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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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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; Ilkjær 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 predomi-

nantly 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).

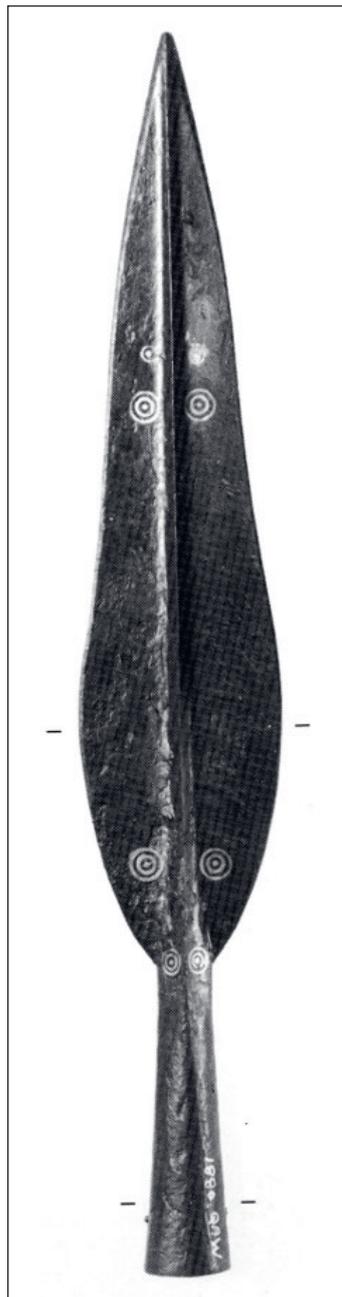
Spearheads of type Vennolum

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 Bemmman and Güde Hahne investigated the same weapon material (Bemmman 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, Bemann 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 Bemann and Hahne allow for a proportionally shorter socket (Bemann and Hahne 1994, 419–20; Ilkjær 1990a,

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



95). There are 56 spearheads of the Vennolum type in Bemann 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 (Bemann and Hahne 1994, 420, note 547).

In general, it would seem that Bemann 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" (Bemann 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 (Bemann 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

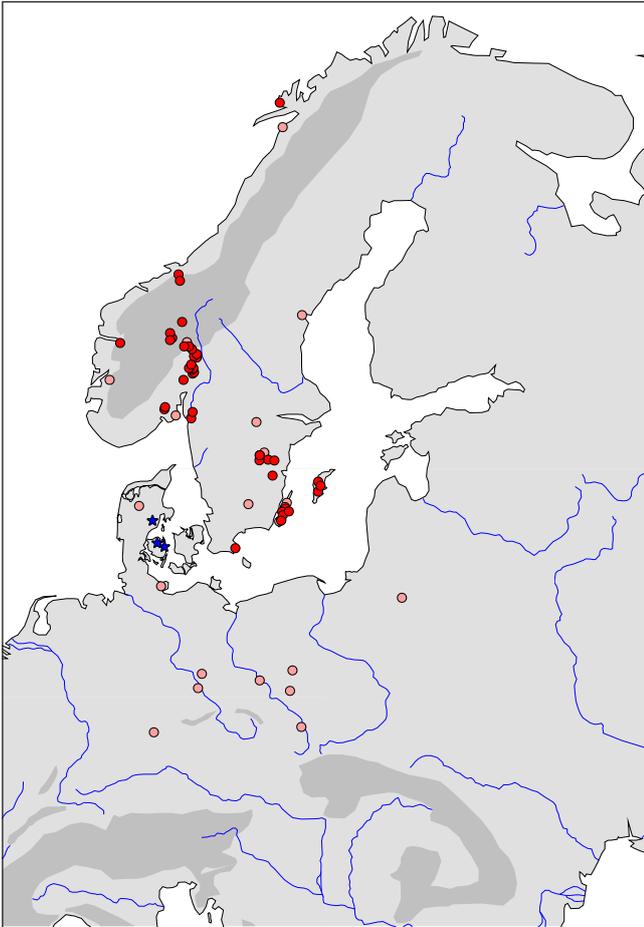


Figure 2a. Distribution map of type 15 Vennolum spearheads according to Ilkjær. Light dots are disputed/omitted by Bemmann and Hahne. Blue stars: bog finds Illerup Ådal, Vimose and Illemose. After Ilkjær 1990a, table 63.

