematically with north/south aligned trial trenches every 17.5m. The trenches are 2.5m wide, and extensions east or west of the trench are made when important features are found within the trench. In this way, the trial excavation covers ca. 20% of the project area.

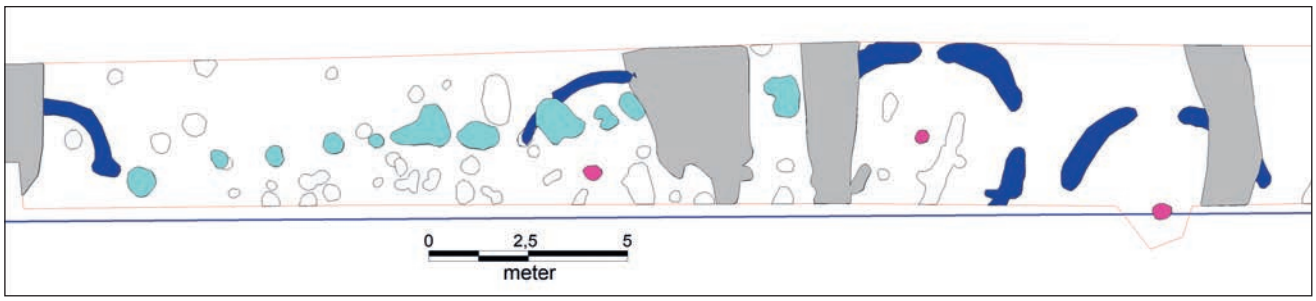

Figure 3. A section of the trial trench (red contour) between Bredebro and Kassø where it cut through a Pre-Roman Iron Age burial site with the urns (pink) placed within ring ditches (blue) and under small barrows, as well as large constructions dating to the Middle Ages, i.e. 13th–14th centuries AD (turquoise). The site was excavated as MSJA 96 Kassø. After Riis forthcoming a.

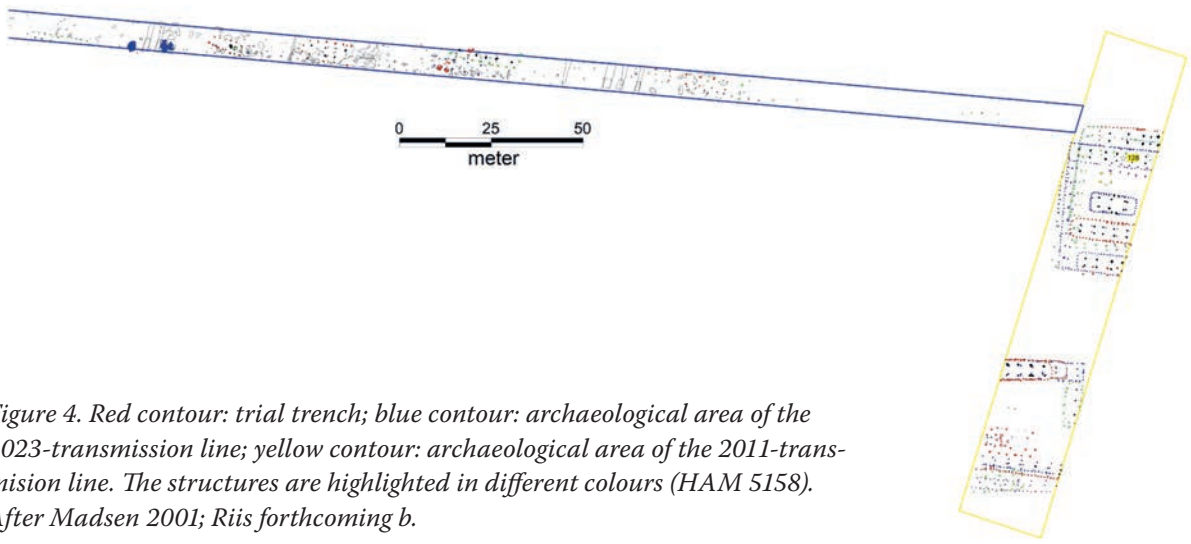

Figure 4. Red contour: trial trench; blue contour: archaeological area of the 2023-transmission line; yellow contour: archaeological area of the 2011-transmision line. The structures are highlighted in different colours (HAM 5158). After Madsen 2001; Riis forthcoming b.

According to the results of the trial excavation, archaeological areas are defined and excavated. Such projects are like any other typical developer-funded project; we can compare the results directly and use the same methods.

Linear projects

In terms of energy transmission lines and pipelines the situation is different (Figure 2, marked blue). Since 2018 and until the end of 2023, the Museum Sønderjylland has carried out trial excavations on thirty such projects, covering more than 145km. The recent transmission lines and pipelines are usually about 7m wide, although they may be considerably narrower or slightly wider.

The 28,6km long transmission line between Bredebro in the west and Kassø in the east has been selected to illustrate various aspects of archaeological excavations of linear projects (project no. 22/6722) (Figure 2, red arrow). The trial excavation and the subsequent excavations of archaeological sites were carried out during spring and summer 2023 (Flensborg 2023). In terms of linear projects, the trial excavation takes the form of a 2.5m wide trench dug lengthwise along the transmission line. When we find structures or other substantial features within the trial trench, we define an archaeological area according to the length within which the features have been identified, but the width is limited to the area which is directly affected by the construction work related to the transmission line.

The transmission line allowed us to excavate merely a thin slice of e.g. the pre-Roman urn field and a Medieval settlement (Moberg Riis forthcoming a) (Figure 3). This archaeological site is located close to an energy plant, and it is possible that other transmission lines or other companies will in time choose to realise projects in the general area. Such potential development projects would improve the scientific value of the excavations of the transmission line significantly. Due to the developer-funded nature of our excavation projects it is, however, largely due to coincidence whether or not it will be possible to excavate additional parts of the archaeological sites which we locate along the transmission lines.

Transmission lines run in all directions. The transmission line Bredebro–Kassø runs east/west (Figure 4, with a blue contour), and cuts a north/south running pipeline (Figure 4, with a yellow contour) from 2011, and thus not counted among the projects presented here. Figure 4 illustrates the difficulties related to such linear projects. In 2011, we were allowed to open up a 24m wide area because this was the width of the directly affected area of the north/south pipeline. The excavation revealed a large number of houses and fences in several phases. In 2023, however, only 7.5m were affected. A 7.5m wide trench is certainly enough to demonstrate an archaeological site, and it offers valuable overall information about the general settlement structure in the region. However, in cases such as this, where we are dealing with a complex site in several phases whose structures run in different directions, it is difficult to fully understand the character and date of the site, and to assess which structures belong to which phases. We will hardly get any complete constructions within the project area, and without complete constructions the typological date of the structures remains difficult.

