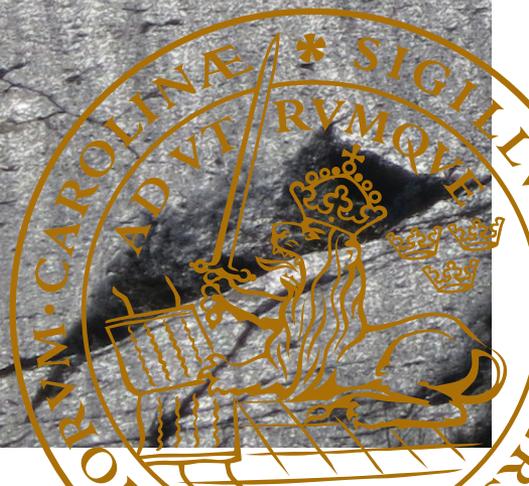


The 15th Nordic Bronze Age Symposium

11-15 JUNE 2019, LUND UNIVERSITY, SWEDEN



The 15th Nordic Bronze Age Symposium
11-15 June 2019, Lund University, Sweden

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LUND
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MADE IN SWEDEN 

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Welcome to Lund

Dear colleagues and guests,

The Department of Archaeology and Ancient History takes great pleasure in welcoming you to Lund University and the 15th Nordic Bronze Age Symposium.

The idea to host the symposium in Lund was born from within the department's research group on Craft and Production, and seen as an opportunity to celebrate the 100-year anniversary of the installation of the first chair in Prehistoric and Medieval Archaeology at our university. The rich Bronze Age of Scania has always held a central position in our department's research, and by organising the 15th Nordic Bronze Age Symposium we hope to pass that legacy on to the future.

Since its inception at Isegran in Østfold in 1977, the symposium has served as a vital forum for archaeological research. This year's symposium offers a rich and varied programme with one keynote presentation and around 65 papers split between nine sessions. The keynote speaker is professor Helle Vandkilde from Aarhus University, who was appointed Honorary Doctor in Archaeology this year by the Joint Faculties of Humanities and Theology at Lund University. The topics of the sessions range from classic themes such as rock art and burials, to the many advances in archaeological science and the new and exiting avenues of interpretation they open up in Bronze Age research.

We wish you a productive symposium, and hope you enjoy your stay in Lund.

The organising committee

Social programme

Tuesday, June 11

19:00 Welcome reception, LUX room C212

Wednesday, June 12

19:00 Light dinner, LUX room C212

Thursday, June 13

19:00 Conference dinner, LUX room C212

Saturday, June 15

08:30–17:00 Excursion to eastern Scania

Coffee is served at 10:45–11:15 Wednesday to Friday, and 15:30–16:00 Wednesday to Thursday. Lunch is served at 12:45–13:30 Wednesday to Friday.

Programme

Tuesday, June 11

- 16:00 **Registration opens in the ground-floor foyer at LUX**
- 18:00 **Welcome and keynote presentation, LUX room C121:**
The metal hoard from Pile in Scania – A local-global perspective on Bronze Age beginnings
Helle Vandkilde
- 19:00 Welcome reception at LUX, room C212

Wednesday, June 12

Session 1 (full day), LUX room C121: Rock art, iconography and Bronze Age lifeworlds – An integrated perspective

Session chairs: *Christian Horn and Lene Melheim*

- 09:00 **Introduction**
Christian Horn and Lene Melheim
- 09:15 **“Herding rocks” – Iconographic depictions of sheep, dog and shepherd on Scandinavian Bronze Age rock art**
Kristin Armstrong Oma
- 09:45 **Neolithic and Early Bronze Age axes depicted on Nämforsen rock carvings – New 3D documentation creates new conditions for dating and interpretation.**
Ulf Bertilsson
- 10:15 **Hunting scenes and narrativity in Scandinavian rock art**
Anna Cabak Rédei, Tomas Persson, Michael Ranta and Peter Skoglund
- 10:45 Coffee break**
- 11:15 **Fantastic beings and where to make them – On boat-ness and boat-beings in Bronze Age rock art**
Fredrik Fahlander

- 11:45 **Changing the story – Re-engagement of rock art during the Bronze Age**
Christian Horn, Marta Guardamino-Díaz, Richard Bradley
- 12:15 **Animated ships**
Gitte Kjeldsen
- 12:45 Lunch**
- 13:30 **Rock art and ritual reality**
Peter Kahlke Olesen
- 14:00 **Pursuing meaning in rock art – A semiotic approach to Bronze Age visual culture and ontology**
Joanna Lawrence
- 14:30 **The narrative structure of rock art**
Lene Melheim
Museum of Cultural History, University of Oslo
- 15:00 **Traces of long-distance interaction in rock art – From the Italian alps to north-western coast of Norway**
Anette Sand-Eriksen
- 15:30 Coffee break**
- 16:00 **How to interpret the rock art site Hammer IX in central Norway?– A conglomeration of motifs, perceptions and additions from the Middle/Late Neolithic to the Roman Iron Age.**
Heidrun Stebergløkken
- 16:30 **The southern Scandinavian Bronze Age creature – Modes of dispersion and transformation**
Laura Elizabeth Svop Ahlqvist
- 17:00 **The Bruserød find – Rock art in grave-context in the Oslo Fjord area**
Magnus Tangen

Session 2 (full day), LUX room C126: Burials, individuals and society

Session chair: *Serena Sabatini*

- 09:00 **Introduction**
Serena Sabatini
- 09:15 **Beyond the steppe – The Yamnaya impact on south-east and central Europe**
Bianca Preda-Bălănică and Volker Heyd
- 09:45 **Not an Iron Age chamber tomb – But a strangely formed Late Neolithic grave**
Lars Larsson

- 10:15 **Old traditions meeting new ideas**
Malene R. Beck
- 10:45 Coffee break**
- 11:15 **Chasing the commoners – Insights from a Bronze Age excavation at Kalvehavegaard, Denmark**
Svenja Weise
- 11:45 **Gender expressions and identities in the Bronze Age – A study of appearance**
Louise Felding
- 12:15 **In the company of men – Thoughts on warrior identities and a peculiar double grave from Karlstrup, Denmark**
Matthew J. Walsh, Samantha Reiter, Flemming Kaul and Karin M. Frei
- 12:45 Lunch**
- 13:30 **The stone cist conundrum – A multidisciplinary investigation of four LN/EBA cist burials on the island of Gotland.**
Magdalena Fraser
- 14:00 **Stone ship grave urns from Gotland, Courland and Saaremaa**
Vanda Visocka, Joakim Wehlin, Uwe Sperling

Session 3 (morning), LUX room B152: Traces of thoughts, traces of trowels
Session chair: *Per Nilsson*

- 09:00 **Introduction**
Per Nilsson
- 09:15 **Sven Nilsson – The father of the Bronze Age**
Påvel Nicklasson
- 09:45 **Images of Late Bronze Age Uppland – Regional identity and interregional contacts**
Karin Ojala
- 10:15 **Retrospect on 100 years of Bronze Age research in Scania**
Kristina Jennbert
- 10:45 Coffee break**
- 11:15 **Dating in the Bronze Age, with special reference to Scandinavian researchers meeting bronze-clad individuals meeting monuments**
Anna Röst

Session 4 (afternoon), LUX room B152: Bronze Age hunting

Session chairs: *Joakim Wehlin & Magnus Ljunge*

- 13:45 **Introduction**
Joakim Wehlin
- 14:00 **Into the wild – Human-animal encounters and South Scandinavian Bronze Age rock art**
Magnus Ljunge, Stockholm University
- 14:30 **Woodland land use during Late Neolithic/ Early Bronze Age, examples from Mälaren region, Sweden**
Lars Sundström & Michel Guinard
- 15:00 **Farmers on the hunt – Hunting and fishing strategies during Bronze Age in Uppland eastern central Sweden**
Fredrik Larsson
- 15:30 Coffee break**
- 16:00 **Not only hunting – Wild resources in the Bronze Age economy at far peripheries of Nordic Bronze Age**
Katarzyna Ślusarska
- 16:30 **Hunting high or low – Evidence of changing hunting practices in the South Norwegian highlands in the LN/EBA?**
Dag Erik Færø Olsen

Thursday, June 13

Session 5 (full day), LUX room C121: Travel and exchange

Session chairs: Johan Ling and Kristian Kristiansen

- 09:00 **Introduction**
Johan Ling
- 09:15 **Swords, metal, sources and trade networks in Bronze Age Europe**
Johan Ling, Lena Grandin, Eva Hjärthner-Holdar, Anne-Lene Melheim, Kristian Kristiansen
- 09:45 **Provenance studies on metal artefacts of the Danish Bronze Age – The archaeological and chemical evidence of metal trade 2100-1600 BC**
Heide W. Nørgaard, Helle Vandkilde and Ernst Pernicka
- 10:15 **Connecting Bronze Age societies along the coast of North-Western Scandinavia**
Knut Ivar Austvoll
- 10:45 Coffee break**

- 11:15 **The core-settlement at Tjora, Rogaland, Norway – Evidence of a Late Neolithic trade port?**
Hilde Fyllingen
- 11:45 **Robuste langhuse i vest – Om regionalitet og monumentalitet i ældre bronzealder periode II-III**
Martin Egelund Poulsen
- 12:15 **Late Bronze Age sites with specialised bronze casting in the eastern coast of the Baltic Sea – meeting points and ports of trade?**
Agnė Čivilytė, Elka Duberow, Vytenis Podėnas
- 12:45 Lunch**
- 13:30 **Early and Middle Bronze Age long-distance visits in the Fenno-Ugric area**
Mika Lavento Professor of Archaeology
- 14:00 **Understanding the dynamics of seafaring in Bronze Age Scandinavia – Boats, their propulsion and the introduction of the sail**
Boel Bessemer Clark
- 14:30 **Bronze Age contact between Scandinavia and the Atlantic West = contact between Germanic and Celtic**
John T. Koch
- 15:00 **Long distance mobility and exchange. New results – changing reflections**
Flemming Kaul
- 15:30 Coffee break**
- 16:00 **The Weinheim-Nächstenbach hoard**
Joachim Neumaier
- 16:30 **Captives as commodities in the Nordic Bronze Age?**
Kristian Kristiansen and Johan Ling
- 17:00 **Discussion**
Kristian Kristiansen

Session 6 (full day), LUX room C126: Bronze Age craft, technique and technology
Session chairs: Eva Andersson Strand, Andreas Nilsson and Andreas Svensson

- 09:30 **Introduction**
Eva Andersson Strand, Andreas Nilsson and Andreas Svensson
- 09:45 **Scandinavian Bronze Age textile production and cloth culture**
Eva Andersson Strand and Ulla Mannering
- 10:15 **Much more than motor skills – Artisanal interpretations of how to practice ceramic craft in a Bronze Age context**
Katarina Botwid

- 10:45** **Coffee break**
- 11:15 **Bronze casting debris in settlements and within dwellings – Revisiting a frequent phenomenon with the case of Asva (Estonia)**
Uwe Sperling
- 11:45 **Painted walls from the Kirkebjerg settlement – Fresh analyses**
Franziska Knoll and Henrik Thrane
- 12:15 **From coast to mountain – Resources and economy in the Late Neolithic and Bronze Age of western Norway**
Nils Anfinset
- 12:45** **Lunch**
- 13:30 **From distant lands – Tracing the nature of Corded Ware expansion, by provenience of battle-axe raw material**
Mads Lou Bendtsen
- 14:00 **Flint daggers in southwestern Sweden**
Malou Blank

Friday, June 14

Session 7 (full day), LUX room C121: Science and Bronze Age archaeology
Session chairs: Lena Grandin and Malou Blank

- 09:00 **Introduction**
Lena Grandin and Malou Blank
- 09:15 **Inside the crucible – A method for investigating the usage of melting crucibles**
Paul Eklöv Pettersson
- 09:45 **Late Neolithic silver? Social landscape, trade and networks from a regional perspective**
Anders Högberg, Lena Grandin and Kristian Brink
- 10:15 **A prehistory of violence – Preliminary results from an osteological study of Late Neolithic-Early Bronze Age skull trauma in southern Sweden**
Anna Tornberg
- 10:45** **Coffee break**
- 11:15 **Agricultural lime disturbs natural Sr isotope variations – Now what?**
Erik Thomsen & Rasmus Andreasen
- 11:45 **Multidisciplinary analyses of human remains from two gallery graves in southwestern Sweden**
Malou Blank

- 12:15 **The stone cist conundrum – The population demographic developments during the LN/EBA on the island of Gotland.**
Magdalena Fraser
- 12:45** **Lunch**
- 13:30 **Investigating sheep husbandry and pastoral economy through an interdisciplinary approach – The case of the Terramare Settlement at Montale, northern Italy**
Serena Sabatini
- 14:00 **Tales of Bronze Age people – Inter-disciplinary investigations in Nordic Bronze Age Denmark**
Karin M. Frei
- 14:30 **A critical assessment of DNA evidence – Did Indo-European speakers migrate out of or into Scandinavia?**
Anil Suri and Gyaneshwer Chaubey
- 15:00 **Could metal composition forward issues about chronology and typology regarding shaft hole axes from the early Nordic Bronze Age?**
Eva Hjärthner-Holder, Johan Ling, Lena Grandin, Lene Melheim and Zofia Stos-Gale

