

Early Metallurgy in Scandinavia: Continuity or discontinuity?

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Abstract

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There are now good reasons for assuming that metalworking did take place in Scandinavia during the period of the TRB culture. However, it has also been argued that this period of metalworking only represented a comparatively brief period without continuity to the Scandinavian Middle Neolithic. This idea contradicts previously presented theories claiming that the introduction of metals in Scandinavia was related to the Middle Neolithic Battle Axe culture. A discussion of the problems concerning these contradictions in interpretation stands in focus in this article. It is argued that the Scandinavian Middle Neolithic was been fully “metal-rejecting”. Our perspective on these matters becomes different if we consider the find material from Denmark/Scania and from central Sweden. Yet, it is also argued that a transformation in the comprehension of metals did take place during this phase.

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Vandkilde and Klassen: two different views on the earliest metals in Scandinavia

Helle Vandkilde's *From Stone to Bronze. The Metalwork of the Late Neolithic and Earliest Bronze Age in Denmark* and Lutz Klassen's *Frühes Kupfer im Norden* are without doubt two monographs of central importance for the discussion of how early metallurgy developed in Scandinavia. However, these two scholars have come to different conclusions on certain matters. These matters might at a first glance seem to be of minor importance, but they are of great interest when we discuss the role of metallurgy for social transformation on a more general level. I will in this article try to bring the work of Vandkilde and Klassen into relation to the

interpretations of Mats P. Malmer and Milan Zapotocky, as well as to some of my own reasoning that I presented in *An Essay on Copper Flat Axes*.

In her work Vandkilde has mainly focused on the transition period from the Late Neolithic to the Bronze Age, but she also discusses the finds from the TRB culture. Klassen, on the other hand, concentrates on the metal finds related to the TRB culture in his analyses. Interestingly enough, they have come to different conclusions concerning the metal objects of the TRB culture. Vandkilde is of the opinion that the metal objects from this period are all imported goods (Vandkilde 1996), whereas Klassen claims that several of these artefacts, mainly the axeheads, were designed in Scandinavia. Klassen also believes it possible that at least some of the copper in these early artefacts might have been

produced in Scandinavia, though most of the copper was imported from the continent (Klassen 2000).

The generally accepted idea has so far been that metalworking did not take place in Scandinavia until the Late Neolithic, a perspective corresponding well with Vandkilde's interpretation. Still, Klassen's arguments are based on a most thorough examination of the material and his presentation is convincing, even if his conclusion is unconventional. It should be noted that there are other scholars who in previous works have taken positions that are along the lines of Klassen's in these matters, even if they are in a clear minority (Liversage 1989; Magnusson (StAAF) 1989; Magnusson StAAF 1996).

The Late Middle Neolithic: a discontinuity in the use of metals?

However, Vandkilde and Klassen agree on the idea that the metal objects of the TRB culture represented something temporary. The metal finds associated with the TRB culture are seen to represent a knowledge or a tradition without continuity to the Late Middle Neolithic or the Late Neolithic. Is it then of importance for the general reasoning concerning metallurgy and social transformation whether metalworking took place during the TRB culture or not? I would say it is, and I do not believe that we can be certain of a strict break when it comes to the role of metals in the Late Middle Neolithic, at least not in all senses.

Some Swedish scholars have actually emphasized the importance of the Late Middle Neolithic for the introduction of metals. Malmer suggested in *Jungneolitische Studien* (1962) that the social transformations combined with the appearance of the Battle-axe culture in Sweden were related to the introduction of metals. Gunborg O. Janzon has suggested that the social system of the Battle-axe culture was related to

mining and extraction of copper (Janzon 1984). These interpretations do not agree very well with the idea that metals already played a certain role within the TRB culture. It can of course be held that the metal in these early periods only played a minor role as an exotic and rare material. The number of metal finds related to the TRB culture in Sweden is more significant than those related to the Battle-axe culture, however (Magnusson (StAAF) 1989). There are also artefacts made of stone from the TRB culture, such as the knobbed battle-axes, which clearly imitate metallic forms (Zapotocky 1992).

Nevertheless, there are finds from the Late Middle Neolithic and the Battle-axe culture that give us reason to question the idea of a "metal-rejecting" period in Scandinavia. It could be that our perspective on the questions surrounding the Scandinavian "Chalcolithic" would change if a wider geographical area were to be considered. In her analysis Vandkilde has mainly focused on Denmark and Scania, Klassen touches only briefly on the Swedish TRB culture north of Scania. I believe that the Scandinavian regions north of Denmark and Scania are of importance for the understanding of the development of metallurgy, even though the amount of early metal objects from these areas is low. The history of early metallurgy in Europe is full of continuities and discontinuities. I will therefore in this article briefly try to put the Scandinavian TRB culture in relation to a wider context.

