

NEW PERSPECTIVES ON THE BRONZE AGE

PROCEEDINGS OF THE
13TH NORDIC BRONZE AGE SYMPOSIUM
HELD IN GOTHENBURG
9TH TO 13TH JUNE 2015

edited by

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Preface

I wish to express my sincere gratitude to all who participated in the 13th Nordic Bronze Age symposium. Thank you for attending the conference, for presenting excellent papers and for asking stimulating questions and sharing a wealth of specialist knowledge, all of which led to a successful, and memorable, conference. I am especially grateful to the session organisers for leading interesting sessions with lively discussions. I am also grateful to Johan Ling for organising the excursion to Tanum on the last day, and to Anna Wessman for leading the excursion to the so-called Bronze Age Strait. In addition, heartfelt thanks must also go to GAST, the student society, and to the student helpers who volunteered during the symposium.

A further round of thanks must go to the contributors to this volume, both for taking the time to write and revise the articles, and for having patience with the numerous small questions that always arise in finalising an edited volume. I would also like to thank my co-editor, Anna Wessman, who assisted until the start of her maternity leave in April 2016. Thanks are also due to Kristin Bornholdt Collins for assisting with matters of language and in the task of adopting the style guidelines of the publisher, and to Rich Potter for setting the volume. I am also grateful to Archaeopress for showing interest when I approached them about publishing the volume.

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Finally, I wish to thank my colleagues at the Department of Historical Studies at the University of Gothenburg for their support, from conference planning to production of this volume. Particular thanks go to Johan Ling, Peter Skoglund and Kristian Kristiansen for their input along the way. I hope that the authors are pleased with the final result, and that many will find the diverse collection of articles an interesting and inspiring read.

Gothenburg, March 2017

Sophie Bergerbrant

Table of Contents

Introduction	1
New perspectives on Nordic Bronze Age graves	5
Kristian Kristiansen	
Mjeltehaugen: Europe’s northernmost Bell Beaker expression?	7
Anette Sand-Eriksen	
Bronze Age burials in megalithic graves in Falbygden	19
Malou Blank	
Identifying commoners in the Early Bronze Age: burials outside barrows.....	37
Sophie Bergerbrant, Kristian Kristiansen, Morten E. Allentoft, Karin M. Frei, T. Douglas Price, Karl-Göran Sjögren and Anna Tornberg	
Visible ships were the graves of Bronze Age ritual specialists.....	65
Gisela Ångeby	
From bird wings to fool’s gold. Organic materials and stone from burials of the Late Bronze Age	81
Karen Margrethe Hornstrup	
Craft and materials in the Bronze Age	95
Nils Anfinset	
On the behaviour of potters and metalworkers at the Narkūnai hillfort.....	97
Vytenis Podėnas and Evaldas Babenskās	
Castelluccio painted pottery: shared repertoires and local identity: A case study from Early Bronze Age Sicily..	109
Valentina Copat, Annalisa Costa and Paola Piccione	
Bronze Age metal workshops in Denmark between 1500–1300 BC: elite-controlled craft on Zealand.....	127
Heide Wrobel Nørgaard	
Bronze casting specialists during the Late Bronze Age in the Lake Mälaren region of East Middle Sweden	143
Reidar Magnusson	
Crafts and resources — western Norway in the Late Neolithic and the Early Bronze Age.....	153
Nils Anfinset	
New currents in Scandinavian Bronze Age settlement and landscape archaeology.....	169
Mette Løvshal and Kristian Brink	
Time warps and long-term structures: images of Early Bronze Age landscape organisation in south-west Denmark	177
Marianne Rasmussen	
Settlements, political economy and social organisation: a study from the Únětice Circumharz Region.....	187
Claes Uhnér	

Continuity and change in settlement from LN II to EBA II. New results from a southern Jutland inland region ..	203
Martin Egelund Poulsen	
Tanum 1821 — Examining cooking pits in landscape studies	219
Stig Swedberg, Annika Östlund and Oscar Jacobsson	
Introduction to the rock art session at the 13th Nordic Bronze Age symposium	233
Johan Ling	
‘It’s a man’s world’? Sex and gender in Scandinavian Bronze Age rock art	237
Christian Horn	
Carved ship images from the Bronze Age barrows of north-eastern Zealand: on the trail of Bronze Age farmer-fishers and seafarers.....	253
Liv Appel	
Materiella bilder: Visuella uttryck bland Mälardalens hällbilder.....	267
Fredrik Fahlander	
Re-cut rock art images (with a special emphasis on ship carvings)	281
Gerhard Milstreu	
The Kivik tomb: Bredarör enters into the digital arena — documented with OLS, SfM and RTI	289
Ulf Bertilsson, Johan Ling, Catarina Bertilsson, Rich Potter and Christian Horn	
The northern perspective 2000 BC – AD 1	307
Marianne Skandfer and Joakim Wehlin	
Textiles from the peripheries? Upland evidence from Norway	313
Christopher Prescott and Lene Melheim	
Stone Age appearances in the south-eastern Arctic Bronze Age	327
Jarkko Saipio	
Different Bronze Ages — the emergence of diverging cultural traditions in the southern inland, Norway.....	343
Hilde Rigmor Amundsen	
Nordic-Mediterranean relations in the second millennium BC	355
Serena Sabatini and Lene Melheim	
The wheel and the sun: ‘Glocal’ symbologies of wheel-pendants across Europe	363
Sara De Angelis and Maja Gori ¹	
Danish beads of Egyptian and Mesopotamian glass in context, and the amber connection	375
Flemming Kaul and Jeanette Varberg	
Mortuary rituals at Mycenaean Dendra: the Baltic connection and the role of amber.....	387
Ann-Louise Schallin	
The North from the perspective of the Greek mainland in the Late Bronze Age	395
Helène Whittaker	
Identity, individuals and agency in the Bronze Age	403
Sophie Bergerbrant	