Session 8 (morning), LUX room C126: Wetland depositions and rituals in time and space
Session chairs: Lise Frost and Mette Løvschal

- 09:00 **Introduction**
Mette Løvschal and Lise Frost
- 09:15 **Sensing the personhood of waters**
Christina Fredengren
- 10:15 **Human remains and hoards from the Bronze Age and Early Iron Age in Wetlands, Eggedal municipality**
Sophie Bergerbrant
- 10:45** **Coffee break**
- 11:15 **The Kallerup find – A unique dry land votive deposit from the Bronze Age**
Marie Vang Posselt
- 11:45 **The Danish Bronze Age antler axes – Depositions in time and space**
Lise Frost
- 12:15 **Relations in landscape – The Bronze Age deposition from Hegra, Stjørdal**
Merete Moe Henriksen

Session 9 (afternoon), LUX room C121

15:45

Concluding discussion

Jan Apel

Saturday, June 15

08:30–17:00

Excursion to eastern Scania

Abstracts

Session 1: Rock art, iconography and Bronze Age lifeworlds – An integrated perspective

Session chairs:

Christian Horn¹ and Lene Melheim²

¹ Dept of Historical Studies, University of Gothenburg, Sweden, christian.horn@gu.se

² Museum of Cultural History, University of Oslo, Norway, a.l.melheim@khm.uio.no

Rock art research is currently undergoing a digital revolution that is quickly shifting the paradigms of rock art studies. New discoveries, documentation techniques, and theoretical perspectives have enabled refined interpretations of rock art imagery, panel formation, and temporality. Seemingly coherent scenes have been created diachronically in a renegotiation of motifs and symbols, through later additions and modifications. A decade ago, the shift of focus from an agrarian to a primary maritime frame of reference was formative for rock art studies. This shift related the making of rock art to important activities that Bronze Age groups in Scandinavia engaged in, such as sea-faring, trade, and warfare. A renewed interest in Bronze Age iconography and imagery in rock art and other media has demonstrated how animism, narrative, and myth may be valid frames for interpretation. Together, these scientific developments enhance the potential for a stronger integration between rock art studies and Bronze Age archaeology in a wider sense; something that needs to be further discussed and developed.

This session invites papers addressing:

- Comparative, methodological and theoretical approaches to rock art
- The interpretation of images and iconography
- Rock art

“Herding rocks” – Iconographic depictions of sheep, dog and shepherd on Scandinavian Bronze Age rock art

Kristin Armstrong Oma

University of Stavanger, Museum of archaeology, Norway, kristin.a.oma@uis.no

In herding, there are three kinds of being. The human shepherd acts as the self-proclaimed agent; the flock of sheep are by category animal others, whereas the sheepdogs act as an in-between. The latter hold a complex ontological position since they can simultaneously be both necessary tools and partners to the shepherd, and they negotiate communications and intentions between two types of agents that both belong to species other than their own. Studying their ontological position brings a different dynamics into human-animal relationships, which are often tacitly understood to be an act of relating between two kinds of beings. The position set out in this paper is that there can be, and often indeed are, more than two kinds of being in human-animal dynamics.

The work that sheepdogs do is often conducted in dangerous, hilly "fringe" landscapes. In the north of Europe, the inaccessible topographies of mountain pastures create fringes in the landscape where it can be difficult and dangerous for humans to follow domestic animals, particularly sheep in transhumance figurations. In this situation, sheepdogs are vital to herding and their ontologically complex situation places them simultaneously on the fringe and casts them as mediators. When they herd sheep in topographically marginal landscapes away from humans they have to make individual decisions, and they mediate between shepherd and sheep and between accessible and inaccessible landscapes. They are the extended eyes, ears and voice of the shepherd – in this sense, they are one with the shepherd – and moreover, they act with surprising independence. Since sheepdogs are not human but act with human-like agency, they may be seen as hybrids.

This paper draws mainly on images of dogs, humans and sheep from Nordic Bronze Age rock art sources, but living arrangements within the household and depositional patterns of dog bones on settlements are also considered to extrapolate an understanding of the physical reality and ontological role of sheepdogs within the social aspects of the practice of herding. Theories from the interdisciplinary field of Human-Animal Studies are utilized to understand how socialisation, habituation and trust create a seamless choreography between human, dog and sheep.

Neolithic and Early Bronze Age axes depicted on Nämforsen rock carvings – New 3D documentation creates new conditions for dating and interpretation

Ulf Bertilsson

Svenskt Hällristningsforskningsarkiv, University of Gothenburg, Sweden, ulf@shfa.se

The weapons/tools previously noted at Nämforsen were mainly described as resembling the pick shaped axes also depicted on several carvings at Laxön and Notön. Gustaf Hallström made a detailed comparison with the long-hafted scythe shaped tools with wide and slightly curved blades that occur at Vingen in Norway without succeeding in getting the dating to coincide. He finally held to the opinion that “the best fit” was the hafted Russian flint-sickles (Hallström 1960). None of these interpretations is entirely convincing. His focus was primarily on what he called “elk head axes” resulting in an emphasis on eastern role models instead of western and southern ones, which, as our analysis do show, would have been more relevant. With the new 3D documentation recently acquired as a base, we have analysed this extensive digital data in order to clarify and deepen the knowledge of these axe carvings. We have focused our analysis on carvings with weapons, individual ones as well as those carried by warriors or other human figures. The results of this analysis, presented in this paper are both surprising and exciting and create new conditions for interpretation and dating of the carvings.

Hunting scenes and narrativity in Scandinavian rock art

Anna Cabak Rédei¹, Tomas Persson², Michael Ranta¹ and Peter Skoglund^{B}*

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²Cognitive Science, Lund University, Sweden, tomas.persson@lucs.lu.se

³Dept. of Archaeology, Linnaeus University, Sweden, *Corresponding author:
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Since the beginning of rock art research, Scandinavian petroglyphs have given rise to vivid interpretations, related to stories and myths found in Saami ethnography, Old Norse religion, and Indo-European mythology. Hereby the narrative potential of rock art has almost been taken for granted, without any thorough consideration of e.g. cognitive, semiotic, and narratological issues involved. At a first glance, it certainly does not seem too far-fetched to suspect that petroglyphs are signs intended to tell some kind of stories, or at least to represent simple event sequences. But how can we know for sure

if stories are told, and what kind of evidence for various interpretative hypotheses can be provided?

In this paper we will discuss some examples of hunting scenes with narrative implications in Scandinavia, in particular images of wild boar hunting found in the South (e.g. near Norrköping, Sweden dating to c. 1700-1100 BC) and hunting scenes, mainly of deer, in Northern regions (e.g. in Alta, Norway dating to c. 4800-4000 BC). An observation is that there are differences between these regions concerning the narrativeness of the pictures, i.e. the images are putting emphasis on different aspects of the hunting process itself.

A number of rock art panels in the in Alta seem to display several phases, or procedural parts of action scripts, such as tracking and killing the prey, and the anatomical inner details of the hunted species while the Norrköping images are limited to the final killing, or confrontational, phase only. Put in another way, Northern hunting scenes discussed in this paper thus rely more on interrelated images, while the Southern tradition display more minimal narratives in single images and signs. The former are thus more explicitly narrative, while the latter require more cognitive efforts of narrative supplementing on the part of the observer.

The paper gives a number of examples to illustrate these differences. Using these images as a point of departure, we shall further discuss and point to some crucial cognitive aspects of storytelling, not least regarding pictorial material, based on findings from schema and script theory within cognitive psychology.

Fantastic beings and where to make them – On boat-ness and boat-beings in Bronze Age rock art

Fredrik Fahlander

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fredrik.fahlander@ark.su.se

The boat motif in Bronze Age rock art is generally assumed to represent real or symbolic boats in one form or another. This paper, however, investigates the possibilities of the boat motifs as independent material articulations made to *do* something. The integration of images in the rocks by means of repeated pecking is argued to constitute a ritual performance to make a being come to life and to tie it to the rocks. The hybrid character of the boat motif as part animal, part boat, suggests that it constitutes a special type of entity, a boat-being, which has no original somewhere else.

The change of perspective on the most common figurative motif from "object" to "being" allows for a more coherent view of Bronze Age rock art as primarily enacted "entities" (boat-beings, anthropomorphs and zoomorphs) tied to the rocks as a subsidiary devices. From such a perspective, the variations in design and elaboration of rock art motifs are less about visual representation and communication, but more about modifying and directing the powers of individual entities for different aims and purposes. Considering the close relation between rock art and the water's edge it is argued to be directed to humans, animals or other beings associated with the water world (but not necessarily in that order).

Changing the story – Re-engagement of rock art during the Bronze Age

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The paper reviews examples for the re-engagement of rock art during the Bronze Age in Europe. This corpus of data demonstrates that people re-engaged with petroglyphs that were carved generations earlier much more actively and frequently than previously assumed. This encompasses an array of different practices including additions, re-emphasizing, updating, and transforming. The different practices themselves incorporate a variety of possible actions, e.g. adding warriors to pre-existing weapons, re-using cupmarks, updating war-gear, or canoe prows. Although rock art is notoriously hard to date, this seems to be an on-going process throughout the Bronze Age.

Based on the example of the Scandinavian and Iberian petroglyphs we will be asking, how and for what was the past used during the Bronze Age including (false?) memory practices, narratives, and ancestral beliefs. With this approach, we will explore the social role of re-engaging with rock art during the Bronze Age to (re-)construct narratives, building (group-) identities, and negotiate social positions.

Animated ships

Gitte Kjeldsen

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Rogaland in SW Norway has a large number of rock art sites within relatively limited geographical areas; ship motifs comprise approximately 72 %. Chronologically, the ship motifs appear in the early Bronze Age and continue into early pre-Roman Iron Age. Examples of significant rock art sites and the difference in choice of place and imagery are presented. Features and locations in the landscape may become significant over time through repeated human interaction, including visual interaction. This may have reinforced personal relationship and may have impacted upon memories of those producing rock art and of the wider social memory of audience. As a phenomenon rock art was embedded in Bronze Age ontology, where the use of open sites over extensive periods of time may have resulted in the incorporation of rock art into different contexts/processes, including burials.

Rock art and ritual reality

Peter Kahlke Olesen

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In the recent history of Bronze Age rock art studies, interpretations involving religion have largely focused on the “meaning” of the images. This is in contrast to earlier studies that, inspired by evolutionistic accounts of ritual and magic, often ascribed an efficacious function to the rock art itself. Drawing on comparative studies of religion, the images were seen as being in some way *real*, rather than symbolic, and as having direct agency in “magic” and increase rituals. Since then, simplistic accounts of fertility magic have been abandoned, and largely replaced by a paradigm that sees rock art in terms of communication, in which an emphasis is placed on the representative function of the image.

In recent years, attention to possible magic and ritual functions of the rock art has increased once more. However, there is a need for a theoretical re-evaluation of these terms and concepts, as well as a critical discussion of methodology. On the basis of the comparative phenomenology of religion, I will discuss theories of how images function as their referents in ritual, and how this ritual reality is materially constituted. Drawing on insights about how rituals situate themselves and their images in a mode of efficacy,

I will look at how these situating aspects might be recognized archaeologically in the rock art and its context.

Pursuing meaning in rock art – A semiotic approach to Bronze Age visual culture and ontology

Joanna Lawrence

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This paper presents an interpretive perspective for examining Bronze Age rock art through a semiotic lens. Developed through study of the Southern Tradition rock art of Scandinavia, this approach is grounded in the fact that every detail of the carvings must have been painstakingly and intentionally added, and the subsequent inference that each component carries meaning. The details annotating schematised figures are proposed to have served a semiotic function, communicating meaning that was situated within a visual ontology that was widely shared. Meanings that would have been understood from an emic perspective were likely not straightforward, but could have been simultaneously plural, flexible, contextually dependent, or subtextual, rendering the carvings ‘unreadable’ to the modern eye. However, I propose that such meaning might yet be approachable through the identification of patterns of association between a figure’s annotations, narrative interactions, and spatial context in relationship to other carvings.

To illustrate this methodology, I present preliminary results from my research on depictions of animals from rock art sites in central and southern Sweden, in which I recorded features of thousands of animal figures in a statistically accessible format. Based on emergent patterns in how animals are depicted in aesthetic and contextual terms, I discuss interpretations of the nature of animals as seen in Bronze Age Scandinavian ontology, and implications for their roles within society.

