



LUND UNIVERSITY

Complex Metalworking in the Provinces, Rural Centres and Towns

Preliminary Results from the project "Exclusive Metalworking in Rural Settings" contextualized

Svensson, Andreas

Published in:

Lund Archaeological Review

2015

Document Version:

Publisher's PDF, also known as Version of record

[Link to publication](#)

Citation for published version (APA):

Svensson, A. (2015). Complex Metalworking in the Provinces, Rural Centres and Towns: Preliminary Results from the project "Exclusive Metalworking in Rural Settings" contextualized. *Lund Archaeological Review*, 20, 7-19. <https://journals.lub.lu.se/lar/article/view/21635>

Total number of authors:

1

Creative Commons License:

Unspecified

General rights

Unless other specific re-use rights are stated the following general rights apply:

Copyright and moral rights for the publications made accessible in the public portal are retained by the authors and/or other copyright owners and it is a condition of accessing publications that users recognise and abide by the legal requirements associated with these rights.

- Users may download and print one copy of any publication from the public portal for the purpose of private study or research.
- You may not further distribute the material or use it for any profit-making activity or commercial gain
- You may freely distribute the URL identifying the publication in the public portal

Read more about Creative commons licenses: <https://creativecommons.org/licenses/>

Take down policy

If you believe that this document breaches copyright please contact us providing details, and we will remove access to the work immediately and investigate your claim.

LUND UNIVERSITY

PO Box 117
221 00 Lund
+46 46-222 00 00

Complex Metalworking in the Provinces, Rural Centres and Towns

Preliminary Results from the Project “Exclusive Metalworking in Rural Settings” Contextualized

BY ANDREAS SVENSSON

Abstract

Svensson, Andreas. 2015. Complex Metalworking in the Provinces, Rural Centres and Towns: Preliminary Results from the Project “Exclusive Metalworking in Rural Settings” Contextualized. Lund Archaeological Review 20 (2014), pp. 7–19.

The research project “Exclusive Metalworking in Rural Settings” was instigated in 2013 with funding from the Berit Wallenberg Foundation. The objective of the project is to survey sites with remains of multimetal craftsmanship of the late Iron Age and medieval periods outside urban contexts. This article aims to contextualize preliminary results from the project and evaluate its chosen source material and methodology.

The survey has so far identified several complex smithing sites in the rural and near-urban landscape. The multimetal sites are divisible into three categories: *sites in the vicinity of towns*, *sites related to central places* and more or less independent *provincial sites*.

Sites from each of these categories are presented below and the results that the macro-level survey has yielded as to the multimetal craftsmanship conducted are analysed. The results are then used to pursue a broader discussion concerning the conceptual aspects of complex metalworking – *multimetallicity* in the landscape.

Andreas Svensson, Faber Arkeologi, Hansavägen 13, SE-245 65 Hjärup, Sweden. www.faberarkeologi.se.

Introduction

Complex metalworking in the form of multimetal craftsmanship can be seen in the Scandinavian archaeological record from late prehistory onwards. Multimetal craftsmanship is defined as the use of more than one metal in the manufacture of objects and its repertoire encompasses luxury commodities such as ornaments and jewellery, other status objects such as decorated weaponry and cutting tools as well as objects of more practical nature requiring the physical attributes of more than one metal to function properly.

Multimetal craftsmanship requires *multimetallicity*, i.e. the understanding and conceptualization of the craft, its raw materials and

finished products on the part of both the smiths and the users or patrons of the metalworkers’ services. This means that the craftsmanship, as well as the metalworkers and their produce, were a vital component in society on a number of levels. To study metal craftsmanship and metalworkers is hence to study all of past society – from technical craftsmanship through economic and social structure all the way to cognitive conceptualization of both the individual and the world. Multimetal craftsmanship offers yet another dimension due to its evident relation to the urbanization processes that emerged in Scandinavia’s later Iron Age and continued up through the medieval period.

The aim of the following short article is to present three metalworking sites with remains of multimetal craftsmanship in southern Sweden. These sites represent the different categories of complex metalworking sites that were identified during the survey project “Exclusive Metalworking in Rural Settings”. The analysis presented below strives to contextualize and thereby evaluate the validity of these categories. By putting the preliminary results of the survey project in context, the macro-level survey is also evaluated mid-way, which will help refine and hopefully invigorate the ongoing project.

Exclusive metalworking in rural settings

The survey project

The project was initiated in 2013 and will continue in its present outline throughout 2014. The aim of the project is to synthesize results from Swedish contract archaeology during the last decades regarding complex metalworking activities beyond the urban craft milieu. The selected chronological focus is wide, stretching from the Late Iron Age (AD 500) up until the High Middle Ages (AD 1300). Sites beyond this chronological frame have only been briefly noted. The chronological focus of the survey is based on the ambition to use its results in the ongoing discussion of urbanity/rurality and craftsmanship in Scandinavian late prehistoric and medieval times. At present the survey is approximately halfway completed and certain patterns are beginning to emerge.

