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This innovative journal is dedicated to the presentation, discussion and interpretation of the archaeological record of southern Scandinavia in its international, regional and local context. Providing a platform for publication and debate for professionals from the museum as well as the university sectors this journal is open for empirical, methodological and theoretical contributions covering all time periods and all kinds of archaeology with relevance for the Scandinavian, Baltic, and North Atlantic regions. In addition, the journal may publish articles of wider theoretical, discursive or global reach.

The *Danish Journal of Archaeology* includes original research articles, news and discoveries, and discussion pieces with the intention of fostering open debate about the archaeological record in its broadest sense and the position of archaeology as a discipline in the modern world.

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Cover: Selection of finds from Füsing (Photo: A. Dobat, collage: K. Atzbach, article from Andres Dobat, Fig. 8 and 9).

Contents

Editorial

Thomas Grane, Sarah Croix, Lasse Sørensen, Rune Iversen, Helene Agerskov Rose,
Mette Svart Kristiansen

The editorial team is happy to present volume 11 (2022) of Danish Journal of Archaeology.

This year has seen a number of improvements for DJA. A major change is to the editorial team itself, as we have welcomed Dr. Sarah Croix, Associate Professor at Aarhus university and Dr. Helene Agerskov Rose, Postdoctoral researcher at the Zentrum für Baltische und Skandinavische Archäologie in Schleswig as new editors. With this arrival, we have widened the scientific range of the editors.

2022 has also seen the initiation of our efforts to expand the quality of DJA through admission to such online resources as Sherpa/Romeo. During 2022, the editorial team has succeeded in streamlining the journal's policies on everything from copyright and license to publication ethics in order to fulfil the requirements of the Directory of Open Access Journals (DOAJ). We gladly announce that the journal achieved this registration in the summer. The registered information contains relevant information for potential authors on the review process, copyright to articles, license terms and the average duration from submission to publication.

As a part of the process, the editorial team decided to take leave with our long-standing advisory board and to thank the members for their assistance, not least in the early years of the journal's online presence after the new beginning at Taylor & Francis in 2012. At the time, it was important to DJA that an advisory board represented the different types of institutions, towards which the journal was originally directed as an outlet for research. Therefore, the advisory board members were divided in the institutional categories, universities, museums and cultural heritage management.

Today, we see ourselves 'simply' as a high-quality scientific journal, which encourages any scholar within our fields of study to submit papers. Therefore, we are proud to have assembled a new advisory board consisting of eight internationally recognised scholars, each roughly covering a time-period from the Stone Age to Modern History. You can see our new advisory board at our webpage under Editorial Team.

The present volume contains nine research articles presented here in chronological order.

Mikkel Sørensen and Torben Diklev present the lithic and bone assemblages together with several new radiocarbon dates from the site of Qorluulasupaluk located in northwest Greenland. The site contains material culture from the Saqqaq, Independence I, Pre Dorset and Greenlandic Dorset groups, which is compared with other sites of Qeqertat and Nuusuarqipaluk in the Thule region leading to a novel discussion about the earliest evidence of humans in Greenland.

In 'Muddying the Waters', Vicki Cummings, Daniela Hofmann, Mathias Bjørnevad-Ahlqvist and Rune Iversen argue for an archaeology-based rewriting of the simplified migration narratives typically characterizing current research reports from DNA analysis of human remains from the transition between the Mesolithic and the Neolithic. The discussed regions include Britain, Ireland and Denmark, where it is emphasized to study monument construction and deposition across wider areas of northern Europe in order to trace multiple links and migrations from different points of origin within these different countries.

Through the combined use of digital and traditional methods, Rich Potter, Christian Horn and Ellen Meijer have been able to discover new rock carvings, which were missed in the old recordings, at a rock art panel at Kalleby, Tanum, western Sweden. In their paper 'Bringing it all together: a multi-method evaluation of Tanum 247:1', the authors present the interesting new results of a photogrammetric survey and argue that collating old and new documentations of rock carvings will help to create a better picture of Bronze Age rock art.

In 'The Flow of Resources in a changing World', Peder Dam, Mikael Manøe Bjerregaard, Arne Jouttijärvi and Jesper Hansen map and analyse provenances of, in particular, iron objects found in South-

ern Scandinavia from the period *c.*200-1050. Based on natural scientific methods applied on an extensive archaeological set of data, the study shows that the well-documented connection between the English territories and Southern Scandinavia had minimal effect on the influx of British everyday products and raw materials. Southern Scandinavians relied on local (200-750 CE) and later also on Norwegian or Northern Swedish iron (750-1050 CE). The paper discusses how these patterns in the flow of resources are related to political, transport-technological changes and demand for raw material in Northwest Europe.

Bente Grundvad Alexiou, Lars Grundvad and Xenia Pauli Jensen present a rich Late Roman Iron Age grave in 'The burial at Veldbæk, Denmark'. The grave contents include a full set of weaponry as well as Roman imported goods and locally made prestige objects. The authors place the grave in a weapon grave horizon of western Jutland with a continuous centre just outside modern-day Esbjerg, which breaks with earlier models, in which this area belonged to the periphery of the site at Vorbasse.

In 'Finding Sliestorp', Andres S. Dobat explores the Viking Age settlement at Füsing, northeast of Schleswig in northern Germany. The archaeological finds include buildings that lead the author to conclude that this was the site of an estate centre or assembly place in the last centuries of the first millennium AD. Dobat suggests a relation to the placename "Sliestorp" mentioned in the Frankish Annals, as well as placing Füsing in the context of the development of economic networks in Viking Age Scandinavia in the 11th century.

Kirstine Haase and Mikael Manøe Bjerregaard present an insightful application of the concepts of lived religion and social practice to the archaeological evidence from St Alban's Church in Odense in their article 'When God came to town'. They show how the urban environment could be activated by King and Church to manifest their authority, and how it contributed to the propagation of Christianity throughout the social spectrum and its integration into the urban way-of-life in the 11th to the 13th century.

In 'Contextualizing an early medieval village', Anders Hartvig and Bjørn Poulsen contribute with new insights into the medieval elite by tying together the history of a village, an aristocratic family and an assembly site in Southern Jutland. The recently excavated village, Petersborg, shows evidence for social stratification. It probably relates to a known family from the area, the Urne, which can be followed in the textual records over several centuries and which may have played an important role in land clearance and village foundation. Village and family are then situated in their broader social and political landscape, in particular through their possible relation to the Urnehoved Thing.

In the paper 'Hunter of the past', Mette Lykkegård-Maes and Andres S. Dobat present the results of a questionnaire-based survey revealing different aspects of the Danish hobbyist metal detector community. The aim is to implement best practice solutions for continuous interaction and cooperation with detectorists in the future both nationally and internationally.

We hope you will enjoy this volume!
The editorial team

The Qorluulasupaluk Site: an important puzzle piece in the interpretation of the Paleo-Inuit cultures in the High Arctic Thule region in northwest Greenland

Mikkel Sørensen[1] and Torben Diklev[2,3]

[1] University of Copenhagen The Saxo Institute Department of archaeology, Karen Blixen Plads 8, 2300 København S, Denmark.
[2] Lodsensvej 12, 3390 Hundested, Denmark.
[3] Corresponding author (torbendiklev@tineliisby.dk)

ABSTRACT
The Qorluulasupaluk site is located in Inglefield Fjord, Thule, northwest Greenland. From a matrix in the coastal erosion zone of the site a substantial amount of artefacts typical of early Paleo-Inuit groups has been retrieved. The assemblage documents the presence of Saqqaq, Independence I, Pre Dorset and Greenlandic Dorset groups. With its location in Inglefield Fjord and its substantial inventory of lithics and bone the site is the first to evidence considerable Paleo-Inuit use of the central Thule region not related to the North Water Polynya. The site inventory calls in question former interpretations of the Saqqaq Culture as an occasional visitor at the North Water Polynya in the Smith Sound region (Schledermann 1990) and as being formed in Disko Bay (Sørensen 2012). It documents use of the central Thule region by the Independence I group, the Saqqaq group, the Pre Dorset group, and the Greenlandic Dorset group. Five radiocarbon dates indicate that the site has been in use from *c.*2200 BC to 200 BC. Four of the dates represent an interval from *c.*2200-1750 BC. The last date represents the interval *c.*350-150 BC. The dating of Qorluulasupaluk is compared with new dates from two other Paleo-Inuit sites (Qeqertat and Nuusuarqipaluk) in Inglefield Fjord and are analysed in relation to radiocarbon dates from other Paleo-Inuit sites of the Thule region. It is concluded that the Qorluulasupaluk site contributes to a new understanding of the Thule region's prehistory and that it raises important questions concerning the earliest prehistory in Greenland.

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Paleo-Inuit; Thule region; Inglefield Fjord; Independence I; Saqqaq; Pre Dorset; Greenlandic Dorset; North Water Polynya.

Introduction

In this article, we present an analysis of the Qorluulasupaluk site. The main problems addressed concern the cultural history of the Thule region: what Paleo-Inuit groups employed the site and when the site was in use. These problems are compared and discussed in relation to the Paleo-Inuit prehistory of the region concerning both diachronous questions and spatial/regional use of the area. The artifact material and dating of the Paleo-Inuit habitation are discussed as part of the earliest human use of the Thule region from *c.*2500-0 BC, and in relation to the human pioneering processes into Greenland. Moreover, we focus on the site location, its ongoing erosion, and its history of achaeological research. Five radiocarbon dates from the site are presented and analysed in relation to the absolute dating of Paleo-Inuit sites and the cultural sequence in the High Arctic, North Water region.

The Qorluulasupaluk site was reported to Thule Museum in 1991 by a local hunter named Masauna Oodaaq from Qaanaaq and was visited and recorded by Thule Museum the same year (Diklev and Madsen 1992, 15). Since 1991 the site has been visited and monitored repeatedly by Thule Museum/T. Diklev due to its erosive situation and its proximity to the museum in Qaanaaq. In 2018 Thule Museum, with the participation of T. Diklev and M. Sørensen, revisited the site to inspect and document it. During visits, artefacts have been collected along the eroded front, and the erosion sediments have also been sieved by T. Diklev. This has led to the largest collection of Paleo-Inuit artefacts made of stone, bone, antler, and tusk from a single site in the Thule region, estimated *c.*10.000 pieces, and a bone inventory, estimated *c.*1500 bones/fragments. Finds from the site have been cataloged according to their location (see below) and today constitute the backbone of the Paleo-Inuit culture display of the present exhibition at Avanersuup Katersugaasivia/Thule Museum in Qaanaaq.

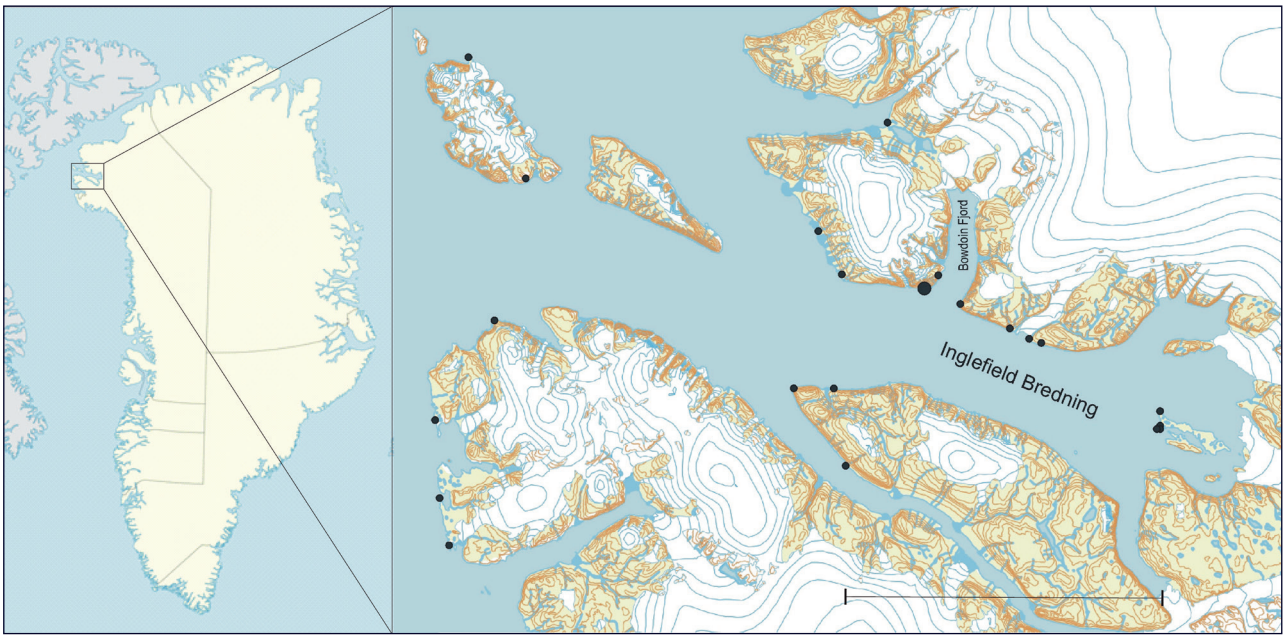


Figure 1. The central Thule region with recorded Palaeo-Eskimo sites. The large size circle is the Qorluulasupaluk site. Scale is 50 km. After Diklev and Madsen (1992) and Sørensen and Diklev (in prep).

Site Description

The Qorluulasupaluk site is located on Cape Tyrconnel between Kangerlussuaq/Inglefield Fjord and Kangerluarsuk/Bowdoin Fjord (Figure 1). It is situated along an eroding, low sandstone cliff that is from 2.5-4 m high. In front of this slope is a 4-7 m wide stony beach. On top of the sandstone a slightly sloping terrain with large boulders and some vegetation is seen. It is in this zone the cultural layers appear, from which the artefacts erode. The site area rises towards the west into a mountainous landscape. Thus, it can be imagined that a Paleo-Inuit site was situated on the sloping, uneven terrain on top of the sandstone along the coast. In 1991 and again in 2018 the sloping terrain was searched for prehistoric structures, but apart from some recent fox traps no features have been found.

The site location on the western cape between Inglefield Fjord and Bowdoin Fjord offers a view across Bowdoin Fjord and along Inglefield Fjord where, during spring and summer, marine mammals migrate into the waters near the productive Bowdoin Glacier at the head of Bowdoin Fjord. Due to Bowdoin Fjord's good marine mammal resources the small village Kangerluarsuk, located at the same coast *c*.4 km north of Qorluulasupaluk, was in use until one generation ago.

Artefacts are found in the erosion matrix along a 75 m stretch in mainly four different areas. From the west to the east these are named the "Western Area", "Midsection", "Bone Scree", and "Knapping Workshop". The Bone scree area contains the most preserved bones. At the eastern end of the beach a sandstone shelf, 3 masl, has been dubbed "The Knapping Workshop" as the overlying sod is full of flakes (Figure 2).

An analysis of the site's inventory in relation to the site area revealed no clear cultural preferences by the Paleo-Inuit cultures for camping and working in specific stretches of the site. In all areas, artefacts from at least three Paleo-Inuit groups have been identified. However, a majority of the Saqqaq artefacts seem to derive from the Midsection and the Western Area while artefacts typical of the Dorset Culture are mostly seen in the eastern area. This spatial distribution of the artefacts is probably best explained if during prehistoric times different Paleo-Inuit groups with different preferences for camping areas visited the site repeatedly. Due to its spatial layout, artifact distribution and taphonomy, the site is interpreted as a palimpsest of many occupations by different Paleo-Inuit groups .

In attempting to define and describe cultural layers, the site stratigraphy was investigated in 1991 and again in 2018 in the Bone Scree where the stratigraphy is most clearly exposed. Howev-

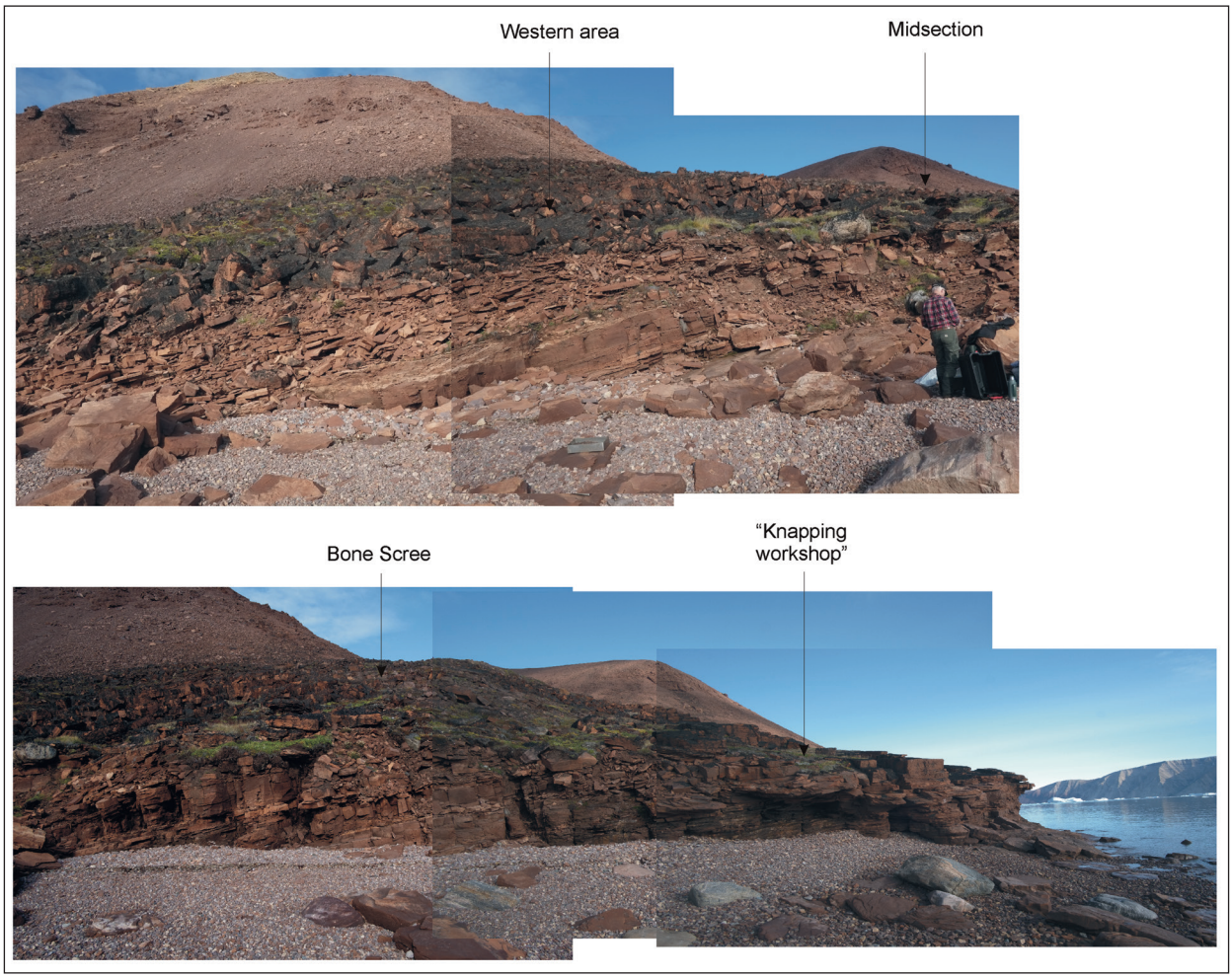


Figure 2. The Qorluulasupaluk site documented in 2018 from the beach (Photo and graphics M. Sørensen).

er, the result of these investigations was unable to document a clear stratigraphic profile with definitive cultural layers. Instead, the stratigraphy reveals mixing by sliding/erosion processes in an uneven terrain of sandstone bedrock and soils consisting of eroded sandstone mixed with cultural materials (Figure 3).

The totality and size of the site both spatially and in terms of the quantity of artefacts is difficult to estimate as the site itself has not been excavated and an area of unknown size has eroded into the sea.

Figure 3. The matrix in the erosion containing stone artefacts, bones, charcoal and burnt stones. A Saqqaq type burin made from killiaq is seen next to the ruler and bones are seen centrally and to the right. (Photo M. Sørensen).

Analytical Methods

The cultural interpretation of the inventory from Qorluulasupaluk and the attribution of different Paleo-Inuit cultural groups are based on analyses and conclusions from the project "Technology and Tradition in the Eastern Arctic" (Sørensen 2012). In this project lithic inventories are analysed systematically in a 'chaîne opératoire' approach. The reductive process of producing lithic tools is sequential in character. Thus, in principle each human action in a lithic production process can be studied through the artifact material. The theoretical background for the methodology and terminology used can be found in the views of Marcel Mauss who stated that '[t]here is no technique and no transmission in the absence of tradition' (1979, 104). Later, these ideas were significantly developed and applied to archaeology by mostly French scholars under the heading *chaîne opératoire* (e.g. Leroi-Gourhan 1964; Lemonnier 1976; Pelegrin 1990; Inizan et al. 1999; Sørensen 2004; Soressi and Geneste 2011). By using the chaîne opératoire approach, we aim to study the technological process as cultural transmission that is embedded in the formative principles of every technological complex. This allows us to study the decisions that are manifested in the technological processes of tool production from raw material extraction through use and discard of the end products (Desrosiers and Sørensen 2016). This approach ultimately provides access to the particular quality of cultural reproduction and thereby allows us to describe the knowledge applied in specific technologies. Consequently, it is possible to define prehistoric human traditions and on this basis study human interactions and migrations among regions through the identification of specific traditional knowledge inherent in the material processes studied. The advantage of method, compared to a traditional typological analysis, is that we can identify and compare many more diagnostic material differences than just the morphology of the tools. Examples are; raw material choice, possible heat-treatment, flake products, core products and lithic knapping tools. There are, however, some challenges in employing this methodology to the Paleo-Inuit cultures of the Eastern Arctic. A main challenge is that what we archaeologically define as "cultures", "cultural groups" or just "groups" are related to and developed from each other in what is defined as "The Arctic Small Tool-tradition" and thereby share technological knowledge[1]. Consequently, in some cases, e.g., when one cultural group is directly ancestral to the other, only few technological choices can separate the cultural groups. Through time, archaeological fieldwork and analysis have demonstrated that the North Water Polynya in the Thule-Ellemere region has attracted no less than six different Paleo-Inuit cultural groups, depending on how these are defined (Grønnow and Sørensen 2006, Schledermann 1990, Sørensen 2012, Sutherland 1996, Darwent et al. 2007). In this article we follow the present definition of cultures of the Eastern High Arctic that constitute: Independence I, Saqqaq, Pre Dorset, Greenlandic Dorset and Late Dorset (Friesen and Mason 2016). However, we also include a Transitional Dorset group, sometimes referred to as Early Dorset (Grønnow and Sørensen 2006). This choice is made to gain the most detailed cultural description of the area in order to analyse the cultural processes in the Thule region as accurately as possible.

The cultural diversity in the Thule region makes it one of the most complicated areas to interpret in the Eastern Arctic. Thus, when a site assemblage as the one from the Qorluulasupaluk has inventories from several Paleo-Inuit groups, it is problematic to subdivide with certainty the assemblage into the specific cultural groups.

One of the main problems in the region concerns the identification of the Pre Dorset cultural group as this group has technological choices and artifact morphologies in common with the Independence I, Saqqaq, Transitional Dorset, and Greenlandic Dorset groups. The best lithic process to discriminate among the groups is the production of burin tools (Schledermann 1990, 344 ff; Desrosiers and Sørensen 2016; Sørensen 2012; Grønnow and Sørensen 2006). Thus, while the Independence I, Saqqaq, and Greenlandic Dorset cultural groups can be identified on several characteristic lithic choices and artifact morphologies in the Qorluulasupaluk assemblage, the Pre Dorset group is attributed solely on its burin 'chaîne opératoire' and burin morphology. The reason for the similarity between Pre Dorset and Greenlandic

Dorset is that Pre Dorset is ancestral to the Transitional and the Greenlandic Dorset (Ryan 2016). In the Thule/Ellesmere region this is acknowledged by the definition of Early Dorset groups (Schledermann 1990; Grønnow and Sørensen 2006).

A strict count of the artifact inventories attributed to each of the identified Paleo-Inuit groups present at Qorluulasupaluk is not possible as the site is a palimpsest with artefacts mixed in the find context. Instead, an approach is chosen where the different Paleo-Inuit groups are identified qualitatively on criteria that are technologically and typologically diagnostic to each of the groups.

In the following, the identified cultural groups are described by their characteristic inventory.

Results: Artefacts and cultural Attribution

The Independence I Group

Artefacts and technology typical of the High Arctic Independence I group are identified in the Qorluulasupaluk site assemblage. No precise number of artefacts can be attributed, but several technological choices and artefacts diagnostic to the Independence I tradition can be identified. These are:

1) Use of large notches at the lateral sides of bases of scrapers and bifacial knife blades.
2) Occasional use of fine serration on projectile points.
3) Finely worked, stemmed angular bases on weapon (lance) blades often of a heavy quality.
4) Production of large and wide regular microblades (above 9 mm width).
5) Burin technology where primarily microcrystalline quartz (mcq) flakes are used for the production of simple spalled burins without grinding of the faces or other edge modification, and with a simple narrow or minimal base modification.
6) Reduction of large tabular cores maintaining a square cross section.
7) A primary use of fine grained mcq, e.g., from the Ellesmerian Folding[2].

Based on these criteria the following artefacts can be attributed to Independence I:

Notched bases on scrapers:	2	(mcq)
Fine serration of small projectile points:	2	(mcq)
Bifacial endblades with stemmed angular base:	4	(grey mcq)
Large/wide microblades (more than 9 mm width):	5	(grey mcq)
Simple burins without grinding or other edge modifications:	8	(grey mcq)

(Figure 4).

Figure 4. Independence I tool types made from grey mcq of the Ellesmerian Folding (Photo M. Sørensen).

The Saqqaq Group

The Saqqaq group is richly represented in the assemblage. Literally all lithic artefacts, technologies, raw material preferences, and tools typical of the Saqqaq group, as described from the large and numerous Saqqaq inventories from West Greenland (Sørensen 2012; Grønnow 2017), have been found at Qorluulasupaluk. This includes rare artifact types such as ground awls and adzes.

A characteristic feature of the site assemblage is a dominant use of silicified and metamorphosed slate termed killiaq. Large amounts of large bifacial killiaq flakes are struck from large bifacial cores and a characteristic heavy grinding of the platform edges is seen on most of the large flakes. This method is defined at Saqqaq sites in West Greenland as part of the Saqqaq concept of lithic reduction.

The following artefacts are typical of the Saqqaq group. The count of artefacts includes diagnostic fragments.

Large bifacial endblades:	37	(killiaq)
Spalled burins with ground faces:	15	(killiaq and mcq)
Arrow points:	15	(killiaq)
Harpoon points:	12	(10 killiaq, 2 mcq)
Fully ground awls:	1	(killiaq)
Beveled point:	1	(killiaq)
Adzes:	2	(killiaq)
Bifacial cores:	2	(killiaq)

(Figure 5).

The Pre Dorset Group

Attribution of a Pre Dorset group is solely based on burin technology and morphology. Pre Dorset burins are produced by spalling, most often they have a well formed relatively broad base and a thinning of the burin blade by retouch made from the spalled burin edge. Moreover, it is important to notice that all the burins attributed to the Pre Dorset in the Qorluulasupaluk assemblage are made from the characteristic blue-white mcq/flint of the Ellesmerian Folding geologically identified in Washington Land and on southern Ellesmere Island. From previous studies and analyses this raw material is dominating in the Pre Dorset people's lithic technology in the North Water Polynya region e.g., in Ellesmere Island (Schledermann 1990) and at Nuulliit (Sørensen 2010).

Burins attributed to the Pre Dorset group:

Spalled burins with broad bases and retouch from the spalled edge:	12	(mcq)

(Figure 6).

The Greenlandic Dorset Group

At Qorluulasupaluk the Greenlandic Dorset people are clearly identified by a number of characteristic artefacts and technologies:

1) Burin-like tools with fully ground facets and faces made from killiaq materials.

2) Microblade cores made from single or dual

Figure 5. Saqqaq tool types made from killiaq (Photo M. Sørensen).

Figure 6. Burins typical to the Pre Dorset group (Photo M. Sørensen).

Figure 7. Greenlandic Dorset tool types made from grey mcq of the Ellesmerian Folding, agate from Siorapaluk, heat-treated chalcedony and killiaq (Photo M. Sørensen).

fronted single platform cores with a characteristic steep platform front angle (*c*.50 degrees).
3) Microblades tanged by gentle retouch of the proximal end.
4) Preference for heat-treating blue/white chalcedony. This material looks milky, shiny and translucent when worked. Most often this material is used for bifacial tools and microblades (Sørensen 2012).
5) Steatite shards from lamps of oval shape (Figure 7 and 8).

Quite a number of stemmed bifacial endblades made from fine grained mcq with large lateral notches (box-bases) typical of the Dorset tradition in Greenland are present in the Qorluulasupaluk assemblage. However, as a similar base morphology is attributed to Pre Dorset in Canada this choice of production is not a secure trait for defining the Greenlandic Dorset in the Thule region and at the Qorluulasupaluk site. Found in this context only endblades that are made from heat-treated microcrystalline quartz (e.g., chalcedony) or local materials (e.g., rock crystal), can with certainty be defined as Greenlandic Dorset. Similar bifacial endblades do also appear in Middle Dorset and Late Dorset contexts, but neither of these groups' artifact technologies or typologies have been defined in the inventory of the Qorluulasupaluk site. A similar problem concerns side blades that are diagnostic of Dorset in Greenland, but appear in Pre Dorset contexts in Canada.

Artefacts attributed to Greenlandic Dorset: Bifacial mcq endblades include fragments of bases.

Burin like tools:	6	(killiaq)
Tanged microblades:	15	(grey mcq, chalcedony)
Side blades:	9	(grey mcq, chalcedony)
Bifacial mcq endblades with large notches:	23	(18 grey mcq, 5 chalcedony)
Oval lamp (fragments): (Figure 8).	5	(steatite)

Figure 8. Greenlandic Dorset type oval lamp made from steatite (Photo M. Sørensen).

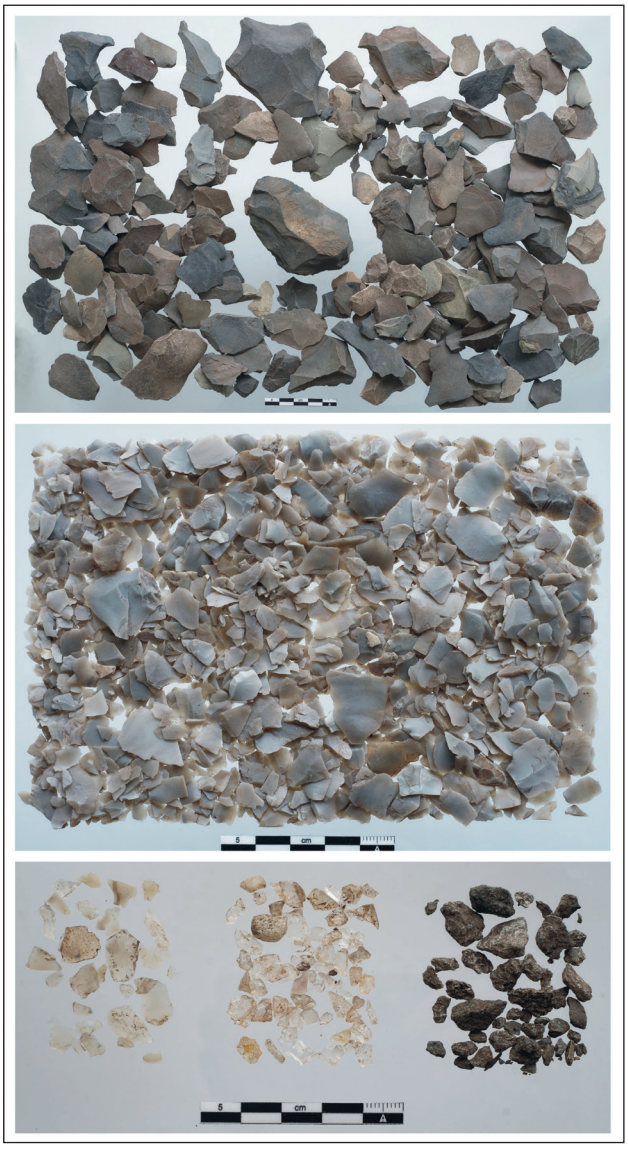


Figure 9. Raw material types from Qorluulasupaluk. Top: killiaq flakes and bifacial core. Central: grey mcq of the Ellesmerian Folding. Bottom: Chalcedony, rock crystal and steatite.