Communicating identity through built space — Concise-sous-Colachoz (CH), a case study	409
Markus Spring	
Tracing boundaries of local group identities in the Early Bronze Age — south-west Norway.....	421
Knut Ivar Austvoll	
Intentionally made: objects as composite indexes of agency and the case of the Late Bronze Age house urns ..	435
Serena Sabatini	
Authors	447

Nordic-Mediterranean relations in the second millennium BC

Serena Sabatini and Lene Melheim

Introduction

When we started planning this session proposal it was our intention to provide a forum in which to discuss new results and perspectives on the very old question of long-distance connections and exchange throughout Europe and the Mediterranean. Participants were asked to first consider provenance analysis of both raw materials and manufactured goods as a means to shed light on mobility and connectivity between Bronze Age societies. Secondly, they were asked to explore the implications of long-distance connectivity at both a local and regional level. The call was well received, resulting in a series of very interesting papers followed by lively discussion in a crowded room at the Bronze Age Symposium in Gothenburg.

Indeed, a discussion about contacts between Scandinavia and the Mediterranean is nothing new in European archaeology; pages and pages have been written on the issue since the pioneering works of Oscar Montelius (1843–1921; 1922, 1986). The theme is far from being exhausted, though; on the contrary, new and refined methodological and theoretical tools allow us to approach this issue from new and sometimes surprising angles.

For a very long time archaeology was bound to the ‘formal’ characteristics of material culture. One could say that typological and decorative patterns provided the main basis for scholars to work out their assumptions on the characteristics of international exchanges and contacts. And, indeed, a number of seminal chronological-typological studies and broad surveys provide an invaluable foundation for any further investigations into this topic (e.g. Aner 1962; Baudou 1960; Herner 1989; Harding 2000; Jacob-Friesen 1967; Jensen 1997, 2002; Kaul 1998; Kristiansen 1998; Larsson 1997; Pydyn 1999; Sherratt 1993; Sherratt and Sherratt 1991; Sprockhoff 1956; Thrane 1975; Vandkilde 1996). Subsequently, several groundbreaking studies appeared in which archaeometric methods were applied to test the origin of metals (e.g. Cullberg 1968; Gale 1989; Junghans *et al.* 1968a, 1968b, 1968c, 1974; Krause 2003; Liversage 2000; Stos-Gale and Gale 2009). In recent years, innovative approaches and advances in science have provided yet more opportunities for

testing the provenance of raw materials and humans, reinvigorating the discourse and sparking a fresh interest in the subject (e.g. Allentoft *et al.* 2015; Frei *et al.* 2015; Haak *et al.* 2015; McKinley *et al.* 2014; Ling *et al.* 2014; Mukherjee *et al.* 2008; Murillo-Baroso *et al.* 2012; Nessel *et al.* 2016; Varberg *et al.* 2015, 2016). It seems that the time has come to explore and develop new theoretical perspectives and interpretative models in order to utilise new results and to investigate the various social and cultural aspects characterising long-distance exchange patterns (e.g. Alberti and Sabatini eds. 2013; Anfinset and Wigglesworth eds. 2012; Earle and Kristiansen eds. 2010; Earle *et al.* 2015; Koch 2013; Kristiansen and Larsson 2005; Kristiansen and Schukowska-Ducke 2015; Melheim *et al.* eds. 2016; Monroe 2011; Vandkilde 2014; 2016; Vandkilde *et al.* 2015).

Recent papers (Kristiansen 2014; Vandkilde *et al.* 2015) have promoted the idea of a new paradigm shift in archaeological studies. Thanks to developments in various scientific fields, a growing number of new data sets are now available to researchers. Lead, strontium and oxygen isotope analyses, ancient DNA and protein studies are just some of the new sources of information. In one way or another, most of the papers of the session dealt with these methods and their outcomes. Our understanding of Bronze Age trade and exchange patterns is largely affected by the results of these new multidisciplinary investigations, and the topic is more complex than ever, even difficult to make sense of at times. At the same time, thanks to these new challenges, the subject is increasingly intriguing and interesting to study. In other words, archaeologists today must be prepared to process, handle and incorporate the information emerging from such advances in scientific analyses in their studies of the archaeological evidence. The Gothenburg Bronze Age Symposium was one of the first scholarly international meetings, if not the very first, in which this turning point in archaeological studies was acknowledged, applauded and widely discussed.

Trade and exchange patterns

The session was especially fruitful in two important ways. Firstly, it was widely discussed and shown that

in the second millennium BC the Euro-Mediterranean zone was an arena for a complex system of variously-sized networks aiming to supply, among other things, a generally large demand of metals, but also of other raw materials such as textiles, glass, amber, as well as ready-made artefacts. Secondly, we wish to highlight an emerging consensus on the need to place a greater emphasis on the role played by continental Europe in the economic development of the entire Euro-Mediterranean region. Further studies are needed to understand the characteristics and scope of the exchanges between the two areas, but it is clear that continental societies were mobile, active and mighty actors, who — as the case studies demonstrate — made simultaneous use of both maritime networks and land communication. Finally, it was also made clear that the various networks and communication channels were to a certain extent complementary and/or competing with each other.

Plentiful written sources from the Near East and the Mediterranean (e.g. Michel and Nosch eds. 2010; Moran 2000; Shelmerdine 2008; Voutsaki and Killen 2001) bear witness to the complexity and extent of such exchanges, at least in the southern part of the continent. The outstanding finds from e.g. the Uluburun shipwreck (e.g. Pulak 2008; Yalcin *et al.* eds. 2005) demonstrate archaeologically the impressive quantity and quality of goods that were circulating in the Mediterranean during the Late Bronze Age. In a continental Europe lacking written sources, the archaeological evidence plays a major role in studies of trade and exchange. Also, the application of new scientific technology enabling provenancing undoubtedly represents a superb opportunity to better investigate movements and connectivity.