The smithing sites can be categorized in three main groups: 1 Sites connected to the urban centres and under their control; 2 Sites in connection to rural central places and under their control; and 3 Sites independently placed beyond the control of an urban centre or a central place.

These spatial categories organize the multimetal sites in the survey on an economic and societal macro-level and enable analytical discussions of several aspects of multimetal craftsmanship and its agents. Since the chosen chronological framework is wide, the definition of what constitutes a rural central place or an urban centre must be correspondingly inclusive. In the survey project “Exclusive Metalworking in Rural Settings” the definition of a site, place or area as a central place, an urban centre or part of the rural provincial landscape has been derived directly from the source used. The interpretation of the author of the report as regards definitions of the site’s scale of urbanity has not been challenged. This is in line with the basic structure of the research project and makes its results more comparable to the ongoing debate about prehistoric and historic urbanism. In future treatments however, the issue of the constitution of urbanity, rurality and regionality of the studied sites needs to be addressed, especially since metal craftsmanship in itself is often used as a defining factor of centrality on many levels (see for instance Helgesson 2002, 22 ff.). Attempts to isolate a few of these aspects are made in this article.

An overview of the sites identified so far (see Fig. 1) also shows similar traits as to landscape structure. Proximity to waterways seems to be essential judging by the way that all smithing sites cluster against coastlines and the larger lake areas. Looking in more detail, it seems evident that the sites were almost exclusively placed in border zones between predominantly agricultural areas and forested areas.

The most striking feature on a geographical macro-level, however, is the close relationship of the multimetal smithing sites to early evolving urbanity in the Late Iron Age and Early Middle Ages. This feature became obvious already during the outline of the survey project and has ever since been at the centre of its research agenda.

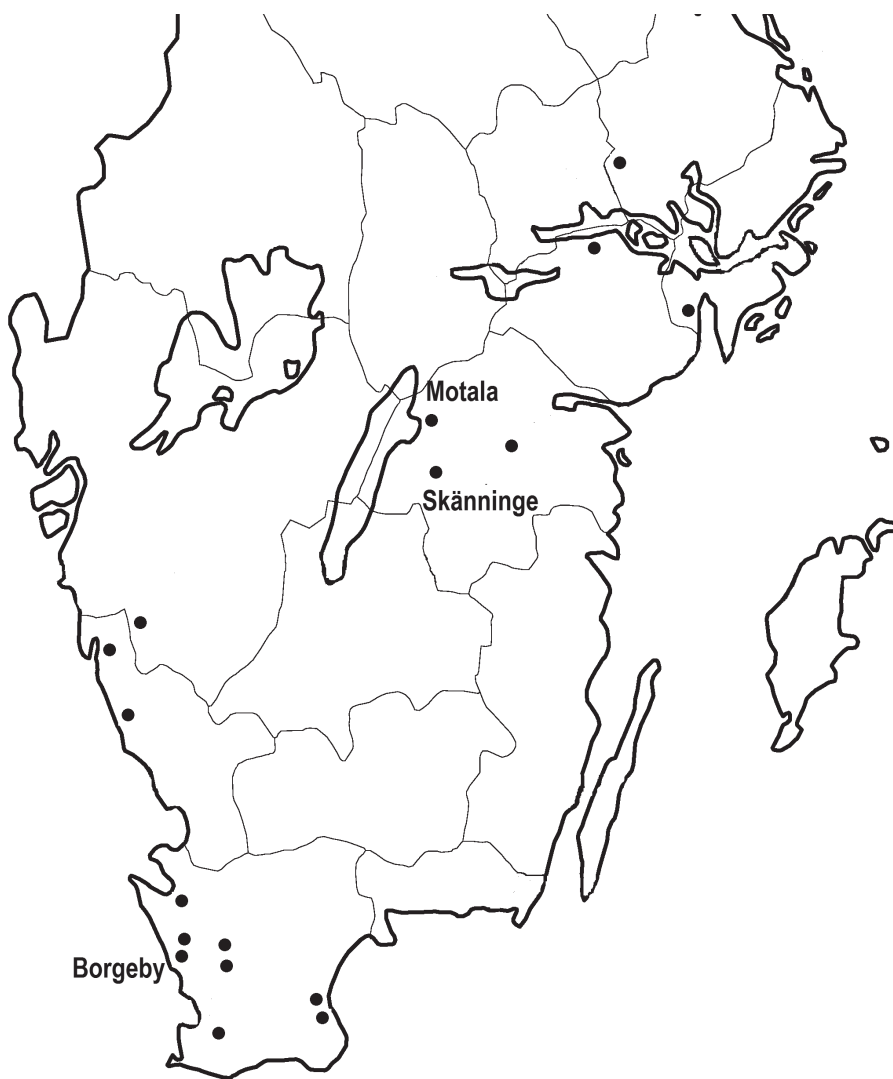


Fig. 1. Overview of southern Sweden showing identified multimetal sites. Each point represents one or up to five sites. Place names of sites discussed in the text indicated. Edited from Lantmäteriets översiktskarta.