The Agency for Culture and Palaces in Denmark publishes strategies and recommendations for excavations related to developer-funded projects. C14-analyses are costly and need to be justifiable. The analyses of the chronological and typological development of buildings

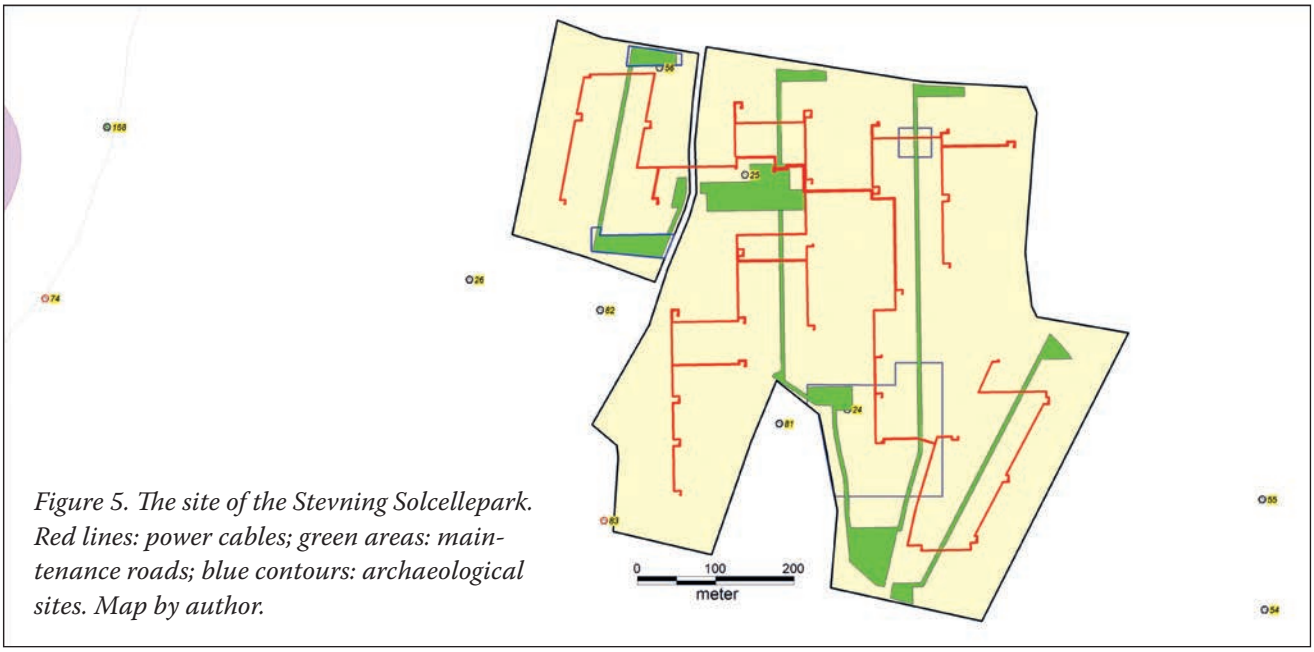

Figure 5. The site of the Stevning Solcellepark. Red lines: power cables; green areas: maintenance roads; blue contours: archaeological sites. Map by author.

on a regional and national scale depend on fully excavated and well-preserved structures. Such typological analyses are complemented by C14-dates in order to strengthen and refine our understanding of the typological development of buildings. This means, that we in general date only fully or largely fully excavated structures in order to get the scientifically best and most valid results. If only a comparatively small section of a building is uncovered by the trench, how sure can we be of the typology of the particular building? From sites such as these we will not be able to carry out comprehensive macro-fossil analyses or other analyses aiming at the functional use of the building because the complete structures have not been excavated.

Developer-funded archaeology implies that excavations take place in areas which are of relevance to modern day society. The distribution of known archaeological sites reflects past activities, but very much also present activities. Transmission lines and pipelines, however, may run through areas which are otherwise not developed and so largely unknown to us, archaeologically speaking. This is one of the great advantages of linear projects – they allow us a cut through different landscape types and grant us glimpses of otherwise unknown areas/activities. Once again, the transmission line between Bredebro and Kassø may serve as an example (Figure 2). One new site is located on the only slightly elevated and dry area in the middle of what is otherwise characterised by marshes and meadows. Here we have found a small section of a site (MSJA 86 Hvidhøjgård Vest; Flensborg forthcoming a). Parts of two to three structures were identified within the trench.

One of the structures is aligned NNW/SSE and is of considerable size, being ca. 7.5m wide and at least 46m long. Typologically, we dated the structure to the Late Germanic Iron Age, but C14-analyses appear to place this site in the Viking Period (Fensborg forthcoming a). We had no knowledge of this site, no metal detector finds or other indications of activities from this period. In this way the excavation granted us a glimpse of an arguably very interesting site.

Another example of a small-scale excavation with an excellent result is a site located ca. 300m south of the village of Korup (MSJA 88 Korup; Flensborg forthcoming b). Here a one aisled building was excavated, dated typologically to the early Medieval Period, 11th–12th centuries. It is interpreted as the predecessor of the existing village of Korup.

Solar parks

Between 2018 and 2023, seven photovoltaic power sites have been erected within Museum Sønderjylland's area (Figure 2, marked yellow). They range in size between 36ha and 406ha. In total they cover an area of 952ha. The Museum Sønderjylland has only experienced projects involving simple metal frame constructions mounted on the ground (see below), and the following discussion of implications relates to this type only. The more complex moveable systems which track the sun have so far not been erected and are not considered in this article. According to Denmark's Agency of Culture and Palaces, museums are supposed to carry out trial excavations of maintenance roads, areas of power stations etc. where the plough soil is stripped off. Large

areas with photovoltaic panels are erected between the maintenance roads (Figure 7).

The areas where the actual photovoltaic panels are erected are per definition not disturbed by the metal frames onto which the solar panels are fastened. The implication is, that the large solar parks are excavated very extensively. The solar park of Stevning on the island of Als (HAM 6419 Stevning Solceller; Moberg Riis forthcoming c) has been chosen to illustrate this situation (Figure 2, yellow arrow). The solar park covers an area of ca. 36ha (Figure 5). The green areas are 5m wide maintenance roads and areas related to the maintenance and storage of material. We examined the green areas by digging 2.5m wide trenches along the roads, and 2.5m wide trenches every 17.5m across the larger areas. The red lines represent 50cm wide cable lines. This solar park was one of the first parks which we examined, and we have subsequently evaluated the method and are in general not overseeing the construction work related to the narrow cable lines as closely as we did in this case. One recent exception to this general rule is a future project which is expected to be realised during 2025 and 2026 (and thus not included among the sites in the statistics of this article). This 100ha large solar park near Nagbøl, Kolding Kommune, is situated in an area which in 2004 was defined as an area with an exceptional archaeological heritage of international importance (*Kulturarvsareal Dollerup*, sb. 82, Skanderup sogn) by the Agency of Culture and Palaces. Such zoning areas were defined in order to protect the archaeological heritage by creating archaeological reserves – a result of the Malta Convention from 1992. In practice, building activities are still allowed to be carried out within these archaeological reserves. At the most, the archaeological reserves act as a warning to the developer, but there are no additional restrictions or responsibilities related to the development within such areas. In order to honour the status of the Dollerup area, the Museum Sønderjylland would – if the project is realised – want to supervise the construction work related to the relatively narrow cable lines as well as the maintenance roads etc. (see below, discussion). The Agency of Culture and Palaces supports this argument, but it remains unclear whether the developer accepts these terms.

The trial excavation at Stevning solar park resulted in four archaeological areas (Figure 5, blue contours). One example is a Bronze Age settlement in the northwest corner of the site. We excavated two buildings dating to Period V of which one is exceptionally large, measuring approximately 35m x 7.2m, i.e. 252m^2 (Riis forthcoming c). Both buildings contained a wide variety of different kinds of grain, such as emmer wheat, einkorn wheat, and durum wheat, hulled and hulless barley. Hulled barley is particularly unusual as its occurrence in Jutland is not widespread until around the birth of Christ (Gregersen 2023). It is unusual for this period to find this wide a variety within the same site. The most unusual element,

Figure 6. C-shaped metal posts onto which the solar panels will be fastened. Photo: Niclas Horn, Better Energy.