Metals

Recent studies from Scandinavia have been at the forefront of new research, demonstrating the challenges that the archaeosciences may present to the archaeological community. The study of a sequence of lead isotope analyses on metal artefacts from Sweden suggested that a significant amount of copper reached northern Europe from far-flung sources such as Spain, Sardinia and Cyprus during the second millennium BC (Ling *et al.* 2012, 2014). The same study revealed a chronological pattern of shifting suppliers. It seems that the supply of raw materials was contingent on economic, political and technological transformations that facilitated or blocked the convenience of specific ores and/or commercial routes during certain periods of time (Earle *et al.* 2015; O'Brien 2015: 279–302; Pernicka *et al.* 2016; Rowlands and Ling 2013).

Similarly, provenance analyses of Danish metalwork presented at the session but published elsewhere

(Melheim *et al.* forthcoming) show an origin of the copper from a variety of ore regions that were previously not taken into account. While filling in and adding nuances the picture created in the groundbreaking study by Ling and co-authors (2012, 2014), in addition to the eastern Alpine and Iberian ore sources, this study points to the Italian Alps as well as the British Isles as substantial supply areas. Interestingly, this and other recent studies (Pernicka *et al.* 2016) demonstrate that the Austrian Mitterberg mine district does not seem to have been *the* main supplier of copper to Scandinavia, as previously hypothesised on the basis of elemental analysis (e.g. Liversage 2000). Still, it seems clear that ore sources in the eastern Alps supplied Scandinavia with metal, especially in the early and late stages of the Bronze Age (Melheim *et al.* forthcoming; Vandkilde forthcoming). The overall conclusions strengthen hypotheses pointing to copper supplies having originated in areas that have been of little or no importance in previous studies. They also strengthen the hypothesis according to which a maritime and Atlantic network must have been crucial for the Northerners in their interaction with other European regions (Earle *et al.* 2015; Rowlands and Ling 2013). The impression is that the demand for metal must have been of massive proportions, and that metal reached Scandinavia from a wide variety of sources, including apparently the eastern Mediterranean (Ling *et al.* 2014), and thus indicating that land and riverine communication were equally important (Earle *et al.* 2015) and could reach to very distant sources.

All in all, the evidence from metal trade studies indicates that European Bronze Age societies were engaged in complex patterns of exchange, and that various networks must have been at work at the same time, embracing the whole continent. An investigation involving analyses of the non-Mediterranean oxhide and oxhide-like ingots, which was presented at the session, but published elsewhere (Sabatini 2016a), presents further proof. The formal and, to a certain extent — when available — geochemical characteristics of the non-Mediterranean oxhide ingots, as well as their distribution patterns and chronology, suggest that they are likely to be connected to the well-known oxhide ingot phenomenon in the Mediterranean (Gale 2011; Gale and Stos-Gale 2012; Kassianidou 2012; Lo Schiavo *et al.* eds. 2009; Sabatini 2016b). While the latter seems to be, with the exception of its initial phase (Stos-Gale 2011), the direct evidence of the Cypriote copper trade, the numerous continental ingots have been tentatively interpreted as tokens of local attempts to connect to wider networks using the internationally well-known oxhide ingot 'brand' (Sabatini 2016a). In other words, at least some of the non-Mediterranean oxhide ingots suggest that there might have been room for economic competition between networks, thus strengthening the hypothesis of ongoing brand economies during the Late

Bronze Age (Bevan 2010). This idea has recently been strengthened by a philological study (Ferrara and Bell 2016) of the Cypro-Minoan signs carved on miniature oxhide ingots from Cyprus. The analyses based on philological arguments suggest that the signs could in fact be interpreted as promoting the brand of Cypriot copper.

The idea of an occurrence of well-known shapes and possible brands that were familiar to people over vast areas appears to be supported by the study of wheel pendants presented in this volume by Gori and DeAngelis (this volume). Our understanding of the considerable presence of such items all over the continent and throughout the Bronze Age becomes more precise when examining the combination of depositional patterns and technological aspects. The analysis of central European wheel pendants from metal hoards seems to suggest that many were actually not used as ‘pendants’; they appear instead to have had the characteristics of ingots, easy to transport and to recognise due to their distinctive shape and colour.

To sum up, the material presented at the session shows that not only was there a massive demand for metal, but that it was circulating in various forms, from very pure raw ingots to ingot-like objects with specific compositions, and that various actors probably attempted to protect and brand their products over very large areas, adopting shapes that were particularly easy to recognise.

Glass and amber beads

A source of broad-ranging discussions during the Bronze Age symposium was represented by recent studies on glass provenance, which showed that glass is one of these materials with a large geographical distribution and a relatively limited number of original production centres (Kaul and Varberg this volume; Varberg *et al.* 2015, 2016). The recorded glass from continental Europe and in particular Scandinavia is known in the form of beads, and is thus generally found in burial contexts, belonging to bracelets and necklaces. Thanks to the geochemical investigations carried out on the Danish beads, this often overlooked material recently shifted from being considered just a decorative object to becoming another category of evidence for long-distance exchange. There is still much to be done to achieve a better understanding of how the material reached northern Europe, and the reasons and patterns that guided it. However, as discussed by Kaul and Varberg (this volume), the material from the Romanian Cioclovina cave hints at the existence of developed land routes between the southern and the northern part of the continent (Varberg *et al.* 2016). Interestingly, this very same route seems to match, at least from the

geographical point of view, the distribution of the non-Mediterranean oxhide and oxhide-like ingots (Sabatini 2016a: fig. 1).