Copper artefacts: the Scandinavian TRB culture and European metallurgy

It seems as if it was not until the beginning of the second millennium BC that a mutually shared cognitive understanding of metals embraced larger parts of Europe. The understanding and use of metal most evidently varied in different regions before this. Changes in the deposition patterns of metal artefacts indicate this (Magnusson StAAF 1996, pp. 122 f.). How did

this understanding evolve? The development of metallurgy cannot be understood as a phenomenon isolated from general social development.

The traditions and material expressions that are attributed to the complex of the so-called TRB culture vary between different regions. The pottery is often considered the most important of the key artefacts. There are some super-regional similarities when it comes to the design of the Central European pottery and the south Baltic and Scandinavian, even if we can discern locally bound specific characteristics. It is not surprising, for example, to find that the TRB pottery of Scania has more in common with the pottery from Zealand in Denmark than it has with material from central Sweden. On a general level, we can say that the archaeological material from Scania dating to the TRB period has more in common with the Danish material than with the material from other parts of Sweden. The TRB culture is thus a concept that we can use both in a narrow sense to describe regionally bound traditions, such as the Scandinavian TRB cultures, or in a more extended sense, where the concept of TRB culture is used to describe more super-regional similarities in the material culture of both Northern Europe and Central Europe (Zapotocky 1992; Midgley 1992).

The similarities in the material culture between Scandinavia and Central Europe demonstrate that these regions must have been connected through some kind of network during the TRB period. The cultural discourse may have differed considerably between different areas, however. These differences might have been of essential importance for variations in the comprehension of things, for example, metal artefacts. Axeheads of copper dating to the middle of the fourth millennium are more common in alpine Central Europe and in the southern Baltic region (comprising southern Scandinavia) than they are in other parts of the extended sphere of the TRB culture. There are axeheads of older age in these parts of Europe, but it seems as if it was only with the Altheim, Mondsee and the later

part of the early TRB culture that copper axeheads became a more common find group. These axeheads show a different design from the older axeheads in South-Eastern Europe (Magnusson Staaf 1996, pp. 54 f.).

There are typological variations in design between the axeheads of Central Europe and those from the southern Baltic and Scandinavia, even if they show certain similarities. This is an observation made both by me and by Klassen (Magnusson Staaf 1996, pp. 65 f.; Klassen 2000, pp. 271 f.). Klassen has analysed these differences meticulously in his work. My own classification of these types of axeheads is less detailed and could be summarized as follows: The axeheads in the alpine region tend to be smaller than the axes found further north. The alpine axeheads also have thicker butts than their northern counterparts. The axeheads from both North and Central Europe, however, also show some similarities. They are most commonly trapezoid-rectangular, in contrast to their contemporary counterparts from East and South-East Europe. A comparatively common type of East European axehead dating from this period are thin and extremely rectangular, with a broad butt. The differences in design between the Central/North European axes and the East/South-East European ones make it unlikely that they should have had exactly the same function (Magnusson Staaf 1996, pp. 65 f.). It may also indicate that the contacts between these regions were less frequent. This is a picture that partly seems to differ from how the situation appears to have been during the first half of the fourth millennium BC (Magnusson Staaf 1996; Klassen 2000).

TRB copper artefacts in Scania and the rest of Sweden

The province of Scania stands out in a Swedish perspective when it comes to the number of finds of early metal artefacts. No other province in Sweden has so many copper artefacts that can be attributed to the TRB culture. The most

common type of these artefacts are flat axeheads. At least 14 flat axeheads of copper can be attributed on typological grounds to the developed phase of TRB culture in Scania (Magnusson (Staaf) 1989, pp. 22 f.). There are only two finds of copper artefacts from Sweden north of Scania that can be attributed on typological grounds to the TRB culture; one from Östergötland (Oldeberg 1974, No. 2295:b) and one from Västergötland (Oldeberg 1974, No. 2528). Both of these artefacts are flat axeheads of copper. It is likely that the axehead from Västergötland dates to a very early phase of the TRB culture, and it might be of South-East European origin. The axehead from Östergötland more likely dates to a developed phase of the TRB culture.