Utilizing results from contract archaeology

The primary source material for the survey consists of contract archaeology reports published between 2000 and 2013. In order to serve as source material the reports must have used a searchable terminology, i.e. the results must be presented understandably and cor-

rectly. In order to fulfil this criterion a basic interpretation of the metallurgical processes undertaken at the investigated site(s) has to have taken place during each project, ideally already within the fieldwork phase. In many cases the metallurgical remains encountered are inconclusive and of sparse informatio-

nal value. It is especially important in these cases to allow for adequate evaluation of the remains. Insufficient interpretation of archaeological material is just as dangerous as incorrect interpretation and it has been explicitly clear throughout the survey project that the single worst problem in synthesizing the data is lack of basic metallurgical interpretation of metalworking remains. Whether a question of general inexperience in dealing with material from metallurgical processes or a result of slimmed budgets and tight time schedules, the problem of insufficient basic interpretation has to be addressed as acute.

Only reports that are published online have so far been added to the survey. This practice has shown that there are substantial gaps in online report publishing between the years 2000 and 2013 despite immense recent attempts by the Swedish National Heritage Board to make reports from Swedish contract archaeology readily available (<http://samla.raa.se/xmlui/>). This has the effect that the survey will not be able to capture the full scope of multimetal craftsmanship in the surveyed area at this time. Since the survey is the first one undertaken concerning multimetal craftsmanship as a craft on its own, the problems connected to the limitations of the source material of the project are of little importance. The survey will not cover all available material, but rather pinpoint areas of special interest suitable for future analysis.

The survey project “Exclusive Metalworking in Rural Settings” serves as an evaluation of the benefits of correctly utilizing results from contract archaeology in research synthesis. It may seem obvious to point out that contract archaeology is one of the prime sources for contemporary archaeological research, but time and time again researchers feel reluctant to use results from contract archaeology. The reasons for this reluctance are probably numerous and are of both practical and tradition-based nature. There is good cause to

suspect harmful prejudice on the part of both the contract archaeologists and the research community, which makes it utterly important to explicitly illustrate through projects like the one presented in this article how the gap between the two practices can be bridged.

Multimetalty as a craft concept

In the following discussions the use of more than one metal is defined as *multimetal craftsmanship*, *complex smithing* or *complex metalworking*. The most common combination of this practice traceable in the archaeological record is iron/steel and copper alloys (Svensson forthcoming). In early urban milieus and defined prehistoric central places the use of precious metals has however been substantial (Brorsson 1998; Helgesson 2002). The metals were typically combined with the denser iron or steel serving as the main material with copper alloys added on secondarily, either melted or softened by means of heating or mechanically forced in raw form. Multimetal crafts could be utilized in the fashioning of a wide array of objects ranging from jewellery to edged tools and weapons. Composite objects such as locks and mechanical instruments requiring moving parts and springs also called for multimetal expertise. These objects grew in complexity as well as popularity during the high medieval period but their origin can be traced back at least as far as late prehistory when jewellery such as fibulae utilized sophisticated holding springs, not uncommonly fashioned using two or more alloys or metallic raw materials (see for instance Lønborg 1998)

The craft of smelting is considerably older than the art of smithing. The art of combining the two, as under discussion here, began in the Late Iron Age and was further developed into the medieval and later periods. Metallurgical experimentation exploring the different characteristics of metals and alloys of metals