The glass study leads to another very exciting issue. As noted, the Scandinavian glass beads are often associated with amber beads. Paradoxically, while being indigenous to parts of the Nordic region, amber seems to be a rarer material in the Nordic Bronze Age than in the Mediterranean (see Whittaker, this volume). Whether being due to an intense export or to value systems that regarded amber differently, the relationship between amber and the exotic Mesopotamian and Egyptian glass has prompted several questions on the value of such materials and their social and cultural meaning (Kaul and Varberg, this volume).

Two presentations approached the amber issue, both from a ‘southern’ point of view (Schallin, this volume; Whittaker, this volume), exploring in particular the much debated evidence from mainland Greece. It is widely acknowledged that most of the amber from the Bronze Age Mediterranean, including the pieces from the Uluburun shipwreck, has a Baltic origin (see e.g. Mukherjee *et al.* 2008; Murillo-Baroso and Martín-Torres 2012). Amber is among the clearly precious raw materials that Scandinavia could offer to the rest of the continent in exchange for a large number of imported goods. As already mentioned, during the Bronze Age amber tends to disappear from local contexts where it had been very common in the previous Neolithic period (e.g. Ramstad *et al.* 2015). The distribution of amber beads in continental Europe and the Mediterranean suggests the shifting, both geographically and chronologically, presence of centres of manufacture and complex patterns of exchange and consumption (Bellintani 2015; Rahmstorf 2014). Nonetheless, amber pieces from the Aegean in particular continue to fuel a debate regarding whether it is possible to consider them as a convincing evidence for large exchange networks stretching across the continent, or just as a sporadic presence (e.g. Czebreszuk 2013; Whittaker, this volume). Further studies are necessary, taking into account that the value of amber lies also in its characteristics when being burnt, and thus taking into consideration that a portion of the exported material might have been consumed in ritual activities of some sort (see Schallin, this volume; Whittaker, this volume).

Textiles

Although no papers on the topic of textiles *per se* were presented during the session, textile production, trade and exchange were mentioned several times during discussions, due in particular to the astonishing results that have emerged on this front through new methods in provenance studies relating specifically to textiles. In

recent decades, thanks to several international projects and not least to the work of the Centre for Textile Research in Copenhagen, textiles in general, and wool production in particular, have been the focus of multidisciplinary research, demonstrating their enormous value and the complexity of their systems of production (Breniquet and Michel eds. 2014; Gillis and Nosch eds. 2007; Gleba and Mannering eds. 2012). While written sources from the Aegean and the eastern Mediterranean provide records as to the complexity of organisation and size of the local production and trade systems (Michel and Nosch eds. 2010; Waetzoldt 1972), archaeological evidence in these same areas and elsewhere remains more difficult to interpret (Andersson Strand and Nosch eds. 2015; Gleba and Mannering eds. 2012; Sabatini and Bergerbrant forthcoming). Textile remains are very few, and tools for the production of textiles only partially reflect the enormous input of labour that was necessary to produce them. In continental Europe, where the written sources are completely lacking, textile research is gradually getting a completely different profile thanks to the opportunity to broaden the scope with the help of environmental and isotope analyses. Recent studies, again from Scandinavia, suggest that a highly-developed wool trade must have been in place on the continent during the second millennium BC (Bender Jørgensen and Rast-Eicher 2016; Frei *et al.* 2015; Frei *et al.* in press). In Scandinavia, the modest signs of local textile production (Bergerbrant 2007: 49; Sofaer *et al.* 2013: 480), combined with the fact that the analysed wool clothing from the Early Bronze Age Danish oak coffins seem to be of non-local origin (Frei *et al.* 2015, in press), suggest that wool was a traded commodity. Further studies are necessary in order to understand the characteristics and scope of the Bronze Age textile trade and exchange — including the trade in and exchange of raw materials. However, the multifarious archaeological evidence from both continental Europe and the Mediterranean bears witness to a textile economy involving Bronze Age societies in various ways (e.g. Gleba and Mannering eds. 2012; Michel and Nosch eds. 2013; Sabatini and Bergerbrant forthcoming). For example, recent evidence from the highlands in Norway (Prescott and Melheim, this volume), speaks in favour of developed pastoral communities that may also have been engaged in some phases of the long *chaîne opératoire* involved in textile production.

Indeed, the very existence of a large-scale trade of organic materials such as wool, fibre and textiles is a useful reminder of the great potential of this area of research for providing a ‘missing link’ in our understanding of mobility and long distance trade in the Bronze Age. The circulation of specific goods or styles will become more clearly delineated and better understood as scientific advances in textile studies continue to be applied in future work.

Conclusions

Although, as noted at the beginning, Nordic-Mediterranean relations have been at the core of heated debates in archaeology for more than 100 years (see e.g. Nordquist and Whittaker 2007; Kristiansen and Larsson 2007; Klejn 2008), the session at the 13th Nordic Bronze Age symposium gathered for the first time researchers from various regionalised branches of Bronze Age archaeology to participate in a focused discussion on the ‘fruits’ of the third science revolution in archaeology (Kristiansen 2014). Emerging from this discussion, and now at the forefront of our attention, is the idea that Scandinavia and continental Europe rightly deserve to be a major focus in wider Bronze Age scholarship. It is now clear that Mediterranean societies must have been well-aware of the potential offered by populations north of the Alps, and their high demand for both goods and raw materials as well as being providers of raw materials that were exotic to the Mediterranean region. The non-Mediterranean oxhide ingots, the glass beads and the copper of Mediterranean origin in Scandinavia and the Baltic amber in the Mediterranean are just a few examples that clearly demonstrate this mutual interest. This discussion will undoubtedly continue into the future, and it will deepen and expand with the development and fine-tuning of more exact provenance indicators as well as broader sets of reference data. It is hoped that this will be paired with theory-driven discussions and increasingly sophisticated models of travel and exchange in the Bronze Age.