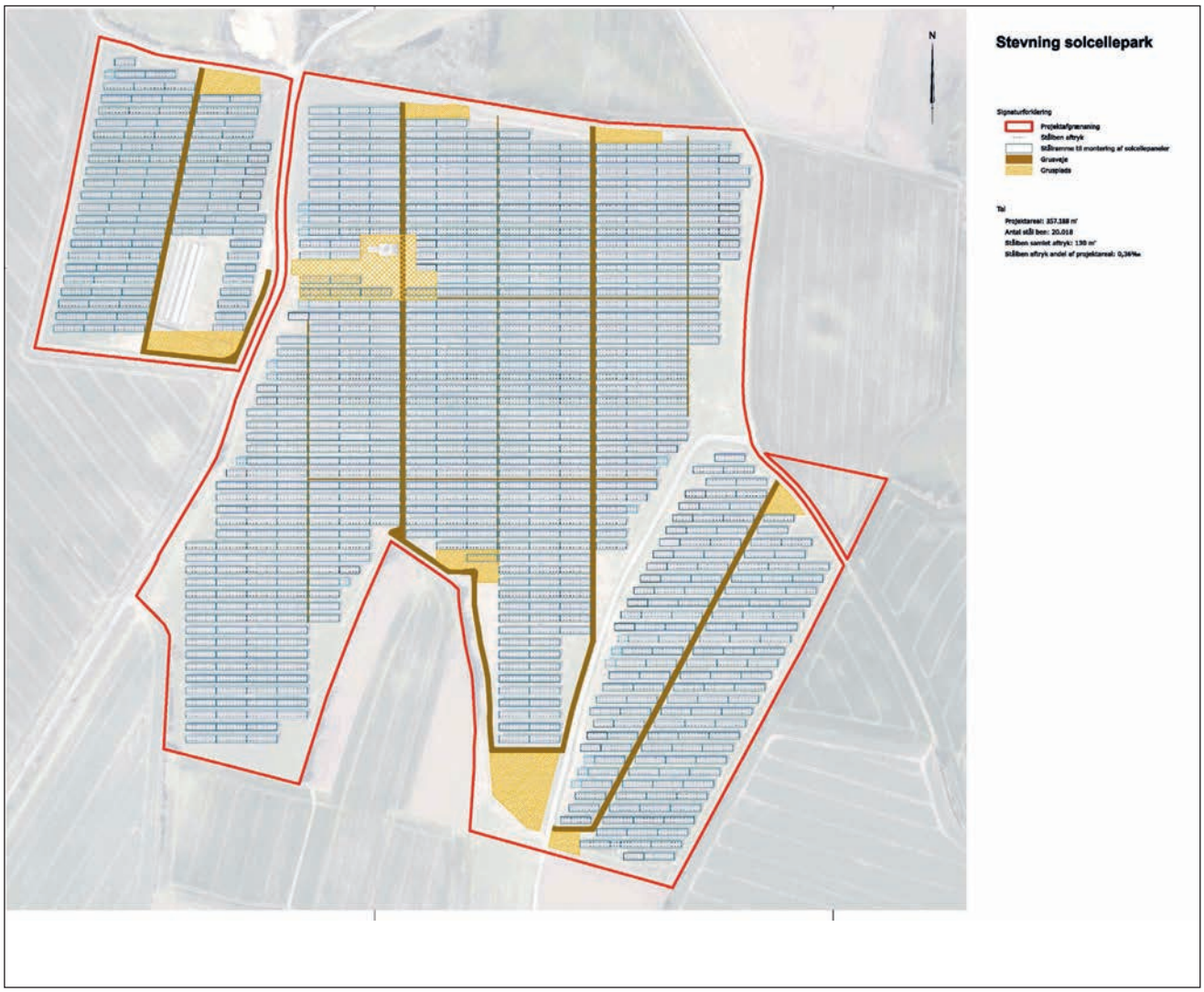

Figure 7. Plan of the Stevning Solcellepark with the erected photovoltaic panels. Graphics: Niclas Horn, Better Energy.

however, is the presence of millet in these samples. Millet is known from a very few Late Bronze Age sites in Denmark, and only very small quantities are known. This find may very well turn out to be the largest concentration of prehistoric millet in Denmark (Gregersen 2023).

The photovoltaic panels are fastened to metal frames with C-shaped posts which are rammed ca. 150cm into the ground in order to be able to withstand the pressure from wind (Figure 6). The inner measurements of the C-shaped posts are 0.0102m^2 and 0.0028m^2 (depending on their position). At the Stevning Solcellepark, the photovoltaic panels required 20.018 iron posts, corresponding to one post per 18m^2 and actively affecting 130m^2 in total of the 36ha large area (Niclas Horn, Better Energy, pers. comm.) (Figure 7). The implication is, that a solar park affects the cultural landscape to a much larger extent than the areas of the maintenance roads, power stations etc. would suggest. The initial erection of solar panels as it was the case in the Stevning example, may arguably not destroy settlement evidence – the character and interpretation of a settlement is not demolished by a C-shaped post per 18m^2. Archaeological remains such as a cremation burial would, on the other hand, be completely destroyed, and it would be impossible to reconstruct its contents had it been directly affected by the metal frames. In addition, there is the urgent problem of the future development of the solar parks; this question is addressed below.

Discussion

The linear projects, including the solar parks, are in our experience much more time consuming than "normal" developer-funded projects. A very close communication with developers, contractors and sub-contractors is required in order to secure a smooth process where all parties can keep their deadlines and stay within their budgets. When we excavate only a narrow slice of an archaeological site and a very small percentage of the

affected area, we not only have the problem of understanding and dating "half" houses (see above). We are also challenged considering the interpretation of the type of site we are dealing with. Is it a small family burial site, or a small part of something larger? What type of settlement is it? A small settlement site consisting perhaps of only one building? Or a large, well-structured settlement site in several phases indicating the social structures of society? Is it a site with special functions? A trading site? These are questions which we are able to discuss when we excavate large coherent areas, but which are very difficult to address when we deal with the linear projects. The few examples mentioned above clearly illustrate, however, that the linear projects are valuable: we can add points to our distribution map of archaeological sites, and this knowledge is valuable for future projects. In addition, the transmission lines and pipelines allow us to get a glimpse of the past in regions or landscapes which are not otherwise target of large-scale construction work. And occasionally, as it was the case at Stevning solar park on Als, we are lucky to be able to open up a comparatively large area, and not just a trial trench.

The question is not whether it is worth our while to supervise transmission lines etc., but rather how we deal with these projects. On "normal" developer-funded projects, our trial trenches are supposed to cover approximately 20% of the area. The solar parks, however, are examined very extensively and irregularly as we are only allowed access to the specific areas where the plough soil is removed (Figure 5). These "trial trenches" cover only a few percent of the total project area, which is not comparable to the systematically laid out north/south aligned trial trenches covering 20% of an area. Unfortunately, there is evidence from other Danish museums that contractors/subcontractors do not restrict the heavy traffic to the official maintenance roads which have been cleared by the archaeological trial trenches in advance of construction work. Instead, heavily loaded trucks drive across the site outside the maintenance roads during the construction phase, thus breaking through the top soil and affecting, in fact destroying, the underlying subsoil and the potential archaeological remains. In this way, the areas actually affected by the erection of photovoltaic panels are considerably larger than the maintenance roads, cable lines etc. would suggest. It is out of our hands what happens at the site during the construction phase after we have completed the trial trenches and/or excavations. The enormous scale of the solar parks makes it practically impossible for the museums to notice such constructional "short cuts", let alone prevent them from happening. Systematic trial trenches across the entire project area of the solar parks would make sure that our archaeological heritage were registered and excavated professionally before it is destroyed forever.