The narrative structure of rock art

Lene Melheim

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As a continuation of the often practice-oriented perspectives of the 2000s, rock art studies have taken a new turn with sophisticated 3D documentation techniques. The fact that panels were altered through time strongly challenges the idea of an inherent message or meaning. Maintaining that myths and religion remain valid frames for

interpretation also in the case of intentional modification, this paper will explore narrative structures in rock art. The take is inspired by three quite different approaches to rock art and myth, which have one thing in common; by identifying key themes they are able to connect singular images to larger narratives. Famously, in *Ships on Bronzes*, Flemming Kaul (1998) argued that the solar myth is represented by ship images and their sailing directions. Åsa Fredell (2003) suggested in *Bildbroar* that in the same way as epic poetry, rock art narratives are characterized by repetitive structure, metonyms, gestures and a fascination for novel technologies. Myths are often expressed through a few key events. In *Rock art and the wild mind*, Ingrid Fuglestad (2017) uses Lévi-Strauss' concepts of mythemes and develops her own term moteme to approach Mesolithic rock art. She identifies a key moteme, which is a visual thematization of the enigmatic relationship between humans and big game. This paper will approach narrative structures in Bronze Age rock art in two different media: slabs/stelae from burial contexts and complex open-air panels. Using examples from the west coast of Norway and Østfold-Bohuslän, I argue that context, microtopography and the quality of the rock were important narrative elements, besides cardinal points and body schemes.

Traces of long-distance interaction in rock art – From the Italian alps to north-western coast of Norway

Anette Sand-Eriksen

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By using accessible pathways and thoroughfares, such as sea-lanes and rivers, prehistoric societies were able to travel and form dynamic networks. This paper will present some preliminary thoughts and ideas on how rock art can play a central role when contextualizing prehistoric interaction.

Through a selection of cases, the paper will explore how the numerous rock art motifs and their composition on panels hold the potential to differentiate between areas and display regional societies within Norway and Scandinavia. As such, rock art motifs can form the basis of comparative micro-regions, which in turn, through their potential as 'mental maps', can be used to examine contact, interaction and movement, both within Scandinavia and further south.

How to interpret the rock art site Hammer IX in central Norway? – A conglomeration of motifs, perceptions and additions from the Middle/Late Neolithic to the Roman Iron Age.

Heidrun Steberglokken

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The rock art site at Hammer in Steinkjer, Trøndelag County in Central Norway, consists of 17 panels located about 7 km west of Bardal which is famous for its many superimpositions of Northern and Southern rock art tradition. At Hammer we also find a coexistence of both rock art traditions. Eight of the panels belong to the Northern tradition, while six belong to the Southern tradition. The last three panels, Hammer I, V and IX, contain figures belonging to both tradition coexisting side by side at the same panel.

Egil Bakka was the last one to document this panel in 1977. However, in 2012 new discoveries of figures were reported, and a new documentation was much needed. During the fall of 2018 NTNU University museum did a new documentation of the panel IX, which led to new discoveries. The documentation revealed what seems to be a special kind of conglomeration of motifs from the Southern and Northern tradition. The motifs we certainly recognize from the iconography, but the combination of motif and how they relate to each other stand a bit out from the normal tendency in this region. Shorelines give a maximum date of this panel to approx. 4400 BP, to the Middle/Late Neolithic period. However, the panel has been in use long after this—new figures have been added throughout the Bronze Age, and possible as late as the Roman Iron Age (three boat images of Hjortspring type). There seems to be a dominance of marine motifs, both from the Northern and Southern tradition. Whales dominate in the oldest phase, but there are also images of elks, birds and boats. The boats are also a recurring feature during the Southern tradition-phase; in addition there are footprints and three images of the not so common motif—the handprints.

I want to look closer at how the figures relate to each other and the sea landscape. New digital methods (HandyScan700) also revealed some interesting aspects we could not quite interpret at site. Two of the images actually consist of two different animals merged together, an elk-whale and a bird-whale/or bird-elk. This is not far from the whale-bear at panel V. The whale seems to have had a special position in this society, and the marine factor throughout the different phases of the panel may reflect a special connection to the sea and the sea landscape. The people are not directly present at the panel and human figures are not present, but footprints and handprints mark a presence

of some sort. But at what level? The humans from this world, or could it be a presence of another world the humans only can catch a glimpse of.

The Southern Scandinavian Bronze Age creature – Modes of dispersion and transformation

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Multiple recent studies have highlighted the highly globalized nature of Scandinavian Bronze Age society, however at the same time strong localized traditions appear to be in place. The southern Scandinavian iconography on Late Bronze Age objects provides interesting perspectives on this seeming juxtaposition, as it adopts and draws on imagery that is shared across large distances throughout Europe. In this presentation, I will discuss how aspects of this pan-European imagery are reworked and reimagined within an apparent localized southern Scandinavian tradition, creating a very characteristic style involving hybridized creatures, abstract representations and seemingly mythical scenarios. I further explore how this zoomorphic imagery may have materialized aspects of animistic beliefs that entangled with large-scale European narratives. The iconography on these Nordic Bronze Age artefacts thus likely reflects a complex relationship between myth and world view within Scandinavian Bronze Age society, influenced by new means of travel, transportation and contact.

The Bruserød find – Rock art in grave-context in the Oslo Fjord area

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During the spring of 2015, archaeologist Kjersti Jacobsen noticed some peculiar lines in a stone standing in a cairn. The cairn, part of a grave field consisting of 30 burial mounds, is located in the inner part of Vestfjorden, at the farm Bruserød in Tønsberg, Norway. The structure is interpreted as a typical Bronze Age burial. This particular cairn was 15-18 meters wide, 1,5 meter high, and with a deep central plundering crater. Somebody had recently vandalized it, by expanding the older plundering crater, moving rocks and even igniting a bonfire inside it. This vandalism resulted in some of the rocks being turned, exposing a boat image for the observant archaeologist who reported it.

The Museum of Cultural History, Oslo, initiated a rescue survey in late 2015. Two other stone fragments with rock art imagery were found in the central bottom of the cairn, and they fitted together forming a second stone with a boat image. The imagery on the three rocks suggests a connection between them. At least two, and most likely all three of the stones with pecked art, was found in the central bottom, and thus can be interpreted as being placed close to the dead in the burial ritual. A test pit was dug, but unfortunately, no dateable material was found, and neither a clear burial chamber. A closer examination is required to answer more questions at Bruserød.

The Bruserød find is not unique, but part of a bigger system where rock art plays a part in burial practice. A bigger emphasis on this phenomenon in recent years has resulted in a rising number of examples, mainly by revisiting older finds and reports, but also by being aware of, and acknowledging, this find-group at archaeological digs. Rock art appear on bedrock underneath graves, on bigger boulders where a cairn is placed around it, and finally on smaller mobile rocks placed in the grave.

This presentation aims to bring new awareness of this group of rock art, by introducing the Bruserød find and seeing it in context with the increasing number of examples from the Oslofjord area (Jong, Virik, Foss and others), and to initiate a discussion of this phenomenon on bigger scale, as an integrated part of life (and death) in the Nordic Bronze Age.

Session 2: Burials, individuals and society

Session chair:

Serena Sabatini

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The study of burials is central to archaeology in many ways. Lately great attention has been paid to the investigation of single individuals' life histories, achieving incredible results. With an eye to recent advances in isotope tracing and ancient DNA analyses, the participants of the session are asked to consider upon new basis the archaeological record and any resulting reflections on the role of burials for Bronze Age societies.

Each burial is likely to have been an event that individuals and/or groups of various sizes attended, following norms, rituals, and customs, but also from time to time possibly altering such norms or introducing new ones. One may consider that during the funerary rituals, the deceased becomes tightly enmeshed with his or her burial. In this process, the complex plurality of each burial with all its consisting elements ends up conveying messages to the world of the living. Burial contexts can be considered as communicating adherence or contrast to dominating values and norms, for instance; they could also signal forms of social, cultural, political or economic distinction characterizing the deceased himself or perhaps his or her kin. Other possible approaches could be also explored and are welcome in the discussion. Additionally Northern European Bronze Age communities adopted different types of burial practices that at times show similarities with practices common in other European regions and at times appear locally rooted. Therefore, the transformative power of external influences should also not be underestimated.

There is a long tradition of burial practice studies; however, the recent manifold scientific advances invite a re-assessment of previous assumptions about the social, cultural and political significance of graves and grave monuments. The time is perhaps ripe for an investigation of burials with renewed attention to the relation between individuals and societies during the Bronze Age.

The papers in this session are asked to explore different types of funerary practices in Bronze Age Northern Europe, unfolding their complexity and examining the dynamics underlying their adoption, development and eventual decline. Considering burial contexts as multi-layered parts and/or whole configurations, papers are invited to address the following, exploring in specific:

- Ritual and customs
- Funerary architectures
- Internal configurations of the tombs
- Grave goods assemblages
- Body treatments
- Dataset from isotopic and genetic analyses

Beyond the Steppe – The Yamnaya impact on south-east and central Europe

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The end of the 4th millennium BC witnessed the movement of eastern steppe populations towards the west and their arrival in south-east Europe. New burial rituals emerged, involving the erection of mounds that can still be seen in the plain landscape of modern countries of Romania, Bulgaria, Serbia and Hungary. They were usually raised for male individuals buried in grave-pits arranged like chambers with mats and wooden covers, lying in supine position with flexed legs, west-east oriented, sprinkled with red ochre and only rarely accompanied by pottery or silver hair-rings. However, the impact of the Yamnaya complex went well beyond the steppe area it was confined to. The innovations brought by these populations changed forever the face of Prehistoric Europe in terms of economy, ideology and society. The current understanding of this complex process, in close relation to new developments in aDNA analyses and isotope studies, is based on concepts such as mobility and migration, interactions, exchanges and transmissions.

Not an Iron Age chamber tomb – But a strangely formed Late Neolithic grave

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During a comprehensive geophysical survey of Iron Age settlement around Uppåkra, a structure with an unusual form was noticed. It was located inside of an anomaly that could be interpreted as the base of a mound. Initially, the structure was understood to

be a grave associated with the Iron Age settlement. It thus became the focus of investigation. It also offered the possibility of testing new three-dimensional documentation methods. The results showed that it was indeed a grave, but it actually dated to the Late Neolithic. Recent digging activity has partially destroyed the grave. However, it is clear that in a southern Swedish context, the grave's construction was unusual. It consisted of a stone-lined grave pit, which was in turn circled by a ditch. Adjacent to the grave pit was a raised stone. Three individuals were interred in the grave, but no burial goods were encountered.

The grave has significant similarities to mortuary structures from the Single Grave Culture. In addition, on Bornholm similar burial structures occur.

Old traditions meeting new ideas

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In 2016 and 2017 The Museums of Eastern Funen excavated a ploughed down Bronze Age barrow near the southern coast of Kerteminde Fjord. The find sheds new light upon the transition from LN/NBAI to NBAII and the concurrent changes in burial customs. The barrow covered a central grave containing the cremated bones of a man and a woman in an oak-coffin, accompanied by an extraordinary set of grave goods. With a date around 1400 B.C. the grave is one of the earliest examples of cremation graves in Denmark. The central grave offers a huge range of perspectives regarding the use of metals, the transmission and introduction of new skills, ideas and perhaps people in the higher levels of Bronze Age society throughout Europe. At the northern rim of the barrow a flat field cemetery, originally containing at least ten inhumation graves, was discovered during the excavation of the central grave. ¹⁴C dates reveals, that the majority of the graves belongs to NBAI, but at least one dates to the LN. The flat field graves doesn't contain grave goods made of metal, instead they seem to have a lot of connotations to the sea, with a content of different shells and perhaps seaweed. Thanks to excellent preservation conditions the anthropological material from the flat field graves is unique in a Danish context. This offers the opportunity of investigating social conditions, living standards, family ties, migration etc. Initial tests indicate, that the individuals in the flat field graves were of local origin. They were buried in a fashion indistinguishable from the late Neolithic tradition. The barrow and the central grave in many ways represent a break in tradition and ideas. The grave goods imply that the two cremated individuals had far reaching contacts, they might have mastered new skills regarding metalwork, possibly they contested special positions in society and they

certainly distinguished themselves from others in the way they were buried. So far it hasn't been possible to determine whether they were of local origin or not. The use of an existing graveyard could indicate the continuation of a family tradition but incorporating new funerary rituals, on the other hand it could also be interpreted as the need of a newcomer to tap into local customs in order to establish a sort of affiliation and fusion with the new society.

Chasing the commoners – Insights from a Bronze Age excavation at Kalvehavegaard, Denmark

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The archaeological record of Bronze Age Denmark comprises several rich elite burials but misses a large proportion of the population – the commoners. For Southern Sweden, it has been proposed that these might be buried in gallery graves and flat ground cemeteries falsely attributed to the Late Neolithic.

In 2016, during a rescue excavation of two cremation graves with rich grave goods, two additional inhumations without valuable objects were found in flat graves at the foot of the burial mound. Additional six burials and a few loose bones were found during a second excavation in 2017, with five of the interred being children. The skeletons are for the most part well preserved, if fragmented, and represent all age groups - adults, children, and even a new-born. Eight burials could be radiocarbon dated. All but one dates to period I or the beginning of period II of the Danish Bronze Age, with one inhumation dating to Late Neolithic I. The chemical signature identifies them as locals, who grew up and stayed on Funen.