The Bone Inventory

Approximately 1500 bones and bone fragments are collected from the site, mainly from the "Bone Scree" area. Preservation of bone from the early Paleo-Inuit cultures is very rarely seen in the Thule region, while Late Dorset semi-subterranean houses and middens found in permafrost condition have produced a rich bone material when excavated (Appelt and Gulløv 1999; Darwent et al. 2019). As the Qorluulasupaluk site does not yield any cultural material younger than the Greenlandic Dorset, the revealed bone material is a unique Paleo-Inuit assemblage. The bone material is mineralized, i.e. the organic matter of the bones is partly substituted by minerals, due to local climatic and geological processes.

The bone material was subjected to an initial zoological study. A clear majority of the bone material reveals seal species. However, also whalebone is present among the marine species. Of terrestrial species, bones from musk ox, caribou, polar bear, birds, and a single tooth from dog/wolf have been identified (Diklev and Madsen 1992; A.B. Gotfredsen oral communication 2020).

Artefacts of tusk, bone and antler appear both as preforms and tools. In total four pressure flakers, one fragment of a harpoon head of type Qt-B (Grønnow 2016, 80), a piece of worked tusk, a rib with a longitudinal grove, and a rounded fragment of a bone tool or preform are identified in the assemblage.

The four pressure flakers and the harpoon head are typical artefacts of the early Paleo-Inuit cul-

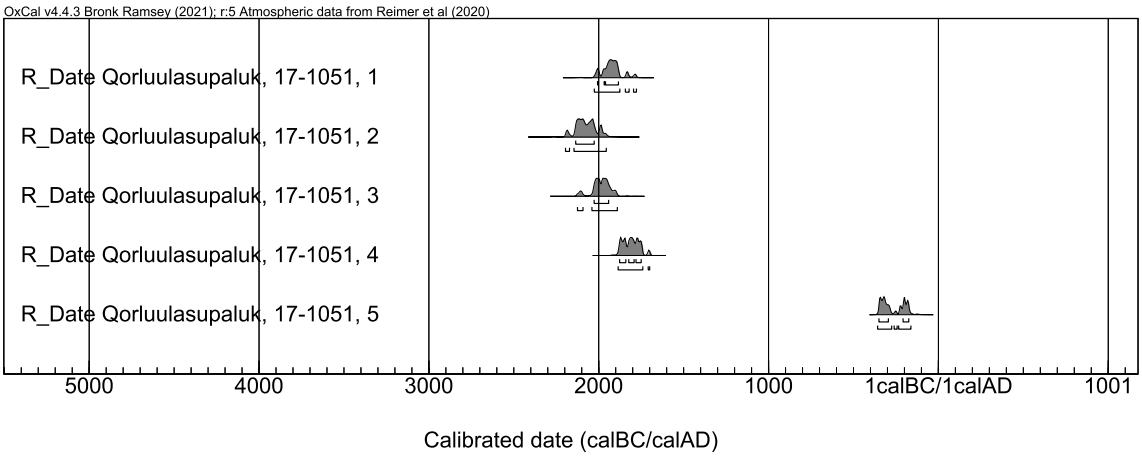


Figure 10. A multiplot of the calibrated radiocarbon dating from Qorluulasupaluk.

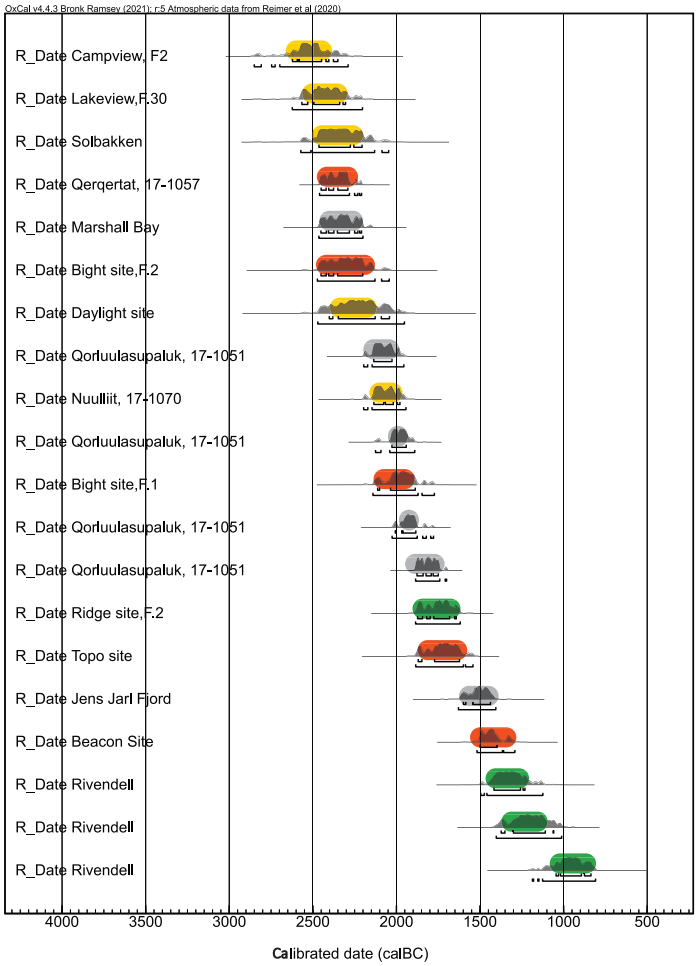
Site	Lab no.	Material	Association	Radiocarbon age BP	13 C	Calibration 68% BC
Qorluulasupaluk, 17-1051	AAR 31881	Antler, Caribou	cultural layer	3575 ± 31	-19.1 ± 0.1	1960BC-1884BC
Qorluulasupaluk, 17-1051	AAR 31882	Antler, Caribou	cultural layer	3684 ± 34	-18.1 ± 0.1	2136BC-2027BC
Qorluulasupaluk, 17-1051	AAR 31883	Bone, terrestrial long bone	cultural layer	3621 ± 30	-18.7 ± 0.1	2028BC-1942BC
Qorluulasupaluk, 17-1051	AAR 31884	Willow, Charcoal	cultural layer	3485 ± 26	-24 ± 1 (d13C AMS)	1878BC-1750BC
Qorluulasupaluk, 17-1051	AAR 31885	Willow, Charcoal	cultural layer	2180 ± 22	-24 ± 1 (d13C AMS)	350BC-175BC

Table 1. The radiocarbon dating from Qorluulasupaluk.

tures. Specimens similar to the ones from Qorluulasupaluk are published from Saqqaq sites in West Greenland, e.g., the Qeqertasussuk site (Grønnow 2016) and the Nipisat site (Gotfredsen og Møbjerg 2004). Thus, due to their types and morphologies, they most likely belong to the Saqqaq group.

Absolute Dating

Five samples for radiocarbon dating were prepared from the bone inventory and from charcoal from the cultural layers and dated by AMS at Aarhus University AMS Center. One sample is from an ungulate bone, two samples are antler (Rangifer tarandus) and two samples are taken from outer/bark charcoal layers of local grown willow (Salix arctica). The radiocarbon dates document that the site was in use during the interval *c*.2200-1750 BC to *c*.200 BC. It is worth noticing that the bone samples date to the 2nd mill. BC, i.e. the earliest Paleo-Inuit culture, while the charcoal samples are younger, the youngest *c*.200 BC. (Table 1, Figure 10).



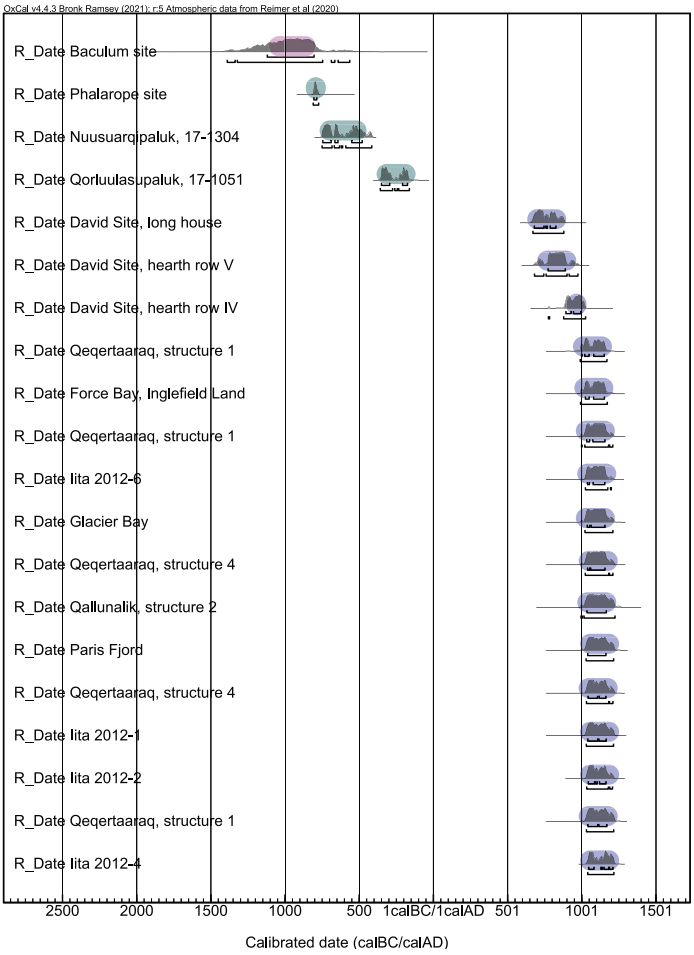


Figure 11a and 11b. A multiplot of 51 screened radiocarbon dates from Palaeo-Inuit contexts in the Thule/Ellesmere region. The cultural attribution of the single dates are marked by colors: yellow; Independence I, red; Saqqaq, green: Pre Dorset, purple: Transitional Dorset, light blue; Greenlandic Dorset, blue; Late Dorset.

The dates from Qorluulasupaluk are compared with Paleo-Inuit radiocarbon dates of the Thule/ Ellesmere region. Only radiocarbon dates that can meet the following criteria are included. They:

1) have a secure Paleo-Inuit context,
2) are faunal, terrestrial material, i.e., bone or antler from terrestrial species,
3) are charcoal from local grown species, and preferably the outer layers of these.

A total of 51 radiocarbon dates meet these criteria. The cultural contexts of the dated material are:

Independence I: 5,
Saqqaq: 5,
Pre Dorset: 4,
Transitional Dorset,
Greenlandic Dorset: 3,
Late Dorset: 27,
unknown: 6
(Table 2, see Supplements).

The chronological sequence is analysed in a radiocarbon multiplot (Oxcal v4 4.3 Bronk Ramsey 2021; Reimer et al. 2020)[3] (Figure 11a and 11b). Given with one radiocarbon calibration standard deviation, the analysis enlightens the following chronological sequence: Independence I *c.*2600-2000 BC, the Saqqaq group *c.*2400-1400 BC, the Pre Dorset to *c.*1800-800 BC. One date of a Transitional Dorset site is in the interval *c.*1100-800 BC. The Greenlandic Dorset is dated *c.*800-150 BC. From *c.*150 BC-700 AD (*c.*850 years) no dates appear, suggesting that the Thule region was devoid of people during this period. The Late Dorset group is dated from *c.*700-1200 AD. The standard deviation of the radiocarbon dating method and the fact that several of the dates are conventional radiocarbon dates with large deviations mean that intervals might be more narrow than here estimated. On the other hand, the few dates of the single groups, except for the Late Dorset, suggest that more dates from other sites may broaden the intervals. During the first *c.*500-600 years of occupation, only dates attributed to the Independence I and the Saqqaq groups are seen. Here we see an overlap of *c.*400 years between the two, and it is therefore likely that the two groups were in the area within the same time span. The Independence I and the Pre Dorset group do not have an overlap, while the Saqqaq and the Pre Dorset group have an overlap of *c.*400 years, and it is therefore likely that also these two groups have encountered in the Thule region. More dates need to be made, single dates need to be evaluated further according to the own age of the sample, and the cultural attribution of the single dated contexts needs to be further scrutinised, before questions of cultural overlaps can be answered with greater certainty.

From this analysis, the dates from Qorluulasupaluk are considered in relation to the individual occupation periods of Paleo-Inuit groups. The youngest date (AAR 31885) must be ascribed to the Greenlandic Dorset as this is the only known group from northern Greenland and the Eastern High Arctic during the 2nd century BC (Grønnow and Sørensen 2004). Of the remaining four dates, AAR 31881, 31883 date a Saqqaq occupation, AAR 31882 must date Independence I or Saqqaq, and AAR 31884 date a Saqqaq or Pre Dorset occupation.

Discussion

It is known from fieldwork around the North Water in both Canada (Schledermann 1990; Southerland 1996) and Greenland (Diklev and Madsen 1992; Grønnow and Jensen 2003; Andreassen 2000; Darwent et al. 2007; Sørensen 2010) that Paleo-Inuit peoples visited and lived next to the North Water Polynya. However, Inglefield Fjord and Bowdoin Fjord are not known for polynyas or early fast ice retreat. On the contrary the Inglefield Fjord area is known for its fast ice, its rich sealing, its summer migrations of marine mammal species, especially narwhal and beluga and its terrestrial resources such as caribou and musk ox. Inglefield Fjord is historically described as an area of the Thule region that has sustained seasonally and chronologically residential habitation due to its rich and stable resources (Rasmussen 1921). Thus, the topographical site location of Qorluulasupaluk, in the central part of Inglefield Fjord, points to a more permanent use of the Thule region than the polynya sites in relation to Smith Sound. A more permanent use of the Qorluulasupaluk site is argued for based on the artifact inventory:

1) At the site is found a rich bone assembly consisting of mainly marine but also terrestrial species.

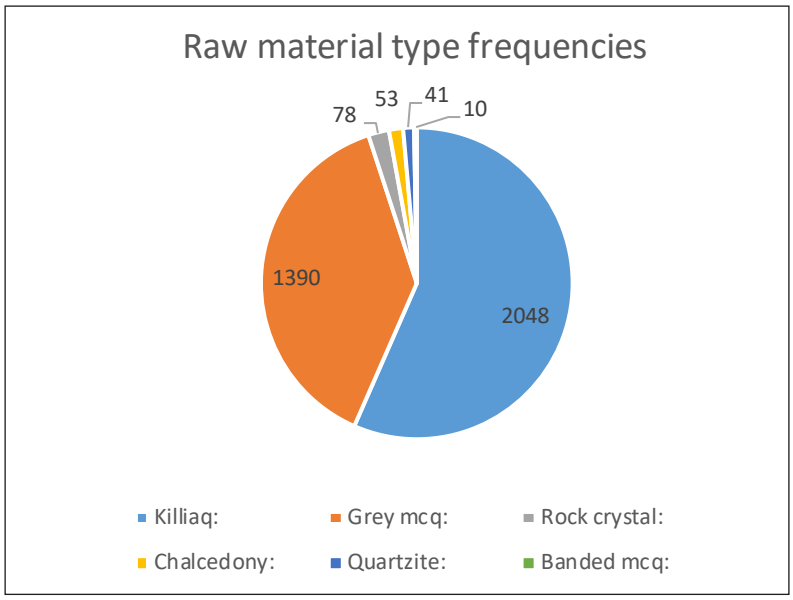


Chart 1. The different lithic raw material type frequencies at Qorluulasupaluk.

2) The lithic assemblage and tool inventory evidence that the entire 'chaîne opératoire' has been carried out at the site, at least for some of the Paleo-Inuit groups (Chart 1).

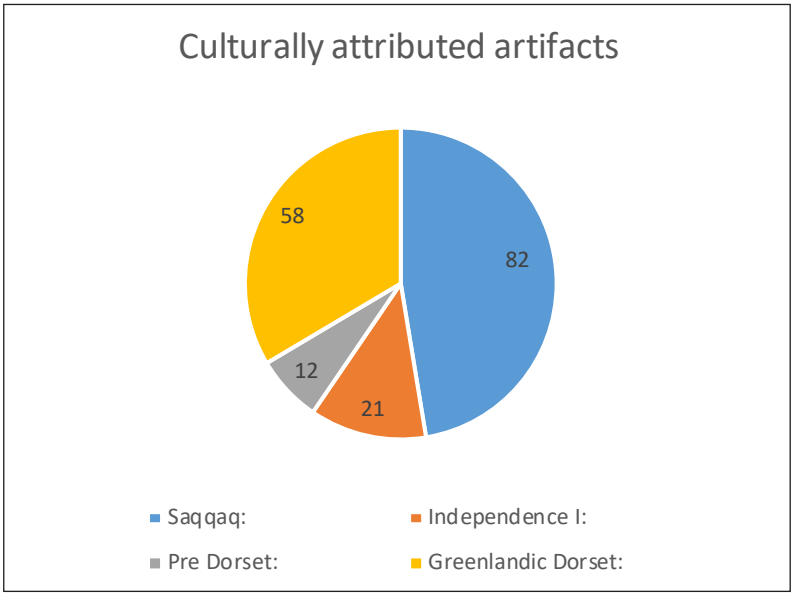
Concerning the Saqqaq group, the following stages of production are seen: procurement of raw material nodules, i.e., in the shape of large bifacial killiaq preforms, their systematic reduction, shown by large amounts of bifacial flakes, and a tool inventory which comprises all known tool types including rare artefacts such as ground lithic awls and adzes. A similar completeness of 'chaîne opératoire' is seen concerning the Greenlandic Dorset comprising all typical lithic tool types including rare artefacts such as steatite lamps.

Thus, Qorluulasupaluk, with its complete lithic inventory and its rich bone inventory, can be defined as "base camp" in the Inglefield Fjord that in periods might have had great importance in a regional Paleo-Inuit settlement system. Consequently, the Qorluulasupaluk site distinguishes itself from the polynya sites, which typically include only a few structures with a limited artifact assemblage of only a few types, indicating short stays during a particular season. Thus, while the polynya sites must have been of primary importance to living in the Thule region due to the outstanding concentrations of marine mammals in the North Water, some Paleo-Inuit groups have, perhaps during particular seasons, favoured living in the central part of the Inglefield Fjord region.

While the "base camp" concept at Qorluulasupaluk is best applied to the Saqqaq and the Greenlandic Dorset groups, it is still important to note that both Independence I and Pre Dorset groups were also employing the site, though probably not for as long and as intensively as the two former groups. The appearance of the latter two groups in Inglefield Fjord likewise documents a non-polynya employment of the region. While we know that the Independence I group had a settlement system directed towards the use of terrestrial inland resources in northeastern Greenland, the appearance of a Pre Dorset group in Inglefield Fjord is more surprising. This group has so far only been identified on few locations in Greenland and only in relation to Nares Strait/Smith Sound and the North Water (Solbakken site in Hall Land and Nuulliit in Steensby Land (Grønnow and Sørensen 2004; Sørensen 2010)). Identifying 12 burins typical of the Pre Dorset tradition from the erosion matrix of a single site indicates the importance of the site for the Pre Dorset people, and suggests that the Pre Dorset had a more permanent use of the central Thule region than formerly anticipated. The evidence of Pre Dorset in the central Thule region is confirmed by a new analysis of other site assemblages in the region (Sørensen and Diklev in press).

During autumn, winter, and spring the Qorluulasupaluk site is locked in a fast ice landscape from where seals can be hunted through their breathing holes, and when basking on the ice during spring,

Chart 2. Frequencies of artefact types attributed to different Palaeo-Eskimo groups at Qorluulasupaluk.



while during summer an open water sea-scape appears where migrating birds and marine mammals, such as seals and narwhal, pass by the site. Further, inland resources can be hunted, too, from the site at the Piulip Nunaa, where to the north Tasersuit, The Great Lakes, with migrating arctic char are situated in a lush landscape, further west along the coast of MacCormick Fjord and likewise along the shore of Murchison Sound south to Cape Ackland. Presence of bird bones suggests that the site was occupied during summer. However, a more thorough analysis of the bone assemblage needs to be made, involving a species list, with named seal species, before a seasonal use of the site can be concluded.

At Qorluulasupaluk the killiaq material dominates the assemblage quantitatively (56 %) (Chart 2). The quality of this material, being fine grained and grey bluish, is strikingly similar to killiaq from the Nuussuaq outcrop in West Greenland (Sørensen and Pedersen 2005; Sørensen 2012; Jensen 2006). However, the large amount of debris as well as the actual conduction and production of this material (i.e., reduction of large killiaq cores and preforms), demonstrate that this material must have been locally procured. So far, no killiaq outcrop has been identified in the Thule region. Yet, based on geological maps, there should be many possibilities of shales, schists and slates having been intruded by basalts in the Thule Super Group, creating killiaq-like materials. The Thule Super Group appears from Inglefield Land to the southwestern part of Inglefield Fjord (Dawes 1997). This suggests that a high quality killiaq outcrop employed by the Saqqaq group is situated somewhere near Qorluulasupaluk. The second most employed raw material in the assemblage is the "blue/grey mcq/flint" (39 %). This raw material is present in the Ellesmerian Folding stretching from southern Ellesmere Island to Washington Land. Outcrops and an abundance of this raw material has been located in Cass Fjord, immediately north of the Humboldt Glacier. It is most likely that the blue/grey mcq at Qorluulasupaluk was procured from this location *c*.300 km north of Qorluulasupaluk as the raven flies and *c*.450 km of travel along the coast or a little less over the ice cap. That would have involved a round trip of *c*.700-900 km before the grey mcq/flint could be transformed into tools and be used, modified, and discarded, if it were not traded between groups of people. Paleo-Inuit groups that favour this raw material in their tool production are the Independence I, the Pre Dorset and the Greenlandic Dorset groups. The high percentage of this particular raw material evidences a strong connection and mobility towards the Smith Sound area, a connection that is confirmed by sites attributed to Independence I, Pre Dorset, and Greenlandic Dorset in this area. The remaining *c*.5 % of raw material comprises 2 % rock crystal, 1 % chalcedony, 1 % banded mcq and 1 % quartzite. Chalcedony appears as small nodules in basalt geology, which in the Thule region could be from the Siorapaluk area, while the banded mcq is most likely synonymous with the agates from a location

a little distance east of Siorapaluk (Sørensen 2012, 53). Rock crystal and quartzite are likely more locally procured raw materials. It is worth noticing that the Siorapaluk agate and the chalcedony bear signs of having been heat-treated, a practice typical of the Greenlandic Dorset group.

With the assemblage from Qorluulasupaluk new questions can be raised concerning the origin of the Saqqaq culture. The present interpretation is that Saqqaq developed as a regional group in Disko Bay, from where it spread to other regions of Greenland. The Saqqaq is understood and defined in relation to the discovery and extensive use of grey, metamorphosed slate, known as killiaq, in West Greenland (Sørensen 2012, 54-59). However, with the assemblage from Qorluulasupaluk it is now clear that killiaq materials were also procured from and worked within the Thule region. This raises the question whether the Saqqaq culture could initially have developed as a culture in the Thule region, before entering West Greenland. With the Qorluulasupaluk assemblage we can argue for a substantial Saqqaq use of the Thule region, i.e., generations of continuous settlement in the region, which must have included a profound knowledge of the area's geology and resources. The earliest radiocarbon dates of Saqqaq contexts are from West Greenland, made on charcoal of local grown species (Grønnow 2017, 435), while the earliest date of a terrestrial bone in Saqqaq context is from Ellesmere Island (Schledermann 1990, 343). Due to the dubious own age of the local wood before burning, it cannot safely be said which date represents the earliest habitation. Further dating and achaeological fieldwork in the Thule region is required to shed light on this enigma.

Conclusion

The Qorluulasupaluk site, topographically positioned centrally in Inglefield Fjord, reveals that Paleo-Inuit peoples settled in the central part of the Thule region. The size of the lithic and bone assemblage and the location in the landscape suggests that the site in periods was a summer base camp or a site for aggregation. This topographical position and the size of the site add important new information to our knowledge about early Paleo-Inuit peoples' use of the Thule region, and the early pioneering processes in Greenland.

The following cultural sequence is documented at the site: Independence I, Saqqaq, Pre Dorset and Greenlandic Dorset. Yet, the majority of the artifact material analysed is attributed to the Saqqaq group. There are no artefacts that can document the presence of Transitional Dorset or Late Dorset groups. Transitional Dorset in the Thule region is so far only known from the Smith Sound/Nares Strait region, while Late Dorset sites are documented from the central Thule region at the Island of Qeqertat in Inglefield Fjord and from Steensby Land at Nuuliit and at Tupeqarfik (Sørensen and Diklev 2019, and in prep).

The absolute dates of the site indicate that it was in use from *c.* 2200-1750 BC (four dates) and during the interval *c.* 400-200 BC (one date). The early interval generally corresponds to the dating of the Saqqaq group in the region, but two of the dates could also date Independence I and Pre Dorset respectively, while the single later date must reveal a Greenlandic Dorset occupation.

The screening and calibration of radiocarbon dates from Paleo-Inuit contexts in the Thule/Ellesmere region suggest that Independence I, Saqqaq, Pre Dorset, Transitional Dorset, Greenlandic Dorset and Late Dorset peoples employed the region subsequently, but also that there might have been an overlap in occupation and a possible encounter between Independence I and Saqqaq, and between Saqqaq and Pre Dorset. However, more radiocarbon dates are necessary and further fieldwork in the Thule region needs to be made before this matter can be further clarified.

Finally, the completeness and amount of Saqqaq inventory in the Qorluulasupaluk assemblage raises the question whether the Saqqaq culture could have developed in the Thule region from where people migrated to West Greenland? With the knowledge we now have, we can conclude that the formation of the Saqqaq culture took place around 2400 BC in either West Greenland or in the Thule region from where long distance migrations took place with the first generations of "Saqqaq people".

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Notes

1) In the following text we prefer to use the term "Paleo-Inuit groups". This term signifies that we are defining groups of people of different history and material culture, travelling and living in the Thule region.

2) The microcrystalline quartz from the Ellesmerian Folding is found with limestone cortex in hand size nodules. The material can therefore also be defined as a type of flint.

3) https://c14.arch.ox.ac.uk/oxcal.html

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Muddying the Waters: reconsidering Migration in the Neolithic of Britain, Ireland and Denmark

Vicki Cummings[1], Daniela Hofmann[2], Mathias Bjørnevad-Ahlqvist[3] and Rune Iversen[3, 4]

[1] School of Natural Sciences, University of Central Lancashire, Preston, PR1 2HE, United Kingdom
[2] Department of Archaeology, History, Cultural Studies and Religion, University of Bergen. Øysteinsgate 3, 5007 Bergen, Norway
[3] The Saxo Institute, Section of Archaeology, University of Copenhagen. Karen Blixens Plads 8, DK-2300 Copenhagen S, Denmark
[4] Corresponding author (runeiversen@hum.ku.dk)

ABSTRACT

This paper explores the current narratives of migration for the start and spread of the Neolithic with a particular focus on the role that the new ancient DNA data have provided. While the genetic data are important and instructive, here it is argued that archaeologists should also consider other strands of evidence. More nuanced appreciations of migration as a long-term process can be created by exploring modern mobility studies alongside considerations of continued mobility throughout the Neolithic in Europe. We can also re-interpret the material evidence itself in the light of these approaches to help trace multiple possible links and migrations from multiple different origin points. This involves the investigation of complex, but connected, practices, such as monument construction and deposition across wider areas of northern Europe than are currently normally investigated. Such an approach will enable us to address long-term processes of movement, migration and interaction and investigate how new, shared social experiences emerged in a setting in which mobility and migration may have been the norm.

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Introduction

The scientific breakthroughs of aDNA research that have taken place within the last decade have turned the Neolithisation debate upside down. The DNA results from Scandinavia and the British and Irish Isles seem to reproduce a picture of migrating farmers carrying a relatively high percentage of Anatolian/Aegean ancestry (e.g. Brace et al. 2019; Malmström et al. 2015; Mittnik et al. 2018; Skoglund et al. 2012; Skoglund et al. 2014). Thereby migration has been reintroduced as the main driver for the transition from a hunter-gatherer way of living to a permanently settled and agrarian lifestyle which often characterises the Neolithic.

There is no doubt that the new scientific achievements of aDNA have contributed significantly to our understanding of how agricultural practices spread from the Middle East to reach northwestern Europe around 4000 BC. However, we cannot understand the complexity of the Neolithisation process through aDNA studies alone, which often seem to assume that the incoming farming population came from a restricted region, and once settled would no longer be mobile. For Britain and Ireland this process has been presented as the migration of people from northern France or the Low Countries, and for southern Scandinavia an influx from northern Germany and the Michelsberg culture. Currently, migration is often only considered likely for the initial arrival of the Neolithic and is not thought to have had a lasting influence on subsequent communication networks. However, this picture is changing as it now seems that there was diversity in the origins of colonists in Britain (Brace et al. 2019) and continued long-term gene flow from the continent. Therefore, the background to the British, Irish and Scandinavian Neolithic is most likely in itself a situation of flux, mobility and admixture and we can no longer immediately assume that single, short migration events are the end of the story.

Against this background we find that the current considerations of mobility and migration are incomplete as they tend to focus on one-off events and one direction of influence. Moreover,

the movements of people in the Neolithic are often explained as reactions to 'hard' factors such as climate change and demographic pressures. Thus, mobility and migration are generally considered atypical and problematic events, a last resort instead of the norm, which again has resulted in an underlying 'a-mobile' approach that has already been soundly critiqued in other disciplines (e.g. Schiller and Salazar 2013; Sheller and Urry 2006; Urry 2007). Generally, we find that there is scope to expand current aDNA-produced narratives with a focus on archaeological evidence and the details of migration as a social process. This paper takes its point of departure in the debate on the Neolithisation of Britain, Ireland and Denmark. On this basis, we propose a model in which genetic and archaeological evidence are combined to provide a more nuanced narrative of the role of migration in Neolithic societies.

A journey without end – narratives of the Mesolithic-Neolithic transition

The transition from the Mesolithic to the Neolithic has garnered considerable interest and debate over an extended period of time throughout Europe. The debate will not be fully rehearsed here but there are some interesting parallels between the narratives in southern Scandinavia and those in Britain and Ireland.

Southern Scandinavia

Around the mid-19th century it was the different nature of the archaeological finds obtained from the shell middens (*køkkenmøddinger*) on the one hand and megalithic tombs on the other that allowed Jens Jacob Asmussen Worsaae to divide the Stone Age into two chronologically separated phases (Iversen and Solheim in prep.). Worsaae presented the division at a meeting in *The Royal Danish Academy of Sciences and Letters* in Copenhagen in 1859 and explained the introduction of megalithic monuments by the immigration of farmers who forced out, but partly mixed with, the indigenous hunter-gatherer population (Forchhammer 1859, 71, 98-105). Thus, the megalithic tombs were linked to the Neolithic and were evidently part of a larger European phenomenon – the so-called 'megalithic culture'.

This remained the prevalent view amongst scholars throughout the 19th and early 20th centuries and informed Oscar Montelius' *ex oriente lux* (light from the East) diffusionist model, which was highly influential internationally (e.g. Childe 1925, 1929). For Montelius (1899), megalithic culture originated in the Near East from where it spread to northern Africa and western Europe. The same understanding of the origins of the megalithic phenomenon and the introduction of agriculture was presented by Sophus Müller and later by Johannes Brøndsted (Brøndsted 1938, 142-44; Müller 1913, 229-56). In contrast, the German linguist and archaeologist Gustaf Kossinna used a limited series of pottery forms to coin the term Funnel Beaker culture, later confirmed by Konrad Jażdżewski (Jażdżewski 1932; Kossinna 1921). Kossinna believed that the Early Neolithic Funnel Beaker culture emerged in the Jutland peninsula from the local Mesolithic (Ertebølle) and subsequently spread southwards (Kossinna 1921, 143). This scenario did not gain widespread acceptance, although the term Funnel Beaker culture eventually became preferred to 'megalithic culture' (Becker 1947, 9). Also, irrespective of the applied terminology or preferred direction of spread, the concept of culture and of the inherent superiority of a Neolithic lifestyle remained unquestioned within the Scandinavian research tradition.

It was only with the arrival of new scientific approaches provided by processual archaeology's 'systems theory' that migration as the preferred explanatory model for cultural change was challenged and the basis for the introduction of agriculture in southern Scandinavia reconsidered. The perspective shifted from incoming farmers to the resident Ertebølle hunter-gatherers who were to a great extent viewed as the drivers of Neolithisation. The reason for introducing a Neolithic economy was initially mainly explained by demographic and climatic factors such as population pressure, or ecological and environmental changes, amongst which a supposed decline in the oyster population was proposed (Andersen 1973; Fischer 1974;

Larsson 1987; Rowley-Conwy 1985; Zvelebil and Dolukhanov 1991; Zvelebil and Rowley-Conwy 1984). In turn, social and ideological factors were increasingly considered as the field was influenced by new ideas from post-processual archaeology. Here elements such as exchange systems, communication networks, social positioning/competition and the acquisition of exotic 'luxury' goods were emphasised (Fischer 1982, 2002; Jennbert 1984, 1985; Klassen 2004, 318-343; Madsen 1987; Nielsen 1987; Tilley 1996, 73). Neither of these research traditions left much explanatory room for migration.