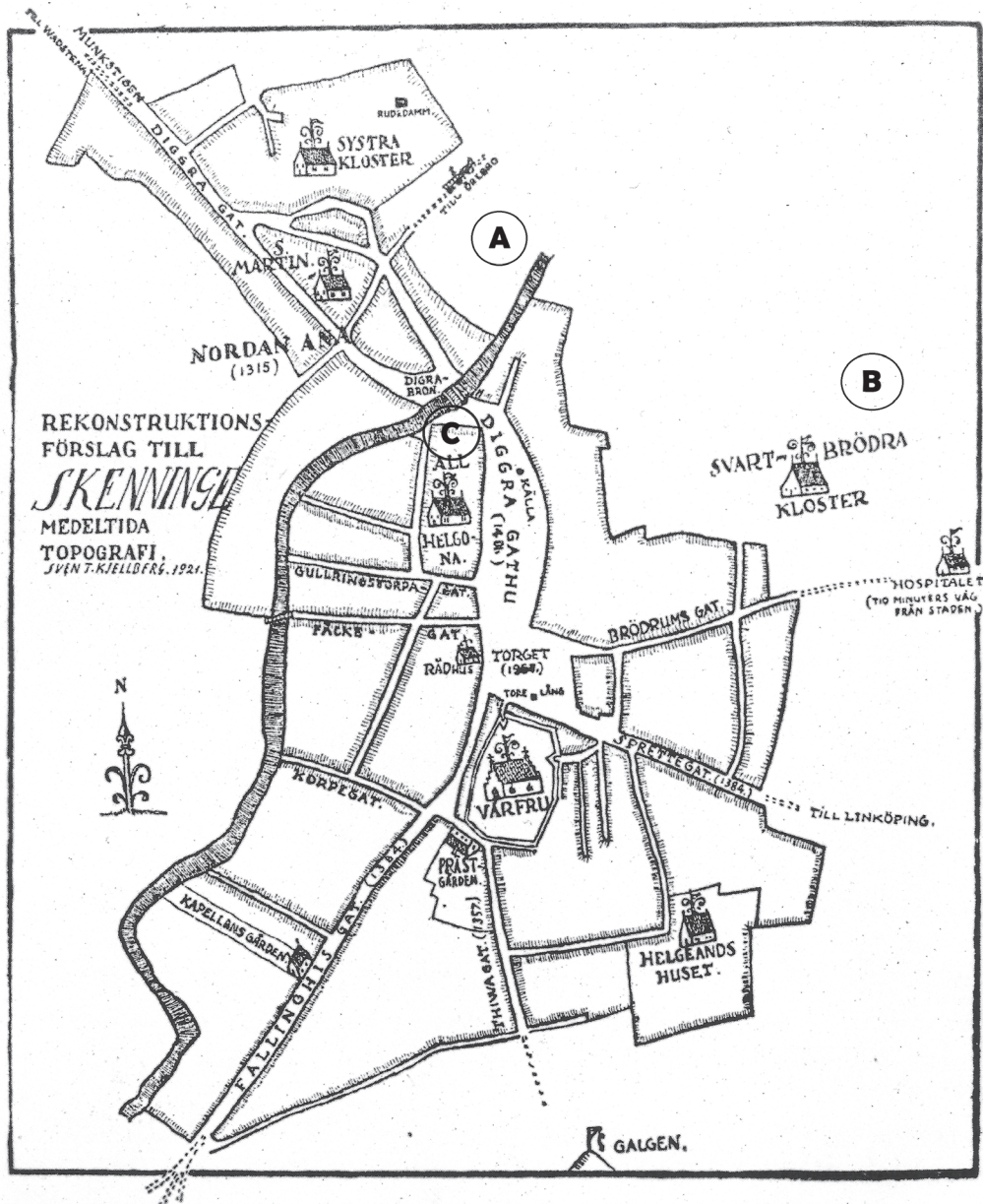


Fig. 2. Reconstruction of medieval Skänninge by Kjellberg 1921. The approximate locations of known complex smithing sites have been added (after Lindeblad 2013, 10).

is however a practice as old as metalworking itself, but an increase of metallurgical experimentation and awareness of raw material properties can clearly be seen as iron was introduced into metal crafts (Hjärthner-Holdar

1993, 19–22). There is no doubt that the Late Bronze Age or Early Iron Age metalworkers were well versed in utilizing the properties of different raw materials and alloys and the survey has consequently yielded a number of

multimetal sites of prehistoric date. The type of complex metalworking carried out at these sites differs from the later dated sites by the obvious absence of ferrous metal treatment, but more interestingly they do not seem to cluster around the early urban areas either (Svensson forthcoming).

Complex smithing requires knowledge of the handling of several metals and mastering of a wide range of metalworking techniques. This knowledge base is here defined as *multimetallicity*. The term multimetallicity also encompasses the understanding of the craftsmen, the craftsmanship and its produce that all surrounding agents shared: the customers or patrons as well as the craftsmen carrying out their work. Multimetallicity in its broadest sense hence contains all of the society in which the multimetal craftsmen worked, traded and lived.

Complex smithing in the vicinity of the town – metalworking at Skänninge, Östergötland

The medieval town of Skänninge in the mid-southern Swedish province of Östergötland was given formal town rights in the middle of the 13th century but was already established as a central place in both economic and religious respects centuries earlier (Nielsen 2002, 46 ff.). Metal craftsmanship also seems to have been present or even dominant among crafts carried out in the vicinity of the early centre before formalized urbanity was fully in place (Feldt & Nielsen 2013). The type of metalwork conducted was of a complex nature including handling of precious metals and objects fashioned from ferrous and non-ferrous metals in combination (Willim & Grandin 2008 & 2010).