This talk will focus on the results of the osteological analysis of all burials, including the cremations, and the conclusions about the social status of the buried implied by the osteological observations, different positioning and furnishing of the graves. The find of well-preserved inhumation graves from this period is a rare event and offers new insights into the life of the inhabitants of Bronze Age Denmark.

Gender expressions and identities in the Bronze Age – A study of appearance

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Through network analyses, this paper investigates identity and regionality in the Early Nordic Bronze Age by studying the individual appearance in female burials from the period. The gendered social roles and identities of these individuals are examined through a comparative study of burials from Denmark (Jutland, Funen, Bornholm) and Northern Germany.

The study wishes to contextualise the recently demonstrated highly mobile female individuals, the Egtved Girl and Skrydstrup woman (Frei et.al 2015; 2017), with the higher aim of trying to gain a better understanding of gendered mobility in the Bronze Age.

In the company of men – Thoughts on warrior identities and a peculiar double grave from Karlstrup, Denmark

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Throughout history alternative gender identities and categories have been integral to social groups that are highly-performative and/or rigorously hierarchical, as e.g. within martial fraternities. Here, we open up for an alternative interpretation of a same-sex double grave from the Early Nordic Bronze Age from Denmark. We suggest the possibility that the hierarchal warrior class – the so-called ‘warrior elite’, may have embodied a distinctive gender category of its own, based on individual mobility and dynamic fraternal relationships. Thus, we suggest that male identities, as represented in some mortuary contexts in the Nordic Bronze Age including members of the warrior class, were more complex than may be hypothesized based purely on gender-normative notions of masculinity. We propose that the warrior lifestyle might have sanctioned intimate interpersonal relationships between men as part of the shared warrior ideology and that this type of relationship might have been a recognized feature of the warrior elite. To investigate this hypothesis, we look at features of the same-sex male double

grave from Karlstrup, Denmark and compare it with other Nordic Bronze Age double burials. For broader context, we draw insights on the graves in our sample with evidence from, among others, Classical and anthropological literature. We offer a brief discussion of why gender-related interpretive frameworks are of value to our understandings of the archaeological record, and provide another layer of information offering a deeper understanding of prehistoric societies and individuals' potential social mobility in the past.

The stone cist conundrum – A multidisciplinary investigation of four LN/EBA cist burials on the island of Gotland.

Magdalena Fraser

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There is an abundant amount of stone cist burials across the island and at least 104 burials distributed at 86 different locations have been suggested to belong to the LN/EBA periods. However, only a third of these have been excavated, most were excavated a long time ago, and many had also been plundered and partially destroyed prior to excavation. Additionally, few have been analysed osteologically, thus little is known about these burials.

Here I will present a multidisciplinary pilot study of individuals buried in four different types of cists that previously has been linked to the LN/EBA based on the artefacts found within the graves. Hägur: a partially destroyed stone cist burial in a cairn excavated in 1944; Suderkvie: a partially destroyed cist burial in a field excavated in 1959; Häffinds: a large cist burial with concentric stone circles, a cairn and a mound excavated in 1984; and Utalskog: a natural lime stone cave burial excavated in 1927.

I present new radiocarbon dating, diet and mobility analyses and mtDNA haplogroups for the individuals buried and compare the results to the archaeological and osteological reports, and excavation photographs and drawings.

Stone ship grave urns from Gotland, Courland and Saaremaa

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Stone ship settings are characteristic burial monuments in Montelian periods III–VI in southern Sweden and Gotland in particular. The burials in these ships often contain cremations and occasionally ceramic urns. A few Stone ship graves are also known on the eastern shores of the Baltic Sea, in Courland (Latvia) and Saaremaa (Estonia) – containing ceramic urns. Interestingly, most of these vessels own morphological traits that speak for external influences (or even foreign provenance?).

These stone ship graves, however, remain singular and exceptional in the funerary milieu of the Bronze Age East Baltic with its stone-cist and barrow traditions and they are striking examples not only for maritime communication but also for the (personal) transmission of Nordic ideological and ritual traits into the eastern material culture.

The ceramic urns in the Latvian and Estonian ship graves deserve particular attention, first in viewing their stylistic and technical features in the context of Nordic-Baltic pottery traditions in the grave and settlement milieu. Second, there is their interesting functional context in the funerary setting and their specifics in manufacture and use. Have they been "ritual" vessels in the first place? The paper discusses first results from comparisons of the chemical compositions, using XRF, as well as stylistic-technical features of selected ceramic vessels from ship graves and settlements from Gotland, Courland and Saaremaa

Session 3: Traces of thoughts, traces of trowels

Session chair:

Per Nilsson

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The research history of the Nordic Bronze Age has been touched upon on a number of occasions during earlier Nordic Bronze Age seminars, although separate sessions or papers dealing explicitly with this subject have been rare. However, judging from the published seminar papers, it is clear that the long history of Bronze Age research, combined with a strong legacy from a number of early researchers, still affects how Bronze Age archaeology is conducted today. The material traces of archaeological thoughts can be found not only in the form of published papers and volumes but also as physical remains in the landscape: for example, excavated and reconstructed graves, exposed and painted rock art panels or earlier trenches found at excavation sites. In addition to this, objects in museums may also bear traces of prior examinations, including letters and numbers that reveal earlier systems of classification. Together with manuscripts, texts and letters found in the archives, all these traces constitute the material and ideological remains of almost two centuries of Bronze Age research. This session welcomes papers dealing with subjects related to the many different aspects of the history of Bronze Age research - from a local, national and Nordic perspective.

Sven Nilsson – The father of the Bronze Age

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In August 1835, Sven Nilsson (1787–1883) invented the Bronze Age. Civilization had arrived to the North in the form of agriculture, metal craft and a settled way of living. He compared Scandinavian bronzes to objects described by Homer in the *Iliad*. This made the period more than 3000 years old. The Bronze Age became prehistoric and impossible to study for old-fashioned text-bound antiquarians. Nilsson spent the next four decades developing methods for studying prehistory. His goal was to solve the enigma of the Bronze Age. In the history of archaeology Nilsson's decisive contributions to the understanding of the Bronze Age has largely been forgotten or ignored. This is because his main thesis was that the Bronze was introduced by a Phoenicians colonisation of northern and western Europe, one of the craziest theories

in archaeology. In reality, modern Bronze Age research rests on his ideas and the rancorous debate they caused. It is time to recognise Sven Nilsson, not only as a great pioneer in the understanding of the Stone Age, but also as the Father of the Bronze Age.

Images of Late Bronze Age Uppland – Regional identity and interregional contacts

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The province of Uppland in central Sweden has often been viewed as a northern “periphery” of a “Nordic Bronze Age region”. At the same time, many researchers have also emphasized the regional character of Uppland and northern Mälardalen. Throughout the twentieth century, Late Bronze Age contacts between Uppland and areas to the east – Finland, the Baltic countries and Russia – were much discussed and played an important role in the interpretation of the Bronze Age in the area.

This paper examines, from a research historical perspective, how images of the Late Bronze Age in the Mälardalen region, more specifically Uppland, have been formed from the late nineteenth century until today, and how views on eastern contacts have affected interpretations of Bronze Age Uppland. In the paper, I will also raise the question about how northern contacts in Uppland during the Bronze Age and the Early Iron Age have been discussed and interpreted in earlier research.

Retrospect on 100 years of Bronze Age research in Scania

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This year marks one hundred years since the first professorship was established in Lund. Many generations of archaeologists have left their traces and significant imprints on our knowledge of the Bronze Age. In this talk I will highlight practices, theories, materials, and methods. The relationship with the department, the decentralized antiquarian authority, and contract archaeology will be discussed. What has been done? What kind of questions in the changing Swedish society can be detected? In what perspectives do this research affects us today, and the interpretations of a “Bronze Age”?

Dating in the Bronze Age, with special reference to Scandinavian researchers meeting bronze-clad individuals meeting monuments

Anna Röst

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The research history of the Nordic Bronze Age populates the distant 3000 years ago with images of *people* of flesh and blood, people with weapons, lavish personal ornaments and individual, often emphasized monumental burials. The enigmatic oak coffin burials where we come face to face with the clothed and coiffed past and the mounds and cairns speaking loudly in the landscape provide an image of strong individuals and life stories echoing into eternity. The narratives of the Bronze Age have ever since Montelius been the story of death – graves – depicting life in its social form. Beside the mounds and cairns, the urnfield-style burial grounds fall neatly into the pattern of stratified society, where one knows one's place and every relation in death makes sense in the archaeologists' interpretation of life. However, in a bewildering contrast there are areas within the sphere of the Nordic Bronze Age where remains of humans seem scattered in a haphazard, almost careless fashion, and the accompanying stone constructions defy burial logic as we know and like it. In my PhD thesis (2016) I demonstrated that it is likely that stone constructions archaeologically labelled "graves" from the Bronze Age were multifunctional constructions, designed to accommodate processes in the transformation of the dead. Furthermore, the materiality of the individual dead was transformed into a substance far from the resting dead ancestors we imagine. In my paper I argue that Bronze Age research suffers from an over exaggerated individualism in reference to grave monuments, a remnant from past narratives. However attractive the oak coffin people's hats, skirts and bronze regalia—the chronological dating has been done, the flirting with elusive individuals needs to stop too, and the views on individuals' trajectories in the Bronze Age eschatology and final place of deposition needs to be expanded.

Session 4: Bronze Age hunting

Session chairs:

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The south Scandinavian Bronze Age has traditionally been associated with an agricultural society, and in recent years also been related to vast maritime networks. This has led to a notion of a farming economy as the basis for trade and travel, as well as for social structures and identities. Yet, ethnographic evidence shows that farming and pastoralist communities are often involved in complex engagements with woodlands and wildlife and that hunting practices play a key role in ritual life as well as the negotiation and creation of identities.

Hunting practices are present in the south Scandinavian archaeological record dated to the Bronze Age in the form of rock art scenes, animal bones, hunting pits and material culture. This has not led, however, to any extensive efforts to study the significance of hunting or engagements with undomesticated landscapes in south Scandinavian Bronze Age societies. In this session we want to explore hunting in terms of ritual, social, and economic meanings and we encourage papers dealing with theories and/or materials connected to farmers as hunters.

Into the wild – Human-animal encounters and South Scandinavian Bronze Age rock art

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Rock art depictions of animals occur frequently in areas with dense concentrations of Bronze Age Rock Art. In many cases the imagery are clearly identifiable as depictions of specific species. Both wild and domesticated animals are presented, sometimes in relation to anthropomorphic images or other images such as boat depictions. Traditionally, animal depictions on South Scandinavian rock art have attracted

relatively little attention from researchers. Rock art animal images have mostly been treated as part of a general cosmological framework, and understood either as symbolic representations or as depictions of actual rituals.

The current paper will address animal depictions as part of the changing social and economic transformation that occurs during the late Bronze Age. The interaction and encounters between animals, non-animals and objects that is presented on rock art offers means to discuss the animistic elements in the worldview of Bronze Age people. It is also apparent that animal rock art depictions operates between our contemporary categorizations of wild and domesticated species, an observation that will be explored in relation to the semi-mobility of Bronze Age pastoralists.

Woodland land use during Late Neolithic/Early Bronze Age, examples from the Mälaren region, Sweden

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Our understanding of late Neolithic society in eastern central Sweden is largely based on studies of stray finds. These comprise known types of artefacts such as axes made of rock and flint, flint daggers, pottery, etc. This has resulted in an interpretation of the area as a south Swedish outpost (Welinder 1974).

Archaeological excavations of settlement sites conducted in recent years have revealed late Neolithic presence in places that have previously only attracted limited attention. Furthermore, finds of slightly unusual archaeological materials were encountered. At present we can identify at least two types of activities that occurred within the dense primeval late Neolithic forest, agriculture and hunting. Both these activities, however, have until now been almost invisible in the archaeological record. This paper will present materials that are most likely the result of such activities. We will present examples from two recent excavation projects from the Mälaren region: Riksten and Road 56 (Uppland).

Farmers on the hunt – Hunting and fishing strategies during the Bronze Age in Uppland, eastern central Sweden

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Already from a cursory study of several sites with bone material from the Bronze Age in Uppland in eastern central Sweden, it is clear that there is an occurrence of wild fauna on the majority of the investigated settlements and burial grounds. Generally, however, these bone materials constitutes at the most 1–2% of the total bones retrieved from the site. The wild fauna remains are thus completely overshadowed by domesticated animals. However, the presence of wild animals and the hunting and fishing associated with them, have nevertheless been a constant in the Bronze Age society. A Bronze Age settlement with an unparalleled animal bone material is Apalle in western Uppland, with nearly 80 different wild species. This number of species is not represented on any other sites from the Bronze Age in eastern central Sweden. But by analysing the encountered species and surrounding landscape on other sites in the same region, from a functional perspective, it is clear that many dwelling sites have had complete hunting and fishing strategies despite the limited bone materials recorded on them. The intention of this paper is to show the range of hunting, fishing and the wild fauna in the Bronze Age material from Uppland, and at the same time, from some case studies, discuss how people at the investigated sites may have utilized the surrounding landscape's different habitats over time. The presence of bone material from wild animals both in ordinary cooking contexts, in ritual contexts, and in craft-related areas, also offer opportunities to touch upon the different uses of the wild animals and their relation to, for example, the ritual sphere.