One could interpret this as suggesting that metal was more abundant in Scania than in other parts of Sweden during this period. This might have been the case. On the other hand, the lack of metal finds in the rest of Sweden should perhaps not be interpreted as indicating that metals were virtually unknown in this area. The comparatively large density of metal finds in Scania may instead be a reflection of a different deposition pattern. There are a large number of artefacts found in central Sweden dating to the TRB culture in Scandinavia which clearly imitate metal artefacts. The most common type of TRB stone artefact copied from metal objects are the knobbed battle-axe heads. A knobbed battle-axe of copper of TRB type is kept at Malmö Museum. The find spot of this knobbed battle-axe head of copper is unknown. It is most likely, though, that it comes from Scania or at least the south Baltic region. Several of the knobbed stone battle-axe heads of TRB type from Sweden show a strong morphological resemblance to this axe (Zapotocky 1992, pp. 68; Magnusson Staaf 1996, figs. 65 and 67). Zapotocky has studied the morphology of these axeheads in detail and created a typological system for their classification. He has detected regional variations in the design of these within Scandinavia. There is, for example, a type of axehead (KIII-2) that is

peculiar to central Sweden (Zapotocky 1992 pp. 120). Klassen sees the distribution of these axeheads in relation to the Vrå culture, a subgroup of the Swedish TRB culture. He also puts forward the hypothesis that metal production might have taken place in central Sweden. There are a number of copper artefacts from the south Baltic region with metal composition that lacks a match among the ores of Central and South-East Europe (Klassen 2000, p. 212).

The knobbed battle-axeheads of stone have interesting implications for our interpretation. Is it so that a small number of axeheads made of copper served as a prototype for a wide array of knobbed battle-axeheads of stone? Or could it be that knobbed battle-axeheads made of copper were more common than the archaeological record indicates, but seldom ended up in contexts where they can be archaeologically retrieved? Are the local types of knobbed battle-axeheads of stone in different parts of Scandinavia expressions of a metallic design developed and re-invented in stone? In other words, did people at the same time acquire a metallic notion in their general design of things, without actually having direct access to metal prototypes? Or do they reflect a potential local metalworking tradition that is now primarily traceable through the stone artefacts? The stone artefacts imitating metal artefacts at least clearly demonstrate that metal objects must have had an impact on the minds of people as early as the TRB phase regardless of whether there was a local metalworking tradition in Scandinavia or not.

We do not know how common metals actually were in the Scandinavian TRB culture. I do not, in contrast to Klassen, believe it to be wholly impossible that all of the metal objects reached Scandinavia through trade and as finished products during this period. There is so far no archaeological find of a workshop from the TRB culture in Scandinavia where casting took place. However, I find the reasons for assuming that at least some metalworking took place in Scandinavia and in the south Baltic region during the developed phases of the TRB

culture far more convincing (Magnusson (Staaf) 1989; Magnusson Staaf 1996, pp. 96 f.). There are a number of reasons that I think speak in favour of this interpretation:

- 1 A concentration of flat axeheads of copper with specific morphological traits is found in the south Baltic region.
- 2 Decorative attributes on flat axeheads of copper dated to the TRB period, such as zigzag ornamentation, occur only on specimens from the south Baltic region.
- 3 The find of an unsuccessfully cast axehead of copper from Jutland, which has a design typical of certain axeheads from south Scandinavia attributed to the TRB culture (Cullberg 1968, No. 62; Magnusson Staaf 1996, p. 74; Vandkilde 1996; Klassen 2000, No. 96 b).
- 4 Specific artefacts such as the halberd from Bygholm, without direct counterparts in the material from Central Europe.
- 5 Regional variations within the region concerning find assemblages and artefact design.
- 6 Categories of metal imitating stone artefacts with typological traits particular to the region.

However, if there was a metalworking tradition in south Scandinavia during the more developed phase of the early TRB culture; was there then a continuity of metallurgical know-how that lived on into the third millennium BC? There are so far only a very few metal finds that can be securely attributed to the very last phase of the TRB culture in the south Baltic region. The situation therefore shows a resemblance to the "copper-rejecting" period in Central Europe. This of course gives us further reason to assume that North and Central Europe have been more bonded together through social and cultural networks during the TRB period than with other regions further to the east, west and south. It should be noted that a copper-rejecting phase is not detectable further west of the Alpine region. It seems actually as if it was only during the early third millennium BC that copper artefacts started to become more common in the

Iberian peninsula. A copper-rejecting period is also difficult to discern in the north Italian material dating to the transition between the fourth and third millennium BC (Magnusson Staaf 1996 pp. 80).