References

- Alberti M. E. and Sabatini S. (eds.) 2013. *Exchange Networks and Local Transformations, Interaction and local change in Europe and the Mediterranean from the Bronze Age to the Iron Age*. Oxford, Oxbow.
- Allentoft, M. E., Sikora, M., Sjogren, K.-G., Rasmussen, S., Rasmussen, M., Stenderup, J., Damgaard, P.B., Schroeder, H., Ahlstrom, T., Vinner, L., Malaspina, A.-S., Margaryan, A., Higham, T., Chivall, D., Lynnerup, N., Harvig, L., British Archaeological Reportson, J., Casa, P.D., Dabrowski, P., Duffy, P. R., Ebel, A. V., Epimakhov, A., Frei, K., Furmanek, M., Gralak, T., Gromov, A., Gronkiewicz, S., Grupe, G., Hajdu, T., Jarysz, R., Khartanovich, V., Khokhlov, A., Kiss, V., Kolar, J., Kriiska, A., Lasak, I., Longhi, C., McGlynn, G., Merkevicius, A., Merkyte, I., Metspalu, M., Mkrtychyan, R., Moiseyev, V., Paja, L., Palfi, G., Pokutta, D., Pospieszny, L., Price, T. D., Saag, L., Sablin, M., Shishlina, N., Smrcka, V., Soenov, V. I., Szeverenyi, V., Toth, G., Trifanova, S. V., Varul, L., Vicze, M., Yepiskoposyan, L., Zhitenev, V., Orlando, L., Sichertz-Ponten, T., Brunak, S., Nielsen, R., Kristiansen, K. and Willerslev, E. 2015.

- Population genomics of Bronze Age Eurasia. *Nature* 522 (7555): 167-172.
- Andersson Strand, Eva and Nosch, Marie-Louise (eds.) 2015. *Tools, Textiles and Context: Investigating Textile Production in the Aegean and Eastern Mediterranean Bronze Age*. Oxford, Oxbow books.
- Aner, E. 1962. Die frühen Tüllenbeile des nordischen Kreises. *Acta Archaeologica* 33: 165-219.
- Anfiset, N. and Wigglesworth, M. (eds.) 2012. *Local Societies in Bronze Age Northern Europe*. Sheffield, Equinox.
- Baudou, E. 1960. *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im Nordischen Kreis*. Stockholm, Almqvist and Wiksell.
- Bellintani, P. 2015. Baltic amber, Alpine copper and glass beads from the Po plain. Amber trade at the time of Campestrin and Frattesina. *Padusa* 2014: 111-139.
- Bender Jørgensen, L. and Rast-Eicher, A. 2016. Innovations in European Bronze Age textiles. *Prähistorische Zeitschrift* 91(1): 68-102.
- Bergerbrant, S. 2007. *Bronze Age Identities: Costume, Conflict and Contact in Northern Europe 1600–1300 BC*. Stockholm Studies in Archaeology 43. Lindome, Bricoleur Press.
- Bevan, A. 2010. Making and Marking Relationships: Bronze Age Branding and Mediterranean Commodities. In A. Bevan and D. Wengrow (eds.), *Cultures of Commodity Branding*: 35-85. Walnut Creek, Left Coast Press.
- Breniquet, C. and Michel, C. (eds.) 2014. *Wool economy in the ancient Near East and the Aegean: From the beginnings of sheep husbandry to institutional textile industry*. Oxford, Oxbow Books.
- Cullberg, C. 1968. *On Artifact Analysis. A study in the Systematics and Classification of a Scandinavian Early Bronze Age Material with Metal analysis and Chronology as Contributing Factors*. Acta Archaeologica Lundensia, series in 4° No. 7. Lund, Lund University.
- Czebreszuk, J. 2013. Mysterious Raw Material from the Far North: Amber in Mycenaean Culture. In S. Bergerbrant and S. Sabatini (eds.), *Counterpoint: Essays in Archaeology and Heritage Studies in Honour of Professor Kristiansen Kristiansen*: 557-563. British Archaeological Reports Int. Ser. 2508. Oxford, Archaeopress.
- Earle, T. and Kristiansen, K. (eds.) 2010. *Organizing Bronze Age Societies*, Cambridge, Cambridge University Press.
- Earle T., Ling, J., Uhnér, C., Stos-Gale, Z. and Melheim, L. 2015. The Political Economy and Metal trade in Bronze Age Europe: Understanding Regional Variability in Terms of Comparative advantage and Articulations. *European Journal of Archaeology* 18(4): 633-657.
- Ferrara, S. and Bell, C. 2016. Tracing copper in the Cypro-Minoan script. *Antiquity* 90(352): 1009-1021.
- Frei, K. M., Mannering, U., Kristiansen, K., Allentoft, M. E., Wilson, A. S., Skals, I., Tridico, S., Nosch, M.L., Willerslev, E., Clarke, L. and Frei, R. 2015. Tracing the dynamic life story of a Bronze Age Female. *Scientific Reports* 5: 10431.
- Frei, K. M., Mannering, U., Vanden Berghe, I. and Kristiansen, K. in press. Bronze Age wool: provenance and dye investigations of Danish textiles. *Antiquity* 2017.
- Gale, N. H. 1989. Lead isotope analyses applied to provenance studies – a brief review. In Y. Maniatis (ed.), *Archaeometry: proceedings of the 25th international symposium*: 469-502. Amsterdam, Elsevier.
- Gale, N. H. 2011. *Copper Oxhide ingots and Lead Isotope Provenancing*. In P. P. Betancourt and S. C. Ference (eds.), *Metallurgy: Understanding How, Learning why. Studies in honour of James D. Muhly*: 213–220. Philadelphia, PA, INSTAP Academic Press.
- Gale, N. H. and Stos-Gale, Z. A. 2012. *The role of Apliki mine region in the post c. 1400 BC copper routes production and trade networks in Cyprus and in the wider Mediterranean*. In V. Kassianidou and G. Pappasavvas (eds.), *Eastern Mediterranean Metallurgy and Metalwork in the Second Millennium BC*: 70–82. Oxford, Oxbow books.
- Gillis, C. and Nosch, M. L. (eds.) 2007. *Ancient Textiles, production, craft and society*. Oxford, Oxbow books.
- Gleba, M. and Mannering, U. (eds.) 2012. *Textiles and textile production in Europe from prehistory to AD 400*. Oxford, Oxbow books.
- Harding, A. F. 2000. *European Societies in the Bronze Age*. Cambridge, Cambridge University Press.
- Haak, W., Lazaridis, I., Patterson, N., Rohland, N., Mallick, S., Llamas, B., Brandt, G., Nordenfält, S., Harney, E., Stewardson, K., Fu, Q., Mittnik, A., Bánffy, E., Economou, C., Francken, M., Friederich, S., Garrido Pena, R., Hallgren, F., Khartanovich, V., Khokhlov, A., Kunst, M., Kuznetsov, P., Meller, H., Mochalov, O., Moiseyev, V., Nicklisch, N., Pichler, S. L., Risch, R., Rojo Guerra, M. A., Roth, C., Szécsényi-Nagy, A., Wahl, J., Meyer, M., Krause, J., Brown, D., Anthony, D., Cooper, A., Werner Alt, A. and Reich, D. 2015. Massive migration from the steppe was a source for Indo-European languages in Europe. *Nature* 522: 207-211.
- Herner, E. 1989. *Spiral Decoration in Early Bronze Age Scandinavia. A Technical and Qualitative Analysis and Study of Production*. British Archaeological Reports Int. s. 552. Oxford, Archaeopress.
- Jacob-Friesen, G. 1967. *Bronzezeitliche Lanzenspitzen Norddeutschlands und Scandinaviens*. Veröffentlichungen der urgeschichtlichen Sammlungen des