Complex metalworking can be traced back to the pre-urban settlement of Skänninge when a few wealthy estates conglomerated for

economic and social gain in the 9th and 10th centuries AD. As urbanization grew, complex metalworking to a large extent remained restricted to the estates in the vicinity of the early medieval town (Bergqvist & Lindeblad 2013, 101 ff.). This had the effect that designated areas for these smithing activities were created at distance from the town centre but still within direct control of the town itself. Hence, the smithing activities, including all its actors, belonged to both the town and its surrounding estates.

Contract archaeology of recent years has pinpointed three main areas surrounding Skänninge with remains of complex metalworking; the estate by St Martin's church and convent (Fig. 2 A), the smithing site north of St Olof's convent (Fig. 2 B) and a presumed multimetal workshop north of the Allhelgona church (Fig. 2 C) (Feldt & Nielsen 2013). These sites all show similar characteristics that can help in defining multimetal craftsmanship from a landscape perspective. Firstly, they are all placed within close proximity of Skänninge's main water source, the Skenaån river. Secondly, they seem to have been open-air workshops in the sense that the smelting hearths and smithing forges were placed in the open without more than a few rudimentary sheltering structures (Feldt & Nielsen 2013, 108, 113). The metalworking activities seem however to have been organized within clearly defined areas in close proximity to both the estates and the growing urban centre (Bergqvist 2009).

Multimetal metalworking and centrality – metalworking around Borgeby, Scania

Another example of the intricate relationship between economic and social centrality



Fig. 3. Iron Age settlements with remains of forging and casting crafts in the Borgeby area. Multimetal sites indicated by stars (after Becker 2005, 281).

and complex metalworking is seen around Borgeby, western Scania. The presence of metalworking including handling of precious metals has been used as an indication of Borgeby's special economic status in the area during Late Iron Age and Early Middle Ages (Helgesson 2002, 74). The metalworking at Borgeby is clearly of a complex nature and of long continuity, as is shown by excavations

over the last half-century which have yielded smithing remains as well as debris and objects from casting in copper alloys and precious metals (Brorsson 1998).

Several complex smithing sites have been identified in the area surrounding Borgeby (Svensson forthcoming). Much like the previous example from Skänninge, metalworking including multimetal craftsmanship was

established in the area in the 8th century but could have its origins considerably earlier. The placement of the smithing sites is also similar, dominated by high-ranking estates or clusters of estates in direct proximity to water sources (Becker 2005). As seen in the example of Skänninge, multimetallicity was restricted to a few estates and not commonly occurring at all Iron Age settlements in the area (Fig. 3).

At Borgeby evidence for multimetal craftsmanship is restricted to the courtyard, and the metalworking activities carried out in the central workshops seem highly specialized and only paralleled in larger interregional central places of proto-urban character such as Ribe, Hedeby and Birka (Brorsson 1998, 233, Fig. 8). In nearby Löddeköpinge and Bjärred, however, several excavated pit houses have yielded remains of both secondary smithing and casting using copper alloys (Becker 2001, 2003 & 2005, 288). How the multimetal smiths active at these settlements were connected to central Borgeby is not easy to discern, even though the metallurgical remains of all three sites are chronologically matched. In the light of the highly specialized metalworking carried out at Borgeby, it is likely that two types of multimetallicity existed in the area during the later Iron Age, a central multimetal craftsmanship within Borgeby and a more rudimentary multimetallicity at the surrounding settlements. This means that even within the “exclusive metalworking” such as multimetal craftsmanship, there were probably several competence levels and consequently different types of multimetal smiths. Complex metalworking must therefore not be seen as elite craftsmanship that only occurred in high-status environments. Multimetallicity was instead widespread within the craft community of the Late Iron Age and Early Middle Ages.

Provincial multimetallicity – metalworking at Motala Ström, Östergötland

Ever since the first large-scale excavations in central Motala, Östergötland in 2000 metalworking has been part of the craft milieu by the river Motala Ström (Lindeblad 2008, 86). The metal craftsmanship shows significant variety, encompassing bloomery iron production, object forging and casting dating from the Roman Iron Age to the high medieval period (Svensson 2012). Motala in medieval times was divided into a north-western part named Bispmotala and a larger south-eastern village called Motala (Lindeblad 2008, 78). It is hard to discern how the two differed in terms of administrative responsibilities or economic and social influence. In relation to the complex metalworking carried out at Motala Ström, however, it is clear that the smithing sites were placed at equal proximity to both villages.