Another issue regarding the solar parks is that according to the developers they will remain in use for some 30 years. The implication is, that nothing else will take place there for the next few decades. There will be no heavy ploughing of the areas, for example, and in that way the area is preserved and there will be no erosion of the archaeological remains during – supposedly – the next 30 years. In the case of the simple constructions of metal frames pressed into the ground, the archaeological remains are arguably not threatened significantly (as discussed above). In the recently revised recommendations from the Agency of Culture and Palaces from 2024, such constructions are not considered to pose a threat to common types of archaeological remains such as settlements. The revised recommendations do, however, acknowledge that less robust remains may be threatened. In areas where archaeological sites or vulnerable archaeological remains are known or presumed it will – according to the revised recommendations – be possible to suggest systematic trial trenches. This is an improvement compared to the previous regulations, but in the concrete example of Nagbøl, the existence of a defined area of archaeological heritage of international importance (as discussed above) was not considered important or delicate enough to qualify for systematic trial trenches of the project area.

The recommendations take into account only the initial erection of photovoltaic panels. A neighbouring museum has experienced that misplaced panels were dug up during the construction phase, resulting in large craters (Esben Klinker Hansen, Vejlemuseerne, pers. comm.). What happens in e.g. 30 years when the solar parks area abandoned, or the panels need to be replaced? We have as yet no knowledge of this part of the process. Will the posts be pulled out gently, leaving thousands of holes in the ground? Or will they be dug up resulting in large craters? Even if the 1st generation C-shaped posts each only affects a small area, what will the area look like after the 2nd, 3rd or more generations? There is an immanent danger that the solar parks will effectively erode entire cultural landscapes.

Conclusions

The Museum Sønderjylland has been dealing with linear projects for decades, and there is no doubt that linear projects, whether resulting from large-scale transmission lines across the country or from comparatively small-scale renewals of pipelines within medieval town centres are highly valuable and bring about information about

our common past, which would otherwise have been lost. The scope of this article is certainly not to question whether the archaeological supervision of such projects is worthwhile – Museum Sønderjylland successfully carries out such projects on a daily basis, and has been for decades. Instead, the intention of this article is to address certain methodological problems and to increase the awareness of potential threats to the archaeological remains. Needless to say, the Museum Sønderjylland is not the only archaeological museum in Denmark dealing with linear projects and large-scale solar parks. Verbal communication with colleagues from other Danish museums has revealed an increasing frustration when it comes to the solar parks in particular. Our neighbours and colleagues in Schleswig-Holstein, Germany, are following comparable principles and are experiencing similar problems (Stephanie Klooss, Archäologisches Landesamt Schleswig-Holstein, pers. comm.). While we have been dealing with linear projects for decades, there is no doubt that the number of such projects increases rapidly due to changing needs for sustainable energy and energy infrastructure. Consequently, the methodological issues addressed here are becoming increasingly urgent to deal with.

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Crafted worlds, imagined pasts: fantasy, gaming and archaeology

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Since the 1970s, fantasy gaming has grown from a small niche hobby to a global multi-billion-dollar industry. Whether played around a tabletop or online, millions of people, including many archaeologists, immerse themselves in imagined worlds or pasts during their spare time. There is no doubt such games provide much-needed enjoyment and escapism for their players. But do some of them also hold the potential to yield real insights into past societies, and can they help us get just a little closer to the lived experiences of our ancestors and the societies and worlds they inhabited? The modern gaming hobby and industry may be a very recent phenomenon, but the human imagination, and mythologies and cosmologies that include the fantastic, are ancient aspects of the human condition; does the fantasy genre, and roleplaying games specifically, have the potential to provide genuine insights into the past? This brief paper begins to explore some of these questions. It considers both the value of gaming for those already engaged in the serious study of the past, as well as the potential that the hobby offers as a gateway to an interest in archaeology and history for the millions of gamers worldwide.

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Introduction

Human beings have played games for millennia, and the development and playing of a myriad of games, be it for leisure, mental exercise, escapism, or as a way of modelling the world (whether real or imagined), can be viewed as a widespread, although not universal, aspect of human behaviour over space and time (see, for example, Hall and Forsyth 2011, 1326 and Parlett 1999). There is abundant archaeological evidence for the existence of gaming, and for the fantastic products of the human imagination, going back into antiquity, with competitive board games probably originating as an elite past time over 5000 years ago (Hall and Forsyth 2011, 1326; Murray 1951, 226–38). But what, if anything, have the modern gaming hobby/industry got to offer to those engaged in the serious study of the human past, and to archaeologists specifically? This paper explores that question, with a particular focus on tabletop roleplaying games (RPGs). It looks first at gaming today, before considering how the games hobby, and tabletop RPGs specifically, can act as a gateway to archaeology and a deep engagement with the past.

A further, linked, theme of the paper is "fantasy", which is a very popular genre within the modern gaming industry, especially in relation to roleplaying games. Like gaming, the fantastic is an ancient concept; the human mind has long had the capacity to range beyond the confines of tangible and apparent reality and can conjure and craft elaborate worlds of the imagination, whether they be the cosmologies and mythologies of antiquity, or the invented worlds of modern Fantasy fiction by authors such as George R.R. Martin, Clive S. Lewis or John Ronald R. Tolkien (and countless others). This paper also explores the potential of imagined fantasy settings ("crafted worlds") to provide useful insights into the cultures and societies of real past societies, through the prism of roleplaying games set in those worlds.

Gaming today

Gaming, having evolved from its origins in Antiquity, is today a multi-billion-dollar sector of the global economy. Games Workshop, founded in 1975 in a flat in Shepherd's Bush, London, is now regarded as one of Britain's most

successful companies; in January 2025 it entered the FTSE 100 Index (the list of 100 most highly capitalised blue chips listed on the London Stock Exchange) and its Chief Executive Officer was named by the Sunday Times as their business person of the year.[1] Such success is based on the widespread popular appeal of gaming. This popularity is reflected in the figures for attendance at gaming-related events such as games fairs and conventions. In August 2024, 335,000 attendees from 122 countries came to the trade fair halls in Cologne to attend *GamesCom*, one of the largest video game events in the world.[2] Later the same month, over 71,000 unique attendees made their way through the doors of the Indiana Convention Center (ICC) and Lucas Oil Stadium for *Gen Con Indy*, the self-styled "Best Four Days in Gaming", in Indianapolis in the United States.[3] Gaming, in this case, mostly meant board-games and role-playing games of the so-called pen and paper variety. And in October, the largest board game event of the year, *Spiel in Essen*, Germany, drew in 204,000 attendees from over 80 countries to seven trade halls that covered a densely crowded 62,500 square meters.[4]

Clearly, there is a considerable market for gaming, and the gaming hobby at large has long since transcended boundaries of age, maturity levels, social backgrounds, nationality, and identity. According to a study conducted by Market Analysts DFC Intelligence in 2020, around 40% of the world population were playing video games (although, admittedly, mass adoption does not necessarily equate to a hallmark of quality).[5]

The video game market is often one of the most talked about whenever the media discuss the topic of gaming, and it is, perhaps, quite likely the largest part of the gaming industry in terms of economic value and overall participation. Contributing factors to this include ease of access, as most people today possesses a device that allows them to play games, even if it is only their mobile phone. Another factor is the ease of play – not so much how easy any individual video game may be, but how easy it is to fit into the average life rhythm. They do not necessarily require other people to play with, the length of an individual play session is usually flexible, and these days often such games are more like a movie where the actions of the spectator/player affect the outcome of the story.