- Landesmuseums zu Hannover 17. Hildesheim, August Lax.
- Jensen, J. 1997. *Fra Bronze- til Jernalder – en kronologisk undersøgelse*. Copenhagen, Det Kongelige Nordiske Oldskriftselskab.
- Jensen, J. 2002. *Bronzealder 2000-500 f. Kr. Danmarks Oldtid 2*. Copenhagen, Gyldendal.
- Junghans, S., Sangmeister, E. and Schröder, M. 1968a. *Kupfer und Bronze in der frühen Metallzeit Europas. Die Materialgruppen beim stand von 12 000 Analysen. Studien zu den Anfängen der Metallurgie*. Römisch-Germanisches Zentralmuseum 2, 1. Berlin, Mann Verlag.
- Junghans, S., Sangmeister, and Schröder, M. 1968b. *Kupfer und Bronze in der frühen Metallzeit Europas. Tafeln. Studien zu den Anfängen der Metallurgie*. Römisch-Germanisches Zentralmuseum 2, 2. Berlin, Mann Verlag.
- Junghans, S., Sangmeister, and Schröder, M. 1968c. *Kupfer und Bronze in der frühen Metallzeit Europas. Katalog der Analysen Nr. 985-10040. Studien zu den Anfängen der Metallurgie*. Römisch-Germanisches Zentralmuseum 2, 3. Berlin, Mann Verlag.
- Junghans, S., Sangmeister, and Schröder, M. 1974. *Kupfer und Bronze in der frühen Metallzeit Europas. Katalog der Analysen Nr. 10041-22000. Studien zu den Anfängen der Metallurgie*. Römisch-Germanisches Zentralmuseum 2, 4. Berlin, Mann Verlag.
- Kassianidou, V. 2012. Copper oxhide ingots and Cyprus – The story so far. *Numismatic Reports XXXII-LXIII*: 9-54.
- Kaul, F. 1998. *Ships on Bronzes. A Study in Bronze Age Religion and Iconography*. Publications from the National Museum Studies in Archaeology and History 3. Copenhagen, National Museum.
- Koch, J. T. 2013. Out of the flow and ebb of the European Bronze Age: heroes, Tartessos, and Celtic. In J. T. Koch and B. W. Cunliffe (eds.), *Celtic from the West 2, Rethinking the Bronze Age and the arrival of Indo-European in Atlantic Europe*: 101-146. Oxford, Oxbow books.
- Krause, R. 2003. *Studien zur kupfer- und frühbronzezeitlichen Metallurgie zwischen Karpatenbecken und Ostsee*. Vorgeschichtliche Forschungen 24. Rahden/Westfalen, Verlag Marie Leidorf GmbH.
- Kristiansen, K. 1998. *Europe before history*, Cambridge, Cambridge University Press.
- Kristiansen, K. 2014. Towards a New Paradigm? The Third Science Revolution and its Possible Consequences in Archaeology. *Current Swedish Archaeology* 22: 11-34.
- Kristiansen, K. and Larsson, T.B. 2005. *The rise of Bronze Age society*. Cambridge, Cambridge University Press.
- Kristiansen, K. and Larsson, T. 2007. The Classical Tradition Strikes Back. Reply to Comments on The Rise of Bronze Age Society from Gullög Nordquist and Helène Whittaker. *Norwegian Archaeological Review* 40(1): 85-93.
- Kristiansen, K. and Schukowska-Ducke, P. 2015. Connected Histories: the Dynamics of Bronze Age Interaction and Trade 1500–1100 BC. *Proceedings of the Prehistoric Society* 81: 361-392.
- Klejn, L. S. 2008. The Bronze Age of Europe: Reflections on K. Kristiansen and T. Larsson: The Rise of Bronze Age Society (2005). *Norwegian Archaeological Review* 41(2): 213-231.
- Larsson, T. B. 1997. *Materiell kultur och religiösa symboler. Mesopotamien, Anatolien och Skandinavien under det andra förkristna årtusendet*. Arkeologiska studier vid Umeå universitet 4. Umeå, Institutionen för arkeologi.
- Ling, J., Grandin, L., Billström, K., Hjärthner-Holdar, E. and Persson, P.-O. 2012. Moving metals Moving metals or indigenous mining? Provenancing Scandinavian Bronze Age artefacts by lead isotopes and trace elements. *Journal of Archaeological Science* 30: 1-14.
- Ling, J., Stos-Gale, Z., Grandin, L., Billström, K., Hjärthner-Holdar, E. and Persson, P.-O. 2014. Moving metals II: provenancing Scandinavian Bronze Age artefacts by lead isotope and elemental analyses, *Journal of Archaeological Science* 41: 106-132.
- Liversage, D. 2000. *Interpreting Impurity Patterns in Ancient Bronze: Denmark*. Copenhagen, Det kongelige nordiske oldskriftselskab.
- Lo Schiavo, F., Muhly, J., Maddin, R. and Giumliamair, A. (eds.) 2009. *The oxhide ingots in the central Mediterranean*. Biblioteca di Antichità Cipriote. Rome, CNR – Istituto per gli Studi Micenei ed Egeo-Anatolici.
- McKinley, J. I., Leivers, M., Schuster, J., Marshall, P., Barclay, A. J. and Stoodley, N. 2014. *Cliffs End Farm Isle of Thanet, Kent: A mortuary and ritual site of the Bronze Age, Iron Age and Anglo-Saxon period*. Wessex Archaeological Reports 31. Salisbury, Wessex Archaeology.
- Melheim, L., Grandin, L., Persson, P.-O., Billström, K., Stos-Gale, Z., Ling, J. and Kristiansen, K., forthcoming. Moving metals III: Possible origins for copper in Bronze Age Denmark based on lead isotopes and geochemistry. Submitted to *Journal of Archaeological Science*.
- Melheim, L., Glørstad, Z. T. and Glørstad, H. (eds.) 2016. *Comparative Perspectives on Past Colonisation, Maritime Interaction and Cultural Integration*. New Directions in Anthropological Archaeology. Sheffield, Equinox.
- Michel, C. and Nosch, M. L. (eds.) 2010. *Textile Terminologies in the Ancient Near East and*