Motala never received medieval town rights but boasted many features associated with urbanity, such as administrative functions of authority of both sacral and non-sacral nature, making the twin villages of Motala almost directly comparable to Skänninge (Lindeblad 2008, 69). But did defined areas for specialized craftsmanship as could be seen in Skänninge exist at Motala as well? The multimetal activities were carried out on both the southern and northern shores of Motala Ström within close proximity of the central bridge crossing the stream south of present-day central Motala (Svensson 2012). The bridge has at least medieval roots and has been a crucial feature of the twin villages since then (Lindeblad 2008, 86). Even though a smithing workshop has been excavated on the southern bank of Motala Ström in recent years, the major part of the multimetal craftsmanship was carried out in the open in pit



Fig. 4. Multimetalists at work. Drawing by Krister Kåm Tayanin/Gaia Arkeologi.

hearths dug directly into the ground with the aid of only rudimentary or temporary shelters (Svensson forthcoming).

At Motala Ström the link between estates and multimetality seems less evident than at Skänninge; instead a designated area on the

shores of the river was chosen to house the activities and the agents. The choice was a logical one for many reasons. It is a common trait for all types of metalworking to be located close to a stable water source, and for complex smithing it seems almost a universal feature

(Svensson forthcoming). The placement was probably also practical in the sense that it was neutrally placed outside but still close by the twin villages of Motala. The choice was made already in the Roman Iron Age, and the same area was in use for metalworking activities up until the 14th century when Vadstena convent took over ownership of most of the lands in the Motala region (Lindeblad 2008, 82).

Whether or not the smithing sites by Motala Ström were in continuous use or reclaimed for campaigns over and over again independently is still open to question. Radiocarbon dates show continuity within the different kinds of metal craftsmanship identified at the sites, which would suggest continuous usage (Svensson forthcoming). If the metalworking by Motala Ström was established in the Iron Age in a controlled fashion and if that same control enabled continuous metal craftsmanship within the same designated areas up until the High Middle Ages, then the twin villages of Motala constituted a rural centre just as developed and economically robust as its urban neighbour Skänninge, at least as far as complex metalworking and multimetal competence was concerned.

The multimetalists

The survey of multimetal smithing sites within the project is ultimately driven by a few elementary socio-archaeological questions: *Who were the multimetal smiths? How was multimetallicity as a concept perceived within society?* and *What was the role of multimetal craftsmanship in the economic and social power struggle of the Late Iron Age and the Middle Ages?*

To answer these questions using macro-spatial analysis we need to view the metalworking sites as agents themselves within the social and economic framework. This effectively means that previous interpretations of the metalworkers as more or less independent

travelling craftsmen have to be completely disregarded. Linking the metalworkers to a specific site does not necessarily mean, however, that the metalworkers represent an unfree class as many current hypotheses have stated (for instance Carelli 2001, 149 ff.). Instead a more complex perspective must be used. The sites give valuable information on the resource requirements of multimetal craftsmanship and the need for the multimetalists to be close to the central economic and social authority. So far the survey has shown – as exemplified by the multimetal sites discussed above – that complex smithing activities favoured placement adjacent to major water sources and seem to cluster at towns or rural central places. The sites also display long continuity, which implies that stability in terms of resources, competence and overall economy was a necessity.

The proficient metalworker

The metallurgical remains found at multimetal sites show great variety as to the materials and techniques used within complex smithing. The multimetalists must therefore have had to possess developed knowledge of metals and alloys, casting and forging techniques and pyrotechnics as well as the artistic skill to fashion the desired objects. The different kinds of metalworking seen at the surveyed sites could of course be interpreted as being the fruit of many active smiths, but the occurrence of complex metallurgical debris such as smithing slag cakes with inclusions of copper droplets at sites like Skänninge and Motala Ström (Svensson 2012 and forthcoming Willim & Grandin 2010), makes it more likely to be one smithing event and consequently one smith at work. Joint efforts would however have been required in many of the stages of multimetal object production since the handling of different materials and techniques at the same time normally brings a need for helping hands (Tord Bergelin, perso-

nal communication).

In the light of this we are therefore looking at what could best be described as a “proficient metalworker”. It is suggested here that the term proficient be used with regard to multimetal smiths instead of the popular term “specialist” which in both the archaeological and archaeometallurgical narratives has been taken to mean far more than a competent and skilled craftsman. This terminology is derived from the ritualization perspective that has dominated archaeological interpretative thought from the 1990s onwards. In this respect the smith is seen as a transcendent agent within society (Østigård 2007, 176) and is ascribed magical properties and religious authority. This ritualized perspective adds colour and dimension to our interpretations, but it does position the metalworkers as passive outsiders in the community. From a socio-economic perspective, however, the smiths are most favourably viewed as active agents. They lived and worked within the community, shaped its features and acted according to a common norm. To comprehend the multimetalists is therefore the same as formulating an understanding of the society in which they lived. By using the concept of *multimetality* in a broad sense, all of society becomes the object of study, not just the metalworkers or multimetal craftsmanship.