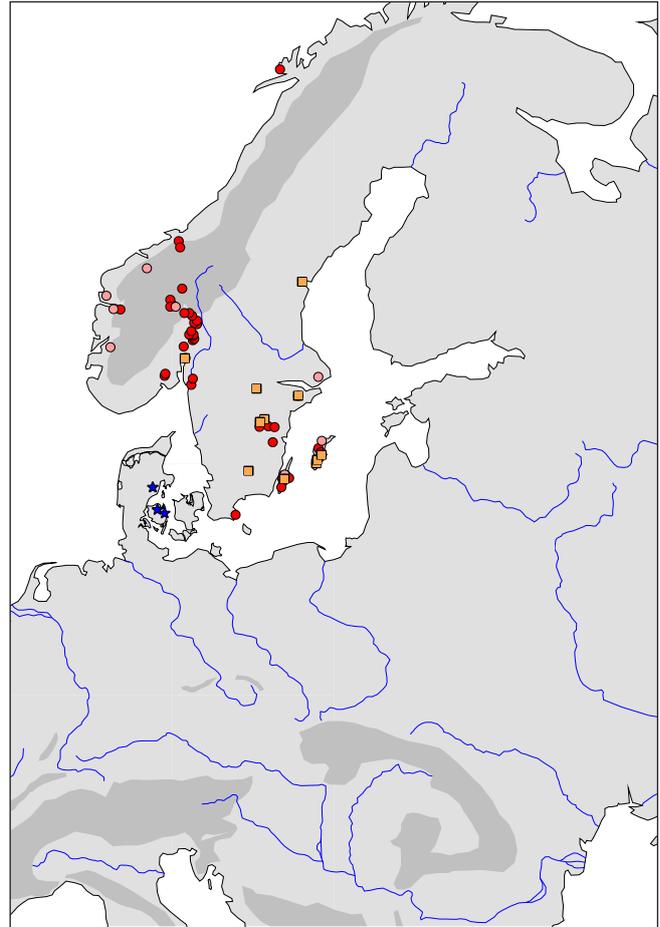


Figure 2b. Distribution map of Vennolum spearheads according to Bemmann and Hahne. Squares are their variant Hamsta. Light dots are disputed/omitted by Ilkjær. Blue stars: bog finds Illerup Ådal, Vimose and Illemose. After Bemmann and Hahne 1994, find list 26 and 27.

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).

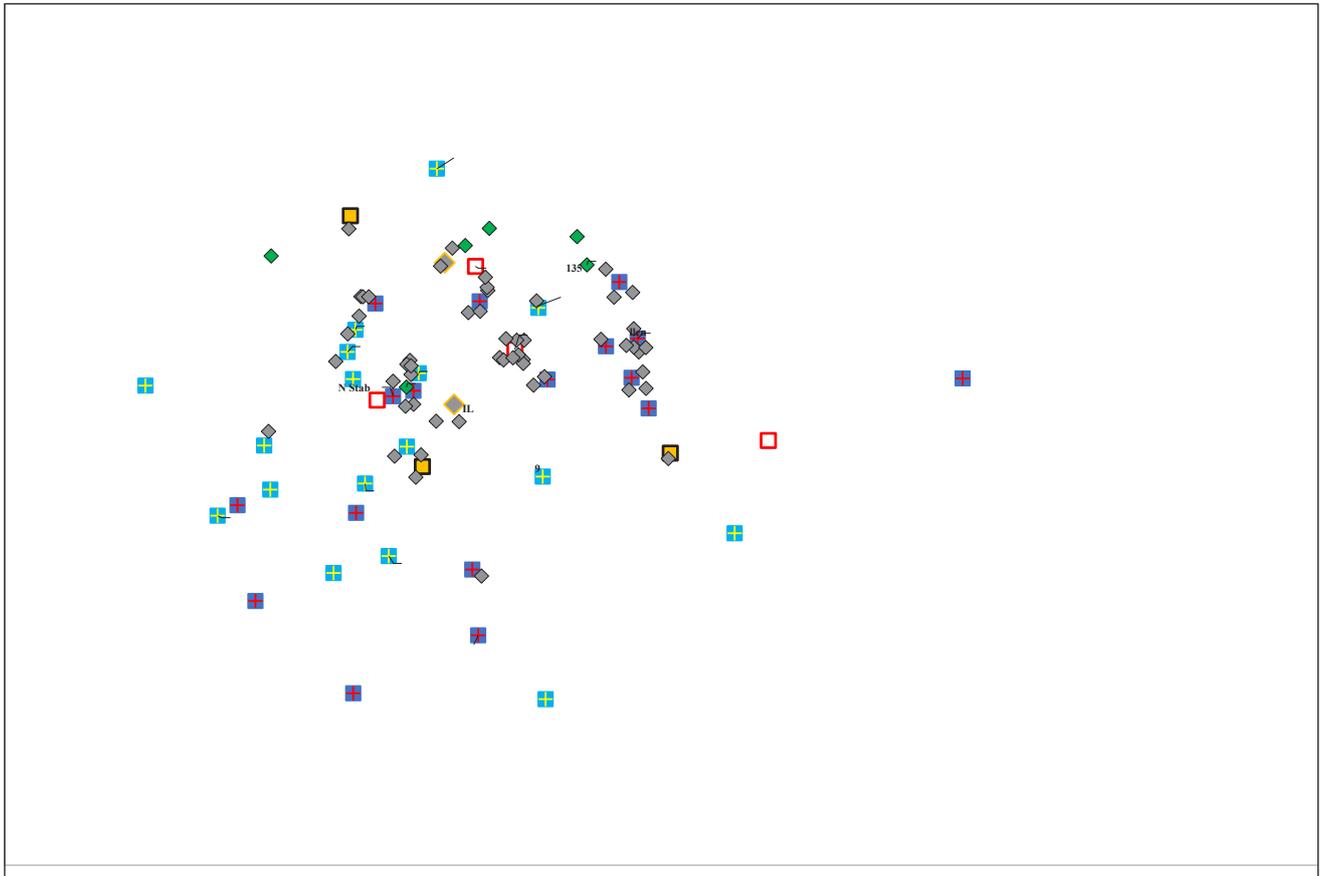


Figure 3. Plot of the 1st and 2nd axes of the PCA of Vennolum-type spearheads. Rhombuses are spearheads from bog finds: grey: Illerup Ådal, green: Vimose. “Wagnijō” spearheads IL IMZ and IL INT are accentuated with a golden frame. Squares are graves. Names in italics (lower left quarter) are spearheads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

pological 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).

Similarly, 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 Szwałcaria, 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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