Whilst playing video games can sometimes be regarded (especially by family members of the gamer) as a somewhat solitary or even anti-social activity, online multiplayer games certainly do have the capacity for a strong social dimension, something movingly and powerfully illustrated in the Norwegian documentary "The Remarkable Life of Ibelin" (2024). More traditional "in-person" forms of multiplayer gaming, such as tabletop board games and the aforementioned "pen and paper" role-playing games, certainly entail a social experience, one perhaps more directly comparable to that enjoyed by gamers in the past. This social aspect of gaming is important and can be (and for many people is) a primary appeal of the hobby. But the range and diversity of games available to modern gamers is greater than at any time in the past; things have come a long way since the *Royal Game of Ur* (a two-player strategy race board game played in Mesopotamia as early as the third millennium BC: see Finkel 2007a).

Gaming the past

In a peculiar intersection of interests, many people who enjoy games also enjoy contemplating various aspects of history and archaeology. This is evident in the popularity of such video game titles as the *Assassins Creed* franchise, a game where the player takes on the role of a member of the shadowy Brotherhood of Assassins, fighting the equally shadowy secret society of the Knights Templar in a variety of historically noteworthy settings. While the accuracy of the depictions of the past are always up for scrutiny and debate, the visual spectacle provided by these games is undeniable and a feature constantly praised – to the point where some of the games of the series created a desire by many players just to wander around these re-imagined historic sites – without having to engage in any skullduggery. Indeed, one of the author's daughters, on a family visit to Florence, was able to navigate the historic heart of the city due to familiarity gained whilst playing *Assassins Creed II*, set during the Italian Renaissance.

The 12th and most recently concluded game in the series, *Assassins Creed Valhalla*, set in Norway and Anglo-Saxon England during the late ninth century AD, managed to generate one billion USD in customer revenue and had the most successful launch of the series, with some 1.8 million players reported by the publisher, Ubisoft.[6] This also reflects the enduring appeal of the Viking Age in popular culture.

The intersection between archaeology and video games is sufficiently significant to have spawned the term "archaeogaming"; a broad archaeological framework which encompasses the study of archaeology in and of video games, and the use of video games and/or virtual and augmented reality for archaeological purposes (see Reinhard 2018).

As a broad framework, there seems little reason to restrict the concept of archaeogaming to video games. Historical themes are also incredibly popular in tabletop board games. *Board Game Geek*, the largest online database of Board Games, lists over 5000 games under

Figure 1. A demonstration copy of Bretwalda, a forthcoming boardgame by PHALANX Image: Andrew Richardson.

their "medieval" tag alone, here defined as "themes or storylines set in Europe or Asia, between the fifth century (476, the fall of the Western Roman Empire) and the fifteenth century (1492, the beginnings of European overseas colonization)".[7]

Late Antique/Early Medieval northern Europe features as the setting for many games. A casual stroll around *UK Games Expo*, in Birmingham in early June 2023, revealed a wide range of titles, including games featuring Beowulf, Ragnarok, or set in Anglo-Saxon England. And a forthcoming boardgame, *Bretwalda*, by the games company PHALANX, represents the struggle for control of Britian between the warring Anglo-Saxon kingdoms (Figure 1).

Clearly there is a considerable intersection between people who enjoy games and people who enjoy historic themes. Perhaps it is based on a common ground of reading or enjoying thought-intensive hobbies in general. In the authors' own experience, gaming can certainly draw players into a deeper interest in, and engagement with, the past. This works especially well with young gamers, including teenagers, an age group sometimes regarded as challenging to engage with archaeology or history. One answer to the question "how do we engage teenagers about the past?" is definitely "get them gaming".

Gaming can also play a very direct role in setting someone on the path to a career in archaeology, as happened in the case of one of the authors (Richardson) via a game of *Call of Cthulhu*. A game of *Call of Cthulhu* (see below) is a role-playing game (RPG) replete with references to the ancient past, in which archaeologists frequently appear as characters. But what is a role-playing game?

Role-playing games

There are a great many ways to explain the essence of what a tabletop role-playing game (sometimes referred to as a "pen and paper" game) is, but fundamentally they all boil

down to a few common features. They are usually played by a group of around four to six people with one of them taking on the role of the Game Master (which depending on the game system being played might alternatively be called the Dungeon Master, Keeper et cetera). The players take on the roles of individual characters with their own special skillsets and backgrounds, while the Game Master presents these characters with the story, setting and auxiliary characters (termed "non-player characters", or NPCs) that the characters get involved in and interact with. Occasionally, when a situation could go one way or the other, various polyhedral dice are rolled to determine the outcome of such things as persuasion attempts, athletic feats or combat. When well-played and game mastered, RPGs can offer a truly immersive experience, which to some extent offers the opportunity to become someone else for a while, in a different setting, in a similar way to an actor playing a part, but without a script.

Today, role-playing games come in all shapes and flavours. Any genre of film or book has probably more than one corresponding role-playing game that could be used to generate stories in these settings. Historical settings are a feature of many role-playing games, and in some archaeologists, historians and researchers feature prominently, as they often do in other forms of media. Archaeologist is an available occupation for investigative roleplaying games such as Chaosium's *Call of Cthulhu*, an RPG where player characters investigate seemingly innocent occurrences, only to find themselves confronted with strange tomes, maddening artefacts, shadowy cults and eventually, an unnameable eldritch horror beyond human comprehension from the pages of Howard Phillips Lovecraft's fiction.

An important aspect of role-playing games is the way that both the players and the Game Masters begin to interact with settings, that are, in the original sense of the word, fantastic. When no clear description of the world and the mechanisms it operates by exist, these gaps have to be filled by the players and their Game Master. Questions arise, such as "can a 'City of Thieves' function from an economic point of view?", or "what does a population of exclusively underground-dwelling, intelligent beings eat, wear or trade with?". And, it is just in the nature of the players of the game to attempt to answer these questions, even if they are of no material consequence to the real world.

Thus, the gaming hobby, and role-playing games in particular, can and do act as a gateway to a deeper engagement with the past, and with archaeology specifically, in the same way that public archaeology, and activities such as living history re-enactment, can contribute to widespread popular engagement with the past. This should be regarded as a good thing. There is a contrary view, sometimes expressed by teachers or parents, that gaming wastes time that would be better spent on studies or work. But, at least in moderation, gaming can be good for the mind, aiding memory, cognition, and mental health (see for example Palaus et al. 2017), and thus can support work and study, rather than undermine them.

But can gaming do more than that, and provide genuine insights into the past, or allow gamers, through an immersive experience, to better empathise with and understand their ancestors? That is perhaps a more controversial matter, and one which will be considered further below. Before that, the potential value of invented fantasy worlds is discussed. Have these often complex and rich works of the imagination anything to offer to those interested in the serious study of our own past?