- Mediterranean from the Third to the First Millennia BC*: 210-271. Oxford, Oxbow books.
- Monroe, C. 2011. From Luxuries to Anxieties: A Liminal View of the Late Bronze Age World-system. In T. Wilkinson, S. Sherratt and J. Bennet (eds.), *Interweaving Worlds: Systemic interaction in Eurasia 7th to 1st millennia BC*: 87-99. Oxford, Oxbow books.
- Montelius, O. 1986. *Dating in the Bronze Age: with special reference to Scandinavia*. Stockholm, Kungl Vitterhets-, Historie- och Antikvitetsakademien.
- Montelius, O. 1922. *Swedish Antiquities*. Stockholm, Norstedt & Sønens Förlag.
- Moran, W. 2000. *The Amarna Letters*. Baltimore, Johns Hopkins University Press.
- Mukherjee, A. J., Roßberger, E., James, M. A., Pfälzner, P., Higgitt, C. L., White, R., Pegg, D. A., Azar, D. and Evershed, R. P. 2008. The Qatna lion: scientific confirmation of Baltic amber in late Bronze Age Syria. *Antiquity* 82: 49–59.
- Murillo-Baroso, M. and Martínón-Torres, M. 2012. Amber Sources and Trade in the Prehistory of the Iberian Peninsula. *European Journal of Archaeology* 15(2): 187-216.
- Nessel, B., Brüggemann, G. and Pernicka, E. 2015. Tin Isotopes and The Sources Of Tin In The Early Bronze Age Únětice Culture. In J. M. Mata-Perelló, M. A. Hunt Ortiz and E. O. García (eds), *Patrimonio geológico y minero: de la investigación a la difusión. Actas del xv congreso internacional sobre patrimonio geológico y minero xix sesión científica de la sedpgym. Congreso en memoria de vicente sos baynat y craig merideth logrosán (cáceres, españa) 25 – 28 de septiembre de 2014*: 1-20. Logrosán, Sedpgym y Ayuntamiento de Logrosán .
- O'Brien, W. 2015. *Prehistoric Copper Mining in Europe: 5500-500 BC*. Oxford, Oxbow books.
- Nordquist, G. and Whittaker, H. 2007. Comments on Kristian Kristiansen and Thomas B. Larsson: The Rise of Bronze Age Society. Travels, Transmissions and Transformations. Cambridge University Press, Cambridge. *Norwegian Archaeological Review* 40(1): 75-84.
- Pernicka, E., Lutz, J. and Stöllner, T. 2016. Bronze Age copper produced at Mitterberg, Austria, and its distribution. *Archaeologia Austriaca* 100: 19-55.
- Pulak, C. 2008. The Uluburun Shipwreck and Late Bronze Age Trade. In J. Aruz, K. Benzel and J.E. Evans (eds.), *Beyond Babylon: Art, Trade, and Diplomacy in the Second Millennium B.C.*: 288-310. New York, Metropolitan Museum.
- Pydyn, A. 1999. *Exchange and cultural interactions*. British Archaeological Reports Int. S. 81). Oxford, Archaeopress.
- Rahmstorf, L. 2014. Von Nordeuropa bis in den orient: Bernstein in der Bronzezeit. In D. Quast and M. Erdrich (eds.), *Die Bernsteinstrasse*: 24-28. Archäologie in Deutschland 4. Stuttgart, Theiss Konrad.
- Ramstad, M., Axelsson, T. and Strinnholm, A. 2015. Amber. In C. Fowler, J. Harding and D. Hofmann (eds.), *The Oxford handbook of Neolithic Europe*: 657–672. Oxford, Oxford University Press.
- Rowlands, M. and Ling, J. 2013. *Boundaries, Flows and Connectivities: Mobility and Stasis in the Bronze Age*. In S. Bergerbrant and S. Sabatini (eds.), *Counterpoint: Essays in Archaeology and Heritage Studies in Honour of Professor Kristiansen Kristiansen*: 517-529. British Archaeological Reports Int. s. 2508. Oxford, Archaeopress.
- Sabatini, S. 2016a. Late Bronze Age oxhide and oxhide-like ingots from areas other than the Mediterranean: problems and challenges. *Oxford Journal of Archaeology* 35(1): 29-45.
- Sabatini S. 2016b. *Revisiting Late Bronze Age copper oxhide ingots: meanings, questions and perspectives*. In O. C. Aslaksen (ed.), *Local and Global Perspectives on Mobility in the Eastern Mediterranean*: 15-62. Athens, Norwegian Institute in Athens.
- Shelmerdine, C. W. 2008. *The Cambridge Companion to the Aegean Bronze Age*. Cambridge, Cambridge University Press.
- Sherratt, A. G. 1993. What would a Bronze Age world system look like? Relations between temperate Europe and the Mediterranean in later prehistory. *Journal of European Archaeology* 1(2): 1-57.
- Sherratt, A. and Sherratt, S. 1991. From luxuries to commodities. In N. H. Gale (ed.), *Bronze Age trade in the Mediterranean*: 351–386. Studies in Mediterranean Archaeology 90. Gothenburg, Åströms Förlag.
- Sofaer, J., Bender Jørgensen, L. and Choyke, A. 2013. Craft production: ceramics, textiles and bone. In A. Harding and H. Fokkens (eds.), *The Oxford handbook of European Bronze Age*: 469–491. Oxford, Oxford University Press.
- Sprockhoff, E. 1956. *Jungbronzezeitliche Hortfunde der Südzone des nordischen Kreises: Periode V*, Mainz, Verlag des Römisch-Germanischen Zentralmuseums.
- Stos-Gale, Z. A. 2011. Biscuits with Ears: a search for the origin of the earliest oxhide ingots. In P.P. Betancourt and S. C. Ference (eds.), *Metallurgy: Understanding How, Learning Why. Studies in Honour of James D. Muhly*: 221–229. Philadelphia, PA, Instep.
- Stos-Gale, Z. A. and Gale, N. H. 2009. Metal provenancing using isotopes and the Oxford archaeological lead isotope database (OXALID). *Archaeological and Anthropological Sciences* 1: 195–213.
- Thrane H. 1975. *Europæiske forbindelser: bidrag til studiet af fremmede forbindelser i Danmarks yngre*

