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

UNN PEDERSEN, ELNA SIV KRISTOFFERSEN, NATHALIE HANNA AND KIDANE FANTA GEBREMARIAM

Unn Pedersen, Elna Siv Kristoffersen, Nathalie Hanna and Kidane Fanta Gebremariam 2025. **Convergence of knowledge: The relief brooch from Jorenkjøl, south-western Norway.** *AmS-Skrifter 29,* 39–49, Stavanger, ISSN 0800-0816, ISBN 978-82-7760-205-9.

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,

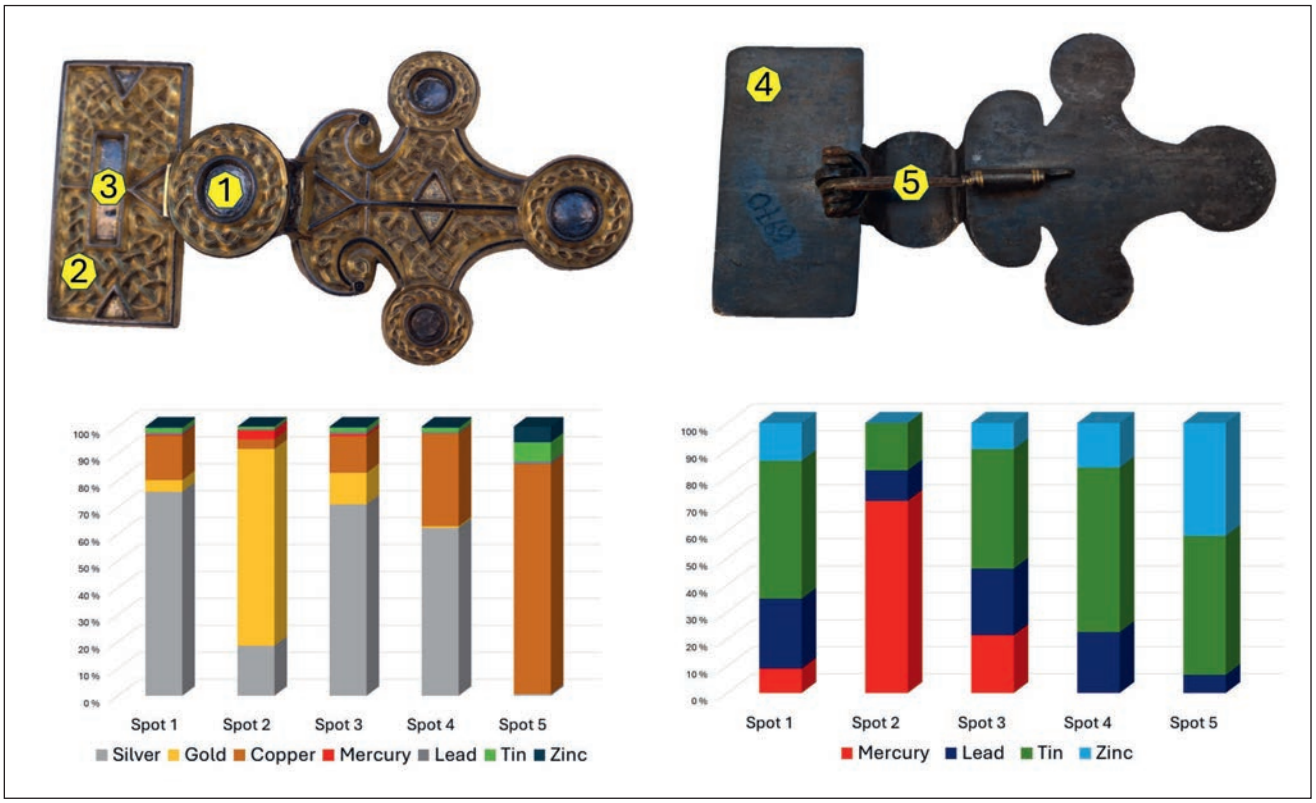

Figure 2. Results from the p-XRF analyses at five selected spots on S6970 along with a micrograph of the gilded surface displayed on the top right (Kidane 2022).

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

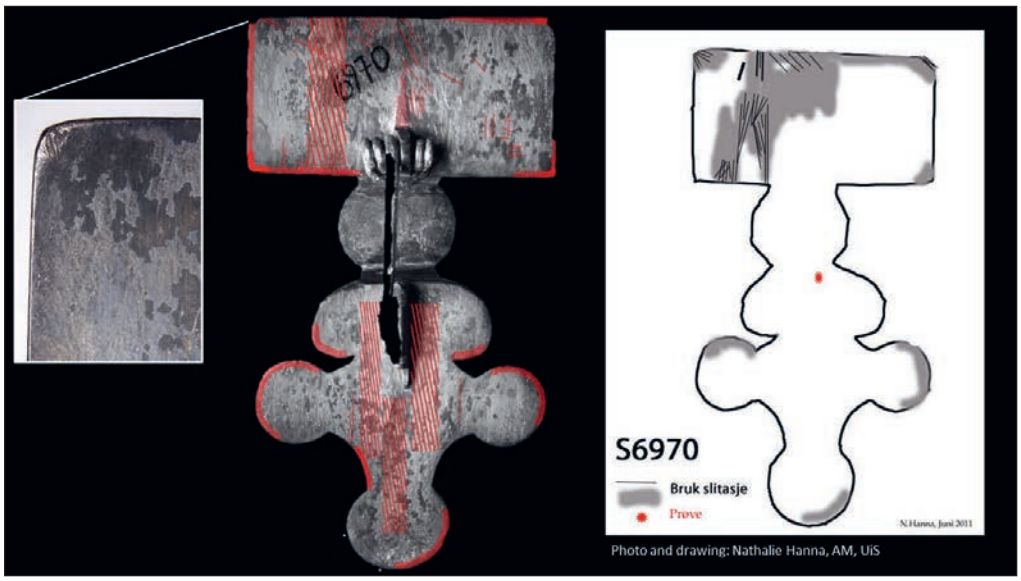

Figure 3. Markings on the reverse on Jorenkjøl. Photo: Nathalie Hanna, Museum of Archaeology, University of Stavanger.

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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