Crafted worlds

The fantastic appears to have played a part in the human consciousness for millennia; for instance, prehistoric rock art from Indonesia dated to ca. 44.000 BP appears to show a hunting scene where the hunters are depicted as therianthropes (part-human, part animal beings), providing evidence of an ability by that date to envisage imaginary creatures (Aubert et al. 2019). And the creation of any kind of fiction, whether involving an element of the fantastic or not, and whether transmitted through oral storytelling, poetry or song, or through the written word, requires an act of imagination and some level of world building. The same holds true for the mythological and cosmological frameworks of past societies (and, arguably, of all religions). The construction of *entire* imaginary worlds (rather than those essentially rooted in, or directly related to, various versions or parts of Earth), purposely fictitious and often highly detailed, with their own internal logic and consistency, is perhaps a more recent phenomenon, and one especially associated with genres such as Fantasy and Science Fiction. The exact beginnings of the modern Fantasy genre are a major subject beyond the scope of this paper. However, the first works of fiction set in an entirely invented world are said to be those by the English socialist writer William Morris (1834–1896).[8] But it was with Tolkien's works that the modern Fantasy genre really came of age[9] and began to become the multi-billion-dollar cultural phenomenon that it now is. Tolkien's Middle Earth still stands as one of the most detailed and fully realised of all invented worlds. It is worth remembering in this context that Tolkien was also the Rawlinson and Bosworth Professor of Anglo-Saxon at Oxford, and the influence of the Anglo-Saxon, Scandinavian and

Figure 2. A mythic representation of the world of Glorantha. Artwork by Eric Vanel, © Moon Design Publications.

Germanic mythologies of the first millennium AD on Tolkien's Middle Earth are, of course, widely appreciated (see, for example, Bates 2002).

Many fantasy worlds have been created since, a few of which rival Tolkien's Middle Earth in their cultural (if not linguistic) depth and richness. And many of these have become settings for fantasy gaming. One, *Glorantha*, was created from the start from an anthropological and mythological perspective, and this is a good place to explore the question of whether fantasy worlds have anything useful to teach us about archaeological enquiry or can provide useful and/or immersive insights into the experience of people in antiquity.

In 1966, a mythology enthusiast from California sat down to write an account of some refugees, fleeing a place named Seshnela as it was being destroyed. Neither the refugees nor the land was real – it was just a case that the notion of creating your own mythology was so fascinating to this author, that he had been experimenting with the subject matter for a while. This author was called

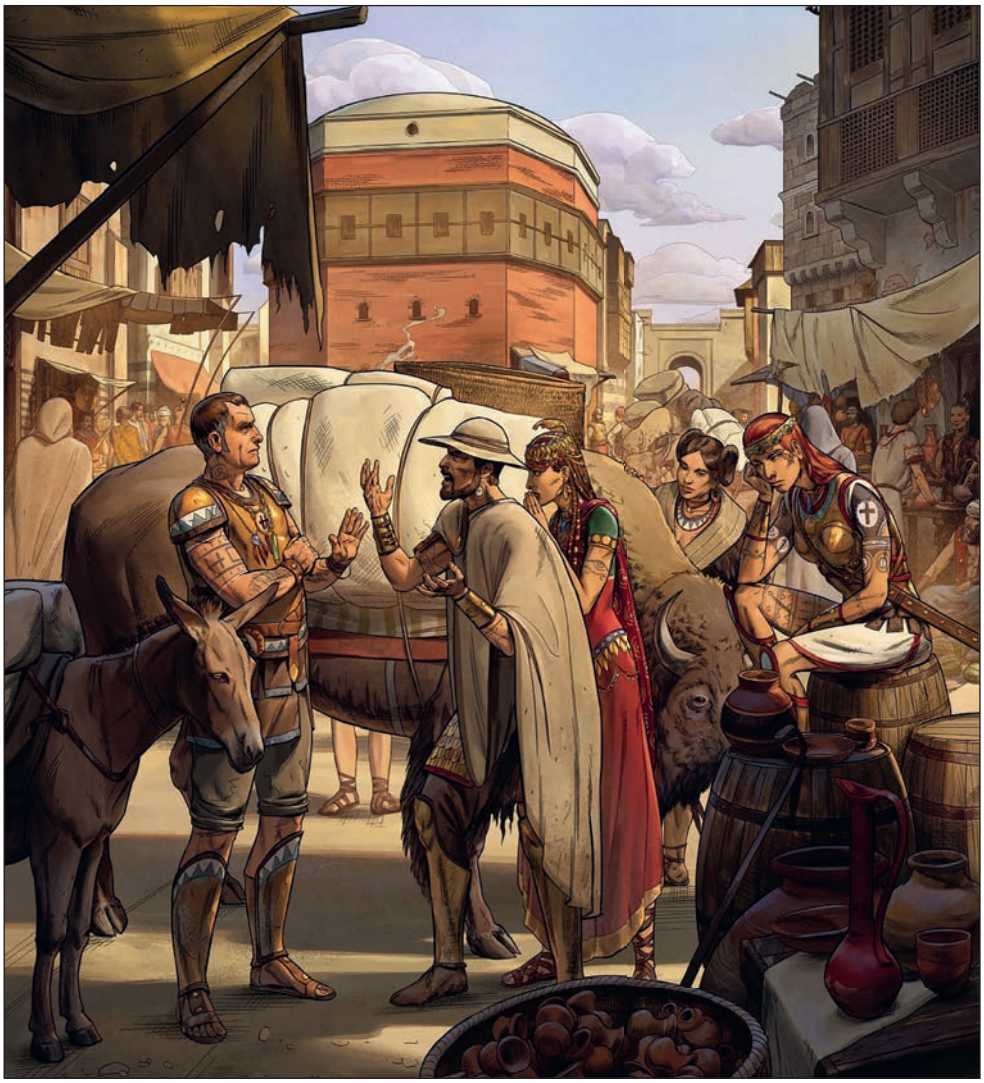

Figure 3. A street scene in the Gloranthan city of New Pavis. Artwork by Andrey Fetisov, © Moon Design Publications.

Greg Stafford and not even a decade later, in 1975, he was self-publishing a complex strategic wargame called *White Bear and Red Moon*, in which the players took on the roles of various heroes and armies, locked in an epic, world-changing battle.[10] The world in question was called Glorantha, a lozenge-shaped planet covered by a dome holding the sky and another below, holding the underworld. It was full of magic, there were gods, and a lot of strange and unusual lifeforms.

Coincidentally, only a year before *White Bear and Red Moon* was published, a man from Chicago was picking up the first print run of the game he had managed to scrape together the funding produce. This man was Gary Gygax and the game was called *Dungeons & Dragons*, often abbreviated as *D&D* (originally produced by TSR, D&D is today owned and produced by Wizards of the Coast, a subsidiary of Hasbro). It was the first role-playing game, and it continues to be the best-selling one to this day. As chance would have it, a friend of Stafford met Gygax at the printers and spontaneously bought the first copy of the game off him to send to his friend, who he knew was also working on a game at the same time. And so, Greg Stafford came to own the first copy of *Dungeons & Dragons* ever sold.

By 1978, Greg Stafford and his friends were running a game company called *The Chaosium* (today usually known simply as Chaosium) and they had developed their own roleplaying game based around Stafford's Glorantha. They named the game *RuneQuest* and, much like *Dungeons & Dragons*, it is still published and played today.

Glorantha is a mythic world, in which the sky is a dome, through which Yelm, the Sun god and Emperor of the Universe, ascends every morning before returning again every evening to the shadows of the underworld. Runes have tremendous power in Glorantha, and all beings, whether mortal or immortal, are bound to them and influenced by them. The Gloranthan cosmos (Figure 2) is inspired by, yet different from, the cosmologies and world views of real past cultures.

Over the years since Greg Stafford created Glorantha, more and more people have contributed to its development, bringing in ideas that were adopted (and sometimes later discarded again), to the point where Glorantha has developed into a highly detailed world, with its own self-contained cultural and mythological heritage that rivals that of any imagined world, and sometimes it seems almost that of the real world. This has been a great communal exercise over the course of six decades and is ongoing. Today, Glorantha stands as one of the most fully developed fantasy worlds, one that has drawn heavily on archaeological and anthropological sources to give it unparalleled depth (Figure 3). There is a huge body of published material on Glorantha, both printed and online, but for a detailed overview see in particular Stafford et al. 2014 and Stafford and Richard 2018.