A copper-rejecting period?

The part that I find most problematic in Klassen's work is his reasoning concerning the breakdown of metal import to Scandinavia during the later part of the TRB culture. He claims that the supply of copper to Scandinavia from Central Europe stopped around 3300–3200 BC during the so-called copper-rejecting period (Klassen 2000, p. 292). Klassen also puts forward the idea that the possible supply of copper from a source in central Sweden which could have supplied metal to the south Baltic region came to a cessation in this period, an event that he relates to the coming of the Pitted Ware culture (Klassen 2000, pp. 216 f.).

It is obvious that the number of metal finds that can be attributed to the period around 3000 BC is very low in Scandinavia. There are, however, metal-imitating artefacts in stone from Scandinavia that come from contexts dated to the last phases of the TRB culture, for example, some of the double edged battle-axeheads (Zapotocky 1992). Klassen explains this by claiming that they are metallic shapes that linger on in design as morphological relicts (my words) long after the original metallic models had disappeared from circulation (Klassen 2000, p. 292). If it was so, one could perhaps expect a certain conservatism in the design of the metal-imitating objects. This is not the case as I find it. There appears instead to have been a development in the design of these objects, for example, of the double-edged battle-axes, that took place after 3300 BC. I think that Klassen's hypothesis, that the increasing number of stone artefacts imitating objects made of copper during the MNA Ib phase in Scandinavia indicates a lack of metal, contradicts some of his other interpretations (Klassen 2000, pp. 292 f.). Metal objects that

can be attributed to the Vrå group, which, according to Klassen's hypothesis, might have produced copper, are almost non-existent. The idea that the lack of metal finds necessarily has to mean that there were no metals around, is in other words inconsistent with his own assumption that the metal-imitating finds of central Sweden related to the Vrå group of the TRB culture indicated the existence of metallurgical knowledge. It should also be remembered that there are a large number of stone artefacts from Alpine Central Europe that imitate metal objects (Zapotocky 1992; Magnusson Staaf 1996, pp. 72 f.).

It could instead be that patterns of deposition were transformed. Something might have caused a shift in the comprehension of metals. The spatial structures for rituals involving the deposition of flint axeheads appear to have changed in this period, at least in Scania. Places such as bogs, where axes had been deposited earlier, seem to have been abandoned (Karsten 1994). The social, economic and ideological stance, in relation to the use of the landscape, may then also have changed. There might have been a shift in the pattern of super-regional trajectories, creating a new social-economic network and framework for exchange and understanding of metal objects. In this transformation, new sources of copper might have come into use. These matters are important for the way we interpret the coming of the Battle-axe culture.

The Battle-axe culture and metals

The Battle-axe culture in Sweden is primarily represented through graves. The burial traditions of the Battle-axe culture show some strikingly similar features to those of the continental Corded Ware culture. One can thus regard the so-called Battle-axe culture as a part of the continental Corded Ware complex. The most characteristic type of grave is the single burial (Malmer 1962). Burials belonging to the Battle-

axe tradition have also been found as secondary graves in megalithic tombs erected during the TRB phase in both Denmark and in Sweden (Skaarup 1989). However, the burial customs surrounding the Swedish Battle-axe culture differ from the burial traditions in Jutland, known as the Single-grave culture. The single graves of the Battle-axe culture, for example, are difficult to detect since visible remnants of superstructures above the topsoil are rare. The Single-grave culture in Jutland can, however, just like the Swedish Battle-axe culture, be regarded as being a part of the Corded Ware complex (Glob 1944).

There is a striking difference between Scania and Zealand as regards the burials from the early and middle part of the third millennium BC, which contrasts with the similarities one can see in the previous TRB phase. The burial customs of the Battle-axe culture in Scania show more similarities to the traditions in the rest of Sweden. The graves of the Swedish Battle-axe culture appear in a geographically wider area than the megalithic tombs of the TRB culture in Sweden (Malmer 1962, pp. 150 f.). The features of the Battle-axe culture thus show greater super-regional similarities than the Swedish TRB culture. This could be interpreted as indicating that certain traditions and ideas embraced a wider area. The Battle-axe culture is also called Boat-axe culture (Malmer 1962, p. 575). The name derives from the specific type of stone battle-axe head that usually constitute a part of the male burial inventory (Olausson 2000). These axeheads are interesting since they seem to imitate metal axeheads, in parallel to the knobbed battle-axe heads of the TRB culture. Their design also has local traits. The boat-axes with their specific design have a general concentration in Sweden and are rarely found in Denmark. I would like to interpret this pattern as a radical change in the structure of the super-regional network for communication and the configuration of human trajectories seen in relation to the TRB culture. (Still, it is interesting in this context to note that that the knobbed TRB battle-axeheads of stone belonging to type

K III according to Zapotocky's classification have a wide distribution over Sweden and Scania, but are rare in Denmark (Zapotocky 1992).)