The survey of multimetal sites in rural contexts has shown that several levels of multimetality probably existed in the landscape. A difference can be clearly seen between the multimetality in the urban and rural craft milieus, but more interestingly the presence of a formalized town does not seem to be a dominating factor for multimetal craftsmanship. Instead, developed trade networks, stability and adequate competence were far more essential components for successful metallurgical campaigns.

Urbanity, ruralism and metal craftsmanship

Complex metalworking has long been exclusively linked to urbanity (Anund 1998). Metalworking has further been seen as an active factor in the consolidation process of the newly established towns in Scandinavia. This close link between metalworking and urbanity has emphasized casting crafts utilizing copper alloys and precious metals in late prehistoric and early medieval contexts (Anund 1996). Hence a distinction of status has been put in place, with casting crafts belonging to the elite metalworkers (or rather metalworkers controlled by the elite) in urban milieus and the metalworking practices of the common folk using iron and steel at rural smithing sites. This resulting status distinction is discernible in the archaeological narrative since the introduction of iron in the Late Bronze Age and onwards and is still counted as valid in Scandinavian archaeometallurgical research (Goldhahn & Østigård 2007, 194).

The macro-level survey undertaken within the project “Exclusive Metalworking in Rural Settings” has shown that the multimetality of the landscape is far more complex. Multimetal craftsmanship was practised on several levels in the provinces, rural centres and towns during the Late Iron Age and into the Middle Ages. There is a strong link between developed multimetality and centrality which is clearly seen in the survey. We have to be cautious, however, with how this relationship should best be interpreted. Complex smithing needed many of the structural and economic features that towns or central places provided, and multimetality was an integral part of the urban concept. But multimetality was widespread in the provinces and not restricted to the formal towns as previously stated (Anund 1998).

The proficient metalworker may have had a comprehension of the concept of urbanity and even on many occasions strove towards belong-

ing within the urban sphere even if his or her workshop was based in the provinces. Urbanity is not just a physical phenomenon in the landscape, but a mindset affecting personal and professional choices both individually and collectively (Anglert 2006, 249 f.). In this respect multimetalty could be defined as an urban influence well established in rural settings. The picture grows more complex, however, with the fact that multimetalty predates the formal towns. Multimetalty and urbanity hence developed in close interaction, but as urbanity was formalized, multimetal craftsmanship – in both cognitive and practical respects – was practised outside the urban centres as well.

Towards a multimetal practice

One of the difficulties of conducting the macro-level survey has been the tendency within archaeological interpretative evaluation to separate metalworking sites into the handling of ferrous and non-ferrous metals. This separation probably has its roots in the status distinction of different types of metalworking previously touched upon. The survey has shown that this distinction is less valid than presently assumed. The occurrence of complex smithing on several levels at settlements, estates and in towns does show that multimetalty was, if not commonplace, then at least well known and widely established already in the Scandinavian Iron Age.

When formulating archaeological and archaeometallurgical narratives in the future we should not view casting crafts and the handling of ferrous metals as two practices separated of necessity spatially, chronologically and conceptually. Rather, definitions and interpretations of the metalworking conducted at smithing sites, in rural as well as urban settings, should be based on the quality of craftsmanship, the volume and circulation of the objects produced and the continuity or stability of the activities.

Acknowledgements

The project “Exclusive Metalworking in Rural Settings” is financed by the Berit Wallenberg Foundation and Faber Arkeologi.

For more information about the project, visit www.fabrarkeologi.se.

References

- Anglert, M. 2006. Landskapets urbanitet. In Larsson, S. (ed.), *Nya stadsarkeologiska perspektiv*. Riksantikvarieämbetet 1:1. Stockholm.
- Anund, J. 1996. Medeltida bronsgjutning – teknik och hantverkare i ljuset av arkeologiska fynd. In Forshell, H. (ed.), *Icke-järnmetaller. Malmfyndigheter och metallurgi. Föredrag från symposium på Jernkontoret den 16 mars 1995*. Jernkontorets Berghistoriska Utskott H 64. Stockholm.
- 1998. Mångsysslare, småstäder och klassresor – Nordens bronsshantverk som exempel på möjligheter inom socialarkeologin. *META* 1998 (4).
- Becker, N. 2001. *En grophusbebyggelse vid Bjärred. Boplatslämningar och grophusbebyggelse från äldre och yngre järnålder. Skåne, Borgeby och Flädie socknar*. Dokumentation av fältarbetsfasen 2001:2. Riksantikvarieämbetet. UV Syd. Lund.
- 2003. *Mer grophusbebyggelse vid Bjärred. Reglerad grophusbebyggelse från den yngre järnåldern. Skåne, Flädie socken, Flädie 23:4, RAÄ 8*. Dokumentation av fältarbetsfasen 2003:2. Riksantikvarieämbetet. UV Syd. Lund.
- 2005. Metallhantverk och specialisering. In Carlie, A. (ed.), *Järnålder vid Öresund, 1: Specialstudier och syntes*. Skånska spår – arkeologi längs västkustbanan. Riksantikvarieämbetet. Lund.
- Bergqvist, J. 2009. *Nya Motalagatan. RAÄ 5 Skänninge 2:1, 3:3, Plåtslagaren 1, 2 Skänninge stad, Mjölby kommun, Östergötland*. Riksantikvarieämbetet. UV Öst Rapport 2009: 2. Linköping.
- Bergqvist, J. & Lindeblad, K. 2013. Storgårdar under vikingatid och tidig medeltid. In Hedvall, R., Lindeblad, K. & Menander, H. (eds.), *Borgare, bröder och bönder. Arkeologiska perspektiv på Skänninges äldre historia*. Stockholm.
- Brorsson, T. 1998. In the Workshop of the Viking Age Goldsmith. Gold- and Silverwork at Bor-