Not only hunting – Wild resources in the Bronze Age economy at the far peripheries of Nordic Bronze Age

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Beyond the borders of the Mediterranean World and far from the main cross-continent routes, in the Southern Baltic region the Bronze Age seems to have had a bit of a different pace. The Bronze Age in this region starts with a delay, gaining full expression within the Urnfield period. Similarly, the end of the Bronze Age is also shifted here

into the second half of the first millennium BC. Environmental data attest synchronous climate shifts and subsequent change in vegetation fully expressed no earlier than around the second half of the first millennium BC.

The northern part of temperate Europe does not offer universal ecological advantages with regards to primitive agriculture. Human dwellings were however surrounded by woodlands and other types of environments offering diverse resources. It is hard to believe that man did not take advantage of it. All the more that, the agriculture, breeding, and technologies did not cover all needs. Although, many aspects of wild resources in the human economy are not clearly visible for scientific research due to different factors. For some reason, not all activities seem to be worth to mention for the people of the Bronze Age. Only hunting, especially deer hunting is a popular motif in figurative representation on the funeral pottery.

This paper discusses direct and indirect sources enabling to estimate the share that different wild resources had in the Bronze Age economy. Emphasis will be placed on hunting strategies and the correlations between this data and the symbolic high importance of deer hunting. Was it a really an important part of the economy or did the importance of deer hunting grew out of ideological premises?

Hunting high or low – Evidence of changing hunting practices in the South Norwegian highlands in the LN/EBA?

Dag Erik Færø Olsen

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This paper will explore hunting as an economic factor by comparing activity from the LN/EBA with the previous EN/MN. The mountain areas of Hardangervidda and the adjacent Nordfjella to the north, serve as the study area with evidence of reindeer hunting from the early Mesolithic to present day. An important question is if the utilization of the mountain areas fluctuated during the Neolithic and early Bronze Age and if so why? Did the importance of hunting as an economic factor change after the transition to a more farm-based society in the LN/EBA? Was there any increase or decrease in the exploitation of mountainous resources? Through a diachronic analysis of settlement sites, these questions will be addressed to explore the role of hunting as part of the economy of agriculturally based societies in Southern Norway.

Session 5: Travel and exchange

Session chairs:

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The Bronze Age was the first long period in human history to witness the development of large-scale exchange in metals and other materials across Europe. The demand for tin-bronze required copper and tin, two metals smelted from ores that typically derived from different regions, often quite distant from each other. The importance of metal for the Scandinavian Bronze Age societies cannot be overemphasized and their flows selectively transformed local social institutions, spurring the exchange of other materials such as amber, glass beads, litchis, and textiles, as well as developing means and routes of transport. The magnitude of Bronze Age trade was quite extraordinary as seen in rates of metal consumption, especially keeping in mind that all metals were imported from far away. Regarding exchange and travel in the Nordic Bronze Age, research findings indicate that elite household investment in boats, crew and warriors played a critical role in the rise of social complexity and long-distance trade. Long-distance exchange has been a central topic for Bronze Age studies for almost 150 years. However, this field of research has recently undergone some huge advancement in terms of analyses and observations of different materials, but also in terms of new theories about social organization and social complexity connected to long-distance travels and exchange. This session aims at exploring the recent trends within this field of research with special attention to the Nordic Bronze Age; thus, it welcomes papers that deal with different materials, means of transport, analytical methods and social aspects that reveal both regional and interregional travels and trade in the Nordic Bronze Age.

Swords, metal sources and trade networks in Bronze Age Europe

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Nordic and European Bronze Age swords were items with high functional and symbolic value and therefore a very interesting case for approaching the question of metal trade in Bronze Age Europe. Often, a correspondence between metal supplies and artefact type/style has previously been assumed. The current study shows, on the contrary, that metal supply and sword brands were mostly unrelated. A comprehensive provenance study of nearly 120 Bronze Age swords, comprising lead isotope and trace elemental data for swords from Scandinavia, Germany and Italy dated between 1600 and 1100 BC, will be presented in this paper. The chronology and geography of the deposited swords indicate that the different regions relied on different metal trade routes, and that these changed during the course of the Bronze Age. The largest variation in metal supply is seen during 1600–1500 BC, when copper ores in Wales, Austria as well as Slovakia constituted the major copper sources for the swords, however, unevenly distributed among the regions. Around 1500 BC, copper mines in the Italian Alps became the main supplier for the Scandinavian and Italian swords while swords from Germany were foremost based on copper from Slovakia and Austria. However, during 1300–1100 BC the sources in the Italian Alps became the dominant supplier of copper for the swords in all regions accounted for here. There seem also to be a possibility that copper from southern Iberia makes its appearance among a few of the Scandinavian swords during this phase. Potential trade routes and trade networks will also be discussed in the light of the shifting sources of copper to Scandinavia.

Provenance studies on metal artefacts of the Danish Bronze Age – The archaeological and chemical evidence of metal trade 2100-1600 BC

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As early as 2100 BCE, societies in the hotspot zone of Denmark and Scania began to use metal. However, this region did not exploit their own metal ores; therefore, the origin of the metal used is of key significance to understanding and modelling the cross-European interconnectivities that were established through trade. For the very first time, the Nordic region was fully dependent on one crucial exogenous resource. The related change within the political economy surely resulted in the establishment of the Nordic Bronze Age.

Regarding the Bronze Age in northern Europe in its entire temporal extension, two possible transport routes along which the prestige artefacts and especially the metal moved to Bronze Age Scandinavia have been intensively discussed and are still hot topics today. Consensus seems that a continental route connecting the Alps, Central Europe and the NBA can be juxtaposed with a maritime route linking Mediterranean civilisations with Atlantic communities in Northwest Europe. However, little is known about the significance, the extent and the direction of the metal trade that kick-started the Bronze Age. Presently, the archaeological evidence of contact within the latest Neolithic and the earliest periods of the Bronze Age point towards northwest and southeast Europe.

An extensive study of south Scandinavian metal artefacts between 2100-1600 BC via lead and tin-isotope analyses has uncovered the direction and extent for the earliest metal transport routes and trading networks. The chemical fingerprint of the analysed artefacts combined with the archaeological evidence highlights the significance of the metal trade for the earliest NBA societies in the North. As the data consists of around 550 samples evenly distributed over the first 500 years of the period in which the Nordic Bronze Age emerges, a reconstruction of the actual networks is realistic. Secondly, the comprehensive approach investigating the stylistic characteristics of the artefacts, trace elemental compositions and lead isotope data source critically allows us to trace not just the probable provenance of the artefacts but also identifies the mixing of ingot-like artefacts at the edge of the metal using societies for the first time.

Connecting Bronze Age societies along the coast of north-western Scandinavia

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This paper addresses organisational variation along the coast of north-western Scandinavia and look into the theoretical potential of “Collective action theory” to address socio-political variation— both regionally and diachronically. The outcome of the framework shows connectivity between societies but also varied organisational strategies that result in an unbalanced power structure.

By capitalising on the maritime trade network up and down the coast, the region of Jæren/Karmøy effectively created a nodal point for wealth accumulation that helped situate it as a maritime power. However, interdependence and connectivity with other, more peripheral regions such as Inner Sogn was a requisite for the maintenance of such a power strategy.

The core-settlement at Tjora, Rogaland, Norway – Evidence of a Late Neolithic trade port?

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In this paper I will present results from excavations carried out at the farm of Tjora between 2005 and 2018. The results of the excavations show a core-settlement, dated to the Late Neolithic and Early Bronze Age, with long-term planning of the settlement structure most likely connected to the control of the natural harbour at Risavika, consequently establishing itself as a permanent port for the exchange of goods coming from Jutland. The material has been analysed within theoretical frameworks for the emergence of trade centres, core-settlement and models of trade- economy, previously applied to the Danish settlement models.

The significance of these findings will help to bridge the gap between the Norwegian and mainland European archaeology for the period in question. The ocean should not be seen as a hindrance to the development in the north but rather as a highway on which commodities, ideas and knowledge quickly changed hands.

Robuste langhuse i vest – Om regionalitet og monumentalitet i ældre bronzealder periode II-III

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I århundrederne mellem 1500 og 1200 f.Kr. oplever Norden en kulmination i byggeriet af gravhøje og langhuse. Deres antal, dimensioner og involverede ressourcemængder sætter overalt præg på landskabet. I Jyllands sandede egne vest for ungmorænen er langhusene særligt store, robuste og tømmerkrævende. Væggene opføres i bulteknik og består således af svære planker mellem kraftige egestolper. Langs den jyske østkyst, på de østdanske øer samt i Sverige og Norge bygges husene tilsyneladende med lettere vægkonstruktioner. Hvad er årsagen til den robuste byggeskik i de vestlige egne af Jylland? Tilgængelige ressourcer kan ikke umiddelbart være forklaringen, for pollendiagrammerne antyder et generelt skovfattigt område i Jyllands gamle istidslandskab. Derimod har der været rigelige mængder af velegnet egetømmer på ungmorænen. Var husbyggeriet i vest afhængig af importeret byggetømmer fra øst? Bulvægshusenes antal og dimensioner er særlig markant i Jyllands sydlige del. Det er ligeledes her, de største gravhøje med jernlag og rige fund danner et tyngdepunkt. Monumentaliseringsprocessen mellem 1500 og 1200 f.Kr. synes dermed at være mest udtalt i denne region, hvilket måske skyldes, at området udgjorde en fysisk tærskel mellem Kontinentet og Norden.

Late Bronze Age sites with specialised bronze casting in the eastern coast of the Baltic Sea – Meeting points and ports of trade?

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The Eastern Baltic has been distinguished as a paradoxical case in European archaeology. Communities that had limited amounts of metal artefacts have also been associated with specialised bronze casting, as there at the same time existed a pattern of sites with direct evidence for such activity in the region. Even more intriguing is that production does not represent local forms, but imitations of Scandinavian artefacts. Amongst them Mälaren type axes dominate. These artefacts are at the centre of attention of long spanning discussions on exchange between the East and the West. Up until now, the question is not answered; therefore this paper addresses technological peculiarities, distribution and significance of Mälaren type axes from the perspective of

long distance trade and cultural contacts. It is noteworthy that sites with bronze casting differed among themselves in their economies and interacted with each other. Finally the question arises: can we interpret local bronze workshops as the main providers of metal objects to the local societies? Or maybe they represent short-term or seasonal meeting points in the vicinities of rivers and lakes, and could had any of them existed as port of trade in the Baltic Sea?

Early and Middle Bronze Age long-distance visits in the Fenno-Ugric area

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The Bronze Age was the period that changed the connections in large areas of the coniferous zone. In the north, the Seima-Turbino-phenomenon meant the quick spread of bronze implements and the large-scale change of the culture. This was caused by the active visitors originally coming from the Middle Volga area— between the Rives Kama and Oka—which influenced the large area between the northern Scandinavia and western Siberia. This all began c 1900 calBC and continued at least to 1600 calBC. Soon after this, the long-distance visits came into the end.

Soon after 1100 calBC, the connections began again. During the IV Scandinavian Bronze Age phase, the Akozino-Mälär bronze axe type characterised the large are. An interesting question is, how the makers of the axe were in contact with each other and what form the possible long-distance connections took in the north. My aim is to discuss the possibilities, how these new visits may have been realized and how they changed the culture in the Fenno-Ugrian area.

Understanding the dynamics of seafaring in Bronze Age Scandinavia – Boats, their propulsion and the introduction of the sail

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Scandinavian rock art, dating to the Bronze Age and Pre-Roman Iron Age, conveys important information about the early development of boats and their propulsion. Along with imagery on other forms of media, it suggests that the sail was already used as a complement to paddling by 1600BC, some 2000 years earlier than previously assumed. This imagery, in combination with experimental sail trials in Bronze Age type boats, and comparisons with the emergence of sailing in other parts of the world,

suggests the sail might have developed in Scandinavia in response to an increase in the need for regular transportation of people and goods and that it might have initially been used over relatively short distances. The need for such regular transportations may also have been linked to the early development of Scandinavian chiefdoms in around 1600 BC. This sailing technology would have begun with the ability to catch a following wind and from there developed into the ability to use the sail through a wider range of wind directions. The combined use of sail and paddling would have significantly increased the range and intensity of regular communication in Bronze Age Scandinavia and would also have greatly facilitated waterborne journeys beyond these shores.

Bronze Age contact between Scandinavia and the Atlantic West = contact between Germanic and Celtic.

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Recent chemical and isotopic sourcing of copper artefacts in Scandinavia and amber in Iberia reveal a trade system that arose and ended in the Late Bronze Age, 1400/1300–900 BC. Much remains to be explained about this previously unrecognized episode of Iberian–Scandinavian contact. What were the exact dates and volume of this trade? What regions and communities were involved? Did people and ideas move with valuable raw materials? A preliminary look at 1) rock-art motifs shared by these regions at this time and 2) the earliest layer of vocabulary shared by Germanic and Celtic (but not Indo-European as a whole) suggests that seafaring warriors were the primary agents of this trade.