Not a great number of metal finds can be securely attributed to the Swedish Battle-axe culture. There are two small copper ornaments that have been found in graves. One of these graves is from Scania, a region comparatively rich in metal finds attributed to the TRB culture. The other find comes from Östergötland (Malmer 1962, pp. 282 f.), an area with only one find of metal that can be attributed to the TRB culture (Oldeberg 1974, No. 2295b). We do not know for sure whether there are any types of flat axeheads, or possibly flanged axeheads of copper, that should be attributed to the Battle-axe culture. There are, however, a number of flat axeheads and axeheads with low flanges made of copper that have a morphology deviating from those attributed to the TRB culture. The butts of these axes are narrow in relation to the edges and they have curved sides. The copper of these axes also has a different chemical composition from their most likely earlier counterparts. A particularly interesting axehead of copper for a discussion of the Corded Ware culture comes from Tävvelsås in Småland (Oldeberg 1974, No. 1872). It has low flanges on only one of the two broad sides, a trait which possibly could be connected with the flint axeheads with hollowed edges that are a key artefact of the Battle-axe culture. The chemical composition of the metal in this axehead actually matches the composition of the copper in the flat axeheads attributed to the TRB culture.

The Battle-axe culture, as was mentioned earlier, has been connected to incipient metallurgy in Sweden. It has been suggested that the appearance of metal during this period transformed the social and economic foundations of society (Malmer 1962, pp. 817 f.). In these interpretations metals play a central role for the transformation of society. It is as if it was the metal in itself that caused all these fundamental social changes. Metal takes the role of a *deus ex machina* through this perspective. Were the people of the Battle-axe culture prospectors for

copper ore, as Janzon (1984) suggests? Malmer's and Janzon's view on the development of metallurgy during the third millennium BC therefore differ from Klassen's. He claims that it was only at the end of the third millennium BC that vast quantities of metals started to come into Scandinavian society (Klassen 2000, p. 310).

There are reasons for questioning the interpretations of Malmer and Janzon. One can ask, for example, whether there are any particular signs of increased metallurgical know-how that separates the Battle-axe culture from the TRB culture. The number of metal artefacts that can be attributed to the Battle-axe culture is far smaller than the number attributable to the TRB culture. These artefacts could be imported goods just as well as the older metal objects. The metal artefacts of the Battle-axe culture do not show signs of a technology that is more advanced than those of the TRB culture. We find stone artefacts imitating metal objects in the Battle-axe culture as well as in the TRB culture. These metal-imitating artefacts in stone clearly demonstrate that metals must have had an impact on the cognitive mind of people already during the TRB culture, and I therefore find it hard to see metal as a novelty specific for the Battle-axe culture.

However, there are also clear indications that metals did play a role in the Battle-axe culture, which contradicts Klassen's interpretation. It may also be that the uses of metal were transformed during the Battle-axe period. The metal objects from the Battle-axe culture come from burials. Only one of the Swedish metal objects of the TRB culture comes with certainty from a grave context (Pihl & Sjöström 1996). The burial customs started, as was mentioned above, to show larger similarities on a super-regional level during this phase. It is therefore also worth noting that the metal object from the grave in Östergötland was found in a province which was poor in metal finds that can be attributed to the TRB culture. There is thus a similarity in deposition of metals in two provinces

distant from each other, Scania and Östergötland. We must keep in mind that it is not very convincing on statistical grounds to claim that these circumstances necessarily should indicate a revolution in the comprehension of metals. Still, it is possible that a change implying transformations in the use and understanding of metals did take place.

The boat-axes with their metallic design belonged to the general inventory in male single graves. "Metal" artefacts of stone, related to particular individuals in the burial ritual, can be said to have formed an element within the Battle-axe culture. This is a significant difference from the "metal" artefacts in stone of the TRB culture, which more often have been found as votive deposits. This might therefore give us reason to believe that the role of metals and the cognitive ideas related to metals shifted during the period of the Battle-axe culture. A super-regional social and cultural communicative network might have been set during the period of the Corded Ware culture that was to be of crucial importance for the developments of the Late Neolithic and Bronze Age – a network that also was to be of significance for the development of metallurgy in Sweden and Scandinavia.