- geby in Scania, Southern Sweden. *Fornvännen* 93.
- Carelli, P. 2001. *En kapitalistisk anda. Kulturella förändringar i 1100-talets Danmark*. Lund Studies in Medieval Archaeology 26. Lund.
- Feldt, A-C. & Nielsen, A.-L. 2013. Hantverkare och varuutbyte. In Hedvall, R., Lindeblad, K. & Menander, H. (eds.), *Borgare, bröder och bönder. Arkeologiska perspektiv på Skänninges äldre historia*. Stockholm.
- Goldhahn, J. & Østigård T. (eds.). 2007. *Rituelle specialister i brons- og jernalderen*. Gotarc Serie C. Arkeologiska Skrifter No. 65. Göteborg.
- Helgesson, B. 2002. *Järnålderns Skåne. Samhälle, centra och regioner*. Uppåkrastudier 5. Acta Archaeologica Lundensia Series in 8°, No. 38. Lund.
- Hjärthner-Holder, E. 1993. *Järnets och järnmetallurgins introduktion i Sverige*. AUN 16. Societas Archaeologica Upsalensis. Uppsala.
- Lindeblad, K. 2008. *Landskap och urbanisering. Östergötland ur ett centralortsperspektiv 700–1550*. Lund Studies in Historical Archaeology 10. Riksantikvarieämbetet. Arkeologiska Undersökningar Skrifter 74. Lund.
- 2013. Arkeologi i Skänninge. En kort historik. In Hedvall, R., Lindeblad, K. & Menander, H. (eds.), *Borgare, bröder och bönder. Arkeologiska perspektiv på Skänninges äldre historia*. Stockholm.
- Lønborg, B. 1998. *Vikingetidens metalbearbejdning*. Fynske Studier 17. Odense.
- Nielsen, A.-L. 2002. The Central Place by the River Skenaån. In Hedvall, R. (ed.), *Urban Diversity. Archaeology in the Swedish Province of Östergötland*. Riksantikvarieämbetet. Arkeologiska undersökningar skrifter 45. Linköping.
- Østigård, T. 2007. Transformatorn – ildens mestare i jernalderen. In Goldhahn & Østigård (eds.), *Rituelle specialister i brons- og jernalderen*. Gotarc Serie C. Arkeologiska Skrifter No. 65. Göteborg.
- Svensson, A. 2012. *Metallurgiskt material från Verkstadsvägen SU2010 i Motala. Specialregistrering och spridningsanalys av metallurgiskt avfallsmaterial*. Faber Arkeologi rapport 2012: 1. Hjärup.
- (forthcoming). *Exklusivt metallhantverk på landsbygden. Förekomsten av småföremålsgjuteri och flermetallsmide utanför de urbana kontexterna utifrån de senaste decenniernas uppdragsarkeologiska resultat*. Inventering av nätpublicerade rapporter och utvalda publikationer 2000–2013. Faber Arkeologi forskningsrapport. Hjärup.
- Willim, A. & Grandin, L. 2008. *Spår efter smide och gjutning i Skänninge. Specialregistrering av arkeometallurgiskt material. Östergötland. Allhelgona socken. Skänninge område 14 och Motalagatan, fornlämning 5*. UV Uppsala rapport 2008: 8. Riksantikvarieämbetet. Geoarkeologiska laboratorium. Uppsala.
- 2010. *Metallhantverk i Skänninge – en mångfacetterad historia. Granskning av arkeometallurgiskt material. Östergötland, Allhelgona socken. UV GAL rapport 2010: 01*. Riksantikvarieämbetet. Geoarkeologiskt laboratorium. Uppsala.

Internet references

The open resource archive SAMLA by The Swedish National Heritage Board. <http://samla.raa.se/xmlui/> [accessed 7 May 2014].

Personal communication

Tord Bergelin. Smith at the experimental forge at Holma, Höör 2014