Parallels between Iberian warrior stelae and Scandinavian rock art were noted long ago. Only recently have shared motifs been begun to be recognized more fully and closely dated to the span 1300–900 BC. Advances in linguistics and archaeogenetics allow rock-art iconography to be linked to word meanings in Proto-Indo-European, Proto-Celtic, and Proto-Germanic, most notably the extensive shared Celto-Germanic (CG) vocabulary for warfare, weapons, and ideology.

Chemical and isotopic sourcing of metal reveals that copper from Great Orme, North Wales, was imported to Scandinavia from 1600–1400 BC, after which copper came from the south-western Iberian Peninsula 1300–900 BC. Many items of CG vocabulary correspond to iconography shared between Bronze Age Scandinavian rock art and warrior stelae from the south-western Iberian Peninsula, also dating to the period 1300–900 BC. Evidence for metal exchange and a shared iconography and

vocabulary of warfare leads to the hypothesis that seafaring warriors were the primary agents for this long-distance exchange. We are undertaking an in-depth investigation of this hypothesis as part of a new international four-year project hosted at the University of Gothenburg and funded by the Swedish Research Council: Rock Art, Atlantic Europe, Words & Warriors (RAW).

Long distance mobility and exchange. New results – changing reflections

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Recent developments in e.g. strontium isotope analyses have made it possible to trace the mobility of single individuals in unprecedented detail, providing the possibility of identifying travel and movement. The human remains of the women from the Danish oak coffin burials at Egtved and Skrydstrup, 1370 BC and c. 1300 BC, have yielded evidence of long distance mobility. They lived in a period characterized by great social transformations stimulated by long-distance connections reaching from South Scandinavia to the Mediterranean. Demands for metal created long distance exchange systems, where e.g. copper from the Alpine region reached Denmark, as shown by lead isotope analyses. The most distant connections are demonstrated by the blue glass beads, turning up in the North c. 1400 BC, coming from Egypt and Mesopotamia, as shown by chemical analyses. The opposite way, Nordic/Baltic amber (succinite) reached the Eastern Mediterranean and beyond.

The ancient Greek (and Homeric) concept of guest-friendship, *xenia*, may give us an idea of the social mechanisms that would make long distance exchange and voyages practically feasible. *Xenia* was a concept of hospitality and friendship of individuals of non-related groups and was a moral and religious obligation of hospitality securing food and accommodation to travellers. The concept of *xenia* as close bonds between ‘*xenoi*’ living far away could provide an explanatory model of how commodities and ideas could spread over long distances, and how the lines of contact could remain open, even at times of hostilities.

By a broader appreciation of the *xenia* guest friendship concept in relation to new Bronze Age long distance exchange data, a better understanding of also the flow of ideas can be attained. Some years ago, it would have been difficult to argue for iconographic or religious influences stemming from Egypt. The Sun ship as a phenomenon would have been seen solely as an independent local development, while today the possibility is open for accepting that some ideas from the eastern Mediterranean and beyond reached South Scandinavia. Can we today allow ourselves to relate some other

iconographic features such as the ‘night-snake’ and the ‘morning fish’ with ancient Egyptian religion? – While the appearance of the ‘sun horse’ could be seen as stemming from Minoan/Mycenaean Greece?

We do not necessarily speak of direct contacts, but of possible ‘middle-stations’ where *xenia* was observed. Here, dialogues and exchange of ideas at the crossroads took place when feasting and drinking practices according to the ancient rules of *xenia* were respected. The recent developments in archaeological science have given us further insights into the routes of exchange and consequently the places where *xenia* provided the melting pot of ideas connecting the South with the North. Such places on the routes could for instance be certain sites in the Alpine region or in the Carpathian region.

Key words: exchange, isotope and chemical analyses, guest-friendship, *xenia*, ideas.

The Weinheim-Nächstenbach hoard

Joachim Neumaier

Bezirksmuseum Buchen, Germany

Captives as commodities in the Nordic Bronze Age?

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What comparative advantages allowed the Nordic region to assemble huge quantities of bronze and gold during the Bronze Age, a surplus of which was deposited in burials and hoards? Warrior might and maritime capability provided the infrastructure, but among the commodities we propose that captives/slaves, along with amber, were of central importance. In order to invest in long distance maritime trade, labour had to be transferred from the agricultural to the voyaging realm. This raises the question: who filled the agricultural labour gap? Viking era historical documents, as well as ethnographic accounts of maritime ranked societies, indicate that captives/slaves often filled this gap and constituted an important part of the economy (Cameron 2016; Ling et al. 2018). We posit that this also likely took place in the Scandinavian Bronze Age. With slaves working the home farms, warriors/traders seeking to raise their social standing, could participate in long distance voyages to take captives who would be

enslaved. We present some examples as evidence of this, and discuss the long-term implications.

Session 6: Bronze Age craft, technique and technology

Session chairs:

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Studies of technique and technology in a Bronze Age context are essential for the understanding of Bronze Age Society. A structured community in which the craftsmen can meet and exchange ideas is a requirement for a technique to be developed. Additionally, techniques continuously improve when the craftsman obtains more experience in the craft, impressions from other craftsmen, knowledge of new materials and access to new tools. This session will explore the different crafts within the Bronze Age context with specific focus on technique and technology and the change therein and we welcome papers focusing on technique and technology from an empirical point of view. This focus aims at facilitating discussions concerning the interaction between different crafts and their respective technological paradigms and how this can be integrated into a more general interpretation of Bronze Age societies.

The session aims to include a wide spectrum of Craft, Technique and Technology within a Bronze Age context, such as:

- Technique and technology in bronze craft
- Technique and technology in wood craft
- Technique and technology in ceramic craft
- Technique and technology in textile craft
- Technique and technology in lithic craft
- The tools for Technique and technology
- The socio-economic contexts for technique and technology

Scandinavian Bronze Age textile production and cloth culture

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Denmark possesses a unique collection of textiles and clothing items dated to the Bronze Age that recently have been re-investigated at the National Museum of Denmark. The textiles were studied and photographed in order to evaluate the significance of the clothing design and textile production. The analyses, which included fibre, and strontium isotope analyses have opened up for new interpretations of the treatment of raw materials for textile production and the introduction of new technologies. The study has also expanded our understanding of the visual appearance of Bronze Age clothing and finally opened an important discussion about wool trade in the Early Bronze Age. In this paper, the different results and interpretations will be presented and discussed with emphasis on the wider implications of the results.

Much more than motor skills – Artisanal interpretations of how to practice ceramic craft in a Bronze Age context

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The artisanal perspective affords us with the possibility of detecting the artisanal actions in ancient contexts. The author has conducted artisanal interpretations of more than seven thousand ceramic fragments in the extensive material from the Bronze Age settlement site at Pryssgården in the South-East of Sweden. The artisanal knowledge and assessments of skill levels are important for detecting and enhancing the understanding of Bronze Age artisanal knowledge. In order to come closer to the *practice* of ceramics in the Bronze Age this paper addresses artisanal questions related to the archaeological contexts. Including the activity areas as well as the natural surroundings of the Pryssgården site in this analysis, a range of artisanal questions can be put forward: –How was clay used in everyday life? –Where to find and extract clay? –What about working with clay? –What different kinds of skills are required in different stages of the process? –Why is clay often stored in house cellar pits? –In what way can ceramic knowledge contribute to other crafts? –What kind of temper do you

need in different kinds of ceramics? –What is high-temperature skill? –To what extent does climate and weather affect the ceramic crafting processes?

This paper includes interpretations of the praxis in direct connection to the context. Activity areas, small houses or workshops are scrutinized to widen the perspectives and to contribute to a more complex way of interpreting ancient ceramic crafting. Hopefully some of the questions may be answered and some will be discussed.

Keywords; tacit knowledge, interdisciplinary, ceramics, artisanship, situated learning, learning, skill, children, artisanal perspective, Bronze Age, Sweden.

Bronze casting debris in settlements and within dwellings – Revisiting a frequent phenomenon with the case of Asva (Estonia)

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Dating to the late Bronze Age, we know of various settlement and bronze-casting sites in the Baltic Sea area with casting debris (moulds, crucibles) found in proximity to or inside house structures. This archaeological record indicates bronze-casting inside dwellings or under roofed constructions. On the other hand, there are numerous examples of settlement sites with separated off-site bronze-casting areas. This instantly brings up questions concerning the ways that hazardous, heat-demanding crafts were practised within settlements or dwellings – and the preventive measures taken by the Bronze Age people engaged in them.

This paper discusses such aspects with examples drawn from the site of Asva in Estonia (800–600 BC). To which extent was indoor-castings practised at the site, and was any secondary waste management employed for metallurgical debris material? Over 2000 clay mould pieces are known from the site so far, mainly moulds for ring objects (lost wax/cire perdue). This debris scatter and cluster in various sections of the settlement – with large numbers in and around houses or roofed structures (with hearths).

In addition to the archaeological contexts, analysis of metal finds and debris (e.g. melts and spruces) was undertaken. XRF analysis on the casting moulds in order to determine the quantity of fragments that have been in contact with the copper-alloys was also performed. These analyses, paired with the analysis of the sites archaeological contexts, were aimed at a better understanding of interrelated domestic and public activities in Asva (and other sites). The site can also shed light on aspects of the multifunctional use

of households and the socio-economic significance of bronze-casting and consumption in the Nordic-Baltic Bronze Age.

Painted walls from the Kirkebjerg settlement – Fresh analyses

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The dumped remains of wattle & daub walls from two houses were recovered in 1977. They have now been subject to thorough analysis and compared to a wider European BA & EIA material (See *Rot, Weiss, Schwarz, 2018*). They remain unique North of the Elbe (Seddin) and contribute to the understanding of the status of the Kirkebjerg settlement from Bronze Age per. V as another extraordinary element. In this paper daub as a material source group is discussed and the materials technical aspects as well as their contextual **significance** are evaluated.

From coast to mountain – Resources and economy in the Late Neolithic and Bronze Age of western Norway

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Over the last 40 years both the datasets and our understanding has increased and changed significantly with reference to the late Neolithic and the Bronze Age in both the coastal and the mountainous regions of Western Norway. The background for this is both a number of large-scale surveys and excavations in the mountainous regions due to development of hydroelectric power, as well as excavations connected to various infrastructural projects on the western coast of Norway. This paper will address sites in both these different ecological regions, and highlight some similarities and differences connected to technology and economy, in a period when there are substantial changes, particularly connected to the role of agriculture. How does this affect the utilization of resources on the coast and in the mountains, and what happens to the lithic technology and other materials in use as well as the raw materials utilized? Can we identify any chronological and typological changes, and what does this mean in a wider perspective connected to larger regional patterns in Scandinavia

From distant lands – Tracing the nature of Corded Ware expansion, by provenience of battle-axe raw material

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The nature of the rise and spread of the corded ware cultures has been highly debated since they were recognized as an independent archaeological phenomenon more than 100 years ago. Whether the spread was catalysed by migration or a gradual cultural diffusion has been heavily debated. In recent years, aDNA analysis has proven that migration played an important role in the formation of the phenomena in eastern and central Europe, but the decalcified soils in Jutland, has not preserved sufficient material for a similar analysis regarding the Single Grave culture. What has been preserved in numbers are the sturdy rock battle-axes, which we find in all presumed male burials. A petrological determination and subsequently dating based on typology of the raw material of 708 rock battle-axes from the Single Grave culture and the Swedish/Norwegian Battle Axe culture, has revealed significant long term and long distance contacts, pinpointing a specific sourcing area – the middle Rhine. These observations combined with the study of the social mechanics behind migration, and the typo-chronological development of the axes, has led to an hypothesis that the main regional subgroups of the Corded Ware complex, coincides with distribution networks, and that they may originate back to early migrations from the east. The study also reveals fundamental differences in the raw material sourcing strategies of the Single Grave culture, and the Swedish/Norwegian Battle Axe culture, indicating different origins of these.

Flint daggers in south-western Sweden

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Flint daggers have been and are still considered useful for dating Scandinavian late Neolithic and early Bronze Age contexts. In the inland of south-western Sweden, where flint is scarce, daggers are regarded as imports from Denmark and southern Scania, although local production can be suspected in a few cases. The flint daggers from the study area are relatively small and often reworked by various techniques and reshaped in different ways. Some of the south-western Swedish daggers have also been important

in the construction of dagger typology. However, this typology has been scrutinized and revised several times over the years. Furthermore, the chronological aspects of dagger typologies, especially in the more peripheral regions, have been criticized and arguments of extensive circulation, reuse and heritage have been brought forward. Dagger types have also been suggested to be related to differences in social status.

Building on previous research, a re-examination of flint daggers³ and new C14 dates of human skeletons from megalithic graves, the chronology of the dagger typology in the inland of south-western Sweden is re-evaluated. Additionally, other aspects linked to production and distribution networks of daggers recovered in the south-western Swedish gallery graves are discussed.