Britain and Ireland

As in southern Scandinavia, from the start of the culture-historic approach – up to and including the 1970s – the migration of people was understood as the principle driving force behind the arrival and spread of the Neolithic into Britain and Ireland. While Childe had identified the possibility of diffusion as a mechanism for the transmission of new materials and practices, the relative isolation and island status of Britain and Ireland off the north-west coast of continental Europe seems to have been implicitly taken as necessitating population movements. Indeed, Stuart Piggott, whose 1954 *The Neolithic cultures of the British Isles* can be seen as the pinnacle of the culture-historic approach, was happy to explicitly discuss 'immigrant agriculturalists' and 'colonists' (Piggott 1954, 15; also see Whittle 1977). For Piggott, the material culture of these migrants represents 'the introduction of completely novel equipment, and there are no signs that an immediate fusion took place with any Mesolithic traditions' (Piggott 1954, 15).

In Britain it was only with the interpretive turn of the 1980s that the Neolithic was understood as not necessarily being the outcome of migrations of people from continental Europe, although this approach was less popular in Ireland. Interestingly, some of the earliest considerations of the 'indigenous adaption' approach were in fact inspired by work on the southern Scandinavian transition to the Neolithic, particularly the work of Zvelebil and Rowley Conwy (1984, 1986). Thus, drawing on a different sequence of Neolithisation in southern Scandinavia, British archaeologists in particular began to argue that the native hunting and gathering populations may have been the driving force in the adoption of the Neolithic in these islands (e.g. Thomas 1988 as an important early example of this approach); Irish archaeologists remained sceptical of this solution and continued to include migration from the continent in their transition models (Cooney 2000). In Britain, discussions on the transition to the Neolithic became increasingly tied to a more general appreciation of the pros and cons of the different theoretical approaches. The new interpretive approach (allied to the indigenous adaption model) was associated with a rejection of evolutionist narratives, which were in turn equated with the old culture-historic approach (and migration-dominated narratives). The increasingly polarised debate therefore soon reached an impasse, with the archaeological record being deployed to vociferously support both viewpoints (exemplified in relation to Britain by Sheridan 2010 and Thomas 2013).

Differences and similarities

The trajectories of dominant interpretations in southern Scandinavia, Britain and Ireland have had a significant influence on one another. While processualist ideas initially reached Scandinavia via the filter of British archaeological discourse, the definition of 'complex' southern Scandinavian hunter-gatherers who were not self-evidently swept away by an allegedly superior Neolithic lifeway in turn had a fundamental effect on discourse in Britain. Although the archaeological evidence was far less rich there, the dominant – and necessary – concern with anti-evolutionist narratives led to the adoption of this scenario as also applying to Britain and to a lesser extent Ireland. The rejection of migration narratives therefore became a matter of theoretical preference that symbolised the emergence of British and Irish archaeology as a post-modern discipline. Although the resulting narratives were subsequently criticised (e.g. Sheridan 2010), this development often removed any consideration of migration as a social practice from the debate. With hindsight, this can be considered

unfortunate, as it left British archaeologists in particular ill-prepared for what happened next.

The archaeogenetic evidence

The advent of aDNA studies has once again placed narratives of migration at the forefront of current research, in particular for the Neolithic period. At a pace that often made it difficult for archaeological readers to keep track of new developments, two horizons of significant population change have now been established across most of Europe: initial Neolithisation processes, and the much later emergence of the Corded Ware and Bell Beaker cultures and related phenomena (e.g. Allentoft et al. 2015; Haak et al. 2010, 2015; Olalde et al. 2018). This also applies to Britain, Ireland and the North European Plain, even though given the sometimes challenging preservation conditions, sample numbers remain comparatively low in some areas.

Beginning with the picture for Britain and Ireland, a swing back to the idea that some migration of continental settlers may have been involved in the initial introduction of Neolithic things and practices was suggested by the interpretation of substantial numbers of radiocarbon dates (Whittle, Bayliss and Healy 2011, 848-871). These showed a pattern of slow and piecemeal appearance of novelties in the south-east of England, followed a century later by a spread into south-central England, from where, a century after that, there was a rapid expansion into much of the rest of Britain and over into Ireland (although some very early dates from the west of Ireland remained unexplained in this model). Studies of the pottery chaîne opératoire (Pioffet 2015) also revealed close links to adjacent areas of the continent, with pottery in south-east England showing most similarities to the Low Countries and that in the south-west to Brittany and western Normandy.

The first large-scale aDNA study in Britain was published in 2019 and identified considerable regional variation, reflecting 'multiple source populations with variable proportions of WHG [Western Hunter-Gatherer] admixture' (Brace et al. 2019, 769). However, it was argued that most of this admixture did not take place within Britain itself, but rather several generations before on the Continent. At the time Brace et al. (2019) were writing, the closest matches for this genetic signature were found within the Iberian peninsula, where expanding farming groups associated with the Early Neolithic Cardial culture of the sixth millennium BC had admixed with resident hunter-gatherer populations to a much greater degree than had been the case for the roughly contemporary Linearbandkeramik in central Europe. It is these admixed 'Iberian' farmers that were identified in Britain, although this did not necessarily imply a direct migration from Iberia to Britain. A similar picture was also confirmed for Ireland (Cassidy et al. 2016, 2020).

The area of modern-day France has always been considered the missing piece in this puzzle of the origins of the Neolithic in Britain and Ireland, but a spate of new work has begun to address this. In their geographically broad study, Rivollat and colleagues (2020; see also Brunel et al. 2020 for a similar picture derived using a different dataset) could show substantial admixture with local hunter-gatherers in southern France and across the Atlantic seaboard, so that people with an 'Iberian' genetic signature were widely present in western and northern France by the time Neolithic things and practices were first introduced into Britain. The authors hence see the British evidence as best explained by migrations from the Paris Basin, mediating 'Iberian' and southern French genetic ancestry, whereas the Irish individuals sampled so far could have a more direct Atlantic affinity. While it is clear that considerably more regional data is needed to draw out the details, this supports the idea of several origin points for the individuals who eventually came to settle in Britain and Ireland. This is all the more likely since several crucial areas, notably Brittany, have not yet yielded remains suitable for sampling.

In southern Scandinavia, initial Neolithisation seems to be more closely tied to the immediately adjacent areas of the continent, as shown in a series of papers by Skoglund et al. (2012, 2014; see also Mittnik et al. 2018; and based on mtDNA Malmström et al. 2015). Similarly, a recent large-scale

study by Allentoft and colleagues (2022, 12) argues that the high level of hunter-gather-associated DNA evident in Neolithic individuals from Denmark is a result of much earlier admixture within central Europe, and that migration is therefore the key process that introduced Neolithic lifeways into southern Scandinavia. On archaeological grounds, it is argued that local hunter-gatherer populations may have continued to live in coastal areas (Gron and Sørensen 2018), where Neolithic things and practices were slowly adopted. This is also supported by a recent genetic study from the island of Lolland, south-eastern Denmark (Jensen et al. 2019) and corresponds to a general European pattern of parallel survival of local hunter-gatherers, with potentially later introgression, as suggested by Lipson and colleagues (2017; see also Allentoft et al. 2022, 16). In southern Scandinavia, the picture is further complicated by hunter-gatherer, or mixed hunting-fishing-farming ways of life associated with the Pitted Ware culture, present from *c.*3100 cal BC onward (Iversen, Philippsen and Person 2021; Philippsen, Iversen and Klassen 2020). The model currently favoured sees individuals expanding south and westwards from the eastern Baltic, which seems supported by early archaeogenetic studies (Malmström et al. 2015; Mittnik et al. 2018; Skoglund et al. 2014), and then entering into complex negotiations and exchanges with Funnel Beaker farmers (Iversen 2010; Klassen et al. 2020).

While the broad-brush picture is becoming increasingly clearer, it is also evident that there was considerable regional, local and even individual variation. For example, one individual sampled from the passage grave at Gökhem in modern-day Sweden showed a strong 'Iberian' component, and is genetically much more similar to contemporary British and Irish Neolithic individuals than to the remaining Funnel Beaker population (Cassidy et al. 2016, 372; Skoglund et al. 2014). A similar west–east link has since been mooted by Sánchez-Quinto et al. (2019, 2) who claim 'a significant farmer-specific genetic affinity between the British Isles Neolithic populations and the Scandinavian populations'. These contacts across the North Sea may be artefactually visible based on several polished axes found in Britain that Saville (2004) argues may have been produced from Danish flint sources or even from Danish axes that were re-worked in Britain (see also Walker 2018, 85-98 for further discussion).

Focusing on a different axis of contact, according to Rivollat et al. (2020, 7) the individual sampled at Tangermünde in Saxony-Anhalt (dated to the Middle Neolithic, but probably following a foraging lifestyle, see Terberger et al. 2018) needs several ancestral components to fully explain the genetic signature: Neolithic farmers with ultimate roots in Anatolia, both Western and Eastern Hunter-Gatherers, and perhaps even a Pitted Ware component. Similarly, Lipson and colleagues (2017) could show that individual sites, like the Blätterhöhle in western Germany, saw much greater levels of gene flow between populations with predominantly Anatolian Farmer and those with Western Hunter-Gatherer signatures, and a similar situation has also been suggested for the somewhat earlier burial ground of Obernai in Alsace (Rivollat et al. 2020).

Problems with archaeogenetic narratives

Clearly the results of the ancient DNA analyses have made a significant contribution to our understanding of this critical period, however several large elephants remain in the room, partly due to the interpretative emphasis of many existing studies. First, the issue of the fate of the Late Mesolithic population has not been adequately discussed or resolved. Several works now show that genomic signatures originally associated with hunter-gatherer populations later re-emerged in a Neolithic context even in areas where they had at first disappeared in the Early Neolithic (this is generally described as 'resurgence', e.g. Lipson et al. 2017). Yet it remains to be theorised what this actually implies – long-term survival of 'encapsulated' hunter-gatherer groups, in spite of considerable disruption; in-migration of populations from areas always dominated by hunter-gatherers (e.g. the Baltic coast); or rather from now Neolithic populations with more mixed ancestry (e.g. from western Europe). Each of these scenarios has very different implications for Neolithic societies. It is also interesting to note that Britain and Ireland buck the wider European

trend of a WHG 'resurgence'. This could either be because Neolithisation processes were more disruptive in these island settings than elsewhere, or because such admixture had taken place during an archaeologically quite poorly documented pioneer phase, as recently argued by Julian Thomas (2022). This is a question that can only be solved through further targeted archaeological work, including the precise dating of any overlap between hunter-gatherer and farmer lifeways (e.g. Elliott and Griffiths 2018).

In addition, from an archaeogenetic perspective the migration process has so far been conceptualised in the simplest possible form, at least for Britain and Ireland: 'A large-scale seaborne movement of established Neolithic groups leading to the rapid establishment of the first agrarian and pastoral economies across Britain, provides a plausible scenario for the scale of genetic and cultural change in Britain' (Brace et al. 2019). Thus, migrants arrived into Britain and Ireland, settled down and got on with being Neolithic until the next wave of migrants turned up at the start of the Beaker period (Olalde et al. 2018). This offers a neat narrative, broadly reminiscent of earlier culture-historical ones, yet entirely fails to come to terms with migration as a complex social process. As has repeatedly been criticised (e.g. Frieman and Hofmann 2019; Furholt 2021; Hofmann 2015; Thomas 2022) we are being presented with models of single, directed and large-scale migrations involving the meeting of two previously separate populations – but each link in this chain can be questioned. Settling not just the 'what' happened (people moved), but also the 'why, how and when' questions, requires substantial amounts of data – isotopic, chronological, archaeological and more – and the testing out of different models and scenarios. Indeed, as more genetic data are accumulating, it is becoming increasingly evident that we are faced not just with single, wave-like events, but with constant admixtures of people which vary considerably both between regions and over time, as for instance argued by the narratives of long-term coexistence of hunter-gatherer and farming lifestyles in southern Scandinavia (Gron and Sørensen 2018) and by some of the regionally and chronologically more sensitive studies by aDNA scholars (e.g. Rivollat et al. 2020).

From a social anthropological perspective, a single mass migration is far from the only possibility, and the drivers of migration in non-state societies very often lie at smaller social scales, such as kinship groups, co-resident communities and so on (e.g. Bernardini 2011; Clark et al. 2019; Mills 2011). For Britain and Ireland, this may also be indicated in the otherwise surprisingly early radiocarbon dates for key sites like Magheraboy, Co. Sligo, and in the chronologically staggered introduction of Neolithic things and practices more generally (see Whittle, Bayliss and Healy 2011). There is therefore ample room to discuss how smaller-scale processes of migration and mobility coalesce into the larger-scale patterns that are the focus of most archaeogenetic publications.

Finally, the importance of material culture in the migration process remains under-discussed. Here we are not simply talking about the potential adjustments that would be needed to adapt established suites of domesticated plants and animals to new environments (Fuller and Lucas 2017) or the technological side of seafaring and navigation capabilities which are particularly pertinent for a migration to Britain and Ireland (Callaghan and Scarre 2009; Garrow and Sturt 2011). Rather, material culture is also crucial in binding newly established communities together. In spite of a complex history of the term, such processes of ethnogenesis involve the use of material culture and practices both in order to demarcate boundaries towards other groups, and to establish a shared common past or origin point as a focus for identification (e.g. Voss 2015), a necessary prerequisite for characterising a collective identity as 'ethnic'. Migration events and general regimes of mobility are key points at which ethnogenesis happens, although it must be stressed that ethnic identity is also deeply intersectional and analytically hard to separate from other aspects, such as gender, socio-economic status or kinship (e.g. Hu 2013; Voss 2015).

While archaeogenetics thus provides conclusive evidence for migration, the scale, speed and modality of the process all remain to be determined, using a variety of data. It is entirely possible that migration proceeded in multiple stages, each with their own respective dynamics. For instance, for

Britain Thomas (2022) proposes an early pioneer movement with very few individuals introducing new ideas, which in turn opened up the possibility for later, larger-scale streams aimed primarily at settlement. Depending on the situation in source and destination areas, migrations could have proceeded at a steady pace, or numbers and speed could have fluctuated. In any case, it seems unlikely that the movement of people to and from the Continent was ever interrupted. In addition, while clear preferential axes of movement are suggested in the literature – namely from northern France or the Low Countries to Britain and Ireland, and from central Europe to southern Scandinavia – it could be helpful to re-think these suggestions on a wider background, in particular since several key areas remain under-sampled, notably the Low Countries, Brittany and the very earliest centuries of a Neolithic presence in south-east England. The picture for southern Scandinavia, while now considerably more detailed from a genetic point of view (cf. Allentoft et al. 2022), also still needs to be considerably fleshed out in terms of how best to combine aDNA and archaeological evidence.

Where to go from here

We suggest a three-pronged approach. First, we can look at mobility studies more broadly to gain insight into the processes of migration for people on the ground. Second, we can explore the evidence for continued mobility throughout the Neolithic in Europe to clarify the background of these migrations. Finally, we can re-interpret the material evidence itself in the light of approaches from the first two points, focusing in particular on wider networks of contacts.

Modern migration studies

Inherent methodological and evidentiary differences may initially seem to limit the applicability of modern migration perspectives garnered from, amongst others, psychology, sociology, politics, and anthropology to the study of prehistoric migrations, which are used by only a small minority of researchers (see e.g. Anthony 1990, 1997; Burmeister 2000, 2016; Cameron 1995; Chapman and Hamerow 1997; Duff 1998; Gori, Revello Lami and Pintucci 2018). Likewise, very few contemporary migrations researchers have looked back to the distant past to understand better the longue durée of migration processes (Tsuda 2011; Tsuda and Baker 2015). However, new insights can be gained by bringing perspectives from modern migration studies to prehistoric case studies.

One field of research common within the analysis of prehistoric and modern migrations is the study of push/pull factors or the 'environmental and social disruptions' that may have caused communities to become displaced (Tsuda et al. 2015, 21). Within contemporary migrations, these disruptions in the 'home' areas are often the factor *initiating* migration, not guiding its trajectory, which is instead largely determined by social (often kin) networks that act as key pull factors promoting migration to particular areas. The resulting 'chain migration' can even lead to the formation of a 'culture of migration', where migration becomes the norm, rather than a crisis response (Tsuda 2011, 320).

Social networks, upheld through return migration and communication networks, help raise awareness of the suitability of a given area for future migration, they can provide guidance and support and help to create feelings of familiarity, situatedness and safety in unfamiliar landscapes and social settings (e.g. Brettell 2014; Tsuda 2011). While modern technology and rapid means of transportation have created very different possibilities here, it is important that we investigate the presence and role of such behaviours also within prehistoric migratory processes. The impact of return migration, for example, could be explored by re-analysing and interpreting cultural change within the original 'home' areas, rather than focussing solely on the impact in the colonised areas.

Within prehistoric research, migration is often represented as large waves of migrants sweeping from one area to another, while modern migrations are primarily undertaken by either individuals or households (Tsuda 2011). However, various scales of migrations are likely represented in each case,

from the concurrent movement of entire social groups – for example entire settlements or clans – to cascading migrations starting with individuals or households which eventually culminate in the movement of larger communities. The archaeological focus on the large scale may be partly due to methodological and evidentiary differences within archaeological and modern migration research. However, it remains to be established for each case what the likely unit of decision-making was. For example, many push factors in the prehistoric past would have impacted the whole community, whereas in contemporary societies with their greater economic differentiation, some individuals are affected more than others. The often-precarious safety situation of contemporary migrants also leads us to question how security, rights of transit and other logistical factors could have been negotiated in the prehistoric past (Tsuda 2011).

Within archaeological research, past migrations are often interpreted to have led to large-scale cultural changes, the adoption of whole sets of new cultural traits and substantial population turnover, but such dramatic impacts of incoming migration are rarely seen in the contemporary world (Tsuda 2011). Historically, there are obvious examples of indigenous populations marginalised and destroyed by colonising immigrants, especially in the Americas and Oceania, perpetrated through widespread (and government-sanctioned) conflict, genocide and disease. Yet while this may remain an unreflected trope for interpreting past migration events, these kinds of catastrophic processes are so far largely absent or difficult to identify from the archaeological record. It is to the substantial literature concerning interaction and integration that we must instead turn for insights into some of the social dynamics that could help explain the widespread cultural changes visible within the archaeological record of Neolithic Britain and Ireland, and southern Scandinavia.

One seminal anthropological text is Barth's influential study on *Ethnic Groups and Boundaries* (1969). Perspectives inspired by cultural ecology are here brought up to develop a typology of four modes of interdependence between ethnic groups:

1. They occupy different environmental niches and are in little to no competition for natural resources. Thus, each group may be largely independent, with interaction likely primarily taking place during exchange and ceremonial or ritual settings.
2. They occupy the same niche but in different territories, and therefore they may compete for resources, resulting in recurrent political and social negotiations or even hostilities.
3. They form a symbiotic interdependent relationship by occupying different niches and by 'provid(ing) important goods and services for each other'
4. They partially occupy the same niche, which would over time lead to either the displacement of one of the groups or greater interdependence and even integration of the different communities (Barth 1969, 19-20)

Barth's ecological perspectives, although relatively easily applicable to much archaeological data, overlook important social interactions and especially integration, in particular by implying that ethnic identities can be rather freely chosen in response to economic strategies. However, the social processes underlying interaction and integration largely depend on the relative permeability and flexibility of the cultural boundaries between the different communities (e.g. Alba 2006; Barth 1969; Taft 1953), which can sometimes imply substantial power differentials (Adey 2017, 104-166; Cresswell 2010). These potentially thorny interactions can be eased through boundary objects, practices, technologies or people that acted as 'brokers' between different communities (Mills 2018; Star 1989; Wenger 1998). The so-called boundary objects are not things that demarcate the boundaries of communities; rather, they are often pre-existing shared frames of reference (sensu Taft 1953), such as common cultural values, technologies, and practices found in both groups.

The pre-existing similarities do not need to be identical; rather, they simply need to appear similar enough to form a common ground between two groups allowing them to see eye-to-eye, on at least that aspect of life. Where boundary objects

exist, they thus help decrease perceived differences between communities, promote positive interactions, and act as points in which knowledge can be shared between the different groups. When the knowledge surrounding these boundary objects is exchanged between different groups, it signals a degree of cultural openness of one group to another by promoting feelings of familiarity (Carley 1991; Mills 2018; Wulf et al. 2010). This helps create communities around these shared practices and objects that foster the construction of a shared socio-cultural identity and the breaking down of cultural boundaries (e.g. Stevens, Veith and Wulf 2005; Wegner 1998). The active sharing of knowledge within these so-called 'communities of practice' (Wegner 1998) may further ease the transformation and innovations within societal practices and technologies to contain influences from diverse origins (Cohen and Toninato 2010).

These interconnected processes help blur cultural boundaries so that 'experiences and outlooks that were once distinctive to each side of the boundary are now shared' (Alba 2006, 350). The episodic boundary-blurring eases the processes of integration as it presents less of a 'rupture' between prior cultural ideals and newly adopted or transformed ways of living (Alba 2006, 351). Thus – rather than necessarily assimilation or acculturation or displacement – new hybridised identities, practices, and technologies can be formed through a collaborative transformation within the communities of practice (Laitinen 2002, 83; Wegner 1998). In these instances, cultural change can occur through different forms and scales of mobility (e.g. Adey 2017; Kaufmann 2002; Urry 2007), without necessitating significant displacement or destruction of local indigenous communities by incoming migrants.

An unsettled Neolithic

Part of the problem of existing narratives of the Neolithic migration process is that two states of being are contrasted absolutely – being mobile, or staying put. Indeed, the Neolithic is traditionally seen as 'sedentary', and therefore being on the move is all too easily conceptualised as a disruptive, large-scale, anomalous and to some extent cataclysmic process that needed harsh 'push factors' to begin and would have a major and immediate impact at destination. The situation is somewhat different in Britain, where mobility has been considered an important element of being Neolithic (e.g. Leary and Kador 2016; Whittle 1997), partly because there is little evidence for permanent domestic architecture for much of Britain (Cummings 2017, 76-83). While this degree of mobility was occasionally rather uncritically seen as a continuation of hunter-gatherer practices into the Neolithic (e.g. Barker 2006, 370-378; Thomas 1998), this is no longer tenable on current evidence. Although hunter-gatherers may have survived alongside Neolithic incomers, the way that mobility was organised between the two communities would have differed. However, even within a 'Neolithic' lifestyle, smaller numbers of individuals appear to have been on the move relatively frequently, whether for permanent resettlement or not. These could help explain the pockets of genetic signatures that stand out locally or regionally, but are also indicated by other lines of evidence. For example, isotopic studies of several megalithic tombs in southern Britain have shown that especially in the early centuries of the Neolithic, a substantial number of individuals may have continued to migrate from elsewhere, with north-west France as a distinct possibility (Neil et al. 2016, 2017, 2020). In addition, longstanding contacts between Britain and southern Scandinavia may also be evidenced by a small number of apparent Funnel Beaker flint thin-butted axes (*c.*3800-3000 BC) and a larger quantity of axes dating from *c.*3000-1500 BC found in Britain, although finds circumstances are often dubious (Walker 2018; re-dated using Nielsen 1978, 1979). This implies that migration routes, and the contacts on which they built, were potentially active for several centuries.

This kind of continued mobility at the scale of individuals and small groups of people is increasingly being recognised as the norm throughout Neolithic northern Europe and linked to a degree of economic diversification. For example, the farming system now suggested for the Funnel Beaker culture could involve a considerable degree of mobility through a reliance on slash-and-burn cultivation (Schier 2009) and the movement of cattle be-

tween communities, sometimes even across bodies of water (Gron et al. 2016). However, as manuring was also practised (Gron et al. 2021), there appears to have been diversity in economic strategies between and perhaps within groups. Dietary isotopes also show different proportions of marine resource consumption in burial populations as late as the Middle Neolithic (Fraser et al. 2018; Terberger et al. 2018). For the Michelsberg culture in both France and Germany, it has been suggested that the level of cattle keeping substantially increased, and that at least the smaller enclosures and some of the open settlements may be relatively temporary camps or cattle corrals catering for a partly mobile population (summary in Lietar 2017, 19-20; Geschwinde and Raetzel-Fabian 2009, 246-249; Seidel 2017; Turck et al. 2014). While agriculture continues alongside, there is thus a greater emphasis in these late fifth and fourth millennium BC Neolithic societies on economic flexibility and the use of diverse landscape niches. Sometimes, this seems to have been coupled with very short-lived settlement sites, best documented for the dendrochronologically dated sequences of the Alpine Foreland (e.g. Hofmann et al. 2016).

These widespread and pervasive changes are important, as they mark a fundamental change in the character of the Neolithic. Many individuals, as well as smaller and larger groups of people, were on the move seasonally or every few years as part of routine economic activities. In such a context, an expansion into new areas would not necessarily require any push factors, but could rather represent a tipping point within, or extension of accepted routine behaviours. Similarly, we should then not expect that these individuals and groups moved only once and then stayed put. Rather than a wave of advance, we would be faced with a series of intercutting, braided rivulets and streams, along which communication was and remained possible in both directions.

Identifying continued movements and influences

We need to consider such existing social connections as a serious motivation for migration and other kinds of mobility instead of focusing exclusively on environmental processes and overpopulation (push factors) as drivers of migration. This can be done by tracing longer-term patterns of similarity and difference, focusing in particular on the details of practices and how they changed over time. This approach will make it possible to trace unfolding patterns over the longer term and to use similarities and divergences in practice to identify at what points connections and mobility were high, and when this may be offset with the creation of more local identities and boundaries. In our ongoing project (*Deep histories of migration: exploring the Early Neolithic around the North Sea*), we have chosen to focus on two key pieces of evidence: monumentality and deposition practices. These are of course not the only indicators of traditions of practice but they are preferable to economic practices, as the latter would react very flexibly to local conditions. In contrast, monuments and depositional practices both have relatively visible, 'public' elements and less observable characteristics which would need more sustained, direct contact to pass between groups. It should therefore be possible to distinguish scenarios of continued direct contact from those of divergence from a common root. Another reason to focus on monuments and deposition practices is that objects (or monuments) both refer back to other, older traditions of practice but they also anticipate future events as they are entangled into a wider network of people, practices and traditions (Hodder 2012). This allows us to transcend common comparisons between single sets of elements and instead reveal underlying shared practices indicative of continuous movements and influences.

In the following case study, we will focus on monuments. Monumentality is central for the creation of community identities, social cohesion and world views, but also shows numerous local and regional idiosyncrasies. The timings of monument appearance and use are very similar in Britain, Ireland and southern Scandinavia (Eriksen and Andersen 2016; Klassen 2014), while it is problematic to argue for connections to France and the Low Countries. Monument types, especially dolmens (Cummings and Richards 2021), show obvious structural parallels between Britain, Ireland

and Denmark, while timber mortuary structures and causewayed enclosures are also found contemporaneously across these areas.

Case study: mobility, megaliths and making sense of diversity

Based on the perspectives and approaches described above, in the subsequent section we will explore how we might begin to analyse and interpret prehistoric migrations, explored through a short case study of the appearance of one particular form of monument found around the North Sea in the Early Neolithic – the dolmen.

The dolmen (known variously by regional names: stendysse in Denmark, portal tombs in Ireland and portal dolmens or quoits in Britain) is a well-known feature of the Early Neolithic either side of the North Sea. Found in vast numbers in southern Scandinavia (Eriksen and Andersen 2016), in considerable numbers in Ireland and in small pockets in western Britain (Cummings and Richards 2021), the dolmen may appear to represent the outcome of migrant Neolithic people settling down in these areas. Certainly the very early dates from excavations at Poulnabrone, Co. Clare, led the excavator to state that 'the builders of Poulnabrone were no more than a couple of generations descended from the first Neolithic settlers in the area' (Lynch 2014, 175). However, a deeper investigation of this form of monument including close scrutiny of the dating of many of these sites across north-west Europe highlights regional differences, temporal variation and other ambiguities (see Cummings and Richards 2021). It calls into serious question whether this form of monument could ever be understood as the outcome of the large-scale migrations of people at the onset of the Neolithic, the model currently implied by the aDNA. But if the dolmen was not an immutable part of the Neolithic package moving with the first 'wave' of migrants, then why are there such striking similarities in form across some parts of north-west Europe?

Confusions regarding this form of monumentality are considerable, much relating to typology. As we have already seen these sites have different regional names, and in both western Britain and Ireland there is further typological disarray in that monuments that are virtually identical to portal tombs but with the addition of extremely short passages are known as passage graves (or sometimes as 'simple passage graves' to differentiate them from the larger and later 'classic' passage grave (Hensey 2015; Kytmannow 2008)). Typological semantics may seem irrelevant in this debate, however since these terms have been used to argue for specific innovation networks related to the start of the Neolithic in different areas this is actually a key issue. This is particularly critical since there is no obvious source for dolmen monuments and as such an origin point from where the idea of dolmen building spreads alongside people moving has never been satisfactorily pinpointed. The most similar form of monument to the dolmen can be found in north-west France in the tradition of megalithic monumentality dating from the fifth millennium BC, but these monuments pre-date the dolmens of southern Scandinavia, Britain and Ireland by many hundreds of years (Scarre 2011). Indeed, most would argue they are fundamentally different monuments, being for the most part large passage graves encased in mounds or cairns. To confuse matters further, dolmens are not the only form of megalith being constructed in the Early Neolithic. In Ireland and Britain other forms of stone monument were built alongside dolmens, including the Cotswold-Severn tradition in Britain, and Clyde and court cairns in western Scotland and north-east Ireland, although some of these monument traditions are slightly later (Schulting et al. 2012). Again, the origins of these forms of monumentality remain obscure. On top of this not all areas clearly occupied in the Early Neolithic saw any megalithic construction at all.

On the other hand, there are remarkable similarities in monumental form across a wide area which are rarely explored or explained. Dolmens employ a large glacial erratic as a capstone which is supported by a small number of uprights, the whole being encased in a platform (or small cairn) of stones (Cummings and Richards 2021). This form of construction is consistent from the western shores of Ireland to the southern coasts of Sweden

Figure 1. The dolmen at Carreg Samson, Wales (Photo: Vicki Cummings).

(Figures 1 and 2). Moreover, the timing of dolmen construction is also paralleled in different areas, with construction taking place primarily between 3800 and 3600 BC (Schultz-Paulsson 2017). Some dolmens are clearly early in the sequence of Neolithisation, like Poulnabrone in Ireland mentioned above, but in other instances dolmens were constructed on top of a sequence of previous Neolithic activity, including settlement, as is often the case in Denmark (Eriksen and Andersen 2016). In these latter cases dolmens were being constructed many hundreds of years after the uptake of a Neolithic way of life, clearly setting them apart from initial processes of Neolithisation. This means that in some parts of northern Europe dolmen building happened perhaps 'a couple of generations' after the start of the Neolithic, while elsewhere many hundreds of years passed between the two. So what to make of this piecemeal and varied tradition, especially in relation to understanding migration?

Problems relating to our interpretation of dolmens arise if we understand them purely as expression of primary settlers arriving into new areas. In this scenario there must be an origin population (and therefore place) from where the idea or blueprint of the megalith came and which the migrants took with them and adapted in their new homeland. Clearly this was not the case. Moreover, if we conceive of migration as a short-term and one-way process then the delayed uptake of megalithic construction is also problematic, because it is difficult to envisage a situation where people remember how to build a megalith like their ancestors many hundreds of years before. However, if we envisage dolmen construction as a social strategy deployed at key times then there is no need to tie it to migrating populations. Indeed, if we abandon the idea of dolmens representing colonisation events at the beginning of Neolithisation then the concept and implementation of the dolmen can be part of an ongoing set of movements and contacts of people across wide areas and indeed over extended periods of time. Moreover, if we abandon the idea that migration and movement are uni-directional and instead see people moving back and forth between and across areas, it is easier to envisage how people may have been inspired by monuments

Figure 2. The dolmen at Ågerup, western Zealand (Photo: Vicki Cummings).

erected in different places and could wish to construct them at varyingly different times (i.e. upon arrival as in the west of Ireland, or many hundreds of years after the uptake of the Neolithic in parts of Denmark). It is just part of a suite of practices that people deployed throughout the Neolithic in relation to whatever was most pressing and relevant for themselves at that moment in time. This also explains why many areas saw no megalithic construction at all. The constant movement of people back and forth is a much better explanation for evidence such as the dolmen monuments than one-way migration. Indeed, one study, as we have already highlighted above, has now identified 'a genetic connection among Scandinavian, British and Irish Neolithic populations' (Sanchez-Quinto et al. 2019, 9473) based on individuals from a range of different types of megaliths across an extended time period. Thus the continued movement of people throughout the Neolithic, or at least in bursts beyond the initial onset of the Neolithic, seems a much more reasonable interpretation of dolmens across north-west Europe. What remains to be explored further is the (quite likely changing) frequency of such episodes of movement, their character, duration and extent.