- bronzealder (periode IV-V)*. Copenhagen, National Museum.
- Vandkilde, H. 1996. *From Stone to Bronze. The Metalwork of the Late Neolithic and Earliest Bronze Age in Denmark* (Jutland Archaeological Society XXXII). Aarhus, Jutland Archaeological Society.
- Vandkilde, H. 2014. Breakthrough of the Nordic Bronze Age: Transcultural Warriorhood and a Carpathian Crossroad in the Sixteenth Century BC. *European Journal of Archaeology* 17 (4): 602–633.
- Vandkilde, H. 2016. Bronzization. *Prähistorische Zeitschrift* 91(1): 103–123.
- Vandkilde, H., forthcoming. *The Metal Hoard from Pile in Scania, Sweden*. Book manuscript with contributions by Katharina Becker, Peter Northover and Zofia Stos-Gale. Jutland Archaeological Society and The Museum of National Antiquities, Stockholm.
- Vandkilde, H., Hansen, S., Kotsakis, K., Kristiansen, K., Müller, J., Sofaer, J. and Stig Sørensen, M. L. 2015. *Cultural Mobility in Bronze Age Europe*. In P. Suchowska-Ducke, S. Scott Reiter and H. Vandkilde (eds.), *Forging identities. The Mobility of Culture in Bronze Age Europe. Report from a Marie Curie project 2009-2012 with concluding conference at Aarhus University, Moesgaard 2012: 5-37*. British Archaeological Reports Int. s. 2771. Oxford, Archaeopress.
- Varberg, J., Kaul, F. and Gratuze, B. 2015. Between Egypt, Mesopotamia and Scandinavia: Late Bronze Age glass beads found in Denmark. *Journal of Archeological Science* 54: 168–181.
- Varberg, J., Gratuze, B., Kaul, F., Haslund Hansen, A., Rotea, M. and Wittenberger, M. 2016. Mesopotamian glass from Late Bronze Age Egypt, Romania, Germany, and Denmark. *Journal of Archaeological Science* 74: 184–194.
- Voutsaki, S. and Killen, J. 2001. *Economy and Politics in the Mycenaean Palace States*. Cambridge, Cambridge University Press.
- Waetzoldt, H. 1972. *Untersuchungen zur neusumerischen Textilindustrie*. Studi economici e tecnologici 1. Rome, Centro per le antichità e la storia dell'arte del Vicino Oriente.
- Yalcin, Ü., Pulak, C. and Slotta, R. (eds.) 2005. *Das Schiff von Uluburun – Welthandel vor 3000 Jahren*. Bochum, Bergbau Museum.