Session 7: Science and Bronze Age archaeology

Session chairs:

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Traditionally, various scientific methods have been applied in archaeology. Some of these are now routinely incorporated, while others are more novel to archaeology and are still developing. Consolidated methods such as radiocarbon dating are constantly refined and strengthened when combined with statistical applications. The far-reaching potential of science has been vividly discussed and debated over the years, not only from methodological perspectives, but perhaps even more regarding the balance and interaction between the disciplines.

Interaction, networks and trade routes have been discussed based on movements of material, as exemplified by combinations of trace element and lead isotope analyses in metal studies. But more often now, different scales of human mobility is also from followed using analyses of aDNA and strontium isotopes, and in combination with environmental investigations, contributes to a more complex picture of the Bronze Age society. However, the number of samples needed to justify the archaeological implications have been questioned, and the importance of access to relevant reference data in order to allow a plausible assessment of results have been emphasized.

This session invites papers with case studies that address for instance the above issues from a diversity of scientific methods integrated in archaeology. We also welcome papers with a more theoretical approach that reflects interdisciplinary collaboration.

Inside the crucible – A method for investigating the usage of melting crucibles

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In order to discuss the use of different alloys used in bronze-casting technology during the Scandinavian prehistory, the preferred method has been to investigate the metal artefacts. In this paper I present the development and application of a method intended to investigate choices of copper alloy during the Bronze Age by element analysis on melting crucibles. This method offer an opportunity to analyse the casted alloys at a certain site, by investigating the crucibles themselves, as they are less likely to have travelled far from where they were used and deposited. The method also opens up a discussion on other materials used in connection with the activity of melting metals. A specific example will be focused on the presence of calcium and phosphorous in combination with copper alloy.

Late Neolithic silver? – Social landscape, trade and networks from a regional perspective

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In 2016 we presented initial results from microscopy, metallography, chemical analysis, and use-wear analysis of a Late Neolithic metal axe of Pile type (Högberg et al. 2016). The axe was found in 2015 during contract archaeological excavations at the village Eskilstorp in south west Scania, Sweden. From the result of our analysis we concluded that the Eskilstorp axe is a silver-coated copper axe manufactured locally during Late Neolithic II. Since the publication of the initial results, we have continued with analysis of the Eskilstorp axe as well as other contemporary copper axes found in south west Scania. In this paper we present results of these new analyses, and contextualize them by discussing aspects of the social landscape, trade and networks from a regional perspective.

Högberg, A., Brink, K, Grandin, L. and Horn, C. 2016. A silver-coated copper axe from Late Neolithic Scania: initial analyses. *Fornvännen*, 111: 258-264.

A prehistory of violence – Preliminary results from an osteological study of Late Neolithic-Early Bronze Age skull trauma in southern Sweden

Anna Tornberg

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Violence and warfare have been of high interest within South Scandinavian archaeology in recent years. Based on archaeological finds, such as weapon hoards, and iconography, i.e. rock carvings depicting fighting, scholars suggest a Bronze Age political hierarchy with warrior elites. There is also evidence that shows that the deposited weapons were once used.

Although many studies of South Scandinavian Bronze Age relate to questions of violence and warrior ethos, data that provide direct evidence of violence, i.e. osteological analyses of skeletal remains, is currently scarce. Bioarchaeology is in itself interdisciplinary and rests on knowledge, theories and methods from a vast number of other disciplines, e.g. anthropology, biology, anatomy, forensic medicine, sociology and archaeology. This means that a bioarchaeological approach to the frequency and meaning of violence in the past can provide knowledge and understanding of biological and medical consequences of violence and, at the same time, lift these results to a wider discussion of societal consequences of trauma and violence.

In this paper I will provide preliminary results of the frequency and implications of violence related trauma in skeletons from the areas of Västergötland and Scania in southern Sweden, dating to the Late Neolithic and the Early Bronze Age.

Agricultural lime disturbs natural Sr isotope variations – Now what?

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The use of $^{87}\text{Sr}/^{86}\text{Sr}$ in prehistoric mobility studies requires accurate strontium (Sr) reference maps, which are often based on present-day surface waters. However, the use of modern agricultural lime in calcium-poor soils can substantially change the $^{87}\text{Sr}/^{86}\text{Sr}$ compositions of surface waters.

Water unaffected by agriculture in western Denmark has an average $^{87}\text{Sr}/^{86}\text{Sr}$ ratio of 0.7124, whereas water from nearby farmland has an average of 0.7097. Moreover, a systematic investigation of a 1.5 km segment of a river originating in a forest—Karup Å shows that $^{87}\text{Sr}/^{86}\text{Sr}$ ratios decrease abruptly from 0.7131 to 0.7099 upon entering lime-treated farmland. Calculations based on these data indicate that more than half of the Sr in the river's catchment area comes from agricultural runoff.

Thus, Sr-based mobility and provenance studies in regions with calcium-poor soils should be reassessed; however, the data still hold valuable information. For example, reinterpreting the iconic Bronze Age women at Egtved and Skrydstrup using values unaffected by agricultural lime indicates that it is most plausible that these individuals originated close to their burial sites, and not far abroad as previously suggested. Yet the results are interesting, in particular, The Egtved Girl's, which show that she may have lived part of the year in one area—likely the nearby river valley, and part of the year in another place—likely the local plateau, perhaps in the practice of transhumance farming. Hence, the knowledge that agricultural lime affects natural Sr variations does not change that Sr-based mobility and provenance studies are very much worth doing. However, future studies should take great care in sampling of waters, plants, soils, bones, *etc.* for Sr-reference maps in areas affected by modern-day agriculture.

Multidisciplinary analyses of human remains from two gallery graves in south-western Sweden

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Collective gallery graves for successive burials were used both during the Neolithic and Bronze Age. In general, these graves are under-studied, and most of the research builds on grave and artefact typology. However, recent research, based on multidisciplinary approaches, has led to new knowledge of burials in gallery graves and Early Bronze Age populations in several regions in Sweden. This paper focuses on two gallery graves in a peripheral part of the Scandinavian Late Neolithic and Early Bronze Age, at Kinnekulle, by the lake Vänern. By integrating various isotope analyses, statistical methods and information from aDNA studies with conventional archaeology, I address questions about human mobility, diet and subsistence, and present models of burial sequences of the graves.

The stone cist conundrum – The population demographic developments during the LN/EBA on the island of Gotland

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Due to recent multidisciplinary research of human remains from burials, the demographic developments during the MN period on the Island of Gotland have become clearer. However, the demographic developments in the LN/EBA have remained largely unknown. There are many stone cist burials on the island, but few have been excavated, they have not been directly dated, and only a handful has been osteologically analyzed. Thus, they have been difficult to assess based on the artefacts alone that often show provenance to both the LN and the EBA.

Here I present a multidisciplinary analysis of individuals from multiple cist burials previously assessed to belong to the LN/EBA based on the artefacts, and show how this was used to investigate population continuity and demographic shifts based on the known population demographic developments on Gotland during the MN period.

Investigating sheep husbandry and pastoral economy through an interdisciplinary approach – The case of the Terramare settlement at Montale, northern Italy

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The aim of this paper is to address the possibility to investigate and reconstruct characteristics and scale of pastoral economy and sheepherding practices when combining the results of various scientific methods.

The issue will be exemplified using the case study of the Bronze Age site of Montale, in northern Italy. Recent work on the site has seemingly demonstrated that Montale was the likely home of a Bronze Age centre of wool production. Evidence to such assumption is to be found in the astonishing number of textile tools, in particular spindle whorls, documented at the site. The presence of large numbers of sheep/goats bones among the local faunal remains suggests that wool was the main manufactured fibre. To manufacture large quantities of wool, however, intense sheep farming would be necessary. An interdisciplinary approach combining archaeozoology, archaeobotany, paleodemography, strontium tracing analyses, Thiessen polygons, and craft knowledge

seem to offer a significant possibility to reconstruct ancient pastoral economy practices in given landscapes.

Tales of Bronze Age people – Inter-disciplinary investigations in Nordic Bronze Age Denmark

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Tales of Bronze Age People is a three-year (2018-2021) *Semper Ardens* interdisciplinary research project supported by a Carlsberg Foundation focusing on investigations of human remains from the Nordic Bronze Age Denmark. The research explores mobility and cultural transmission at multiple scales and across landscapes. This project expands from the on-going *Tales of Bronze Age Women* project (also supported by a Carlsberg Foundation) and combines state-of-the-art biogeochemical, biomolecular, and anthropological and archaeological investigations. Current research foci range from isotope analyses (e.g. $^{87}\text{Sr}/^{86}\text{Sr}$) of human remains from both inhumation and cremation graves, to osteological analyses, as well as to systematic collection of data for statistical analyses, all with a focus on basing interpretations on multiple frames of reference from an anthropological archaeology perspective aimed at illuminating aspects of individual lives in the past. Additionally, the project also looks at objects such as glass beads which through chemical analyses enable to investigate their provenance, and hence it aims at shedding light at potential relations between the provenance of the human remains and that of the glass beads from the same context.

This presentation will focus on recent results of strontium isotope analyses of human remains from the Nordic Bronze Age (from this and other research projects), and will discuss them in light of each other to shed light on how the number of samples (many individuals) *vs.* in-detail studies of single individuals (many analyses of different tissues) provide different knowledge of past societies.

A critical assessment of DNA evidence – Did Indo-European speakers migrate out of or into Scandinavia?

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Some recent genetic studies have made stunning claims of having found evidence that large migrations of Bronze/Late Bronze Age populations carried Indo-European (IE) languages into Europe and regions of Asia from the Pontic Steppe, and the Yamnaya culture was the ostensible home of Proto-Indo-European (PIE), the hypothetical mother-language from which the various IE languages are believed to have been derived [1-4]. This was immediately disputed on the basis of archaeological evidence, which does not support IE migrations from the Steppe to Scandinavia, which is also believed by some scholars to have been the homeland of PIE [5]. When challenged over their interpretation of the archaeological data and linguistic models, the authors of the aforesaid genetic studies conceded that their conclusions might have been sweeping and unfounded [6]. This once again leaves unresolved the Bronze Age peopling of Scandinavia, given that there are genetic differences between the Neolithic/Mesolithic and Bronze Age populations, with the latter demonstrating affinity with Steppe populations. We examine if current genetic evidence can answer this question, or at least suggest future lines of enquiry. We shall also point out possible errors of interpretation and even methodology in the genetic studies, owing to which such studies may have failed to undertake a truly independent scientific evaluation of the historical linguistic models. Independently, reported genomic analyses of ancient and present-day bovines, and other domesticates, hold vital clues to human migrations in the Neolithic and Bronze Ages. Overall, we hope that our paper shall provide archaeologists and historians with a better appreciation of the potential and limitations of genetic analysis as a tool for reconstructing the past.

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Could metal composition forward issues about chronology and typology regarding shaft hole axes from the early Nordic Bronze Age?

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Shaft hole axes dated to the Early Nordic Bronze Age 1600–1500 BC is a theme that has both stimulated and puzzled BA research for quite some time (Montelius 1917, Vandkilde 1998). There are two types of axes, Fårdrup and Valsømagle, and most scholars have recently related and dated both of these types of axes to about 1600–1500 BC, the so called period IB horizon, i.e. the very onset of the extensive Nordic Bronze production. In terms of form, style and ornamentation the bronzes from this chronological phase show, in general, strong similarities within the Nordic sphere (Vandkilde 1998, 2017). However, new analytical results indicate that there is variation in lead isotope and trace element compositions, within the group of artefacts from period IB; differences primarily related to various ore sources. However, some of these objects rather share compositional similarities with objects from period II than from period IB. Such a subdivision is potential for the two types of shaft hole axes: Fårdrup and Valsømagle. In this paper we will discuss whether the observed differences are related to the spatial distribution or rather related to typology. The current results suggest that the Valsømagle axes could be related to bronzes from period II, whilst the Fårdrup axes may be related to IB. This brings forth the question that Montelius put forward already in 1917 – whether period II began 1500 BC or as he stressed in 1550 BC?

Session 8: Wetland depositions and rituals in time and space

Session chairs:

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This session focuses on the spatial and temporal aspects of wetland depositions and rituals in the Bronze Age. Wetland depositions and rituals sometimes reveal repeated visits to the same zones or areas – occasionally with more than 100 years between each deposition. At the same time, these wetland landscapes often appear ‘unmarked’ by humans, and equally so, their boundaries seem difficult to point out. Thereby a series of interesting questions arise pertaining to the spatial and temporal dynamics of Bronze Age depositional and other ritual practices.

Within the last ten years, ¹⁴C dates have been sampled on an increasingly large scale and their systematic integration with Bayesian statistics represent promising new ways of approaching these questions from new perspectives and ways. Moreover, the fields of spatial cognition and landscape studies have paved the way for rethinking issues related to spatial perception and memory, place continuity and landscape affordances in the use of these landscapes. Together, this provides more than enough of a foundation for a session focusing on depositions and rituals in the landscape in time and space.