Conclusion

Archaeogenetic analyses have put migration back on the agenda, but have so far focused mostly on the initial horizons of transformation, when genetic turnover can be documented at a large scale. This is slowly changing, but alongside the emergent focus on kinship and social inequality we have argued that archaeologists are now ideally placed to also address long-term processes of movement, migration and interaction, critically examining both watershed horizons and the periods in between, when mobility is unlikely to have stopped completely. The detailed archaeological evidence that has been collected over the decades is a unique asset that can now be brought to bear on this new set of questions.

This paper has aimed to introduce the way in which our current project (*Deep histories of mi-*

gration: exploring the Early Neolithic around the North Sea) will be investigating migration over an extended time period. The overall aim of our project is to get away from pursuing comparisons on an ad-hoc basis, relying exclusively on superficial morphological and typological similarities and single characteristics. Instead, by starting with sets of complex, but connected practices, such as details of monument construction and deposition, we can show whether contact was occasional, with only the easily observable elements being copied, or whether whole sequences of actions or hidden traits were adopted, implying more intensive episodes of communication and involving the further movement of people. This broadly practice-based approach will help us to trace multiple possible links and migrations from different origins. We will also explore whether generalised connections and widespread individual mobility or accidental convergence are the more likely process, all of which may be relevant at particular moments. This involves a shift of migration research from the large, continental scale to the complexity of regions and sites. It necessitates new theoretical angles, taken from migration research in other disciplines, and it needs the formulation of explicit scenarios of how people move and how this is manifested in archaeologically visible ways, for example through the transmission of innovations. All of this will allow renewed discussions about the impact of migration beyond the aDNA data, investigating how new, shared social experiences emerged in a setting in which mobility and migration may have been more than one-off events.

Thus, in our project we will compare and contrast regional case studies across Britain, Ireland and western Denmark to consider in how far shared material culture patterns can be linked to different kinds of transmission processes, of which migration is one possibility. As an example of this in this paper we have briefly discussed how dolmen monuments, originally conceived as the outcome of initial migrations of people, can now be understood instead as boundary objects – essentially material practices which acted as brokers between many different communities. As the project progresses we will also explore similarities involving more 'hidden' practices which can indicate the actual movement of people, and these then will need to be classified further in terms of intensity, direction, duration and impact. This needs multiple sources of evidence which integrated with the aDNA data should enable us to radically rethink the very nature of mobility throughout the Early Neolithic and rewrite the current migration narratives.

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Bringing it all together: a multi-method evaluation of Tanum 247:1

Rich Potter[1,3], Christian Horn[2] and Ellen Meijer[2]

[1] Department of Historical Studies, University of Gothenburg, Sweden
[2] Department of Historical Studies, University of Gothenburg, Sweden: Swedish Rock Art Research Archives (SHFA)
[3] Corresponding author (richard.potter@gu.se)

ABSTRACT

This paper presents the results of a photogrammetric survey of the rock art panel Tanum 247:1 in Kalleby, which revealed two entirely new boats and an additional partial human figure that were previously missed in a documentation history over 50 years long. Through the combined use of digital and traditional methods the results could be verified. It is therefore argued that collating documentations, both past and present, can help to create a better picture of Bronze Age rock art carvings. In addition to using new and traditional documentation methods together, panels should be recorded beyond what is known, both in terms of discovering unknown carvings, as well as creating better data for future researchers.

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Introduction

This paper focuses on a rock art panel in Kalleby (Tanum 247:1), upon which a photogrammetry survey revealed an entirely new boat that had previously been missed in over 50 years of documentation. The collection of 3D data using Structure from Motion (SFM) and Structured Light methodologies in Rock Art analysis has become a standard practice. However, rather than dismissing traditional methods of frottage and tracing, we want to demonstrate how both can fruitfully complement each other. Once 3D data has been recorded, there are a number of different ways in which the data can be processed and manipulated. Using a multi-method approach, including the traditional techniques, this paper examines how bringing the outputs of several documentation methods together may help to enhance the analysis and interpretation of rock art panels, including the discovery and verification of new carvings.

Kalleby is located in the UNESCO world heritage area in Tanum (Bohuslän, Sweden). The figurative Bronze Age rock art in Tanum was created by engraving, or pecking, patterns into the exposed granite bedrock, perhaps using stone or antler tools from a period of 1700 BC, or even already during the Late Neolithic to around 300 BC (Bengtsson 2013; Goldhahn and Ling 2013). The vast majority of rock art images are abstract in the form of hundreds of thousands of cupmarks (Tvauri 1999). Recently, conclusive evidence has emerged that the cupmark tradition began in the Neolithic (Iversen, Thorsen and Andresen 2021). Most of the figurative carvings appear to relate to figures interpreted as warriors, boats, weapons, and animals, though there are a wealth of other types of carvings as well (Bertilsson, Horn and Ling 2021; Ling 2014; Nimura 2015). The Bohuslän area is home to around 1500 such panels (Ling 2014, 5).

New discoveries, evaluation, and quality control are important aspects of rock art research and documentation, as such the recorded data should be as error-free and extensive as possible (Nordbladh 1981). All methods have specific and different advantages and disadvantages, which means they can be used to evaluate the results of different record-

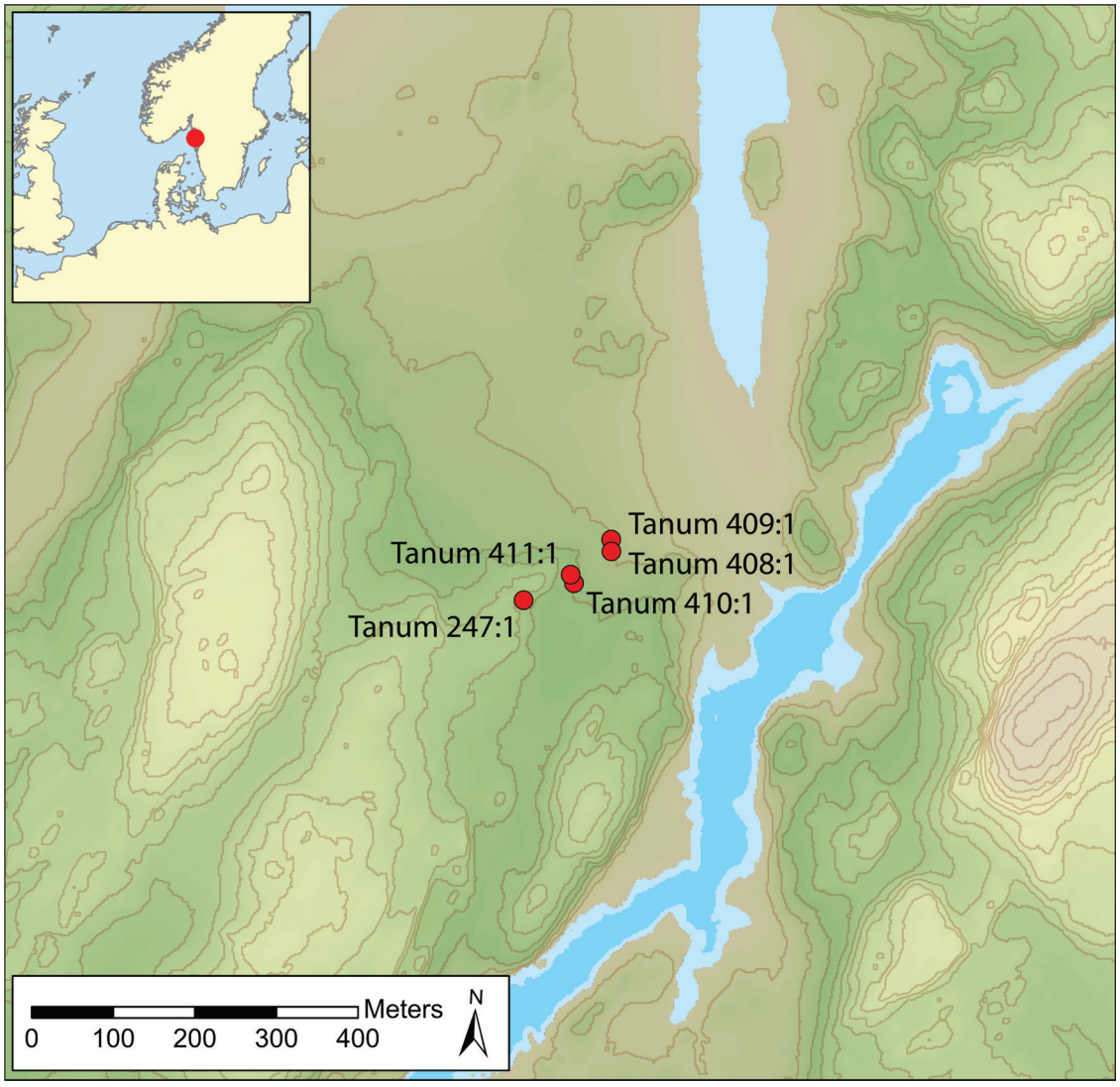

Figure 1. Map showing the locations of panels mentioned in this article (Base map: © Lantmäteriet).

ings of the same site. This paper seeks to utilise the results of digital and traditional visualisation methods to investigate how both can strengthen the interpretation of rock art sites and verify new discoveries. Furthermore, it is hoped that this case study advances best practice approaches to rock art investigation.

Site Description

Tanum 247:1 is situated on the border of a field in Kalleby, and forms a roughly straight line with four other rock art panels, Tanum 408:1, 409:1, 410:1 and 411:1 (Figure 1), which were also recorded using SFM in the same field session. Tanum 247:1 is located roughly 45 m above the sea level making it one of the higher laying panels: they generally seem to cluster around 18-25 m above the sea level. The panels in the area overlook a shallow valley which was likely dry, or perhaps a wetland during the Bronze Age. From higher points like Tanum 247:1, it may have been possible to see fjords that were a relatively short distance away.

The panel Tanum 247:1 was chosen as a case study because it was previously documented, as described below, but held high potential for a greater number of carvings than were previously known since it covered a large area, and was of a fairly uniform and high quality surface typically used for carving – although now lightly eroded. According to the national heritage database of Sweden (Fornsök), the panel measures 1.75 by 1.00 metres. It slopes down towards the east and descends at a fairly steady angle of 15 degrees. It is placed in an

area of planted forest and is bedded in with grass and moss. The bedrock onto which the panel was carved is primarily Bohus Granite and features a small segment at the top which is from a quartz or pegmatite dyke (Figure 2, Mark Peternell (Department of Earth Sciences, University of Gothenburg), Personal Communication, 2021)

Previous Work

The rock art panel at Tanum 247:1 has previously been documented at least four times using traditional methods with varying results. The panel was inventoried in 1971 and described as having one ship, 1 metre long with a minimum of three 30 cm tall human figures, two cup marks - one above and one below the ship, and a 45 cm tall human figure at the bottom of the panel. The description mentions that the panel is highly eroded, a fact that every documenter has reaffirmed, and which can also be confirmed here (Fornsök).

The second documentation was made within the 1970s to 1980s by Torsten Högberg and was a frottage using industrial textile towels with blue carbon paper and no fixation. It was made of selected areas of the panel where rock art was recognized using a tactile survey (Figure 3a). The frottage clearly shows a boat that can be dated to period IV (Ling 2014, 105). Inside the boat there are a number of kneeling figures and potentially a lur blower, which could belong to period III, but they could also be later (Ling 2014, 103). There is also a larger figure above the boat, as well as one below which appears faintly and could point towards a Late Bronze Age dating. The strongly exaggerated calves, the curvilinear construction of the body, the belt-like empty space on the hips, and the weapon have been used as arguments for such a date (Fredell 2003, 2009), but recently new evidence has shown that the chronology of human figures may need to be reconsidered (Bertilsson 2015; Horn and Potter 2018; Ling and Bertilsson 2017). There appears to be a second boat over the cracked part of the panel, the dating of which is unclear. This second boat remained unrecognized in the original report, but was mentioned in a re-evaluation conducted in 2009 which will be discussed below.

Figure 2. An orthomosaic of the panel Tanum 247:1.

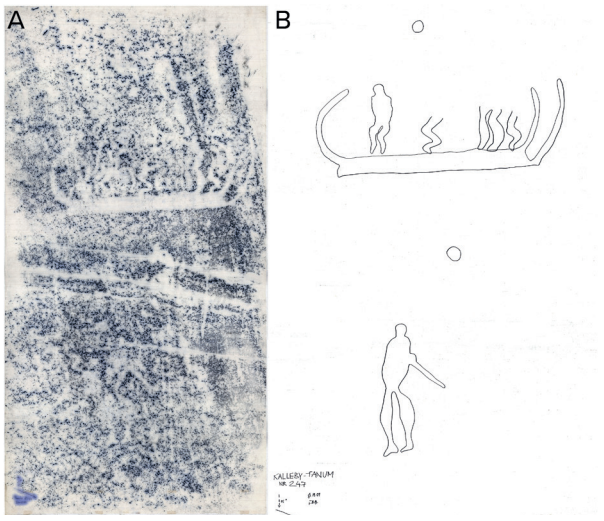

Figure 3. Frottage and tracing image of Tanum 247:1 by Torsten Högberg.

The third recording was a tracing taken in 1983 which missed some important features (Figure 3b). The legs of a number of the figures shown in the boat in the earlier frottage were present, but their bodies as well as the figure above the boat were

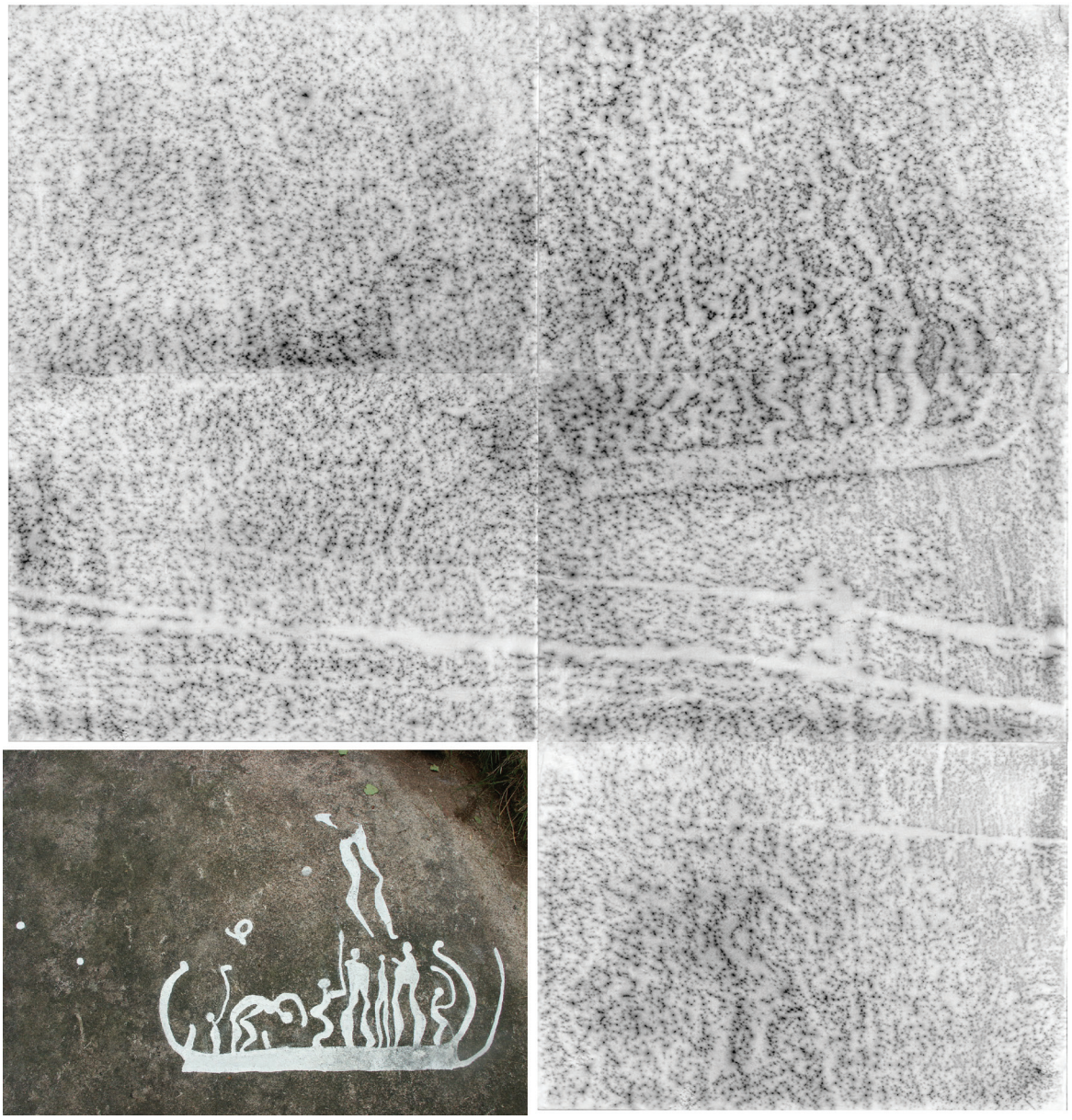

Figure 4. Frottage created by Tanums Hällristningsmuseum Underslös with photo of chalk painting created by Gerhard Milstreu, inset.

missing. It also shows a figure below the boat, but the exaggerated calves seem to be interpreted as thighs. The result lacks some key features on the prows of the boat which makes it seem like it dates to period III (Ling 2014, 105)

The photograph of a chalk painting by Gerhard Milstreu at Tanum 247:1 conducted in 2003 differs from the tracing from 1983. This documentation recognizes the boat with seven figures, including a lur blower. Furthermore, several cupmarks, a pair of legs with exaggerated calves above the boat, and a figure with exaggerated calves towards the bottom of the panel were recorded (Figure 4).

The most complete traditional documentation was created during the same field seminar as Milstreu's chalk painting in 2003. This shows the boat and the figures extremely well, and was used as the base point onto which the new results were overlaid. However, when this rubbing was conducted the lower left part of the panel was not documented, presumably because it was considered to be too eroded. A raking artificial light was used at night, and it was decided to only document areas where traces of carvings were visible.

Documentation Method

The new recording was conducted during fieldwork in the summer of 2021. The panel was captured using standard photogrammetric documentation methods, including structure from motion, which are discussed elsewhere (Cobaz and Jagersand 2003; Green 2018; Horn and Potter 2018; Meijer 2016). The equipment used was a full frame Canon EOS R5 in manual mode and a Canon 28-70 mm RF lens shooting at 28 mm. The panel was largely shaded and there was also minimal wind, so shooting conditions were ideal. The panel was initially lightly cleaned and loose material was removed so that the full panel could be recorded. A total of 913 images were taken, all of which aligned successfully in Agisoft Metashape. All photographs were manually masked prior to alignment and checked for quality to minimize erroneous points. The model was then processed in the software using high settings and accuracy throughout for the best quality result.

For the analysis of the panel, a variety of visualization methods were used. Firstly, a Digital Elevation Map (DEM) was created in Agisoft Metashape, imported into ArcGIS Pro, and processed using the local relief modelling (LRM) methods outlined in Horn, Potter and Pitman (2019). It was processed with the focal statistics tool using cell sizes of 90 and 250 and then subtracted from the original DEM and given a standard deviation of 1.5 to highlight the carvings better. This produced two visualisations of the panel, each highlighting different features in different ways, which were then used for comparison when the final interpretation was drawn.

The 3D mesh that was created in Agisoft Metashape was then run through a visualization tool called Topographic visualistion toolbox[1] (Horn et al. 2021). It was calculated using the full quality mesh with resolutions of 1, 10, 100, and 250. The best-looking output maps were selected for comparison.

The 3D mesh was then placed into a virtual reflectance transformation imaging (RTI) 'studio' created in Autodesk Maya, which moved the light with each frame and rendered out an image using a similar technique as described elsewhere (Goskar and Earle 2010; Goskar and Cripps 2011). These were then calculated in RTI builder and compiled based on the principles laid out by Cultural Heritage Imaging (CHI) (Cultural Heritage Imaging 2013). The result was investigated in RTI viewer using the specular enhancement rendering mode from various angles. The 3D mesh was also investigated in Meshlab using the radiance scaling shader and a moving light in line with standard analysis methods for rock art (Díaz-Guardamino Uribe and Wheatley 2013; Jones et al. 2015).

Comparative approach

Due to the erosion, some of the motifs were quite difficult to determine or were entirely missing from previous documentation attempts. In order to verify the results of the new documentation and to evaluate earlier findings, the output of a number of different visualisation techniques were overlaid, starting with the frottage created during the field seminar of Tanums Hällristningsmuseum in 2003, overlaying the LRM results. Older documentation like the frottage by Torsten Högberg was then used in the same manner. The tracing created by Gerhard Milstreu was used as a reference point, with the outlines from the LRM and Frottage being preferred as a baseline. The traditional recording methods were rectified to match the orientation and scale of the LRM in ArcGIS. These were then exported as TIFs and included in the analysis. The results from the methods were then compared using Adobe Illustrator. A final interpretation of the new 3D recording was drawn to create a better comparison.

Throughout the analysis and interpretative process, the orthophoto and textured 3D mesh created in Agisoft Metashape were consulted to make sure that natural features and damage were not misidentified as rock art. Once the initial investigation was completed using digital methods, we returned to the site and conducted a traditional rubbing on the surface that was covered by the 3D documentation to evaluate our findings (Figure 5).

Figure 5. A frottage being produced at Tanum 247:1 (Photo: Ellen Meijer).

Result

The LRM output provided the baseline for the interpretation as it produced a strong visualization of all the known features as well as new previously undiscovered images. The majority of the features were visible on the LRM directly, but we also utilised the results from the other methods to verify that what we were seeing was real, as well as to fine tune the results. The carvings are outlined in the figure below, and subsequently described.

Boat 1 (B1 on Figure 6) was updated by adding outward turned prows, suggesting that an Early Bronze Age boat was returned to and updated. The presumed addition on the prow becomes narrower where it meets the original prow, slots into the original carving, and the visualisation suggests that it is carved deeper, implying that it was created by another carver. This logic is also why other carvings in this paper are considered to be later additions (Horn and Potter 2018; Milstreu 2017). If the boat is considered prior to its update, then the prow design and the two Lur blowers may indicate a period III boat. The style of the stems after the update might be reminiscent of period IV or V. The boat features several other figures, three crouching, three standing. The deeper carved human figures may also be additions and it appears as though the prow may also have been extended. Although the rock above this carving is quite eroded, it was still possible using a combination of techniques to pick out the outlines of the figures.

Within the boat there appear to be two lur blowers, an acrobat, and at least five other anthropomorphic figures (Figure 7). There is potentially also

Figure 6. LRM view of the panel with interpretations marked. Motifs are labelled as they are described in the text. Red dotted lines indicated amendments to the carvings, or figures that are obscured by others. Light blue dotted lines denote features we felt might be present but were not sure enough about to confirm.

another figure hidden behind the acrobat. This, as well as the elevated figure whose legs are represented below the acrobat on the boat itself, suggest that some of the human figures were added later.

Boat 2 (B2 on Figure 6) features long outward curved stems, which can be compared to period V boats (Kaul 1998; Ling 2014, 105). The boat was originally a different length, or is intersected by another boat. The Late Bronze Age stem extensions seem to be updates to a boat that had much simpler stems, perhaps dating it to period III (Ling 2014, 105): an idea supported by the possible lack of crew on the ship. There is potentially at least one larger figure present in the middle of the boat which also seems to have been added later, but we were not certain enough to add it to our interpretation.

Boat 3 (B3 on Figure 6) is located below boat 2 on the panel and features outward curved stems which are elongated. There is no crew indicated on the ship. The stem design indicates a period V ship (Ling 2014, 105). However, given the observations so far, it may also be an updated earlier boat.

There are a number of other potential boats and features which may have been present, but they were heavily eroded, and it is not clear enough to be determined with any confidence whether it was in fact a feature, natural, or erosion/damage.

Human 1 (HF1 on figure 6) appears to be in fact two motifs superimposed on top of each other. The original figure (1a) is approximately half the height of the second figure (1b) and features exaggerated calves and a very short torso. Comparative examples of figures like this can be found on Tanum 410:1, approximately 65 metres away. The carving was later potentially extended, and a more anatomically correct version of the body was engraved. In its final form it features a sword sheath with a winged chape, which extends approximately from the head of the older figure (1a). The larger human (1b) appears to be holding a circular object and may also have a line going through its arm that curves round its head, which could be the representation of a lure, but the precise relationship is not certain. The larger figure may date to period V, as is often suggested based on the chape which resembles Central European examples (Fredell 2003, 2009). However, it is worth pointing out that the typological comparison is not an exact match (Pare 1991).

Figure 7. Detail image of Boat 1.

Human 2 (HF2 on Figure 6) is directly in front of human 1 and appears to be the same height as the original version (1a). It seems to only be the upper half of the figure and it seems to be holding something which could potentially be another lur. This figure is connected to the prow of boat 2.

Human 3 (HF3 in Figure 6) is located on top of boat 1 and seems to consist only of a pair of legs with exaggerated calves. It does not appear to have ever been completed, which is well-documented phenomenon in Scandinavian rock art (Fahlander 2021). However, the carving is also in a high erosion area, so it may have originally been a complete human body.

The boat originally mentioned in the inventory that was potentially visible on the original frottage was determined to most likely be natural damage or erosion, as although it appeared boat shaped in the original image, the panel itself did not hold a regular enough form to be considered rock art (Fig. 3a, 6). Part of B2 can be seen in the original frottage, to the left of the HF1, but it is extremely faint as the level of carbon that was laid down was lower in this area, suggesting that it was not an area of focus for the documenter.

Based on the observations in the older documentations, the new documentation using photogrammetry uncovered two boats (B2-3) and a partial human figure (HF2) that were previously unknown. The make-up of HF1 is also rather different than previously recorded.

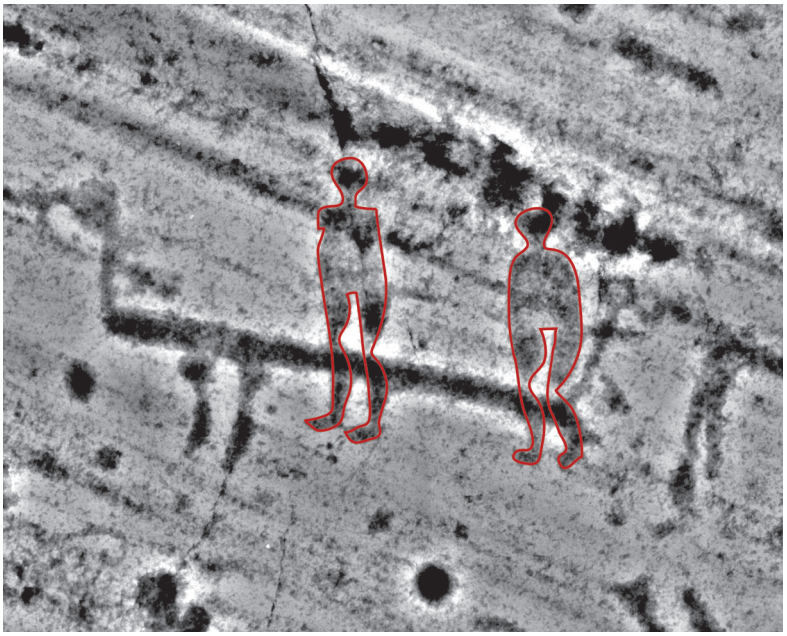

Figure 8. Illustration showing the two similar figures from Tanum 410:1.

The greatest enhancement using multiple techniques combined was on B1, as described above, where greater distinction of the figures was able to be determined. Overlaying our documentation with earlier ones allowed us to enhance the details on the boat crew of B1 as well as HF1 and 3. In addition it was possible to show that the human above B1 and the acrobat superimpose an older human figure. Our results also demonstrate that there is still room for improvement in the future. New, yet to be discovered, evaluative techniques will perhaps be capable of enhancing the visibility of areas on the panel where we felt there might be something, but were unable to accurately depict them with any confidence.

Discussion

There are four other panels in the local area which were also recorded using the same techniques. It is apparent that the carvings on Tanum 247:1 share similarities both in terms of the ship and figure design with Tanum 408:1, 409:1, 410:1 and 411:1, suggesting that some of the carvings were made contemporaneously, perhaps even by the same individuals. However, to establish this a more in-depth comparison is necessary.

There is also evidence of different carvers returning to the panel after generations and updating the images (Milstreu 2017). Two examples of this in particular are HF1 and B2. HF1 seems to be composed of one smaller figure with a torso added at a later date to make the figure taller. There is a comparable example of the smaller figure found on Tanum 410, some 60 metres away (Figure 8), which suggests that perhaps these two figures where carved at roughly the same time period, and it was then later extended with extra equipment added (the sword sheath and the possible lur).

B2 was updated at least once and made to be longer than it originally was. This is seen by the fact that there is an old shallower prow extruding from within the middle of the ship. It shows yet another kind of way in which carvers in the past re-engaged with previously existing images in addition to those already identified (Bertilsson 2015; Horn and Potter 2018; Milstreu 2017). It may be possible that the elongation of the boat has to be seen within the same context as the elongation of the warrior. This process was previously observed, although in a different way, in Finntorp which is within 6.5 km of Kalleby (Horn and Potter 2018).

From the panel at Tanum 247, it would have been possible to see the water in the valley which was a fjord during the Bronze Age which connected the area to the sea. Within the surrounding area there is a cluster of rock art which all contains maritime elements including boats and humans – some of which are quite similar in terms of the motifs that were carved upon them. This could indicate that the area was a natural harbour or landing site,

which was potentially controlled by a local group. The local community may have carved the rock with symbols of maritime journeys and warriorhood during boat launching ceremonies, perhaps involving narratives of heroic journeys conducted by their ancestors which would also reaffirm their claim over this land (Horn 2019; Ling and Cornell 2017). It may well have demarcated the landscape and could have been used as such for a long period of time. At some point, carvers appear to have returned to the rock art sites and reemphasized and updated the boat images and the humans to make them fit better to changes in material culture and visual conventions with the aim to keep the images, narratives, and the memories linked to them relevant (Horn and Potter 2020).

Rock art and all of its potentially associated social functions, perhaps illustrating narratives, heroic stories, or myths, were important to the inhabitants of the Kalleby valley throughout the life cycles of the panels including making, viewing, adding, updating, and transforming images during the Bronze Age (Ranta et al. 2019; Redeí, Skoglund, and Persson 2020). They were perhaps a relatively frequently used aspect of life not only as images, but as a practice tightly interwoven into the social fabric that people not only viewed, but also actively engaged with. Their meaning and presence were probably curated to keep them relevant to changing social, political, economic, and ideological circumstances. However, since this was based on older carvings their meaning may have been kept within the same frame of reference, i.e., boats and warriors, making existing images places of memory that helped to keep stability and social cohesion (Horn and Potter 2018, 2020).

Conclusion

Using 3D documentation has revealed new carvings and unknown aspects of previously documented images in Tanum 247:1. However, it has also highlighted the need to evaluate these results with documentations derived from other methods. It was extremely useful to return to the site after the first data collection with SFM and create additional frottage sheets. This gave us the opportunity to confirm the results of the LRM and build a stronger interpretation of what we were seeing on the screen. This suggests that the best way forward is to record new finds as extensively as possible using a combination of new and traditional methods. While older methods are clearly reductive, and some are even more interpretative than others, i.e., tracings, they all have a value in highlighting specific aspects of engraved surfaces. It is also necessary to document at different scales with the new methods i.e., from full panels to individual images as well as close-up approaches like macro-photogrammetry. Ultimately, we need to utilise as many methods as possible together, both traditional and new, to create a fuller picture of what is represented by the carvings.

It was clear from this exercise that regardless of which technique is used to evaluate the results, it is important to redocument entire panels, rather than collecting only what is known. In the future there will undoubtedly be better techniques than presented here, so it will be crucial that the results we create now are as complete as possible so that they can be of more use to future researchers.

As this case study has shown, this incorporation of all of the available methods led to the discovery of several new anthropomorphic figures, and potentially two new boats on a panel that has a documentation history spanning over five decades. The results showed that images were added over time, revisited, and extended or otherwise changed. Using the proposed approach may help us to understand just how important carvers were and how deeply engrained rock art and the making of rock art were in Bronze Age societies in southern Scandinavia.