The transition to the Late Neolithic

Vandkilde has been able to distinguish clear variations in deposition patterns of metal objects during the periods of the Late Neolithic and Early Bronze Age in Denmark and Scania, variations that also reflect regional dissimilarities within Denmark. These differences concern both the artefact composition as well as the contexts of the depositions. The metal artefacts are in her interpretation related to the shifting social and economic predicaments of Late Neolithic and Bronze Age society. She has been able to detect something that almost can be described as cyclic changes. The social, economic, and one could perhaps even say political development of these

periods, in other words, does not follow a strictly straight evolutionary order. However, the structural developments of each cycle can be considered as a response to the preceding cycle (Vandkilde 1996).

If metals really were as good as absent from Scandinavia during the early and middle part of the third millennium BC, then Vandkilde's interpretation stands fully unaffected. However, I have outlined a slightly different scenario above. It appears, for example, as if metals did play a role in the Battle-axe culture. The Swedish developments seem at least partly to deviate from the Danish ones. How does this perspective harmonize with Vandkilde's? It could be that our understanding of the Swedish *and* Danish Late Neolithic and Early Bronze Age will be modified if we try to draw the contours of both the Danish and the Swedish situation. This perhaps goes beyond the reach of a single article. I will only very briefly allude to some of the trends we can see.

The relationship between the Battle-axe culture and the Pitted Ware culture of the Swedish Middle Neolithic is complex. They both represent a tendency to super-regionality, though. This trend appears to have been even stronger during the Late Neolithic. To generalize somewhat, one could say that the burials started to show considerable similarities during this period over large parts of Scandinavia, even if there were of course local variations at the same time. Stone cists were erected in southern and central Sweden as well as in Denmark. The differences in cultural expression that were so clear between Zealand and Scania during the Battle-axe period seem to have become less apparent during the Late Neolithic. Flint daggers have a wide distribution over Sweden and Denmark. The correspondence in the Late Neolithic find material is stronger between Denmark and Sweden. The material seems rather to reflect "local" idioms in burial customs and artefact design during the Late Neolithic, rather than differences of "languages" as was the case during the Battle-axe period. The number of

metal finds dated to the Late Neolithic in Sweden is considerably higher than those dated to earlier periods. These objects also appear in provinces of Sweden without earlier finds, for example Västmanland (Magnusson Staaf 1996, p. 75).

It thus appears as if a wide reaching social network covering large parts of Scandinavia seems to have been established during the Late Neolithic. These cross-Scandinavian contacts between Denmark, Sweden and Norway seem to have become even stronger during the Bronze Age. This is reflected, for example, through the metalwork. It is a fact that the vast bulk of the metal finds dated to the Bronze Age come from Denmark and Scania. However, the super-regional similarities are so large during the Bronze Age in Northern Europe that we may speak of a Scandinavian Bronze Age culture. It seems reasonable to assume that the interaction between the various regions of Scandinavia must have increased in importance. In order to obtain a deeper understanding of what happened in Västergötland, in Småland or on Gotland during the Late Neolithic and Early Bronze Age, we may therefore consider what happened in Denmark and in Scania and vice versa. What happened, for example, at the transition between the Middle Neolithic and the Late Neolithic? This goes beyond the scope of this article.

This of course does not disqualify any of Vandkilde's theories or interpretations. They are still valid. The cycles and developments that Vandkilde describes in her work may however been a part of a larger and multidimensional process. It seems as if it was only during the later part of the third millennium BC that the wider technological potential of metals started to be employed over most parts of Europe. The metal artefacts of the Late Neolithic and Early Bronze Age in Scandinavia clearly show that the human trajectories setting the framework for communication in Europe must have undergone radical restructuring during the third millennium BC. An exchange involving metals among other goods seems to have taken place on a wider geographical base than before. It seems likely to assume that

this exchange rested on a similar cognitive comprehension of metals. A foundation for such a comprehension might have been laid with the Corded Ware culture and the Bell Beaker culture. This stands in contrast to the earlier TRB culture, where metal artefacts seem to have taken on quite different roles in society in separate parts of Scandinavia and Central Europe.

The question concerning early metals is of great significance for our understanding of the Neolithic in Scandinavia. Metal might not have been of central importance for the economy of these societies, but it presents a set of problems that give interesting perspectives to a discussion of how and why social networks, trajectories and strategies were transformed.

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