Figure 4. Some of the animal tribes of Prax, as depicted in the board game Khan of Khans Artwork by Ian O'Toole, © Moon Design Publications.

To illustrate the depth of the Gloranthan cultural setting, the next section takes a focussed look at the inhabitants of Prax.

Case study: the tribes of Prax

Prax is a dry, arid land, similar to the Eurasian steppe or North American chapparal. According to the mythology of the land, the beings living there were dying because the area had become inhospitable to life. The god Waha came to the land, and one of the deeds he performed was arranging the so-called Survival Covenant – a system by which half the beings would live off what plants Eiritha, mother of Waha and also a goddess, could provide from her hiding place in the earth. The other inhabitants would live off the bodies of the former. Since all the beings agreed that this would be necessary to ensure everyone's survival, lots were drawn over several contests. This resulted in animals such as the bison, ostrich, llama, bolo lizard, rhinoceros, impala and sable antelope feeding on plant life, while the humans, who won most of the contests, taking their place as the herders and consumers of the animals. However, the Morokanth, bipedal tapir-like creatures, won their contest, and consequently earned the right to herd and eat humans (a fact that resulted in both sides accusing the other of somehow cheating

during this contest). In practical terms, this mythological past means that the different peoples of Prax live divided into their own tribes, each keeping herds of the animal that is sacred to them (Figure 4).

This subsistence model also has important mythological implications. For instance, each tribe depicts Eiritha, the Praxian mother goddess, in the guise of their own tribal animal (see Figure 5). The same deity represented in different ways by different cultural groups is, of course, a model drawn from Earth's antiquity.

This mythological background has consequences for the material culture of these tribes. A nomadic people in a land of arid steppe, who derive their food primarily from bison, for instance, would eat a diet dominated by red meat and also perhaps milk and cheese-like products. Also, the bison would be their main source of materials for crafting – namely bones, fur and horn.

If one were to imagine what a small shrine dedicated by the Bison Riders to Eiritha might look like, it seems likely that bone, horn and fur would all feature, and that it would perhaps depict a goddess in the shape of a human female but with the head of a bison. The Ostrich Riders, on the other hand, would not have immediate access to milk, fur, horn or strong bones, but instead to eggs and feathers. A votive image of Eiritha made by the Ostrich Riders would therefore perhaps take on an entirely different form, perhaps as an image carefully pierced into a particularly large eggshell, with a halo of feathers stuck into the back shell to simulate the arrangement of feathers on an ostrich.

This sort of line of thought can be spun all the way through the other tribes, categorising them in terms of whether their herd animal have fur, or a leathery hide, whether they provide workable bone or not, and what their horn, if available, might be suitable for.

All these factors would also have implications regarding trade. All tribes rely on trade with each other and with caravans that pass across and through Prax. Some trade is also conducted at the oases in Prax (which are permanently inhabited by a separate culture group), and some aspects, such as tanning, might feasibly require a degree of outsourcing to crafters who are more sedentary than the nomadic tribes. In this way, the animal nomads would be able to acquire raw or worked materials provided by the other tribes, especially if the material provided cannot be substituted through anything that their own herd of beasts can provide. However, there is then the question of whether a Praxian of a certain tribe would object to using materials from a different herd beast when it came to items of religious importance, such as the altars discussed previously. It is, after all, the depiction of their sacred goddess through materials other than those that are sacred to their own tribe. On the other hand, as the mythology goes, the same goddess provided for the other tribes, a circumstance that is not disputed. So, would it matter or would there perhaps be a cultural taboo attached to it?

Of course, there is no right or wrong answer, because there is no objective truth in this case. Everything here – Glorantha, Prax, the Tribes, the gods Eiritha and Waha – are completely made up. So then why does it matter? A non-gamer archaeologist or historian might well answer "it doesn't". But then again, many non-archaeologists might also ask "why does it matter that we think about the lives of people in the past?" In both cases, similar intellectual drives and processes are at work. Whether dealing with an invented imaginary culture, or a past culture, simply asking the subjects is not an option. Thus, if curious about an aspect of a culture, whether real or imagined, one can draw on archaeological and anthropological methods, practice and theory. A key difference that must be acknowledged is that our understanding (however flawed or partial) of past real-world societies and cultures, is founded upon a basis of material evidence (or certainly should be); this is an essential aspect of archaeology. This is not really the case in a fictional or fantasy setting. However, well-constructed fictional/fantasy settings generally do have their own internal consistency and logic, and many (including gaming settings) have a widely accepted canonical version. Whilst these aspects may be far more flexible or elastic than in the real world, they are not generally completely so, especially in collaboratively constructed settings involving multiple authors and/or players. Thus, areas of disagreement about the interpretation or representation of aspects of a fantasy setting can generate intense debates, with protagonists citing "evidence" (such as earlier, sometimes contradictory, publications) that support their point of view. Such debates can often resemble, at least superficially, the evidence-based debates that take place between archaeologists or historians about the actual past.

Do debates about such matters in fictional or fantasy settings have any real meaning? In the case of the imaginary Tribes of Prax, perhaps not. However, for a professional artist commissioned to draw a depiction of how the Bison Riders worship for a game book, they are of very legitimate concern. For a player who has decided that his or her character would like to make a votive image of Eiritha according to the customs of the tribe their character belongs to, it might be a question asked but then waved through by the *Game Master*, as being a matter of little consequence beyond providing extra colour to the narrative. But many roleplaying gamers can be obsessive

about points of detail (especially when it comes to their characters!). Some, once having considered the question, will not be able to let go of it, and it will be researched at length, debated, and then, quite inevitably, be compared to real-life examples of cultures deemed to represent the best analogy to that in question.

Thus, very many gamers playing in imagined settings like Glorantha love visiting museums in search of comparative material. They will often share newly discovered archaeological finds reported on by the media with their friends and networks, often framing the conversation in terms of relevance to a particular aspect of a game or setting. This is because their minds, almost immediately in some cases, go beyond considerations of what these objects mean in terms of the world we live in, to how these objects would enhance their interpretation of their chosen fantasy setting. They view artefacts though a dual lens of genuine appreciation for their real-world, archaeological value, alongside a vision of the place and role of artefacts in the world of imagination.

Of course, whereas the archaeologist seeks insight into the past though interpretation of material culture, the gamer or game designer might try to deduct details of the material culture of the people in their setting from their own knowledge of the imaginary culture being portrayed. However, they will usually do this by analogy with real-world cultures. Thus, there can be little doubt that archaeology provides a rich resource for games designers and gamers.

Conclusion: Gaming is good for archaeology

What, then, are some of the benefits that can be drawn from gaming for those engaged in the serious study of the human past? Firstly, gaming, and tabletop roleplaying in particular, is an important and potentially easily achievable way of engaging a very large segment of the population about the past. An adventure set in a particular historic moment can, within a few hours, teach five or six students about the people involved, their times and the way they lived and generate an overall interest in the wider subject matter, when funding a Netflix series on the topic or making an *Assassins Creed*-style game is not economically feasible and educational textbooks can't quite seem to drive the message home. The immersive nature of roleplaying is the key here; lessons that are based on a lived experience become deeply embedded.