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Declaration of interest statement

There are no conflicts of interest to report.

Notes

1 https://tvt.dh.gu.se/

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The Flow of Resources in a Changing World

Mapping and analysing import of iron and other everyday goods to Southern Scandinavia c.200-1050 CE using database of scientific based provenances of archaeological artefacts

Peder Dam[1,3], Mikael Manøe Bjerregaard[1], Arne Jouttijärvi[2] and Jesper Hansen[1,3]

[1] Odense City Museums, Overgade 48, DK-5000 Odense C, Denmark
[2] Heimdal- Archaeometry, Skovledet 30, DK-2820 Virum, Denmark
[3] Corresponding author (Peder Dam, pda@odense.dk and Jesper Hansen, jesha@odense.dk)

ABSTRACT
The influx of prestigious foreign objects into Southern Scandinavia throughout the Iron Age and Viking Age has been studied by many. For example, Roman or Frankish luxury objects would find their way north via trade or through dynastic gift exchanges as part of a conspicuous elite culture. Access to crucial raw materials was in many ways formative for both prehistoric and historic societies. The availability – or lack thereof – of specific resources could determine technological developments, and the need for nonlocal raw materials could shape evolving networks. For prehistoric and early historic times in Southern Scandinavia, the written sources and typological studies have limited value in determining the provenance of various raw materials. A typological deduction based on design can indicate the area of production for certain artefacts, but the raw materials used might originate from elsewhere. Based on scientific methods, this study sets out to map and analyse the geography of the available provenances of materials used in archaeological objects with special focus on iron in the period *c.*200-1050. From where did the raw materials found in Southern Scandinavia originate? Was there a connection between the flow of raw materials and the political situation?

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Introduction

In the Viking Age, *c.*750-1050 CE, one crucial connection for Southern Scandinavia was Britain and Ireland (hereafter the British Isles) – established through raids, settlements, and Danish rulers in England. This case study aims to investigate if the political situation across the North Sea can be documented using the provenances of the raw materials of archaeologically retrieved artefacts found in Southern Scandinavia. The focus here is not on prestigious objects but instead the study searches for the provenances of different raw materials, including what can be defined as *everyday* objects typically without a clear typological provenance. The primary focus is on materials that are not likely to have reached Southern Scandinavia as loot or gifts, for example, gold and silver objects. Instead, more humble materials are examined such as iron, steel, and lead, which are more likely to have been commercially exchanged. Did the political and transport-technological changes in Northwest Europe, 200-1050 CE, also influence the flow of raw materials into Southern Scandinavia, or did trade and commerce of raw materials develop along other lines than the somewhat abstract sphere of dynastic ties between regions, for example?

Theoretical background

The present study finds its theoretical foundation in a relatively recent trend in archaeological research with a reinforced focus on empirical object studies. For this study, the empirical approach implies that the physical archaeological objects – to be more exact, provenances derived from scientific analyses of raw materials – form the foundation for an analysis of contact and exchange in past societies of Southern Scandinavia, 200-1200 CE (Dam et al. in press).

Hopefully, through basic provenance studies of the applied raw materials, it will be possible to examine patterns in the flow of resources in the centuries where practically no written sources exist. For Viking Age and early medieval Scandi-

navia, the present study can reinforce an empirical approach to a field of research that has previously relied heavily on typological studies, numismatics, and written sources (Aannestad 2016; Hansen 2018; Pedersen 2004; Roesdahl 2007, 2018). In this way, the methods presented here are highly relevant for the recent trend of network and social identity studies in archaeology, as exemplified by the research initiative UrbNet (About UrbNet).

This specific approach to archaeological data has been referred to as The Third Science Revolution (Kristiansen 2014) and has, according to some scholars, been opposed to the post-processual approach in archaeology. The alleged revolution in archaeology has met critique (Chilton 2014; González-Ruibal 2014; Huvila 2014; Larsson 2014; Niklasson 2014), and concern has been raised that the increased focus on results from natural sciences will shadow the more humanistic part of archaeological research to the extent that scientific results will be considered more factual and reliant and thus will come to determine the direction for archaeology and its research paradigm (Lund and Sindbæk 2021; Ribeiro 2019; Sørensen 2017). However, a true interdisciplinary collaboration between natural sciences and traditional archaeological methodology can be beneficial (cf. Haase 2019, 27-34; Hansen 2018; Lund and Sindbæk 2021). Whether the starting point for an empirical and object-based study be a traditional archaeological typological approach or provenances derived from physical science, the objects can form the groundwork for analysing past societies within a humanistic or social scientific framework with a focus on human intentions, movements, and identities.

Cooperation between these different research areas is by no means a new occurrence in archaeological studies; on the contrary, it has been an ongoing development since the mid-20th century. The interaction between research disciplines is often a mutually enriching process. In the case of the present study, for instance, new data for metallurgic provenancing have been calculated, spurred by a humanistic set of research issues (Dam et al. in press; Jouttijärvi 2019a). New and improved methods for handling and presenting large amounts of data enable the use of a more considerable volume of data from a geographical and temporal widespread area; data that hitherto existed as scattered and isolated observations (Dam et al. in press; Haase and Hammers 2021; Hansen 2018). One of the apparent benefits of such a consistent application of natural scientific methods in determining provenance is that a much more extensive archaeological data set can be activated involving raw materials, objects, or even small fragments of objects that previously had little or no value in discussions about resource flow, contacts, exchange, or mobility in the past. Potentially, this activates a large amount of archaeological data that, up until this point, has not been relevant beyond the interpretation of the exact structure or site where the object was recovered (Loftsgarden 2019, 76; Løvschal 2016). This creates a much sounder and firmer empirical base for answering specific archaeological research questions acknowledging, of course, that research questions and conclusions derived from the presently available data are only temporary and will be subject to change when new methods, empirical data, or scientific paradigms emerge.

For studies of object biographies (Gosden and Marshall 1999; Haase and Hammers 2021; Kopytoff 1986), the information derived from scientific provenances adds an important new layer of information to the life cycle of objects. Indeed, the provenance of the raw materials of an object can be considered as its birthplace. It gives the option of a much more detailed biography of even seemingly insignificant objects such as iron nails. This is also true for stylistically provenanced objects where, even though the design is imported, the establishment of the source of the raw material can sometimes reveal whether it is local or an object with a local style but made from imported raw materials (Brorsson 2018; Christensen 2019, 105-109; Pedersen 2004, 62).

Several studies that form part of the current research paradigm have emerged in recent years. One of these is "Population genomics of the Viking world", conducted by Margaryan et al. (2020). Through intense genomic analysis of the physical remains of a relatively large number of human individuals, the study aims to investigate the flow of genomes in and out of Scandinavia in the Viking

Age. The aim and outcome of the genomics Viking study are empirical and statistical.

An examination of the import of bronze to Southern Scandinavia, which has several methodical similarities with this study, was recently published by Nørgaard, Pernicka and Vandkilde (2021). Using scientific methods on 543 bronze objects from 3800-1300 BCE, various regions of origin for the tin and copper used in the bronze were found and mapped, areas such as England/Wales, the Slovak Ore Mountains, the Mitterberg area, and the Inn Valley in the Eastern Alps.

Another trend in recent years in Scandinavian archaeology is network studies. Several case studies on Viking Age objects in the North Sea and Baltic regions have been undertaken by Sindbæk (Raja and Sindbæk 2018; Sindbæk 2007, 2008, 2010, 2013). Using distinctive objects such as ceramics and spindle whorls, Sindbæk demonstrates how some specific objects cluster together in certain geographical areas and might relate to their user's cultural affiliation and social identification in opposition to inhabitants of adjacent areas. These areas are sometimes regional and sometimes interregional. The studies illustrate how, by applying network models to archaeological data, it is possible to go beyond simple distribution maps. Regional differences that seem distinct based on a single object group will be blurred or even dissolve when combined with other objects in a network study. An example of this is the areas divided by the Great Belt in the Danish realm which Sindbæk suggests is more unified in the Viking Age than previously interpreted, whereas a division across the Øresund between Zealand and Scania seems more marked. Sindbæk (2008, 2010) also demonstrates how the Viking world materiality consists of goods distributed to larger areas, mainly through a few central settlements or emporiums. If these nodes are removed from the network, the other sites will break apart into isolated entities. We might have already known about the importance of these nodal sites such as Birka, Ribe, or Hedeby from written sources or conspicuous archaeological structures, but in this way, it is possible to emphasize their role in the network through the analysis of quite plain everyday objects. This can also draw attention to less obvious nodes and their importance in the goods distribution of the Viking world.

The network studies and their ability to showcase contacts and movement of goods beyond simplistic distribution maps are an inspiration to the present study. By introducing a large contingent of uncommunicative objects into the studies of networks, communication, and exchange, it should be possible, over time, to radically add to the common understanding of distribution patterns and flows of resources in the past. Even though the accumulated data set for this study does not qualify as "big data", it could definitely be considered "large data" in an archaeological context. The aggregation of the data allows the use of records with very diverse origins in terms of provision history (excavation circumstances, post-excavation examinations, applied scientific analyses, and precision in terms of provenance) to reveal new connections and patterns that were hitherto obscure. One strength in this method is that all objects with provenance can be included – even single finds – because the focus is solely on the movement of material resources from one place to another. When new data is added in the future, the outcome of the analysis will be amplified as abnormalities and vagueness in the raw data will be diluted. Through the use of graphic representations, dispersed material is presented in a more tangible form. These representations can then become building blocks for new network studies. The new results make it possible to start addressing hypotheses of the human motivations and historical reasons for the observed patterns. That, after all, will always be the main focus of human studies.

The project – and the aim of this paper

Within the framework of the research project, Raw materials throughout millenniums, executed by Odense City Museums (see Dam et al. in press), scientific studies of the provenance of archaeological objects were recorded from a large number of previous studies carried out by a large number of individual researchers. The aim of the project was partly method development, partly broad data collection, and partly analysis of provenance data from several angles. The methods and materials used in that research projects are described at length in Dam et al. (in press). The aim of the pres-

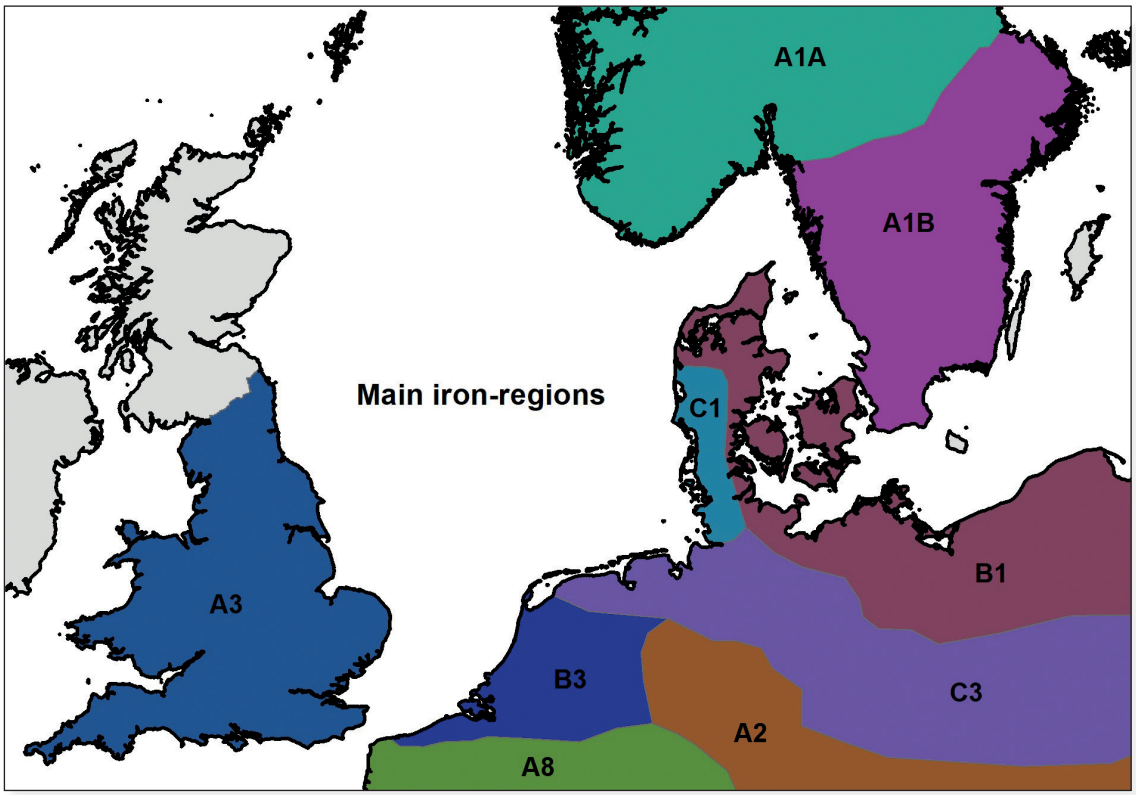

Figure 1: Main iron regions used by Jouttijärvi (2020a) when determining provenance. In some cases, smaller and more specific regions are used. Other researchers of iron provenance use somewhat different regions, for example Buchwald (2005) operates with regions such as Norway, Scania, and several smaller regions (Map: Peder Dam, Odense City Museums).

ent paper, as mentioned, is more narrowly to let the collected data contribute to research questions of whether the political or transport-technological changes in Northwest Europe, 200-1050 CE, also influenced the flow of the analysed types of raw materials into Southern Scandinavia. In this paper, the focus is especially on iron and the proposition of a specific British connection is tested.

As far as possible, all available provenance studies which are considered valid and have a complete set of data have been recorded and mapped in the project using GIS regardless of the type of material, source of information, or applied scientific method. In total, 1410 provenances from Southern Scandinavia 200-1200 CE have been registered and mapped. The provenances have been determined by a wide and very heterogenous range of analyses, depending on the type of material. For example, strontium isotope – and DNA analyses have been used on animals and human remains, dendrochronology has been used on wood, ICP analyses have been used on ceramics and metals have been analysed for combinations of a number of main components and trace elements in each archaeological artefact. These results have, after the analysis, been compared to the general picture for the European regions and beyond. All this data can be accessed by downloading the project's database (see supplementary), in which all researchers and publications are also credited. Furthermore, in these publications, the specific methods related to every record of data are described (Dam et al. in press).

Neither in the project as a whole nor in this paper it is the aim to assess the circumstances of the finds or of the representativeness of the individual objects, as long as the provenance analysis was assessed as valid. On the contrary, the goal is to focus on the overall trends with an expectation that the special circumstances that may occur with the single objects will level off as the amount of data grows. As will be described below, however, some parts of the data are unsuitable to use in studies depending on the questions asked. At the time of writing, some types of material have over-representation from some regions and from some periods, which makes it beneficial to focus primarily on the most numerous and evenly distributed materials in analyses.

The findspots for all objects included in the data set are geographically precise, whereas the provenances are established to large regions only, such as Western Jutland, Norway, or various Central European regions (see Figure 1 regarding iron). Given that many of the 92 established regions of provenance of different materials 200-1200 CE are partly overlapping (such as Norway, Southern Norway, and the Oslo Fjord area), the only possible way of mapping the data is to merge the records into larger data sets – for example, by showing the area-relative concentration of provenances (cf. Figure 7-10 and Dam et al., in press)

In this paper, Southern Scandinavia is defined as present-day Denmark, Schleswig in present-day Northern Germany, and Scania with Halland and Blekinge in the southern part of present-day Sweden. These territories constitute the known extent of the Kingdom of Denmark from the late 10th century perhaps reaching as far back as *c.*600 AD and the first mentions of the Danes (Andersen 2017; Hansen 2015). Any concept of a strong and stable geographic kingdom comparable to historic Denmark in the preceding centuries is at best disputed and associated with significant uncertainty. Having said that, the 10th-century geographical area has been considered an appropriate limit for the long-term studies in this paper combining a good data availability and a relatively well-known geographical and political frame.

The provenanced objects are somewhat heterogeneous regarding the geographical spread of findspots, object age, and types of raw material. For instance, iron objects are richly represented with a total of 169 objects from 200-1050 CE, and while the findspots for these objects are more or less evenly spread across Southern Scandinavia, the finds from 1050 CE onwards almost exclusively derive from a smaller group of urban environments. This results in a geographical and analytical distortion that may affect the outcome of analyses to some degree for the period after 1050. For that reason, objects from 1050-1200 CE are not included in the initial analysis and maps of provenance below. However, these objects will be included in some of the discussions about the results of this case study. Non-ferrous objects in the data set are either rare or more disproportionate for some periods or findspots. The provenances for these objects will be included as a supplement to our investigations of iron flow and specifically in the examination of the British connection.

The analyses below will primarily focus on the provenances of iron objects for two reasons. Partly because they constitute the largest and most evenly distributed data set and partly because we expect iron, which was produced both locally and imported to Southern Scandinavia, to be a good indicator for the flow of raw materials – iron, along with other metals, served as leading products of the economic system (Hilberg 2017, 261-62). Iron can also be considered an everyday commodity as opposed to metals such as gold and silver. For the focus on the British connection in the Viking Age, iron is of interest due to well-documented English iron resources and the appealing notion that iron could have been exported on Scandinavian ships as goods or ballast like soapstone and whetstones from Norway (Baug 2017, 121; Hilberg 2017, 258-262; Loftsgarden 2019, 76).

The iron objects are divided into two groups, the first dating to approximately 200-750 CE and the second to approximately 750-1050 CE. In many ways, the later period (the Viking Age) marks a significant turning point in the history of Southern Scandinavia – the growing use of sails on ships facilitated an increase in seagoing transport, and foreign relations significantly increased politically, commercially, and culturally in those centuries (Bill et al. 1997, 68; Crumlin-Petersen 1999; Hilberg 2017, 258-264). Since the 10th century, in particular, Christianity gained ground in Scandinavia and connected the region culturally to the rest of Europe on a hitherto unprecedented level (Abrams 2012, 25). Scandinavian trade expeditions, raids, conquests, and settlements in the British Isles make up a significant part of Scandinavian archaeological and historical Viking research.

Maps of Iron Provenances 200-750 CE

The data set contains 50 records of provenanced iron from the period 200-750 CE. Geographically the group consists of finds from most of Southern Scandinavia: Bornholm, Zealand, Funen, and most areas in Jutland. As yet, in our data set, there are

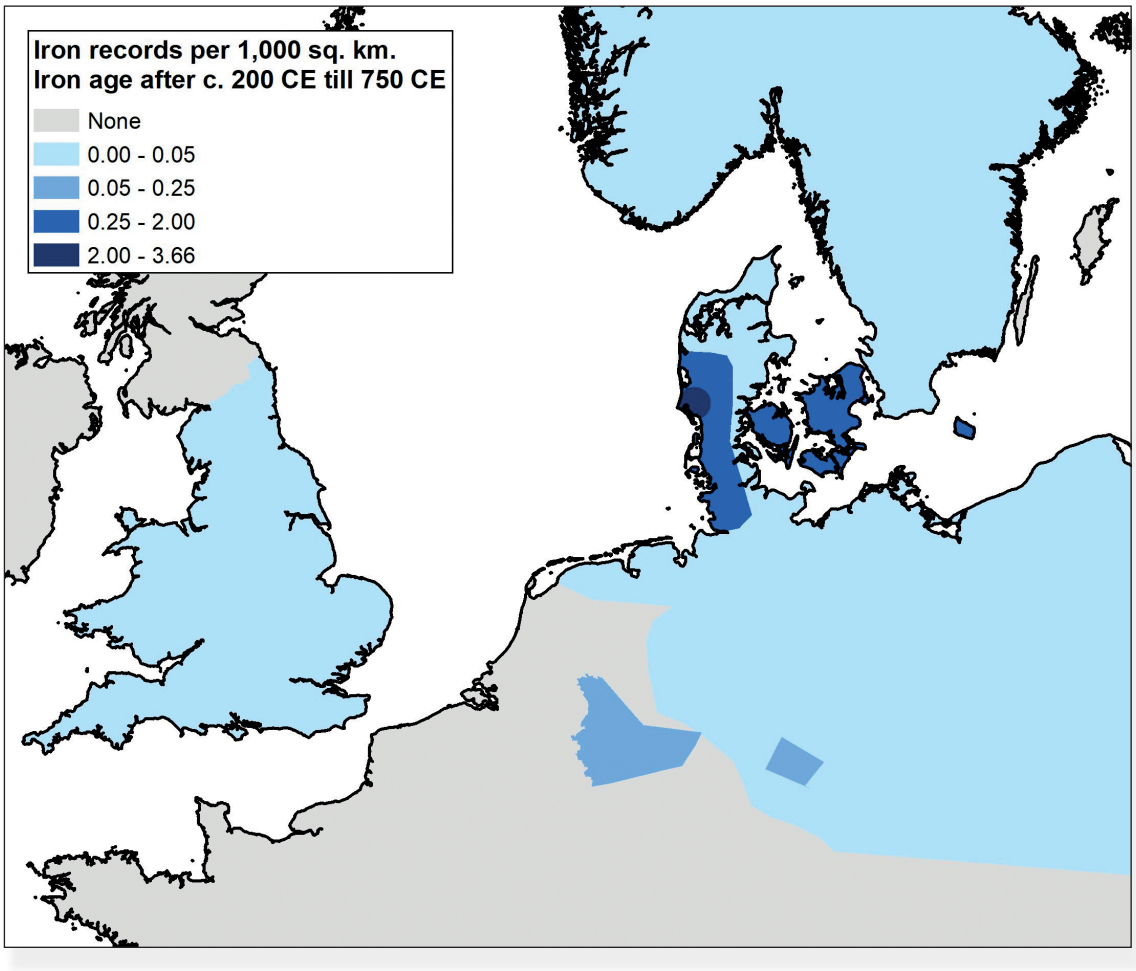

Figure 2: Iron provenances 200-750 CE based on the established provenances of 50 iron objects found in Southern Scandinavia (Map: Peder Dam, Odense City Museums).

no established provenances of iron objects found in Schleswig, Scania, or the northernmost part of the Jutland peninsula. Some of the iron is of local origin, while some is imported from adjacent or more remote regions. Even though the result is not unambiguous, one region, in particular, stands out: Western Jutland (region C1 in Figure 1). This area, situated west of the maximum expanse of the Weichsel glaciation, has significantly more occurrences of bog iron than the rest of Southern Scandinavia, and far more iron furnaces have been excavated in this region than in the rest of Southern Scandinavia (Mikkelsen and Nørbach 2003, 101-106). Of the 50 provenanced objects, 19 have been found to derive from Western Jutland. The group consists of objects found both within Western Jutland and iron found in other regions of Southern Scandinavia. In contrast, no iron objects from this period found in Western Jutland have extra-regional provenance. Future establishments of provenances are likely to change this picture to some extent, but there can be no doubt that Western Jutland was more or less self-sufficient in iron and even exported it quite often – to a much greater extent than other regions in Southern Scandinavia.

A possible distortion of this picture is that the dataset does not include provenanced iron objects found in the Scanian part of the research area; this is in contrast to the subsequent period, 750-1050 CE (see below). As discussed below, Scania at least in historic times had a significant iron production, whereas it is more uncertain how large it was in prehistorical times (Björk 2009; Ödman 2009). In this study, it has not been possible to ascertain provenances from objects found in this area, but further provenance studies may change this.

Local iron production was also present in Eastern Jutland, Zealand, and Funen and its surrounding islands (Lyngstrøm 2018), but no export of iron from these areas has been ascertained for

this period. Furthermore, many of the iron objects found in these areas have extra-regional provenances: Western Jutland (12), the Scandinavian Peninsula (10), Germany and Central Europe (6), and England (1).

Figure 2 maps the concentrations of provenanced materials from this period, illustrated in area-relative values, the darker the shade of blue, the higher the value. A high concentration of provenanced materials can be seen from Western Jutland (0.9-3.7 per 1000 km2). The value for Zealand, Funen, and surrounding islands is also relatively high (0.3-1.9 per 1000 km^2), but this is probably because 24 of the 50 provenanced objects are found in this region. The remaining area-relative values are evenly spread out, apart from the highlighted German regions Sigerland and Schmalkalden, based on two specific provenances of objects, particularly from these small regions.

Overall, the data shows that iron used in Southern Scandinavia 200-750 CE was primarily of local origin or from Western Jutland. There are examples of iron from more remote regions, first and foremost the Scandinavian Peninsula and Germany/Central Europe, but iron was generally a local raw material in this period.

Map of Iron Provenances 750-1050 CE

The data set contains 119 records of provenanced iron dating to 750-1050 CE, the Viking Age. That is more than twice the number from the previous period, and the findspots are also more evenly spread across Southern Scandinavia. Only from Schleswig in present-day Northern Germany, there have been recorded no finds with established iron provenance.

As in the previous period, we see iron of local origin and iron imported from other regions (Figure 3). However, the overall pattern deviates somewhat from that of the previous period (Figure 2). A clear difference is the increase of iron imported from Norway. The raw material from no less than 58 objects has been provenanced to Norway, alternatively Northern Sweden, and a further ten objects found on the Danish island of Bornholm are provenanced to either Southern Norway or Scania. Iron from Western Jutland still makes up a substantial portion (19) especially considering the relatively small size of that region, but there is a clear tendency toward an increase of iron import from the Scandinavian peninsula.

Iron was still produced locally, especially in Western Jutland and perhaps also to a larger extent in Scania, but in reality, many parts of Southern Scandinavia reveal local produced iron such as Funen, Zealand and surrounding islands, Eastern Jutland, and Northern Jutland. However, a possible provenance to Northeast Germany or Northern Poland cannot be entirely ruled out (see Figure 1). The objects with provenances from B1 have been found within the B1 region and are thus not examples of iron export. This contrasts with iron from Western Jutland, which was utilised both locally and in other regions.

The role of Scanian iron in this period still relies on a small data set. Only eight objects found in this region have been provenanced, all of these were nails made with Norwegian iron. While on the Danish island of Bornholm, ten nails were found consisting of material provenanced to Scania, although the iron in these nails might also originate from the southern part of Norway (Buchwald 2005). There is a challenge partly due to the small data set and partly because it can be difficult to distinguish Scanian provenances from those of the rest of present-day Sweden (see Figure 1). Studies in Scania based on archaeologically located iron furnaces and written sources show extensive iron production, *c.*1200-1650 CE, mainly located in the forest regions of northern central Scania (Ödman 2009). Excavated furnaces from prehistoric times are much fewer and mainly located closer to the agrarian settlements further south, east and west, indicating that iron production was then orientated toward domestic consumption (Björk 2009). This is supported by the data set showing no clear indication that large amounts of iron came from Scania to the present parts of Denmark west of the Øresund during the Viking Age, although more data would be desirable.

Most iron imported from other regions came from Norway and Western Jutland. This observation is in accordance with recent studies of Norwegian iron production which show the escalation of production in the latter part of the Viking Age with a surplus of raw material surpassing the local

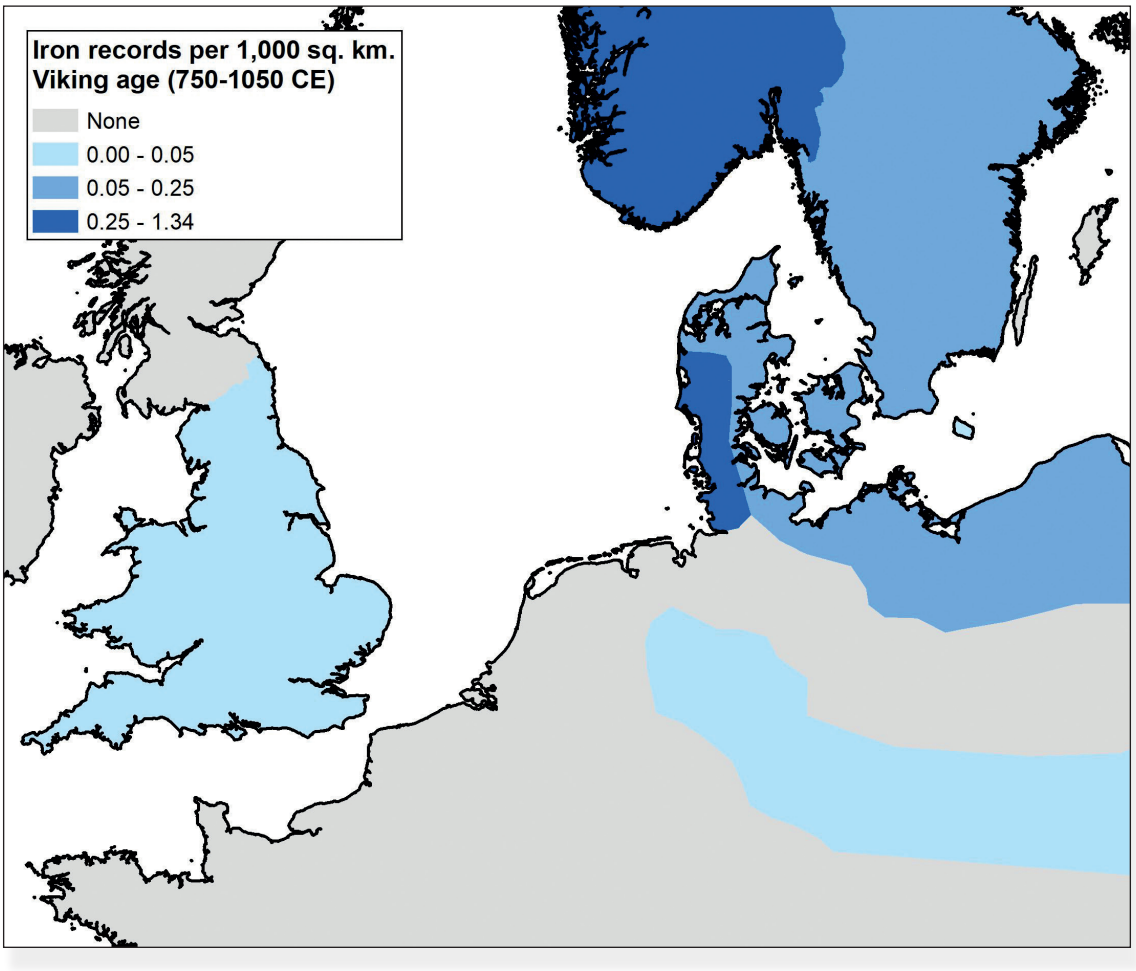

Figure 3: Iron provenances 750-1050 CE based on 119 established provenances for iron objects found in Southern Scandinavia (Map: Peder Dam, Odense City Museums).

demand, thus turning iron into a commodity in Scandinavian trade (Lauridsen and Birch in press; Loftsgarden 2019; Rundberget 2015, 178-184, 2017, 9-10; Tveiten and Loftsgarden 2017, 115-121).

Relative increase from 200-750 CE to 750-1050 CE

Figure 4 shows the relative percentage increase in iron provenances from 200-750 CE to 750-1050 CE. Provenances concentration from the two periods as shown in figures 2 and 3 were compared, and regions where this was decreased are coloured red, whereas regions where this was increased are coloured green. The darker the green, the more significantly the increase.

The most notable difference is seen in iron originating from Norway (an approximate 1000 % increase) and iron originating from Scania (an approximate 600 % increase). The latter admittedly increased from low numbers to average numbers, but the increase for Norway is substantial.

For the other regions in figure 4, it is important not to over-interpret the increase or decrease in numbers of iron provenances. The number of individual records in the data set is still not huge and is geographically skewed. For instance, the increase in British provenanced materials is calculated from just one object in the first period, to three objects in the second. However, what is clear is that significant iron production continued in Western Jutland, and iron was still imported from Germany and Central Europe, although on a relatively smaller scale than before.