We welcome all papers that explore issues related to wetland depositions and rituals, for example, through case-based studies or studies with a strong methodological or theoretical focus. Potential sub-themes are:

- The Late Bronze Age-Early Iron Age transition
- Questions of place continuity – marking, memory or mere coincidence?
- Questions of scale – sites, zones or beyond?
- The interplay with landscape and landscape changes
- Spatial perception and memory
- Markers of depositional sites (natural or man-made)

- Special locations? (e.g., at crossroads)
- Methods
- Depositions outside wetland areas

Sensing the personhood of waters

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This paper explores ways in which agentic powers of water were not merely ascribed to environment, but also sensed, observed and acknowledged by people in the past. I will look at the evidence for this in wetland depositions of artefacts, but also of human and animal body parts. This material will be used to discuss both how sacrifice might have transformed human-animal relations, and how these depositions might have stabilised and firmed up the personhood of waters. The paper is based on research carried out in the project *Tidens Vatten* that has created an overview of human and animal remains depositions in waters and wetlands of Sweden. Here, the material from the Bronze Age is in focus.

Human remains and hoards from the Bronze Age and Early Iron Age in wetlands, Eggedal municipality

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Richard Bradley's seminal work *The Passage of Arms* was published 1990. In it he discusses the relationship between deposits of human remains and hoards in wetlands in prehistory. Despite this groundbreaking introduction to the subject, there have been few subsequent investigations into Bronze Age hoards and human remains in Scandinavia, though some studies are on-going. To date, most of the work on human remains found in wetlands has been focused either on the Neolithic or the Early Iron Age. Within the on-going project *Towards a new European Prehistory. Integrating aDNA, isotopic investigations, language and archaeology to reinterpret key processes of change in the prehistory of Europe* many probable Neolithic human remains have been radiocarbon dated, and a large number of human remains with a possible Bronze Age

and Early Iron Age date will be analysed as part of a separate sub-project. This paper will discuss the archaeological depositions in wetlands from the Bronze Age and Iron Age in Egedal municipality, where human remains have been found in over 32 locations in wetland or former wetland areas. It focuses on the relationship between the human remains and other ritual depositions in this context, such as hoards and single depositions. This paper will focus on the landscape setting and its significance in relation to Bronze Age and Iron Age depositions in wetlands. A number of skeletons found in the municipality have already been dated to the Neolithic, Early Bronze Age, Late Bronze Age and the Early Iron Age. Can associations between human remains and other votive offerings in wetlands help us understand their date? In what ways does this association enhance our understanding the Bronze Age ritual landscape?

The Kallerup find – A unique dry land votive deposit from the Bronze Age

Marie Vang Posselt

Museum Thy, Denmark

The Danish Bronze Age antler axes – Depositions in time and space

Lise Frost

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The Danish Bronze Age antler axes represent a part of the extensive and varied group of Bronze Age single depositions primarily found in relation to rivers, bogs and wetland areas. However, whereas there has been strong focus on metal depositions, so far, non-metal depositions are highly under-researched, including their dating and deposition patterns. This paper presents a new synthesis of this find group based on new ¹⁴C dates and landscape analyses. The use of the natural landscape and the ¹⁴C dates reveal an immense time depth in relation to deposition patterns and place continuity. In some areas there are repeated visits to the same zones or parts of a certain river, lake or bog – sometimes with more than 100 years between each deposition. Unlike most other find groups, the antler axes are represented in the archaeological record throughout both the Early and Late Bronze Age. Moreover, the landscape studies show that the antler axes are strongly affiliated with rivers and wetlands in close relation to rivers. Their connection with flowing water places this group of finds among a more overarching European Bronze Age tradition of depositing metal in water.

Relations in landscape – The Bronze Age deposition from Hegra, Stjørdal

Merete Moe Henriksen

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The late Bronze Age hoard from Hegra in Stjørdal, Trøndelag, comprising more than 40 complete objects and fragments of bronze was discovered in 2017, making it one of the largest depositions of metal objects from the Bronze Age in Norway. The objects were found on a terrace overlooking the Stjørdal valley in close proximity to several rock art sites in the area, among them the well-known site at Leirfall. Following the discovery of the first finds in winter and spring 2017, an excavation of parts of the terrace was carried out in autumn 2017 by way of mechanically removing the top soil. The site thus represents a rare example of a well- documented deposition site in Norway from the Bronze Age. The investigations of the site revealed that the objects had been deposited in relation to a wetland area. This paper will give a presentation of the find and its landscape context, and provides a first attempt to look for relations between various ritual sites in the landscape in the Stjørdalen valley.

Session 9: Concluding discussion

Session chair:

Jan Apel

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General information

Venue

LUX, Lund University's centre for humanities and theology

Helgonavägen 3

223 62 Lund, Sweden

All sessions are held in rooms C121, C126 (both in building C) and B152 (in building B).

Lunch and coffee is served in a designated area of the LUX foyer, while the reception and dinners are held in the staff cantina, room C212 (building C, second floor).

Registration and secretariat

Registration will take place in the ground-floor foyer at LUX.

The registration and information desk is manned by student volunteers and is open:

Tuesday, June 11 16.00–19.00

Wednesday, June 12 08.30–14.00

Thursday, June 13 08.30–14.00

Friday, June 14 08.30–14.00

The excursion to eastern Scania

The excursion on Saturday, June 15 will go to eastern Scania where numerous Bronze Age monuments are still visible in the landscape. The excursion includes a visit to the Bronze Age cairn of Bredarör in Kivik, where it will be possible to enter the center of the cairn to study the interesting stone cist with petroglyphs. There will also be a quick stop at the Bronze Age–Early Iron Age grave field of Ängakåsen before departure from Kivik. The excursion will also provide the opportunity to visit the rock carving sites outside of the town Simrishamn as well as the rock carvings of the dolmen in Gladsax. Lunch and coffee is included in the excursion fee.

The buss leaves LUX at 08.30 (meeting point outside entrance A) and will be back in Lund at 17.00.

Wi-Fi access

If you have set up eduroam at your home university this can be used to connect to the Wi-Fi at Lund University. When you are on campus your device should connect automatically, but you may need to enter the username and password provided by your home institution. If you are unable to connect to eduroam please contact your home institution. By connecting to eduroam you are agreeing to be bound by its regulations, the University information security policies and those of your home university. For more information, see www.eduroam.org.

Security and First Aid

In an emergency call: 112

The University's emergency telephone number: 046 222 07 00

If you need to contact the caretaker or the University's duty officer, call 046 222 07 00.

If something happens that requires you to call the emergency services or another public authority, please use the contact information below.

Make sure you are aware of the location of the nearest fire extinguisher and emergency exits.

There are always two alternative exit routes. Study the evacuation plans which are located in the corridors and the stairwell.

Ambulance: 040 676 93 00

Work Environment Authority: 010 730 90 00

Poisoning information: 08 33 12 31

Medical Products Agency hotline: 0771 46 70 10, 0771 450 450

Police: 114 14

Healthcare advice: 1177

Accessibility

Outdoor tactile paving guides the visually impaired to the southern (A) and northern (B) entrances of LUX. These in turn connect to indoor tactile flooring. These entrances provide the easiest access to lifts and ramps leading to the various parts of LUX. Audio induction loops are available in rooms C121 and C126.

Harassment statement¹

The Department of Archaeology and Ancient History at Lund University seeks to create an inclusive atmosphere at the 15th Nordic Bronze Age Symposium; this means an environment in which all attendees may participate equally, and may learn, network, and converse with colleagues in an environment of mutual respect. Everyone who attends the symposium is entitled to an experience that is free from harassment, bullying, and intimidation. This includes, but is not limited to, sexual harassment and misconduct including unwelcome physical or verbal advances or contact of a sexual nature. Harassment also pertains to behaviours including stalking or bullying based on sex, gender identity, ethnicity, religion, disability, sexual orientation, or age (including ‘teasing’). Such conduct is harmful, disrespectful, and unprofessional. No attendee should, under any circumstance, engage in harassing, bullying, or intimidating

¹ This statement is based on the official policies of Lund University, and has been written using the harassment statement of the Classical Association in Great Britain (www.classicalassociation.org) as a template.

behaviour directed at any other attendee, in person or online. All attendees accept the obligation to uphold the rights of fellow attendees to be treated with respect.

If an attendee experiences harassment (including any of the behaviours listed above, widely inclusive), that person is encouraged to make a report in writing and/or to speak in person to the head of the department, **Martin Hansson**, or the department safety representative, **Susanne Gustafsson**. All reports of inappropriate or harassing behaviour will be looked into, and any further action, including police action, will be undertaken in conjunction with that attendee. If warranted, the person about whom the complaint has been made may be contacted without attendee.

Your attendance at the 15th Nordic Bronze Age Symposium at Lund University indicates your acceptance of this policy.

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Susanne Gustafsson

Safety Representative

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Organising committee

The 15th Nordic Bronze Age Symposium was organised by the Department of Archaeology and Ancient History at Lund University.

Committee members

Jan Apel (Lund University and Stockholm University)

Katarina Botwid (Lund University)

Fredrik Ekengren (Lund University)

Andreas Nilsson (Lund University)

Andreas Svensson (Lund University)

Anna Tornberg (Lund University)

Instructions for speakers and session chairs

Speaker instructions

- Please arrive at the room 15 minutes before your session starts and report your presence to the Session Chairs.
- Bring the presentation on a USB stick. The student volunteer in charge of the room will assist in uploading the presentation, either before the session starts or in one of the breaks.
- Please make sure the presentation is in a commonly used and compatible format. Prepare the presentation preferably using PowerPoint version 2016, 2013 or 2010 (although versions 2007/2003 are also supported).
- If you prefer to bring your own laptop, the student volunteer will help you connect it either at the podium or at the teacher's desk (HDMI or VGA).
- Each presentation is allocated 30 minutes: 20–25 minutes to present and 5–10 minutes of discussion. Please do not exceed the allotted time.
- Please be aware that members of the audience may want to live tweet and/or take photographs to post on social media of you and your presentation. Advise your Session Chair if you do NOT want to participate in this.

Session chair instructions

The chair and/or co-chair are expected to:

- Arrive at the room at least 15 minutes before the session starts.
- Ensure together with the student volunteer in charge of the room that the presenters have no technical problem to connect their computers and use the screen.
- Encourage the audience to seat themselves close to the front of the room. If the room is approaching full, point out empty seats to those still standing.
- Start the session on time.
- Introduce yourself to the audience.
- Ask people to set all cell phones on silent.

- At the beginning of each talk, recall its total duration (30 minutes, including questions and answers), and introduce the speaker.
- Make sure the speaker uses a microphone if necessary.
- Inform the audience if the speaker does not allow photographs to be taken of the presentation and/or information to be posted on social media.
- Encourage discussion and moderate the question period. Consider preparing a question to get discussion started. Make sure questions can be heard and understood, repeating them if necessary. Please ensure that all presenters are treated with professional courtesy.
- Comply with the timing by notifying the presenter before the end of their time slot (use the coloured cards with times marked on them—5 mins, 1 min and STOP—provided in each room). If a speaker does not leave time for questions, please proceed immediately to the next lecture, without Q&A.
- Make sure that the audience uses a microphone at the Q&A (the student volunteer will assist you with this).
- Notify the student volunteer immediately of AV equipment problems.
- After all the speakers have presented their papers, thank them and the audience, and close the session.

Rooms

- Each room is staffed by at least one student volunteer who is familiar with the room and its equipment, and will stand by with microphones for the audience.
- The student volunteer is responsible for unlocking the rooms, logging on to the computer and starting the projector before every session.
- All rooms are equipped with microphones for the speakers (in the form of a headset and a stationary microphone at the AV-podium) as well as a hand-held microphone for the audience.
- All rooms are equipped with projectors with widescreen proportions (16:9 or 16:10).

- All rooms are equipped with a conference package including a copy of the programme, abstracts, and coloured cards with times marked on them—5 mins, 1 min and STOP.

Room C121

Building: C, on the first floor

Type: Auditorium

Seats: 91

Equipment: AV-podium, CD/DVD/Blu-ray (stand-alone), Computer (Windows), VGA and HDMI-connections for laptop, Document camera, Speakers, Audio induction loop, Sound system, Teacher's desk, Blackout curtain, Two projector screens, Two projectors (16:10 widescreen proportions and 1280x800 resolution), Whiteboard.

Room C126

Building: C, on the first floor

Type: Auditorium

Seats: 91

Equipment: AV-podium, CD/DVD/Blu-ray (stand-alone), Computer (Windows), VGA and HDMI-connections for laptop, Document camera, Speakers, Audio induction loop, Sound system, Teacher's desk, Blackout curtain, Two projector screens, Two projectors (16:9 widescreen proportions and 1920x1080 resolution), Whiteboard.

Room B152

Building: B, on the first floor

Type: Lecture hall

Seats: 66

Equipment: AV-podium, CD/DVD/Blu-ray (stand-alone), Computer (Windows), VGA and HDMI-connections for laptop, Document camera, Speakers, Sound system, Teacher's desk, Blackout curtain, Projector screen, Projector (16:10 widescreen proportion and 1280x800 resolution).