In addition, the gaming industry is experiencing something of a golden age in terms of artwork. Whereas in the 70s, gaming artwork was often highly derivative and painted by whoever was at hand and willing, these days many companies employ professional and highly talented artists who are specialised in working according to highly detailed briefings. The results are fantastically evocative depictions of people, their clothes, goods and surroundings, and also include incredibly detailed maps and vistas. This is very similar to the way that archaeological reconstruction art is commissioned and produced. Indeed, there is a great deal of overlap between the skill sets needed by artists working to visualise imagined, fantasy, settings and those of specialist archaeological reconstruction artists. Some artists do already work in both spheres, to the benefit of both the heritage and gaming sectors.

The vast popularity of the gaming hobby, with its strong online communities, also frequently means that game-related archaeological and historical topics are widely discussed by large numbers of gamers, who, almost like a computer running a simulation hundreds of times to generate a plausible outcome, can take a hypothetical event, and filter it through a simulation that accounts for the human experience.

This process can enhance their own understanding of the challenges involved in living in a certain society. However, it also enables others to see how certain situations or events may involve, especially when comparing the outcomes of multiple groups, grappling with the same set of circumstances. The information gathered from such informal discussions might not generate something of immediate scientific value – after all, people who live today have different sets of values and due to this, nobody is capable of accurately transferring themselves into the headspace of someone who lived nearly two millennia ago, even though thinking as their character is something that most gamers get quite skilled at over time. But it does perhaps make it easier to find the moments where there is a disconnect between the experience of present-day humans and people in the past, in situations where actions or societal norms from history may initially seem very alien to the modern population. Thus gaming, and historically engaged gaming communities, have the potential help to understand different modes of thought and how modern thinking influences how the past of humanity is viewed today.

Furthermore, for archaeologists, or anyone interested in the serious study of the past, it is contended that gaming does have the potential to provide insight into that past. This can be based on playing a well-designed game that attempts to represent a historic setting. Of course, the essential unknowability of the past, and the impossibility of any objectively "true" representation of it, remains a significant problem here. But that problem applies to

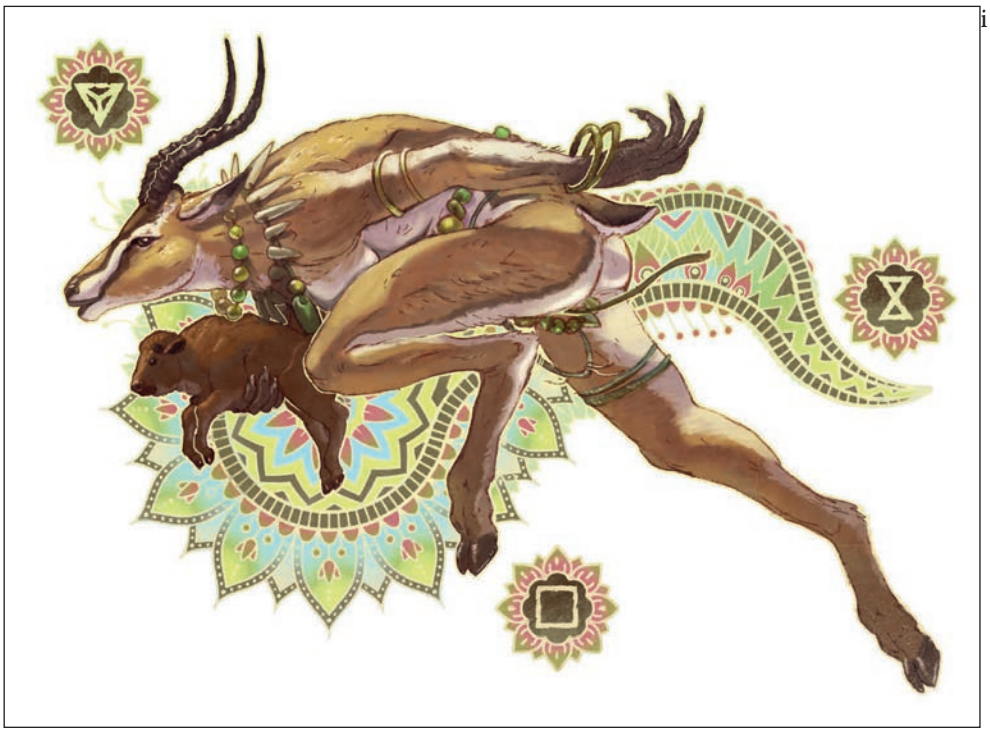

Figure 5. The goddess Eiritha as worshipped by the Impala people of Prax. Artwork by Loïc Muzy, © Moon Design Publications.

archaeology as much as to gaming. An archaeologist, historian, or gamer can try to "get inside" the head of a human in the sixth century AD (for instance), but they can certainly never actually do it. However, *trying* to get closer to that person's way of thinking and being, whilst acknowledging that it can never be wholly successful, remains a worthwhile effort; arguably, if this was not the case, there would be little point to archaeology. Pluralist approaches to attempting to engage with and understand the thinking of others, even those very different from ourselves, provide some basis for optimism in this respect (see for example Berlin 2016), other theoretical perspectives perhaps less so.

But what about games set in fantasy worlds such as Glorantha? Here the potential for useful insights into the past may not be so obvious. But it does exist. Roleplaying games are designed to provide an immersive experience, and their essence is that the player roleplays a character, getting inside their head, and their situation. There are many roleplaying games set in the historical past, including the Dark Ages of northern Europe. These do have merit, though potential errors and anachronisms (such as bales of straw in a mead hall) can jar for those with expertise in these settings. Partly for that reason, a world like Glorantha can appeal to archaeologists (and there is a long tradition of archaeologists being involved in writing or playing in Glorantha) more than historical settings. It provides a "safe space", free from any angst about historical accuracy. That doesn't mean it cannot provide genuine insights into past cultures. Just two examples include lustrating the effectiveness of gift-giving as a tool of political power, and, perhaps more fundamentally, the question of approaches to ritual behaviour. It is still possible to encounter archaeologists who seem to regard "ritual" as a separate and distinct form of behaviour from strictly functional behaviour and practices. Hence people will talk about having discovered a "ritual" site or deposit. In Glorantha, gods, spirits and magic are real and all-pervading. In that sense, it is close to the reality that many people in the past believed themselves to be inhabiting. In such a world, ritual and functional behaviour is inextricably interwound, whether cleaning the longhouse, preparing for a fertile harvest, or undertaking a cattle raid. The lived, immersive experience of inhabiting a magical and mythic reality, where ritual and functional behaviour are indivisible, has proven a most valuable insight that gaming, and gaming in Glorantha in particular, can provide.

In the end, it all comes down to a very simple observation: there is no reason why the archaeologist/historian and the gamer can't be friends, and there are many ways in which the gaming and heritage worlds intersect, usually to the benefit of each. But, if the reader is thinking that games, "fantasy" and imagined worlds like Glorantha are frivolous distractions from the study of the real past, then they would do well to remember that our ancestors inhabited a cosmos coloured, peopled and shaped by the human imagination; to understand them, one must understand that. Greg Stafford (1948–2018), creator of Glorantha, said it as well as anyone, and it seems appropriate to leave the last word to him:

> Fantasy is not so much a suspension of disbelief as it is an acceptance of our own unconsciousness. Fantasy is as old as man, beginning back in our animal history when someone had the first abstract thought. In our Western society, empirical data and rational thought have become the touchstones of experience. This is worse than cutting off half your body. The fantastic is easily half of the universe, whether you count galaxies and nucleotides or court a demon in a pentacle (Stafford et al. 2014, dust jacket).

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For online sources, see end notes.

Endnotes

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