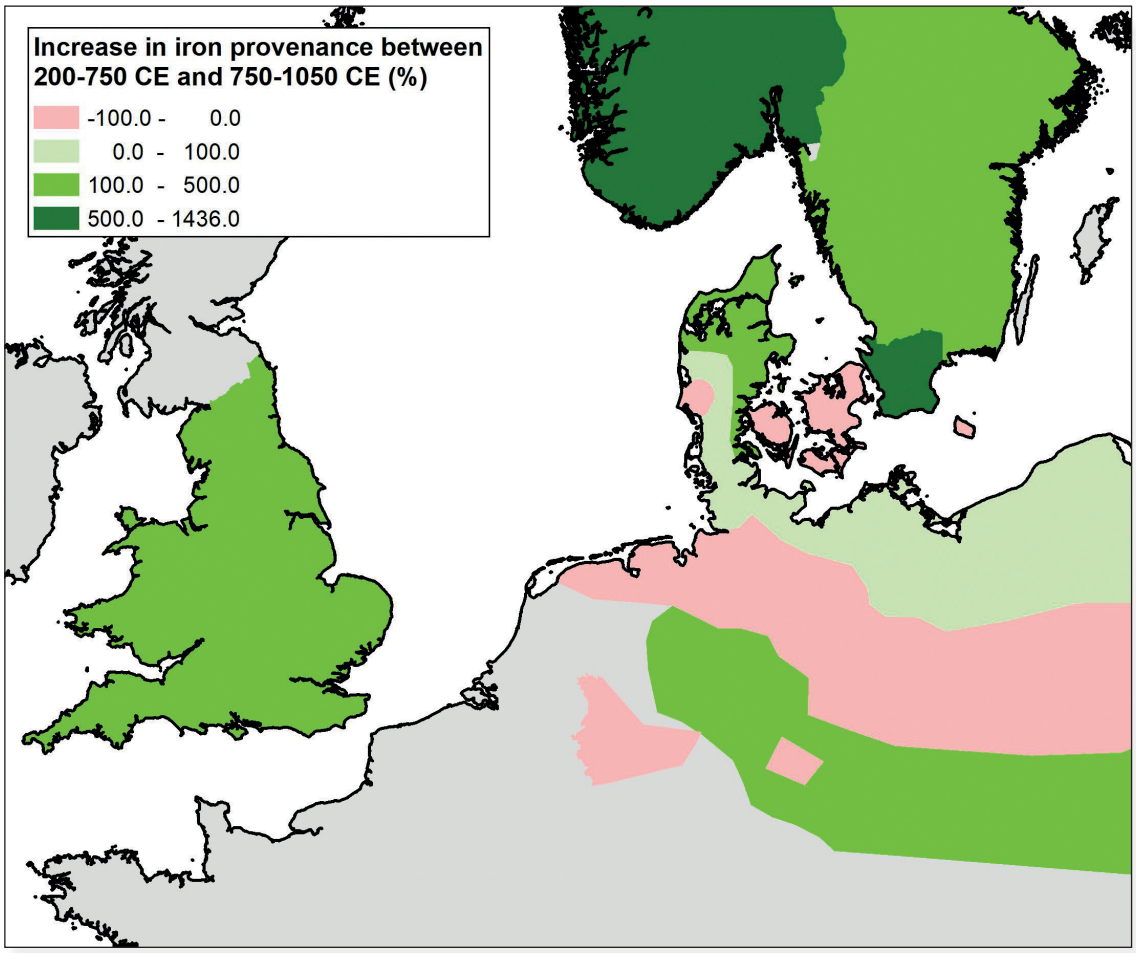

Figure 4: Relative increase of iron provenances from 200-750 CE to 750-1050 CE. (cf. Figure. 1 and 2) (Map: Peder Dam, Odense City Museums).

Differentiated use of iron from various regions, and composite objects

Iron varies in quality and was therefore used for diverse purposes; imported iron was often of higher quality than the locally produced material (Jouttijärvi, Thomsen and Moltsen 2005, 288). Therefore, it is not surprising to find that some types of artefacts where strength was not a top priority, such as nails, could be made of local and low-cost iron, while artefacts where strength and sharpness were of the essence, such as tools and weapons, would often be made of imported iron (Jouttijärvi 2010, 126; Lyngstrøm 1998, 54). The craftsmen of the era possessed knowledge of the different qualities of their raw material and would optimize its use accordingly.

One purpose of this study was to examine if there is a larger contingent of material of British origin when focussing on higher-quality iron and, more specifically, steel in composite Viking Age knives. When singling out specific groups of artefacts from the dataset, the actual number of relevant records will be much lower, making it crucial to take the context of each individual find into account. From an excavation in the town centre of Odense, Denmark, a large number of medieval metal objects have been provenanced. The iron in four out of five knives was provenanced to the Scandinavian peninsula, while the fifth was made of local iron. In contrast to this, two needles, plus seven out of ten nails, were most likely made of locally sourced iron (Jouttijärvi 2019b). These examples from Odense, although post-Viking Age, illustrate the differentiated use of iron, and this tendency is also seen in objects from other sites (cf. Orfanou et al. 2021, 19).

Objects made from two or more different types of material – so-called composite objects – constitute a compelling subgroup. When the provenances for two or more raw materials are established, those objects can reveal information about the site

of manufacture and one or more steps in the object biographies. If all raw materials stem from the same region to that of the findspot, the object was likely assembled locally. On the other hand, if one material is local to the findspot and the other from a different region, the object was likely manufactured locally using partly imported raw materials. Finally, all the materials could originate from different regions to where the object was recovered. In that case, either all raw materials have been imported or the object has been manufactured elsewhere, perhaps where one of the raw materials originated, and the artefact has later been moved to the findspot.

Many knives found in Southern Scandinavia dating from the Viking Age and onward are made with a combination of iron and steel. The result optimises the materials used, combining the hardness and sharpness of the steel and the flexibility of the iron in a very sturdy and efficient blade (Jouttijärvi 2010).

From Funen, twelve Viking Age knives have been provenanced, table 1 (Bech and Lauridsen 2021; Jouttijärvi 2010; Price et al. 2014). Only three of these knives were made from iron that was sourced locally or from a neighbouring region with a similar composition. The steel in these three knives is provenanced to the Scandinavian peninsula and they were probably manufactured on Funen from local iron with the inclusion of imported steel. Five of the knives consist of iron from Western Jutland and steel from the Scandinavian peninsula. The final two knives contain steel from England and Germany/Central Europe, respectively. This subgroup of seven knives could have been manufactured either in Western Jutland with local iron and imported steel or locally on Funen with both materials imported. Only one knife has both iron and steel from the same distant region (Jouttijärvi 2021c), that is Norway or the Northern part of Sweden. As such, the knife seems to have been manufactured in Norway and represents an imported finished object. Finally, one knife (Jouttijärvi 2010) is made of iron from Middle or Southern Sweden and steel from Nor-

Object no.	Date	Provenance of iron	Provenance of steel
OBM4520 x 1731	600-1050 CE	C1 (Western Jutland)	A1A (Norway and Northern Sweden)
OBM4937 x1399	750-1050 CE	C1 (Western Jutland)	A1A (Norway and Northern Sweden)
OBM8414 x 278	750-1050 CE	B1 (possibly local)	A1A (Norway and Northern Sweden)
OBM8414 x 339	750-1050 CE	C1 (Western Jutland)	A1B (Central- and Southern Sweden)
OBM8414 x 378	750-1050 CE	A1B (Central- and Southern Sweden)	A1A (Norway and Northern Sweden)
OBM4520 x 395	750-1050 CE	C1 (Western Jutland)	A3 (England)
OBM8414 x 449	750-1050 CE	C1 (Western Jutland)	A2 (Germany and Central Europa)
OBM8414 x 455	750-1050 CE	B1 (possibly local)	A1B (Central- and Southern Sweden)
OBM8414 x 492	750-1050 CE	B1 (possibly local)	A1B (Central- and Southern Sweden)
OBM16224 x 5	750-1050 CE	A1A (Norway and Northern Sweden)	A1A (Norway and Northern Sweden)
OBM4520 x 1583	800-1000 CE	C1 (Western Jutland)	A1A (Norway and Northern Sweden)
OBM4520 x 1634	800-1000 CE	C1 (Western Jutland)	A1A (Norway and Northern Sweden)

Table 1: Provenances for twelve Viking Age knives, made from iron with a steel core, found on Funen. Knives with uncertain provenances and/or dating have been omitted. Regions of provenance in brackets refer to those established by Jouttijärvi (see Figure. 1).

way or Northern Sweden. This knife could very well have been made in Scania with local iron and imported steel.

Despite the knives representing products that include both standard materials and those of higher and more refined quality, there is almost no link to the British Isles. Of course, British and/or Irish provenance might still be found among special types of higher-quality iron or steel that have not yet been analysed, but so far there is no clear indication of this. In contrast, during the Viking Age, steel was apparently almost exclusively brought into Southern Scandinavia from the other parts of Scandinavia. Of the 64 records of steel, 55 were from the Scandinavian Peninsula, and only one was from England. It could be argued that the single knife with English steel and iron from Western Jutland shows that steel, at least in some cases, was brought from England to Southern Scandinavia as raw material, but the current provenance data set indicates that the influx of English iron and other everyday goods seems of minimal importance.

A British connection?

In the 1980s, it was stated that the archaeological evidence for an Anglo-Danish connection in the Viking Age was so scarce that the finds could hardly evidence the crucial historic events (Olsen 1981, 171). Since then, many metal-detecting finds have shed new light in this field of research.

The connection between the English territories and Southern Scandinavia goes further back than the Viking Age. Around the year 700 CE, Saint Bede, a monk, and the first English historian, described how, from the middle of the 5th century onwards, the Jutes, Angles, and Saxons settled in England from Jutland, Schleswig, and parts of Northern Germany respectively. Although the precise circumstances and the origins of these peoples are debated, the connection between England and Southern Scandinavia is well-documented in this period, at least on an elite level (Hansen 2015, 164-165; Hines 1984, 1992). In the following couple of centuries, neither written nor archaeological sources seem to suggest shared historic ties between Scandinavia and the British Isles. The first documented Viking raid in England was on Lindisfarne Priory in 793 CE. In the subsequent centuries, there were numerous raids and settlements by Scandinavians on the British Isles, and in the late 9th and part of the 10th centuries, large parts of England (Danelaw) were ruled by Scandinavian leaders. In 1013, the Danish king Sweyn Forkbeard (approximately 987-1014 CE) invaded England, and for the following decades, the country was under shifting Danish and English rule.

Given the important ties between England and Southern Scandinavia in the Viking Age and given there is archaeological evidence for iron smelting abundant all over England from the 8th century BCE and onwards (Paynter 2018), it is surprising to see only very few instances of iron from that region in this data set for the Viking Age. Only four objects, three iron and one steel, contained raw material with a British origin. It could be presumed that the close political connection, at least in the later part of the researched period, would have been evident in the provenances of raw materials found in Southern Scandinavia. Indeed, improved maritime technology would have made the transportation of British products or raw materials possible. The raids and extortion of Danegeld enforced by the Danish kings must have also meant a flow of goods to Southern Scandinavia. However, judging from our data set, this influx of British goods did not affect an everyday product such as iron to a significant degree. Southern Scandinavians still relied on local production for simpler iron objects, while high-quality iron was imported from Norway and other Scandinavian regions.

One further approach to assessing the British connection with the data set is to consider all records of objects with British provenances regardless of the type of raw material and extend the period of interest beyond 1050 CE. However, before taking the following into account, it is important to be aware that the non-ferrous objects are not as numerous as the iron objects, and they are more disproportionate in distribution across periods and findspots. Twenty-seven additional materials from *c.*750-1200 are sourced from the British Isles, eighteen of which are wood. Wood makes up a large proportion of the database because there are often many provenanced samples from large archaeological excavations. For in-

stance, 17 samples from the Viking ship Skuldelev 2 have been provenanced – 13 of these from the construction phase are provenanced to the Dublin region, while four samples from ship repairs can be provenanced to Britain (Bonde 1999; Bonde and Stylegar 2011). A solitarily stave from a stave-built tub found in Viborg in central Jutland shows a definitive connection to England as it derives from Northern England, possibly around Yorkshire, and is dated after 1010 CE (Daly 2005, 153).

In total, there are twelve records of metal, including the aforementioned three of iron and one of steel, sourcing from the British Isles in the period *c.*750-1200 CE. Except for some lead from a coffin found in the Abbey Church of Sorø on Zealand, all the metal objects were recovered in or near the town of Odense on Funen (Jouttijärvi 2020c, 2021a, 2021b). Three samples of lead stem from a coffin dated to around 1201 and provenanced to Southwest England (Jouttijärvi 2020b), while a lead ingot from the first half of the 12th century is provenanced to England or Wales (Jouttijärvi 2019b). The silver from a paten and the foot of a chalice, both from a late 11th-century miniature eucharistic set, have a probable provenance in Western England or Northern Wales based on the lead isotope, while the typological analysis indicates that it was manufactured in North-Western Germany (Bjerregaard 2017, 6, 16-17; Ebsen and Jouttijärvi 2018). The rest of the objects are Viking Age: a piece of gold braided jewellery is provenanced to Ireland, while a silver fibula brooch from the Nonnebakken ring fortress is provenanced to England. A raised bismuth level indicates that silver from Arabic dirhems might be mixed in with the raw material (cf. Hilberg 2017, 259-260; Jouttijärvi 2021d).

As mentioned earlier, the steel from a Viking Age knife is also provenanced to England. The knife was found in a Viking Age grave on Funen, and a nearby grave within the same burial ground has recently revealed an intriguing connection to England. Via DNA analysis, the inhumed male has been identified as a second-degree family relation to a male recovered from a mass grave in Oxford. This means that they were, for example, either half-brothers, nephew-uncle, or grandson-grandfather. The individual in Oxford had been violently killed around the year 1000, probably connected with the St. Brice's Day massacre in 1002. His relative in Denmark died of old age but had older lesions on a neck vertebra and the left side of his pelvis which may have been caused by a sword (Bennike 2006; Margaryan et al. 2019, 12-13, 2020, 393). As such, the case of kinship and the knife of partly English origin found nearby tells a very intriguing story of contact between a settlement in Northern Funen and the town of Oxford, with the knife being the only physical proof of actual transportation of raw material or goods from England to Denmark.

Similar to the iron material, there are remarkably few objects made from other raw materials which originate from the British Isles. Furthermore, many of these objects must be considered high-status artefacts. The Skuldelev II ship holds special status here. As a vessel and means of transportation, its purpose is to move, and as such, cannot be considered an import but still demonstrates distinct evidence of contact across the North Sea. Furthermore, even though wood as a raw material could be considered an everyday commodity, the amount of suitable timber needed, and the highly specialized construction of the longship are a manifestation of high status.

In conclusion, the available object provenances do not give reason to believe that there are a number of British raw materials in Southern Scandinavia hidden within objects of local style. The relatively large number of objects with British origin recovered from around Odense does not necessarily indicate a special connection between this area and England but is more likely due to an increased focus in provenance research by Odense City Museums over several years. Overall, in terms of finds and their provenances, object from the British Isles only make up a very small group (Hansen 2018).

Discussion

As described above, there is a significant shift from the use of Western Jutland iron in the period 200-750 CE to a higher use of Norwegian or Northern Swedish iron in the period 750-1050 CE. In contrast to this, the data set does not show a notable increase in materials of British origin for everyday

iron and steel objects despite the increased contact across the North Sea in this period. Future studies of object provenance will refine this overall picture but will probably not change the fundamental conclusion that the strong political ties of the Viking Age only had a limited effect on the exchange of standard goods of iron and steel from Britain to Southern Scandinavia. Other groups of raw materials also have no significant number of British provenances, even though it must be remembered that the number of records of these materials is not as high or as evenly spread as those of iron. In contrast, more prestigious or conspicuous Viking-Age objects have British provenances, which is supported in stylistic studies of English influence in Southern Scandinavia. Those finds include silver coins, riding equipment, and magnificent swords that point to elite groups in society (Pedersen 2004; Roesdahl 2007).

Evidently, English goods of various kinds were transported to Denmark during the Viking Age. In the first half of the 11th century, an increase of English coins found in silver hoards can be seen, especially in Scania. These coins could very likely stem from Danegeld, the coins from which were absorbed into monetary circulation in Scandinavia (von Heijne 2011, 189-90; Moesgaard 2006, 412-413; Roesdahl 2007, 12-13). Some objects, typologically determined as English, have revealed that the concept of export-import is not always a straightforward transfer of physical goods from one place to another. The clay from glazed and wheel-thrown English-styled ceramic found in Lund (Scania) and Lejre (Zealand) has been established as local. Thus, the pottery indicates the import of styles and technology rather than actual trade across the North Sea. This is very probably down to an English, or perhaps Anglo-Scandinavian, craftsman from the Stamford area who had migrated to Scandinavia and perhaps even produced English styled ware for a contingent of English immigrants (Christensen et al. 1994, 75; Larsson 2000, 71-74, 80-83; Pedersen 2004, 62).

Despite a well-documented connection between Southern Scandinavia and England during the Viking Age and not least during the Danish dominion in the first half of the eleventh century, there is no evident effect on the exchange of everyday objects from England across the North Sea. This matter has been discussed previously (Pedersen 2004; Roesdahl 2007, 2018). In their study of the late 10th century ring fortress Aggersborg, Roesdahl, Sindbæk and Petersen (eds. 2014) conclude that archaeological evidence for the exchange of everyday objects from England in Southern Scandinavia is scarce, and even though an increase of English objects can be observed around 1000 CE, the artefacts in question are mainly connected to coinage, warfare or the ecclesiastical strata (Pedersen 2014, 413). English moneyers operated in Scandinavia, and English clerics were appointed to bishop sees within the Danish realm in the 11th century. Thus, the English influence in terms of actual objects, stylistic details, church architecture, and important changes in Danish minting or church organisation is evident but also limited to the highest reaches of society (Abrams 2012, 29; Larsson 2000, 80; Spejlborg 2014).

To understand the scarcity of British influence, at least three propositions must be considered: the relationship between the political alliance and trade/exchange of goods in the Viking Age, the nature of the British connection, and finally, the demand for certain goods in Southern Scandinavia.

Firstly, what influence on trade did the Scandinavian royals and elites, who led the expeditions to the British Isles, have? Sindbæk concludes in his study of the early towns and trade networks in the Viking Age that these "cannot be reduced to a reflection of a political network. The long distance exchange brought its own rules, which did not necessarily support existing political structures. The choice of sites had to match the interest of travellers and the conditions of geography as much as the ambitions of rulers" (Sindbæk 2007, 129). In essence, our analysis supports this conclusion. Changes in the political and dynastic relations during the Viking Age are not clearly reflected in the current data set. The new political ties across the North Sea do not seem to substitute well-established networks within Scandinavia. The iron trade, as with many other commodities, was probably already routinised and specialised within Scandinavian networks, as demonstrated by the increase of imports from the Scandinavian peninsula in this study. These existing trade networks are also evident from Norwegian soapstone vessels and, later on, combs, reindeer antler and quern-stones found

throughout many parts of Southern Scandinavia (Baug 2017). Norwegian iron might have been transported along the same routes and thus made the import of British iron unnecessary.

Secondly, what was the nature of the connection between England and Southern Scandinavia? The current data do not indicate extensive commercial activities. We know, for example, that Cnut the Great travelled from England to Denmark several times and probably many others with him, but was the settling of the Danes in England in general of a more permanent nature, in the sense that the migrated men and women rarely would return to the old country and bring back goods from England?

Recent research on the phenomenon of Viking diaspora (Jesch 2015, 2021) concludes that strong and long-lived ties existed between the Viking diaspora in the settled areas overseas and the Scandinavian motherlands but mainly focuses on the Norwegian connection to the Atlantic Isles and Ireland and especially to Iceland where Norwegians settled in a largely unpopulated land. The evidence for a strong South Scandinavian Viking diaspora in England seems less obvious. Abrams, on the other hand, tend to see Viking diaspora as ties between elite centres that may have affected the hinterlands less, but at the same time does not subscribe to a simplistic view on emigration as a one-way translocation of people (Abrams 2012). Indeed, written sources tell of Danes who migrated, and runestones in Scandinavia tell of Scandinavians who died in England. Also, the aforementioned DNA study reveals a significant Danish gene flow towards England (Margaryan et al. 2020). Although the number of immigrants from Southern Scandinavia is uncertain, there is no doubt, that there was a significant immigration during the period. Find patterns of diagnostically Scandinavia metal objects suggest that these immigrants mainly comprised non-elite rural settlers who upheld their Scandinavian cultural affiliation for at least a couple of generations. The distribution of Scandinavian style ornaments and bullion silver suggests that these objects were not the result of a significant import via the market towns in England but were probably produced locally (Kershaw and Røyrvik 2016, 1676). Most Danes in England should probably be considered immigrants with no active ties to the old countries. The Danish elite probably upheld a stronger connection to Southern Scandinavia and might have travelled back and forth across the North Sea (Spejlborg 2014, 84-85). This seems to be suggested in the mainly high-status quality of many English finds in Southern Scandinavia (Pedersen 2004).

Thirdly, it must be taken into consideration whether there was an actual need and incentive in Southern Scandinavia to import regular raw materials, like iron, from England. The conditions for trade across the North Sea definitely existed with the seagoing, sail-bearing vessels and the contacts established through expeditions and settlements. Depending on the location in Southern Scandinavia, the distance to Norway and England could be much the same, and trade connections within Scandinavia could have been well-established before the connections between Southern Scandinavia and England emerged during the Viking Age. Evidently, iron from the Scandinavian peninsula constitutes the bulk of materials that are neither local nor from Western Jutland. The interest for British raw material in the Viking Age could consequently be orientated towards resources not readily available domestically, locally, or within establish networks, such as lead and jet, or more perishable commodities such as fine cloth. Artefacts with an English provenance were generally restricted to high-class objects.

No final conclusion about the matter can be given here, but it would seem that a political relationship is not necessarily reflected in the influx of trade goods on all levels. At least, there is no indication that the alliance between Britain and Southern Scandinavia affected the trade of everyday goods significantly.

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Declaration of interest

No conflicts of interest are known by the authors in relation to the material addressed in this manuscript.

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A rich weapon burial from the Late Roman Iron Age at Veldbæk, Denmark – comments on the distribution of power in southern Jutland

Bente G. Alexiou[1,4], Lars Grundvad[2] and Xenia Pauli Jensen[3]

[1] Museum of Southwest Jutland (Sydvestjyske Museer), Ribe, Denmark
[2] Sønderskov Museum, Brørup, Denmark
[3] Moesgaard Museum. Archaeological Department, Højbjerg, Denmark
[4] Corresponding author (ben10@sydvestjyskemuseer.dk)

ABSTRACT

During two campaigns in 1997 and 1999, archaeologists from Esbjerg Museum excavated a spectacular Late Roman Iron Age weapon burial at Veldbæk in Esbjerg, Denmark. In addition to full weaponry, the deceased was buried with magnificent grave goods such as gilded fittings for a military belt, gaming pieces, a gold finger ring, a silver animal fibula, a red carnelian intaglio, and a copper-alloy-clad wooden bucket. The assemblage dates the grave to the transition between periods C1b and C2 of the Late Roman Iron Age, which is to say ca. AD 250 or shortly thereafter. The grave is a crucial new piece in the puzzle to understand how power was distributed in southern Jutland during the Late Roman Iron Age.

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During the 1980s and 90s, a hypothesis concerning a warrior hierarchy in Jutland during the Late Roman Iron Age was constructed: the area around Vorbasse in southern central Jutland was the seat of power and the region was under martial rule by strategically placed local subordinates (Ethelberg 1990, 115-117; Ethelberg 1992, 114-118). The basis for the theory was a set of rich weapon burials all placed approximately equidistant from Vorbasse and characterized by a relatively uniform grave material including weapons and wooden buckets.

The question is whether this hierarchical, militaristic structure still works as an explanatory model for this period. The excavation of a Late Neolithic burial mound from the Single Grave Culture (2800-2400 BC) near Veldbæk in Esbjerg, southwestern Jutland, Denmark, revealed an exciting discovery of a spectacular weapon burial from the Late Roman Iron Age (AD 150/60-375). In terms of distance from the presumed centre of power at Vorbasse, it would fit well as an example of a local aristocrat in the hierarchy governing the periphery during this period.

This article presents this weapon burial from the Esbjerg area and places it into its proper local, regional, and societal contexts.

Find history

The Veldbæk burial mound was first mentioned during the systematic mapping of sites by members of the National Museum in 1891, when it was described as mostly gone. In 1917, it was reported as completely ploughed away.[1] On a map from 1796, the mound was registered as a linear mound, and it also appears in the Royal Topographical Map series from 1842-99 (Figure 1). Thus, the mound almost completely disappeared from the landscape between the period when the later maps were produced and 1917.

In 1997 and 1999, Esbjerg Museum excavated two thirds of the area the mound occupied.[2] The primary burial was a man's grave from the Single Grave Culture. It was recorded as being disturbed by several younger burials, among these an urn and

Figure 1. The location of the site. The Single Grave Culture burial mound that is the subject of this article is marked with red on the Royal Topographical map from 1842-99 (Graphic: Lars Grundvad).

an inhumation grave from the Iron Age (Søsted and Siemen 2003; Siemen 2009, 459-460).

This article focuses on the later, intrusive inhumation grave in the mound. While the Single Grave Culture material has already been presented in Palle Siemen's catalogue of Early and Late Neolithic graves from southwestern Jutland (2009, 459-460), the Iron Age grave has not been comprehensively published until now. Today, the Iron Age grave is still unique despite the fact that the area is well-researched and multiple excavations have revealed settlements from both the Early Roman Iron Age and the Early Germanic Iron Age.[3]

Topography

The landscape around Esbjerg sets the framework for the find. Burial mounds were built atop the Esbjerg moraine plateau, which stretches all the way north to Varde and east to where Varde/Holme Å meets with Sneum Å, which flows southwesterly around the plateau forming the boundary in that direction. The plateau was formed during the penultimate Saale glaciation and the subsoil consists of mixed sand and clay moraine deposits that form multiple inhabitable plateaus bordered by small streams and wetlands (Stoumann 2009, 17).

The burial mound was built on a large, flat area near the southern edge of the Esbjerg plateau. Maps show that the solitary mound lay south of a group consisting of at least five mounds, three of which contained grave goods from the Single Grave Culture. Before widespread drainage projects, the area was surrounded by extensive wetlands. Novrup Å runs from south to north and east around the plateau. The early topographic maps of Denmark show it as the northern boundary.

Excavation of the mound and surroundings

At the beginning of excavation in 1997, the remains of the mound were faintly visible as a vague, oval elevation, ca. 20-30 m long and 20 m wide, oriented NE-SW. Grave C (the weapon burial) and Grave D (the Single Grave burial) were found in the centre of the mound area, and it was initially assumed that there were two episodes of digging where one constituted a looting hole. Excavation was completed in the summer of 1999 revealing two additional graves (Figure 2).

The mound boundary was difficult to discern, so the circle on Figure 2 represents an estimate. In the excavation report it was estimated that the mound measured 16-18 m across based on Grave A's (an

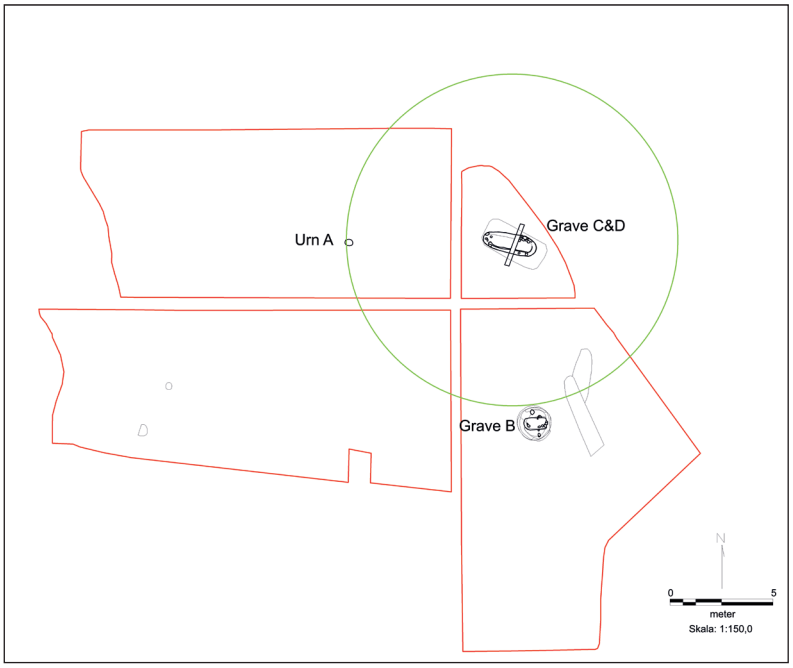

Figure 2. Excavation plan. The presumed mound border is shown in green. An urn from the Early Iron Age (Grave A) is marked on the western edge of the mound. Only shattered pottery sherds and burned bones were left. A child's burial from the Single Grave Culture appears to the south (Grave B) and Grave C (the subject of this article) is shown in the centre. Grave D is the central Single Grave burial (Digitalization: Museum of Southwest Jutland).

urn from an earlier part of the Iron Age) placement at the edge (Søsted and Siemen 2003, 6).

The weapon burial and its contents

The grave was a ca. 330 x 150 cm, approximately E-W oriented, roughly rectangular pit, into which the deceased was placed in a log coffin (Figure 3). Artefacts in the form of pieces of an iron spear head along with many heavily degraded shield boss fragments quickly appeared (Søsted and Siemen 2003, 7).

At the very bottom of the grave, a stone pavement was found which could be best documented in the eastern part of the grave. In the western end of the grave two pots were excavated and, immediately northwest of them, 16 glass, amber, and stone gaming pieces turned up. It is assumed that a wooden gaming board accompanied the pieces, but it has long since disintegrated. In the western end of the grave, in a deeper level, more gaming pieces were found, presumably having sunk down into the grave fill when the grave collapsed. A total of 30 gaming pieces were excavated. In addition to these pieces, many indistinguishable iron fragments were found in the eastern part of the grave.

At the bottom of the grave, traces of the coffin were registered in the form of a 2-6 cm wide strip of

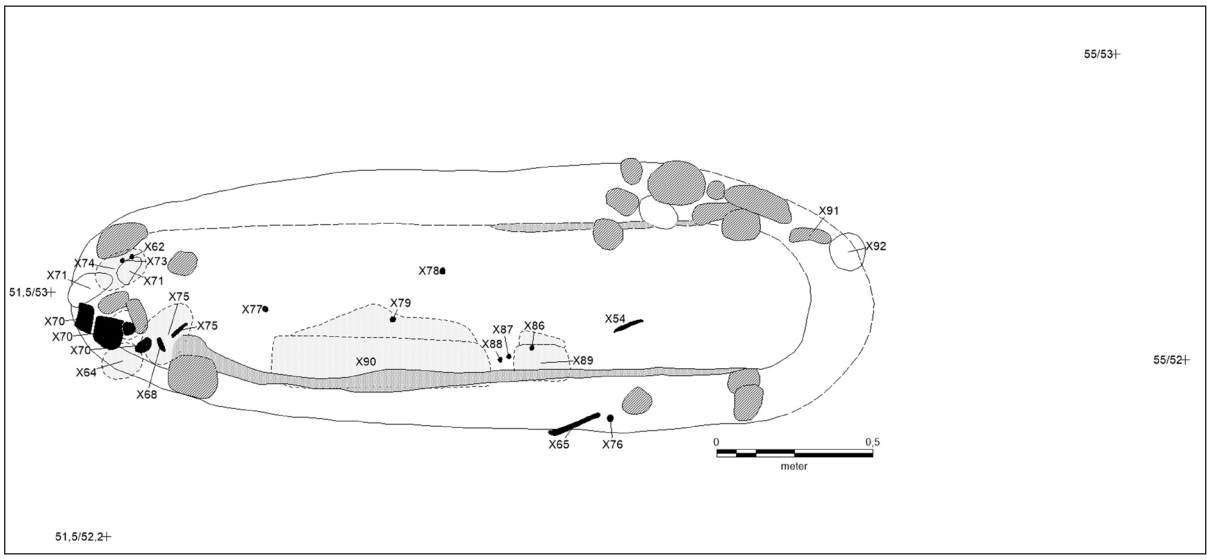

Figure 3. Excavation plan of Grave C. X-numbers mark the finds (Drawing: Palle Siemen).

decomposed wood. Traces from the wood revealed a coffin with parallel, straight sides and rounded ends to the east and west. Bowed sides rose from a flat bottom indicating a hollowed-out log coffin. Samples of the decomposed wood show that the coffin and lid were made of oak (Karg 2001, 1). No trace of the deceased was identified. Instead, numerous burial goods including: a sword, spear head, gold finger ring, animal fibula with a deer, and wooden bucket with copper-alloy fittings, were found during preparations to remove the bottom of the grave en bloc.

As no remains of the corpse were preserved, its orientation and whether the deceased was placed supine or on its side is uncertain. X-rays of the sword and belt fittings suggest that the grip lay to the east, as the fittings are described as being found north of the sword. Thus, the head of the deceased should also have lain to the east. Further indicators of the body's orientation are a fibula, which probably was on the deceased's shoulder, along with the gold ring's placement in the middle of the grave just north of the sword where the left hand should rest.

The assembled grave goods indicate a high-status burial. Based on the weaponry, the usual interpretation would be a male burial, but there are no skeletal remains to confirm this. The find groups will be treated separately as weapon-related items, imported goods, and elements that help to date the find.

Two pots

In the western and high end of the grave stood two fragmented pots, an s-curved mug (x70) (Figure 4) and a bowed, handled bowl (x71-72). The mug is 9.5 cm high, burnished, and decorated with two horizontal furrows under the neck along with etched wave ornamentation and hashmarks. It is of Ethelberg's type 1a3 with flared rim and partially vertical neck, dated to the period C2-C3 (Ethelberg 1990, 68, 73-74). The bowl with a vertical handle is burnished and decorated with three series of paired furrows. The vertical handle and relatively large size identify it as Ethelberg's type 4C1, dated to the period C1b-C2 (Ethelberg 1990, 84-85). Use-wear show that the pots had been used domestically before being deposited as grave goods. At Hjemsted burial ground, which is located approximately 50 km south of Veldbæk, for example, it was common to deposit one to three pots in the grave, placed both above and inside the coffin (Ethelberg 1990, 27, 43, Fig. 22).

Weaponry

Two shafted weapons were found in the grave: a spear head and a javelin head, both made of iron. The spear head (x17-22) was in several pieces, but it was observed to have been placed almost vertically, slightly canted to the southwest and with the socket towards the centre of the grave. It is 24 cm long and relatively well preserved (Figure 5). The point is leaf-shaped with a ridge running from the

Figure 4. The two pots (A: an s-curved mug. B: a bowed, handled bowl) were very probably placed on the lid of the coffin (Photo: Henrik Brinch Christiansen).

socket up along the blade, while the upper part of the blade is diamond-shaped in cross-section. Two different cross-sections within the blade itself can be seen on a series of spear heads from Vingsted and are also known from both Nydam and Ejsbøl bogs. Jørgen Ilkjær mentions them both as type 9 and during the review of his type 26 Svennum, which both belong to weapon group 7-9 dated from the close of period C1b to period C2, which is to say the second half of the 3rd century AD (Ilkjær 1990, 133-139; Engelhardt 1865, Table X:11-12; Ørsnes 1988, Table 129:11-12).

The javelin head lay in the southern end of the coffin. It is 27 cm long with two symmetrical barbs, and a partly preserved shaft (x54 and x75) (Figure 6). The type of wood has not yet been determined. Despite the heavily corroded socket, the ratio between socket and blade is clearly between 1/3 and 2/3. Together with a width of the blade at its middle of more than 12 mm, the javelin head can be identified as Ilkjær's type 6 Svennum (Ilkjær 1990, 165, 200, Tables 168-174). Thus, the javelin belongs to weapon group 7, dated to the transition between periods C1b and C2 in the mid-3rd century AD.

Additional finds from the southern part of the grave include wood, textile and iron remains related to a sheathed, double-edged sword with a relatively well-preserved handle and a silver disc or button (x89.03) (Figure 7). The preserved part of the sword is 52 cm long, of which 15 cm is the handle and pommel. Little can be said about the ca. 5 cm wide blade, as much of it is still concealed by the scabbard. During conservation, it was determined that the blade is pattern-welded, double-edged, and the handguard is perpendicular to it (Adomat 2001, 1). The tang is ca. 2.7 cm wide and the handle itself is ca. 9.3 cm long and up to 3.2 cm wide as preserved. The handle is wooden, but the type of wood has not been determined. It has not been possible to analyse the construction of the scabbard, but it seems to have a wooden core, which is well known from the period (Biborski and Ilkjær 2006). In addition, two layers of textile have been distinguished, one of indeterminate weave and the other of a broken 2/2 twill.[4] Textile remains were found on the pommel, scabbard, and handle. Possibly it was swathed in

Figure 5. Spear head after conservation. Length: 24 cm (Photo: Silja A. Christensen).

Figure 6. Javelin head after conservation. Length: 27 cm (Photo: Silja A. Christensen).

Figure 7. The double-edged sword in wooden scabbard. The silver disc is placed where it is believed to have sat, if it functioned as a sword scabbard bead. Preserved length: 52 cm (Photo: Silja A. Christensen).

cloth when placed in the grave. The pommel was too damaged to recognize its form and type.

The silver disc (x89.03) measures 3.1 cm in diameter and is 2 mm thick. On the back some wood is preserved, and it may have been attached to the scabbard. Its function has not conclusively been determined. It could be a sword bead, or more properly a scabbard bead (Rau 2010, 380-384). Sword or scabbard beads made of glass and amber are widely known in Scandinavia from weapon sacrifices at Vimose, Thorsbjerg and Nydam, as well as from a range of grave finds from the Late Roman Iron Age (Werner 1956; Engelhardt 1869: Pl. 1; Pauli Jensen 2008, 142-143; Blankenfeldt 2015, 232-239; Rau 2010, 363-384). They could also be produced from precious metals in combination with, for example, rock crystal, such as seen at the Nydam bog (Rau 2010, 376, Table 48:1). However, the preserved wood on the backside of the silver disc from Veldbæk argues against an interpretation of a sword bead.

Additionally, remains of an iron shield boss (x21-22) were found, probably placed near the spear head. It is heavily fragmented, but it is possible to recognize the profile, which is a slightly indented neck that is separated from the top by a distinct bend. It most likely belongs to Ilkjær's type 6b or 6c with low necks and vaulted tops (Ilkjær 1990, 35; Ilkjær 2001, 299-306). Type 6 is linked to weapon groups 6 and 7, which date from period C1b to the start of C2, where they are widespread in South Scandinavia. In southern Jutland they occur in the graves from Næsbjerg and Vorbasse grave 11 (Ilkjær 2001, 306, cf. Table 1). Other fittings from the shield have not been identified, but it is not unusual that only parts of a shield were deposited in weapon burials from the Roman Iron Age (Henriksen 2009, 97 and references therein).

Knife

A knife with a partially preserved, wrapped handle was also excavated. It is not clear what was used for the wrapping, but it appears to have been fastened to the handle with a dark substance. The blade is relatively simple, but it is too deteriorated for the form or type to be determined. The position of the knife in the grave is unknown.

Military belt

Two opulent belt fittings were found north of the sword (x89.01-02) (Figure 8). Both were made of several rectangular plates held together by respectively two and three hinges. They are finished on both sides with a decorative edge of eight connected, elongated silver triangles ending in a point with a hole and a rivet. The two central plates were each equipped with leaf gilded strips with a row of 11 beaded wire rosettes around silver rivets. On each strip, the 11 rosettes are flanked on each side by beaded wire.

The rivets fastened the gilding to an organic material which is not preserved. However, remains of both leather and textile were detected on the gilding, so it is possible that the item contained both. The fittings are fragmented but it is possible to determine that the width was ca. 10 cm. Similar, but not identical, ostentatious fittings are known from the Nydam bog. These are also constructed with hinges, though they are slightly younger than the grave at Veldbæk (Rau 2010, 252-253, Fig. 95-96). The rich weapon burial from Aasø just outside Glumsø on Zealand had, in addition to imported Roman pottery, remains of gilded fittings with hinges from a ca. 8 cm wide belt. This grave dates to the period C1b and is thus slightly older than the one at Veldbæk (Lund Hansen 1987, 416; Przybyła 2016). A grave roughly contemporary with Veldbæk (from the period C1b-C2) is known from Hammenhög/Roegshög in Scania, Sweden, with a military belt featuring gilded fittings and hinges, as well as a double-edged sword, shield boss, gaming pieces and two dice (Stjernquist 1955, 168, Plate XL:3-7). The rich grave from Sætrang just north of Oslo, Norway, also contains a magnificent belt with gilded hinged fittings (Slomann 1959, 18-20, Plate III, V; reconstruction from Rau 2010, Fig. 100). It was excavated in 1834 from one of a series of large mounds. Highlights from the grave finds are gold finger rings (including a spiral ring of Beckmann type B30; Beckmann 1969, 42-43),

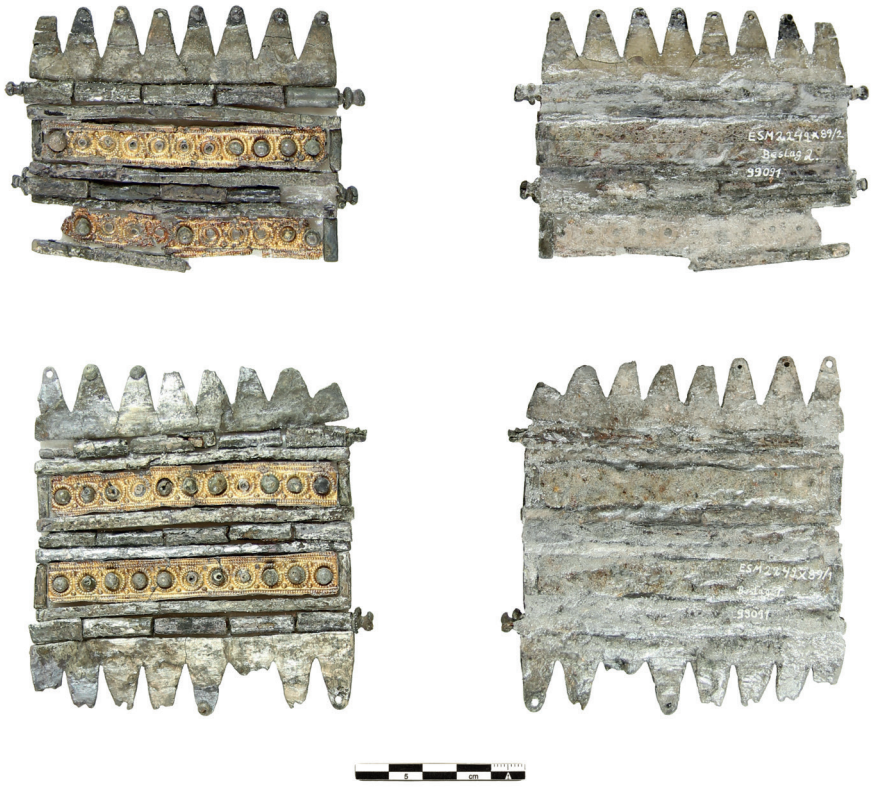

Figure 8. The two magnificent, hinged belt fittings that may have come from a military belt. The small one measures 8 x 10.5 cm and the big one 9.4 x 10.5 cm. After conservation (Photo: Silja A. Christensen).

imported Roman pottery, a wooden bucket with copper-alloy fittings, a double-edged sword with an hourglass-shaped handle, spear and javelin heads of Ilkjær's type 11, and an iron shield boss. The grave dates to period C3 and thus later than the Veldbæk grave (Slomann 1959; Lund Hansen 1987, 434; Ilkjær 1990, 306, cat.no. 735; Rau 2010, 258).

Marzena Przybyła has reviewed clothing accessories with sheet metal from South Scandinavia, including those from Veldbæk (2018, 470-473). She analysed the components of the decorative motifs and highlighted the similarities between the use of silver rivets at Veldbæk, sword decorations from finds at the weapon sacrifice at Illerup Ådal in eastern Jutland, and a rich grave from Thorslunde near Copenhagen (Carnap-Bornheim and Ilkjær 1996, Table 184; Engelhardt 1871; Przybyła 2018, 470). The long, gilded fitting with 11 rivets holds parallels in the weapon sacrifices from Ejsbølgaard-East – though with only 8 and 10 rivets – and at the Nydam bog, among other things in combination with arcade decoration (Nørgård Jørgensen and Andersen 2014, Fig. 101; Rau 2010, Fig. 102-103, Table 12-14; Przybyła 2018, 473). These are both from southern Jutland and a bit younger than the grave at Veldbæk. The ring motif around the rivets can also be found in belt fittings from weapon sacrifices, but it is also seen on other objects, such as on fibulae and high-end weapon equipment both in southern Scandinavia and on the Continent (see for instance Przybyła 2018, 473-479, Fig. 15/40; Carnap-Bornheim and Ilkjær 1996, Abb. 264-269; Carnap-Bornheim 1997, Abb. 1; Przybyła 2005, Abb. 2; Becker 2001, 143). It is reasonable to presume a South Scandinavian craft tradition and more specifically, Przybyła suggests that the workshop may have been placed somewhere in Jutland (2018, 470).

In the Late Roman Iron Age, a group of ostentatious gilded belts and bandoliers appear in large weapon sacrifices like Nydam, Illerup Ådal, Vimose, Ejsbøl, and Thorsbjerg (Carnap-Bornheim and Ilkjær 1996, 444-449; Engelhardt 1869, Table 13; Nørgård Jørgensen and Andersen 2014,141-144; Matešić 2015, 98-100) and in rich South Scandinavian and northern German

graves (Slomann 1959; Carnap-Bornheim 2003; Rau 2010). The striking military belts likely appeared under the influence of the Roman Empire, where they were the mark of a Roman soldier. However, the South Scandinavian belts had their own style (Hoss 2013; Pauli Jensen 2015, 273; Matešić 2015, 124-145). Thus, the Veldbæk example belongs to a distinct group of military belts with spectacular gilded fittings belonging to the highest warrior class with clear connections to finds from Jutland, Zealand, and the rest of South Scandinavia.

Figure 9. All the gaming pieces (including the carnelian gemstone in the centre) set on a reconstructed game board, as they might have appeared in the game Hnefatafl. (Layout after Michaelsen 1992, 60) (Photo: Henrik Brinch Christiansen).

Glass, amber, and stone gaming pieces

Most of the gaming pieces were recovered from the western end of the grave and are believed to have lain on the lid of the coffin. The rest were found in the grave fill and the bottom of the coffin. They were made from glass, amber and stone (Figure 9). The majority was found with their flat side down and convex side up. 18 of the 30 pieces were glass, divided into the following colours: seven grey/black (x2, x7, x8, x9, x11, x15, and x73), four blue/turquoise (x4, x13, x16, and x63), four white (x5, x10, x66, and x68), and three light green (x65, x74.01, and x74.07). Eleven pieces were made of amber (x1, x3, x6, x12, x14, x62, x72/x74.6, and x74.02-x74.05) and one of stone (x69).

Glass gaming pieces are perceived as imports from the Roman provinces. There are numerous finds from the forts along the Roman limes, but also outside the frontier, in Barbaricum. Most common are the black and white examples (Krüger 1982, 156-158; Matschoss 2007), precisely as seen at Veldbæk. In central Barbaricum, Late Roman Iron Age gaming pieces and boards are closely linked to the Haßleben-Leuna horizon, which is characterized by especially rich graves with both Roman and Germanic status markers (Schulz 1933; Schultz 1953; Matschoss 2007). In current-day Denmark, coloured glass gaming pieces are known from period B2 onwards, however, the majority are from the Late Roman Iron Age C1-C2. They are primarily found on Zealand (Lund Hansen et al. 1995, 235, Fig. 8:15; Fonnesbech-Sandberg 2002, 212; Matschoss 2007, 477), although gaming pieces are also recorded from graves and settlement sites in the Southeastern part of Funen (Henriksen 2009, 156-160). Gaming pieces are rare in southwestern Jutland. Examples include Dankirke (three glass gaming pieces, two black and one multicolored;), Esbjerg (two amber gaming pieces and one of clay), the rich, Late Roman Iron Age grave from Brokær found in 1878 (bone/antler gaming pieces and a rectangular die), which is somewhat older than the Veldbæk grave, and those found among the burnt grave goods recently excavated from a rich urn burial at Sneum (Hansen 1990; Lund Hansen 1987, 439; Rasmussen 1995, 77-79; Møller 2016).

In contrast to glass gaming pieces, ceramic, amber, and bone examples are interpreted as local copies. Thus, the grave at Veldbæk contains both locally produced gaming pieces and imports from the Roman provinces.

A gemstone

At the bottom of the west end of the grave's central part, a small, 15 x 10 x 4 mm, red carnelian gemstone (x77) was found (Figure 10). Victoria, the winged Roman goddess of victory, is engraved on it, shown hovering over the globe with a laurel wreath in one hand and a palm branch held over her shoulder in the other. The goddess's long

Figure 10. Carnelian gemstone found in the western end of the grave. We suggest it was part of a boardgame. Size: 1.5 x 1 x 0.4 cm (Photo: Henrik Brinch Christiansen).

Figure 11. Animal-shaped silver fibula in the form of a running, backward-looking deer. 4.5 x 3.4 cm (Photo: Henrik Brinch Christiansen).

wings can be seen on her back, and she is draped in long, billowing robes. Carnelians and other semi-precious stones are uncommon in South Scandinavia but have been found as gemstones in finger rings of Beckmann's type 17b and 22a within group IV (Beckmann 1969, 34-36, 39; Andersson 1993, 63-64, 66-67). Beckmann dates type 17b to period C1-C2, while Andersson places rings with one set stone to period C2 and the especially rare rings with elliptical stones to period C3 (Beckmann 1969, 36; Andersson 1993, 64-65). Roman finger rings with mounted stones of type 22a are only known in South Scandinavia from Hågerup on Funen, dated to period C1b (Henriksen 2009, 328), though without a carnelian (Beckmann 1969, 39; Andersson 1993, 67). Rarely, carnelians have been found in other types of jewellery, such as in the gold fibula from the rich grave at Årslev on Funen, with eight gemstones individually set, of which three are carnelian and the rest garnets (Storgaard 1990, 32-35). However, none of the stones are engraved. One gemstone, much like that from Veldbæk and also dated to the 3rd century, was found in Ribe during excavation of the Viking-era marketplace (Wistoft 1978, 12). Additionally, finds of semi-precious stones including carnelians derive from the Gudme/Lundeborg complex in southeastern Funen (Thomsen et al. 1993, 84; Thrane 1993, Pl. 11).

The carnelian from Veldbæk was not set in a ring but found in the grave along with seven amber and glass gaming pieces. Therefore, it is suggested that it had functioned as "the king" in the boardgame (Duff and Duff 1935, 310-311; Krüger 1982, 161; Michaelsen 1992, 60).

Plate fibula

In the southeastern part of the grave, north of the sword, a silver plate fibula shaped as a running, backward-looking deer (x89.04) was found (Figure 11). The fibula is Almgren's type 229/Thomas's type F series 2 (Almgren 1897, 103; Thomas 1967, 60-66).

There are two or three similar, but not identical, examples known from southern Jutland: One is from Dankirke near Ribe, ca. 36 km south of Veldbæk. The Dankirke deer is made from copper-alloy and more graceful than the Veldbæk example. It looks back at a bird perched on its back. The fibula was not found in a closed context. Consequently, it could belong to the Late Roman Period, but the publications place it in the Germanic Iron Age (Thorvildsen 1972, Fig. 19; Hansen 1990, Fig.1; Przybyła 2018, Fig. 10/90:4).

A second, more poorly preserved deer fibula was found in a woman's grave (grave 5) at Vorbasse, ca. 40 km northeast of Veldbæk. Here, it was found in combination with a gilded, four-armed swastika fibula with threaded beads as well as other fibulae, amber and glass beads, a wooden bucket with copper-alloy fittings, and more. The grave dates to period C2 (Hvass 1979, Fig. 8; Przybyła 2018, Fig. 10/90:1, cat. no. 184; Lund Hansen forthcoming). The final parallel comes from Billum, near Varde in central western Jutland. A very poorly preserved animal fibula was found in Grave 1, a rich burial of a woman. Additionally, the grave held a tutulus fibula, gold and silver pins, glass and amber beads, a wooden bucket with copper-alloy fittings, and a Roman glass goblet. The grave dates to the end of period C2 or beginning of period C3 (Frandsen and Westphal 1996; Przybyła 2018, Fig. 10/90:6).

Moreover, deer fibulae with forward-looking heads are known from the rest of Jutland and Zealand. Additionally, deer fibulae are known from southern Norway, and Gotland and Scania in Sweden (Przybyła 2018, Fig. 10/89-90). The most well-known comes from an inhumation grave at Skillinge, Scania, dated to the start of period C2. It shows a deer in profile with an impressive rack of antlers – a motif that is also known from the Continent (Stjernquist 1955, 132, Plate XXIX:11-12; Schach-Dörges 1997, Fig. 60a-c).

The fibulae mentioned above are cast, but the motif of the backward-looking deer is also known from embossed examples: Grave 24 at Engbjerg burial ground west of Copenhagen comprised a rectangular plate fibula with an animal, whose body and legs seem to depict a running deer looking forward. It is made of a thin silver plate hammered flat and covered with a thin layer of gold (Boye 2009, 313-316). The grave is interpreted as that of a young girl, richly endowed with necklaces of glass and amber beads, an antler comb, pottery, copper-alloy fibulae, and a spiral finger ring of Beckmann's type 30. The Engbjerg grave dates to the close of period C1b (Ethelberg 2009, 15; Boye 2009, 315). The well-known plate fibula of gilded silverplate from Tangendorf near Hamburg also depicts a running, backward-looking deer, but here on a round disc. The find, which comes from a secondary burial in a Bronze Age mound, dates to the 3rd-4th century AD (Wegewitz 1941; Werner 1966).

Berta Stjernquist argues that the North European animal fibulae from the 3rd-4th centuries have their origin in the slightly older ones that are very common in the Roman provinces in the 2nd and beginning of the 3rd centuries AD (1955, 133). Animal fibulae in general are especially linked to the Germanic Elbe region (Almgren 1897, 103; Thomas 1967, map 8; Schach-Dörges 1997, 80). According to Marzena Przybyła, the cast, zoomorphic plate fibulae should be seen as a Scandinavian variant. She places the majority in period C2 but also mentions later examples (Przybyła 2018, 383, Fig. 10/89). Interestingly, most of the Scandinavian plate fibulae belong to female graves (Przybyła 2018, Fig. 10/92), but they apparently also occur in burials with weaponry, as at Veldbæk.

Gold spiral finger ring

North of the sword, two pieces of a finger ring were found (Figure 12). The fragments are from a gold spiral ring wound around itself twice with an outer diameter of 24 mm and a total weight of 12 g. This type of simple spiral finger ring belongs to Beckmann's type 30 (Beckmann 1969, 42-43, Table 15; Andersson 1993, 70-75). The type is frequently found in South Scandinavia, where it is

Figure 12. Spiral finger ring found in the middle of the bottom of the grave's southern end. The outer diameter of the ring measures 24 mm (Photo: Henrik Brinch Christiansen).

especially common in northern Jutland, Zealand, and Funen, but it is also known from the Continent and the Mediterranean region (Beckmann 1969, 43; Andersson 1993, 70). In the Esbjerg area, spiral golden finger rings from two graves in Næsbjerg were delivered to the National Museum at the start of the 20th century. The graves contained a relatively rich assemblage of jewellery, including a copper-alloy fibula of type A VII, 196, a silver fibula of type A VII, 205-6, and amber and glass beads (Mackeprang 1943, 101 nos. 110 and 112; Beckmann 1969, nos. 56 and 58; Andersson 1993, cat. nos. 660-661). Gold spiral finger rings are also known from a pair of stray finds in the Malt and Ribe districts (Andersson 1993, cat. nos. 645, 646 and 648), as well as one specimen found by a metal detectorist at Bramming Nygård in the Gørding district, all in the county of Ribe.[5]

According to Kent Andersson, this type is associated with high status contexts that also contain finds such as silver objects, imported Roman pottery, weapons, and in some instances wooden buckets with copper-alloy fittings (1993, 70). Almost all the gold finger rings of type B30 found in graves date to the Late Roman Iron Age (Andersson 1993, 72).

The bucket

A relatively well-preserved wooden bucket bound with copper-alloy straps (x92) stood in the northeastern part of the grave (Figure 13). It is built of 13 yew staves with a width of 2.5-4.5 cm bound with four horizontal copper-alloy straps with a width of 3.0-3.5 cm (Søsted and Siemen 2003, 14). It holds a copper-alloy handle (form 1b after Becker 2008, Fig. 3) fastened to the bucket with two trapezoidal fittings (type IIIa after Becker 2008, Fig. 4) decorated with horizontal incised furrows. The top and bottom of the bucket are ca. 14 cm in diameter, and it is 17.5 cm high, thus it could hold about 2.7 litres of liquid when filled to the rim.

A similar, but not identical, bucket was found 11 km east of the Veldbæk burial in a grave at Sneumgård. It also had trapezoidal handle fittings of type IIIa but with a handle of form 1a (Becker 2008, Fig. 3-4). It is slightly larger than the one from Veldbæk with a height and diameter of ca. 18 cm, meaning it could have held ca. 4.6 litres of liquid (Engelhardt 1873, 315; Becker 2008, cat. no. 54). Most of the ca. 65 wooden buckets with copper-alloy fittings found in present-day Denmark are from Zealand and Funen (Lund Hansen et al. 1995, 233-234) with just a few examples from Jutland, such as Sneumgård and Veldbæk (Becker 2008, maps 4 and 9; Lund Hansen 2009, 178). Moreover, buckets with trapezoidal copper-alloy fittings are especially linked to South Scandinavia, particularly Funen and Zealand. They are widespread in Barbaricum, although buckets with copper-alloy fittings are especially common in northwestern Europe. All the Danish buckets are found in graves from the Late Roman Iron Age, and these graves are all exceptional with far more than the average amount of grave goods (Lund Hansen et al. 1995, 234; Becker 2008, 368).

Figure 13. Copper-alloy clad wooden bucket found in the grave's northeast corner. Height: 17.5 cm (Photo: Henrik Brinch Christiansen).

In the above sections, we have reviewed the Veldbæk grave's form and furnishings. Based on the finds it is clear the grave belongs to the end of pe-

riod C1b or the start of period C2 (ca. AD 250 or shortly thereafter). We can discern that the grave is anchored in the local society both regarding the burial form and some of the grave goods, for example the pottery. On the other hand, it distinguishes itself from the majority of graves from this period with, for example, a full set of weapons, rich jewellery, and imported Roman goods.

In the following we will expand our horizon and place the Veldbæk grave in a wider context.

Veldbæk in local, regional, and social contexts

Due to the location, assemblage and date of the Veldbæk grave, it belongs in the southern group of weapon burials defined by Jytte Ringtved, which is to say the area south of Randers fjord/ Agger Tange (1988, 98-110). Weapon burials and graves with furnishings similar to the Veldbæk grave from Ringtved's southern group in the Skast

Site	Date	Weaponry: Spear, Javelin, Shield boss, Sword	Jewellery	Gold Finger ring	Imports	Military belt	Bucket with copper-alloy fittings
Veldbæk grave C	C1b-C2	S, J, Sw, Sb	Silver fibula	B30	carnelian, gaming pieces	X	X
Jens Kusks Vej grave JV	C1b	S, J (type Svennum) arrow?	Silver fibula	B30			
Jens Kusks Vej/ Tjæreborg grave KK	C1b	S, J, Sw with chape, Sb				with glass mosaic	
Sneumgård sb.17	B2-C1b	S (type 25)	Swastika fibula, silver fibula, neck ring, amber and glass beads				X
Gammelby grave II	C1-C2	Sw					
Næsbjerg	C1b-C2	Sb (type 6)					
Næsbjerg, grave E	C1b	4 arrows	Copper-alloy fibula (M III,1/ Ethelberg 5b)				
Tornfeld (NM 19397-402)	C2-C3	Sb	Copper-alloy fibula				
Faurfeld (NM 19398)	C3-D	Sb					
Næsbjerg By	C1b		Copper-alloy fibula A VII,186, Silver fibula A VII, 205-06, amber and glass beads	B30			
Næsbjerg By grave AI	C1-C2		Amber- and glass beads	B30			
Sneum	B2	S (single-edged)		X	cauldron		

Table 1. Weapon burials and other rich graves from the Late Roman Iron Age from Skast district, Ribe County (Skast herred, Ribe amt).

Figure 14. Important weapon graves from Roman Iron Age that are mentioned in the text and are within a radius of 17 km from Veldbæk. Included here are also Brokær and Oksvang (marked with orange) (Graphic: Lars Grundvad).

district (Danish: herred) are shown in Figure 14 and Table 1. It must be noted that the discoveries and excavations were made at different times, with varying methodology, and with a range of research focuses. With these reservations, a brief description of the finds follows.

Two weapon burials from Jens Kusks Vej in Tjæreborg (8 km east of Veldbæk) were part of a larger burial ground, where impressive finds dated to the Late Roman Iron Age were excavated, among others a snake head ring and a Hemmoor bucket. The two graves held respectively a younger and an older man. The older man in Grave KK was buried with exceptional equipment in the form of a shield, sword, shafted weapons, and balteus disc from a sword belt (Siemen 1987). The younger man in Grave JV was equipped with shield, spear and javelin as well as items only found in the richer circles such as a silver fibula, and one course of a gold finger ring (B30). The excavator interpreted the men as father and son (Siemen 1987; Siemen and Stoumann 1996, 143).

At Sneumgård (11 km east of the Veldbæk grave), a spear head of Ilkjær's type 25 was found and, additionally, seven pots and sherds from four others, fragments of a gilded silver buckle, pieces of a gilded silver fibula, parts of a gold neck ring, amber and glass beads, and a wooden bucket much similar to the one from Veldbæk (Siemen and Stoumann 1996, 147). However, the finds cannot securely be assigned to a specific grave (Engelhardt 1873, 315; Mackeprang 1943, no. 114; Ilkjær 1990, cat. no. 647). Other noteworthy finds include a sword in a wooden scabbard from Gammelby Grave II at Storegade in eastern Esbjerg (Siemen and Stoumann 1996, 145-146), and a shield boss of Ilkjær's type 6 from Næsbjerg, and arrow heads suited for warfare in Næsbjerg grave E (Ringtved 1988, 172, 218; Ethelberg 1990, 116, Fig. 55; Ethelberg 1992, 116).

Two graves from the end of the Late Roman Iron Age that were not professionally excavated come from Tornfeld and Faurfeld, both containing shield bosses of Ilkjær's type 8. An additional two graves from Næsbjerg By that contained gold finger rings of type B30 can also be mentioned (Mackeprang 1943, 101 nos. 110 and 112; Beckmann 1969, nos. 56 and 58; Andersson 1993, cat. nos. 660 and 661). All in all, four gold rings of the same type were found within a quite limited area indicating

that the area holds some sort of special significance during this period.

The Sneum grave from the Early Roman Iron Age should also be mentioned in this context as it, among other, contains a single-edged sword, gold finger ring, and a cauldron of Roman origin. The grave indicates some degree of continuity in the Sneum area, as it is approx. 100 years older than the Sneumgård find mentioned above.

Thus, from a very small area within a radius of 17 km of Veldbæk, ten weapon burials from the Late Roman Iron Age have been registered. Moreover, it seems like the area was home to important people well before the Veldbæk grave was dug. The question is how to interpret this concentration.

The weapon burial tradition especially flourished at the close of the pre-Roman Iron Age and in the Early Roman Iron Age but wound down during the Late Roman Iron Age (Lindeneg Nielsen 1975; Martens 2002; Pauli Jensen 2015 with additional references). With this in mind, the Veldbæk grave and the many weapon burials in the vicinity are interesting, not least because only ca. 10 % of the weapon burials (about 20) from the Late Roman Iron Age have full weaponry (including Veldbæk and Jens Kuskvej Grave KK, see Table 1). However, the shield fittings from all the graves in the Esbjerg area are of iron, which does not place them high in the military hierarchy identified in the weapon sacrifices. On the other hand, the exceptional military belt with gold-plating definitely belongs to the higher military echelons (Carnap-Bornheim and Ilkjær 1996, 483-485).

The Veldbæk grave's impressive weaponry reflects both close local connections and an affiliation with a widespread elite milieu that extends beyond southwestern Jutland. Especially, imported objects such as the gaming pieces and the carnelian gemstone from a Roman finger ring, but also the animal fibula and the bucket can be seen in a series of so-called princely graves in the Haßleben-Leuna horizon (Schulz 1933, 43-45, Taf. 1, 4-6, 18, 22; Schultz 1953, 35-67, Taf. II, XIII, XXVII; Becker 2001, 154, 159, 204-214 Storgaard 2003, 119-123). The affiliation to this elite environment is underlined in both equipment and in the motif of the animal fibula which can be interpreted as another indication of common shared symbolic elite expressions (Rau 2012, 381-383).

Veldbæk: at the centre or on the periphery?

Several models of the structure of Late Roman Iron Age society generally and in southern Jutland specifically have been proposed. They are primarily based on grave finds and only rarely encompass other types of material. It is clear that a more in-depth study of organization and development would be achieved if, for example, the recent years' excavations of settlements in the area were included in the analyses. This is not possible in the framework of this article, so with that reservation we will focus on the graves and their evidence.

Per Ethelberg published a Late Roman Iron Age period C1b inhumation from Hjartbro in southern Jutland in 1992 (1992). The grave goods included full weaponry (spear, javelin, sword, and iron shield boss with decorative copper-alloy band), fragments of a prick spur ("stuhlsporn"), and a gold spiral finger ring (B30) (Ilkjær 1990, cat. no. 279; Ethelberg 1992). Using the grave at Hjartbro as a starting point, Ethelberg proposes a weapon burial horizon for southern Jutland. This represents the establishment of a warrior aristocracy surrounding a minor king or noble residing in Vorbasse, evidenced by the size of the settlement there and its central placement in relation to the southern group's weapon graves (Ethelberg 1990, 113-119; Ethelberg 1992, 114-118).

In contrast, Stig Jensen proposes the existence of small, independent, parallel power centres (1991, 85-86). This interpretation is echoed by Palle Siemen and Ingrid Stoumann (1996, 145-146), who propose that magnates or chieftains with weaponry were controlled by a chiefly lineage – perhaps from Sneumgård or Oksvang, where gold snake head rings and, in the case of the burial ground at Sneumgård, a Hemmoor bucket have been found. They argue that the relatively numerous Late Iron Age weapon burials from the Esbjerg area can be interpreted as a range of local military leaders that led to the establishment of a martial hierarchy of

a more permanent nature (Siemen and Stoumann 1996, 144-146). The distribution of rich graves in the Esbjerg region could indicate a series of smaller units within a hierarchy led by a magnate that controlled a host of common warriors from the periphery who were not buried with such pomp and wealth (Siemen and Stoumann 1996, 145-146). In this, they reject Ethelberg's theory on one hand, but use the same insignia (snake head rings) to identify a new centre on the other.

The problem is that if one recognizes the existence of one alliance with snake head rings as status and allegiance markers, it follows that there must have been other groups that were not a part of it. If two (or more) groups tried to distinguish themselves from each other, would they use the same marking to indicate their fellowship? Or would other alliances employ a different visual identity to distinguish themselves? One could, for example, de-emphasize copper-alloy or silver shield fittings in favour of impressive gilded military belts to show membership in another group. This allegiance could be reflected in the rich South Scandinavian graves with similar plated ornaments mentioned earlier, but also aided by the luxurious belts found in the large weapon sacrifices from the Late Roman Iron Age. Perhaps in the Esbjerg area we have yet another of the defeated groups whose equipment was sacrificed at Illerup, Ejsbøl, Nydam and Vimose? Or perhaps one of the victorious parties (Pauli Jensen 2017, 75-80)?

But how does this relate to the general Roman Iron Age power structure in the Esbjerg area? Even though the recently discovered Sneum cauldron grave mentioned above is around 100 years older than the Veldbæk grave, it supports the idea that for generations one or more rich, powerful families at Sneumgård were affiliated with the regional ruling lineage from Veldbæk, Tjæreborg, Gammelby and Næsbjerg. The question is whether the rich graves show a need for placing a new leader at the helm of a given area or whether one family or lineage controls an area for generations? Lars Jørgensen described how a family's status was transmitted through grave goods within a family group in burials on Bornholm from the end of the Late Roman Iron Age through the Early Germanic Iron Age (1988, 38-39). He suggests that only one representative of each generation was buried with grave goods that indicate high status. Is it possible this is similar for the Esbjerg area? If so, the consequence would be that instead of discussing nobles, we should emphasize noble lineages, as most recently proposed by Rune Iversen (2011, 101). In the case of the Esbjerg area this would mean that continuity in the suite of grave goods could reflect the same family's hold on power over their realm – "family" understood in the broadest term possible.

The Veldbæk grave's combination of weapons, opulent belt, Roman imports, and locally produced luxury goods demonstrate a link to a martial hierarchy, a diplomatic understanding, and connections to powerful families in other areas of South Scandinavia and on the Continent. Both military and political power were (and still are) essential elements for the preservation and transfer of power. By visually signalling the ability and the will to use violence, as well as showing ties to important allies, the magnates of the Esbjerg area retained their power for centuries. Alliances and trade ties presumably shifted many times, but the area never lost its importance.

Final remarks

With the excavation and then rediscovery of the materials from the rich weapon burial with imported goods from Veldbæk, an important contribution was made to our understanding of the distribution of power in the Esbjerg area in the Late Roman Iron Age. The grave belongs to a group of especially rich burials in the Esbjerg region that constitute a well-documented power centre with close connection to continental centres of power of the Haßleben-Leuna-horizon. The southwestern Jutland group's extent and role is not yet fully defined, but a picture of a leading lineage based at Sneum emerges.

If we accept a noble lineage placed at Sneum, it is a clear break with Ethelberg's theories from 1992 that posit the population of the Esbjerg area being controlled by a family based in Vorbasse. Rather, Veldbæk, along with Sneum, show a noble lineage that has a different visual identity and demonstrates its military alliances by other

means than the Vorbasse dynasty. Therefore, the Iron Age power structure in the area that is today Denmark was more complex than proposed in the 1990s. It shows a picture of multiple small chiefdoms or areas of control that each manifested themselves visually by means of a distinct cultural identity. An identity that is best seen archaeologically in the grave material.

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Notes

1 Ribe county, Skast district, Esbjerg parish, sb.nr. 170 (190503-170); https://www.kulturarv.dk/fundogfortidsminder/Lokalitet/75882/

2 The excavation is registered as ESM 2249. Report by Kasper H. Søsted and Palle Siemen. Excavation in 1997 was by Kasper H. Søsted and Ulla Mejdahl while Palle Siemen excavated the site in 1999.

3 ESM 1917 (190503-30; https://www.kulturarv.dk/fundogfortidsminder/Lokalitet/164425/): Report written by Hemming Zaramella Hansen and Palle Siemen. ESM 1358 (190503-256; https://www.kulturarv.dk/fundogfortidsminder/Lokalitet/117425/): Dated to the Late Roman Iron Age/Early Germanic Iron Age. SJM 382 (190503-331; https://www.kulturarv.dk/fundogfortidsminder/Lokalitet/214308/): Dated to the Late Roman Iron Age/Early Germanic Iron Age. Report written by Sarah Qvistgaard and Claus Feveile. SJM 979 (190503-368; https://www.kulturarv.dk/fundogfortidsminder/Lokalitet/241182/): Dated to the Late Roman Iron Age/Early Germanic Iron Age and excavated under the leadership of Tobias Danborg Torfing.

4 The interpretation is by the authors based on Anette Adomat's drawing juxtaposed with a photo of 2/2 twill textile from Mannering 2017, 16.

5 SJM 949 x35, kindly shared by Claus Feveile; http://sol.sydvestjyskemuseer.dk/?mode=detail&genstandsnr=200360395&side=2&antal=21&indexno=35&search=sjm%20949&sid=2c079756e61c634fb06a80c4b53354e6&tt=43). FF 239820.

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Finding Sliesthorp? The Viking Age settlement at Füsing

Andres Siegfried Dobat[1]

[1] Department of Archaeology and Heritage Studies, School of Culture and Society, Aarhus University, Moesgaard Allé 20, 8750 Højbjerg, Denmark (farkado@cas.au.dk).

ABSTRACT

In 2003, a hitherto unknown Viking Age settlement was discovered at Füsing in Northern Germany. Finds and building features suggest that the site was an estate centre and assembly place. As such, the site flourished from around 700 to the end of the 10th century. With Hedeby/Schleswig and the Danevirke in direct eyesight, Füsing is embedded in a special topographical context. What in other circumstances would have been yet another high-status estate centre to be discovered in South Scandinavia thus takes on a different significance. It is suggested that Füsing – among other functions – served as a seasonal garrison and naval base in the defensive system of the Danevirke. As such, the site may be identical with the mythical Sliesthorp, which is mentioned in early written sources as the centre of power of the first Danish kings in this disputed border region of their realm.

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Introduction

At the initiative of continental traders and early Danish royal power, Hedeby, the largest of the Viking Age emporia in Scandinavia, located in modern day Schleswig-Holstein in Northern Germany, started to flourish in the early 9th century. This laid the foundations for a long-term development, leading to the growth of the medieval town of Schleswig, which was later replaced by Lübeck, the centre of the Hanseatic trading network, a function it eventually lost to Hamburg, one of the economic centres of the modern world.

According to the Frankish Annals, a site called Sliesthorp played a key role in the establishment of Hedeby. The annals account of a succession of decisive events in the first decade of the 9th century. At this time, the Danish king Godfred emerged on the scene as a somewhat reckless but nevertheless serious opponent of the Franks. In 808, he is referred to as the main protagonist behind the establishment of the international emporium Hedeby and the instigator of the Danevirke, a linear rampart system that was to function as a defensive barrier against attacking forces from the south (Dobat 2008) (Figure 1). The same source refers to a visit by the Danish king to Sliesthorp in 804, together with his fleet and warriors, to negotiate with the Frankish emperor Charlemagne. On both occasions, Sliesthorp (referred to in 804 as *locum qui dicitur Sliesthorp* and in 808 as *ad portum, qui Sliesthorp dicitur* [the place/harbour which is called Sliesthorp]) seems to have been the base of operation for the Danish king's endeavours (Frankish Annals, 79, 89). These are the only written references to the enigmatic Sliesthorp, which etymologically can be interpreted as referring to the '*farm or village at the Schlei fjord*', and which is not referred to again in any of the later written sources, where Hedeby is referred to as Slesvic or Hedeby/-um (Laur 1955; Radtke 1999, 365).

Traditionally, these written references to Sliesthorp are connected with Hedeby, the well-known settlement at Haddeby Bay, which oldest roots can be traced back to the 8th century, and which flourishes from the early 9th century onwards (Jankuhn 1986, 64; Hillberg and von Carnap-Bornheim 2007, 201; Schietzel 2014, 34).

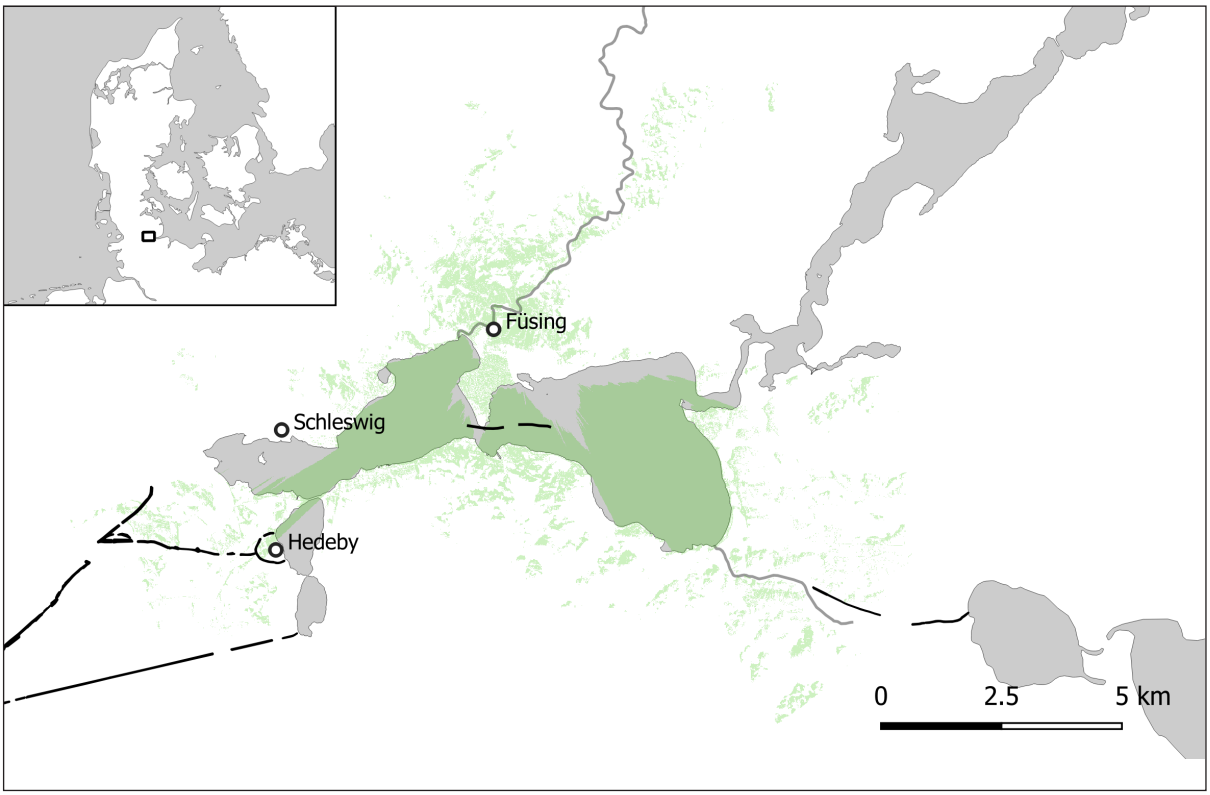

Figure 1. Füsing and important sites and monuments in the inner Schlei region (Hedeby, Schleswig, the earthen rampart sections of the Danevirke and the barrage/barrier at Reesholm). Green layer: viewshed analysis indicating visibility of surrounding terrain and structures at the site (Graphics: Casper Skaaning Andersen, Archaeological IT, Aarhus University).

However, the accounts in the Frankish Annals are not very specific, and all they imply is that Sliesthorp was positioned at the shores of the Schlei fjord and somehow connected with both Hedeby and the Danevirke.

In 2003, metal detector surveys led to the discovery of a hitherto unknown Viking Age settlement site at Füsing (LA 73), on the northern shores of the Schlei Fjord, within the range of vision from Hedeby and in direct connection with the Danevirke (Figure 1). The site has since been the subject of intensive metal detector and geomagnetic surveys, and from 2010 to 2014, excavations were conducted on the site.

Finds and building features, notably three-aisled longhouses and pit houses (sunken featured buildings) indicate a residential 'farm-like' complex with various auxiliary buildings. The settlement flourished from around 700 to around 1000, serving as an assembly place with economic but first and foremost military/defensive functions. As such, the site is not only a new possible candidate for Godfred's Sliesthorp besides Hedeby; it also offers new possibilities for broadening our understanding of the Viking Age emporia and the character and development of the economic and political networks that connected early medieval Europe and Viking Age Scandinavia.

Regional setting and hinterland

Positioned on the elevated terrain of a sandy moraine plateau, Füsing is surrounded to the west and south by the inner section of the Schlei Fjord (the 'Grosse und Kleine Breite') and to the north by the Füsing River. Surrounded by water and/or marshy ground on three sides, the site was situated in a strategically advantageous and naturally secured area.

With the Schlei Fjord, penetrating the Jutland peninsula from its eastern coast and leading up to Hedeby and Schleswig, Füsing was connected to an important waterway, both on a supra-regional and on a local level (Figure 1 and 2). In a more regional perspective, the Füsing River constituted a transport route, allowing at least smaller vessels to penetrate further into the site's hinterland, the

Figure 2. View over the site (in the centre) and the inner part of the Schlei Fjord from northeast in early August 2006. Top left: Haddeby Bay and the settlement area of Hedeby; top centre: the area of medieval Schleswig (Photograph: Esben Schlosser Mauritsen).

southern part of the landscape of Angel. Here, 9th- and 10th-century grave finds point to a densely settled landscape. Of particular interest is a dense cluster of chamber graves and weapon graves with riding equipment (Lemm 2016, 106). They represent members of an aristocracy with direct affiliations to the 10th-century Jelling dynasty (Randsborg 1980, 129) and reflect a recolonisation in the aftermath of the conquest and incorporation of the Schleswig region into the Jelling dynasty's sphere of influence (see Andrén 1983, 53; Unverhau 1990, 22-28).

Both the northern shores of the Schlei Fjord – here forming a protecting bay – and the river provided natural anchorages and protection for large numbers of vessels. Seen from the fjord, the position of the settlement was prominent and visible within a distance of nearly 10 km. In the same way, it is possible, from the elevated position of the settlement plateau, to overview most of the inner Schlei Fjord, from Missunde in the east to the narrow entrance to the Haddebyer Noor and the settlement area of Hedeby as well as the area of medieval Schleswig (Figure 1 and 2).

Also visible from the settlement plateau was the peninsula of Reesholm, forming a bottleneck between the northern and southern shores of the fjord 1,500 m south of the settlement. Around 737 (according to dendrochronology), a massive barrage or barrier was constructed around the tip of the Reesholm peninsula (Kramer 1994; Auer and Nakoinz 2017). The structure consisted of square-shaped log-built boxes, approximately 4 m in length and width, with semi-worked logs and planks primarily of oak. It formed a 1,600 m long, linear structure with an east-west orientation, extending both east and west of the southern tip of the Reesholm peninsula. Chronologically, the structure is linked to the large-scale refurbishing and extension of the main defensive line of the Danevirke (the so-called 'Main Wall'). It was a central element of the overall defensive system of the Danevirke, protecting the Jutland peninsula against intruding forces from the south. In this system, the bottleneck south of Reesholm, where the fjord's northern and southern shores originally were less than 150 m apart, was of great strategic significance. Not only did it constitute a suitable point of control of seaborne traffic to

Figure 3. Combined result of non-invasive investigations at Füsing between 2003 and 2014. Yellow: geomagnetic and growth anomalies indicating pit houses and other structures (based on survey conducted by the Institute of Geosciences, Department of Archaeo-Geophysics at CAU-Kiel, Harald Stümpel and Esben Schlosser Mauritsen); green: metal detector and other surface finds (Graphics: Casper Skaaning Andersen, Archaeological IT, Aarhus University).

Hedeby and Schleswig and vice versa. It was also a vulnerable point in the defensive line of the Danevirke, making it a potential crossing point over the fjord for hostile forces coming from the south. The original function of the enormous construction remains dubious. One of its purposes may have been to prevent hostile forces from bypassing the Danevirke system by crossing the fjord at Reeshol. Besides that, one cannot rule out alternative or additional functions, such as that of a fortification of a naval base and harbour or a navigational barrier, facilitating the control of the waterway.

Discovery, methodological background and history of the investigations

Isolated stray finds and undocumented observations of prehistoric features on and around the settlement plateau of Füsing since the 1950s had long indicated Viking Age settlement activity. It was, however, not until the first metal detector surveys that the Füsing site could be positively identified as a large settlement site. The initial metal detector surveys were conducted in 2003, following up on the results of a pilot study on the maritime cultural landscape of the Schlei Fjord during the Viking Age (Dobat 2003). They led to the discovery of the first metal artefacts, including scrap metal and fragments of dress accessories (Figure 3).

In 2005, a geomagnetic survey was conducted by the Department of Geophysics/ Institute of Geological Sciences, University of Kiel, using a high-resolution fluxgate magnetometer. The survey covered most of the supposed settlement area and resulted in the identification of a large number of more or less well-defined, positive geomagnetic anomalies (Figure 3). During the dry summer of

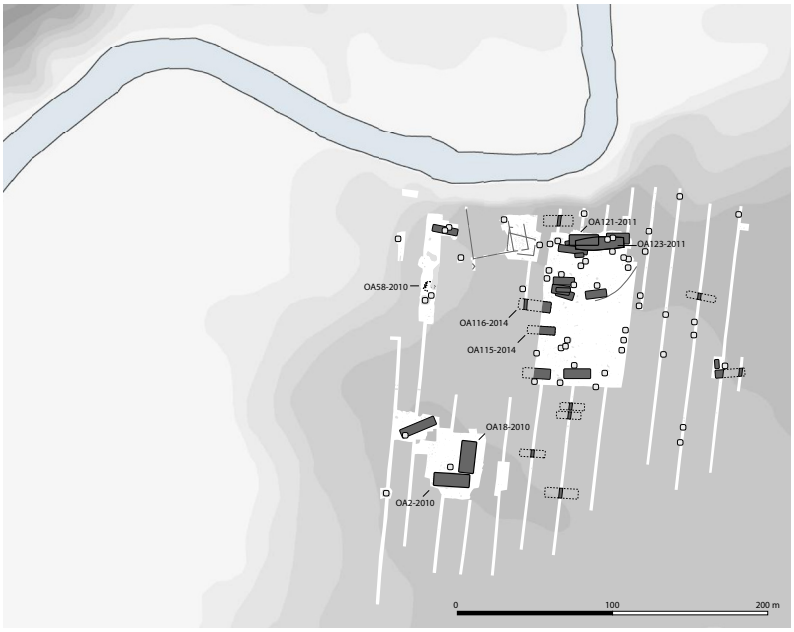

Figure 4. Total result of the four excavation campaigns from 2010 to 2014 with pit houses, longhouses and other building structures (Graphics: Casper Skaaning Andersen, Archaeological IT, Aarhus University).

2006, a series of aerial photographs were taken and analysed, confirming the evidence from the geomagnetic survey (on the background and results of the non-invasive surveys carried out prior to the excavation campaigns, see Dobat 2010).

In 2010, a generous donation by the Danish Carlsberg Foundation opened up the possibility to conduct the first excavations at Füsing. During four campaigns between 2010 and 2014, excavations uncovered 12,700 m² of the settlement area (Figure 4). The excavations were organised and run by Aarhus University in cooperation with the Archäologisches Landesamt Schleswig-Holstein and the Stiftung Schleswig-Holsteinische Landesmuseen. Campaigns in 2011, 2012 and 2014 were training excavations for students from Aarhus University (DK) and Harvard University (US), respectively. Their primary goals were

1) to gain insights into the overall structure of the site;
2) to identify the dominant types of buildings; and
3) to gain a better understanding of the site's chronological and functional background.

With the aim to get a representative picture of the settleent structure, the excavation followed a twofold strategy including the digging of linear trial trenches and the subsequent excavation of larger areas, where trial trenches had contained features of particular interest.

The settlement[1]

Geomagnetic surveying and the aerial photographs provided a first insight into the size and overall structure of the Viking Age settlement. Seen in combination with the distribution pattern of metal detector finds, the non-invasive surveys indicate that the total spatial extent of the settlement was between 60,000 and 85,000 m² with a focal point of activities on the elevated ground along the southern riverbank in the settlement's northern part.

In light of the general appearance of settlements in Viking Age Scandinavia, the majority of the 100+ more or less well-defined growth- and geomagnetic anomalies can be interpreted as pit houses (compare Brown, Goodchild and Sindbæk 2014, 4.4) – an interpretation which is largely supported by excavation data. Pit houses obviously constituted a dominant architectural feature of the site. As anticipated, however, neither the geomagnetic survey nor the aerial photos resulted in the identification of any post-built structures at Füsing.

Most of the recorded houses and other forms of constructions are post-built houses of different shapes and sizes (Figure 4 and 5). The 24 longhouses of Viking Age date are mainly typical three-aisled constructions, consisting of a varying num-

1 A complete dataset covering all data generated during the investigations at Füsing between 2003 and 2014 can be accessed via https://museumsgis.dk/projekt/fusing/

Figure 5. The excavation in the north-eastern part of the settlement. Discernible are 15 pit houses and several longhouse constructions, with the biggest of the longhouses (OA123-2011) hitherto discovered at Füsing in the trench's northern part (Graphics: Casper Skaaning Andersen, Archaeological IT, Aarhus University).

ber of pairs of roof-supporting posts, lines of wall posts and, in some cases, entrance sections. Of these, 15 have been recorded in their entirety, while the remaining ones have only been identified partially. The longhouses at Füsing vary considerably in size, with the longest building (2011-OA123) measuring between 28 and 31.25 m (depending on the interpretation of the record) in length and 8 m in maximum width. Characterised by a maximum width of 8 m and six pairs of roof-supporting posts as well as a substantial wall construction with a curved alignment, the building is a classic example of longhouse architecture in Viking Age Scandinavia (Skov 1995; Eriksen et al. 2009, 29-66). Most of the houses that have been documented in their full spatial extent, however, are considerably smaller, ranging between 6 and 20 m in length. All of the longhouses except one are orientated east-west. Finds of fragments of clay daub with a coating of chalk whitewash suggest that at least some of the longhouses at Füsing had white-coloured walls (Henriksen and Holst 2014).

The three-aisled longhouse is emblematic of Iron and Viking Age Scandinavia, and all the buildings discovered at Füsing fit well into the broad spectrum of longhouse architecture of farms and manors in the eastern parts of Jutland and the Danish isles of this period (e.g. Christensen 2016, 133-150). Based on size and construction, most of the longhouses at Füsing probably served as secondary stable or storage buildings. Another functional significance can be assumed for the few bigger longhouses, notably OA123-2011 but possibly also OA2-2010 and OA121-2011 (Figure 4). In light of their special topographic position and relation to other buildings on the site, they most likely served as living quarters, forming the centre of a settlement complex.

Besides post-built structures, the dominating element of the settlement at Füsing was pit houses (Figure 4 and 5). Of the 52 pit houses recorded in the excavated area and the trial trenches, 25 have been fully investigated. Assuming a more or less even spatial distribution, the total number of pit houses at Füsing can be hypothetically extrapolated to between 250 and 350 individual features. It is possible to distinguish between two basic types of pit houses, with the clear majority (type 1) being characterised by a basic construction consisting of a pair of roof-supporting posts, originally supporting a presumably tent-like roof, and a line of wall posts placed at irregular intervals. While some are characterised by a round or oval ground plan, others tend to have a wall with a more rectangular shape with distinctly rounded corners. In both shape and construction, the pit houses at Füsing resemble the dominating type of pit house known from an abundance of settlements in South Scandinavia (e.g. Thomsen 2009; Tummuscheit 2011; Schade 2018, 25-33). A different constructional solution and hence shape characterises a smaller group of houses (type 2) with a strictly rectangular ground plan, one to four corner posts in addition to the roof-supporting ridge posts, and a wall trench suggesting a wall consisting of horizontal planks.

A limited number of pit houses at Füsing show traces of a more permanent use in the form of cultural layers (floor layers), and only one third was equipped with either a fireplace or a stone-built

oven construction. Most of the pit houses at Füsing are characterised by a rather flimsy construction (with notable exceptions), which can be indicative of largely seasonal usage. This is supported by the lack of evidence of craft and production activity in the primary context of the pit houses' floor layers (apart from tools for textile work such as spindle whorls and loom weights, which were found in most of the pit houses). All this suggests that the Füsing pit houses were used as dwellings, mostly on a seasonal or cyclical level.

Besides the pit houses, pits of varying sizes and fill consisting mainly of fire-cracked stones constitute another characteristic feature at the settlement. The production of foodstuff or beverages seems to be the most plausible functional explanation. One group of stone-filled pits with a central pit containing the deposition of an axe head together with a large iron knife (OA58-2010) may also suggest a cultic background. Ritual activity, notably the deposition of butchery waste and weapons, is a characteristic feature of elite residences across Scandinavia (Helgesson 2004, 226; Jørgensen 2009, 338). It is possible that this group of stone-filled pits has an equivalent background and reflects the sort of cultic/religious activity that was closely associated with chiefly estate centres and the military and religious authorities residing at these sites.

In two areas, the excavations led to the discovery of longhouse complexes: On top of the plateau in the southern part of the settlement, where the geomagnetic surveying had not indicated any significant features, two three-aisled longhouses were recorded in 2010: one larger building (OA2-2010) with five pairs of roof-supporting posts, curved long-walls and a length of 24 m, and one slightly smaller (OA18-2010) also with five pairs of roof-supporting posts and 20 m in length. Based on the architectural traits and carbon-14 dating (see appendix 1), the structures can be assumed to belong to the settlement's later phase, probably the 10th century.

On the high plateau in the northern part of the settlement, the area which according to the results of both surface surveying and excavation appears to have been the focus of the Viking Age occupation at Füsing, more than six partly intersecting post-built longhouses could be documented, together with a section of a palisade fence (Figure 5). The latter was probably not of defensive character, but merely served to limit access and/or demarcate an area reserved for special activities. The large longhouse (OA123-2011) was recorded here, on the very top of the natural settlement plateau. The house was built on the same spot in two successive phases at some point around 900 or the first half of the 10th century according to architectural traits, carbon-14 dating (see appendix 1) and stratigraphic relations. The building was burned down, as is indicated by substantial amounts of charcoal and other carbonised or burned material in the filling of the posts belonging to this particular building phase. In one of the two entrance posts, the excavation resulted in the discovery of a bodkin-type arrowhead. In the second entrance post, a caltrop (or foot trap or crow's foot) was found (Figure 6). Well known from the high medieval period until recent times, when they were used effectively against cavalry attacks, the caltrop is the first of its kind from a secure Viking Age context. The find and its context in one of the entrance posts calls to mind the brutal accounts of family feuds in later Norse written sources, when an opposing party was enclosed in the family hall, which was then set on fire, for instance in Njal's Saga (chapter 129). Although not provable, a similar event may have been the background for the burning of the largest of the Füsing longhouses, with the arrowhead and the caltrop reflecting the final stage

Figure 6. The iron foot trap or crow's foot discovered inside the filling of one of the entrance posts of the large longhouse OA123-2011 (before restauration) (Photo: the author).

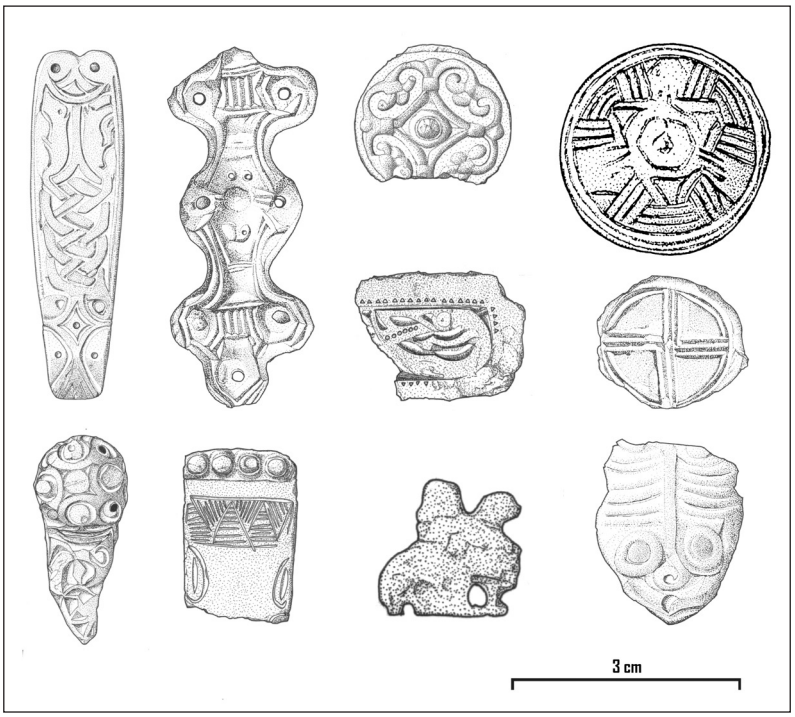

Figure 7. Selection of typical metal detector finds from the Füsing site with Scandinavian, Continental and Western European objects dating from the 7th to the 10th centuries. The width of the disc-brooch at the top right is 2.6 cm (Drawing: Gert Hagel-Bischof, Stiftung Schleswig-Holsteinische Landesmuseen).

of a violent conflict, probably at some point during the first half of the 10th century.

The finds

Systematic metal detector surveys and excavations in the search for artefacts buried in the plough soil at the site have produced a comprehensive finds assemblage (for a more detailed discussion of the artefacts produced prior to the excavations between 2010 and 2014, see Dobat 2010, 151-171) (Figure 7-10). During excavations, the secondary filling material of post hole features and pit houses as well as the pit houses' floor layers was sieved through a two-millimetre strain, which resulted in a large number of small-sized artefacts, notably beads and glass fragments (Figure 9 and 10b).

The finds resulting from detector surveys consist of mainly non-ferrous metal objects (signals indicating iron objects were discriminated). The majority of the assemblage consists of functionally unidentifiable fragments of predominantly lead and copper alloy, among these ingots, melting taps and a single crucible, which reflect craft activity. A touchstone and other items indicate the presence of specialised craftsmen practicing not least bronze casting and possibly even glass working, as is suggested by a small number of tesserae and melted glass.

One must ask the question whether indications of craft and production necessarily reflect a central function of the site per se, or whether they are connected with the site's function as an assembly place and military stronghold. Not least warriors would have had the need to repair and maintain their equipment and infrastructure on a daily basis, which could be an alternative explanation, notably for those finds indicating metalwork (compare Ulriksen 2018, 379; Hadley and Richards 2018, 11). Dress accessories such as brooches, pins, pendants and various types of fittings primarily of copper alloy represent a significant amount of the assemblage of surface finds and finds from the pit houses (Figure 7). The vast majority are common Scandinavian types, paralleled in the broad spectrum of especially South Scandinavian grave and settlement assemblages from the second half of the 7th to the 10th century.

A small group of artefacts attract particular attention due to their more exclusive character or their qualitative manufacture. Among these are several high-status objects of Carolingian origin and Scandinavian pieces of figurative metalwork which can be associated with the aristocratic sphere (Figure 8) (Dobat 2010, 163-169). The latter applies, for instance, to a fragment of a gilded mount from an exclusive type of 10th-century harness bow (2003-X1296). As pieces of highly figurative art displaying pre-Christian mythological

Figure 8. Selection of finds of special character from Füsing. Animal head-shaped clasp mount (top left); fragment of a mount from a harness bow (bottom left); Carolingian mount of unknown function with glass inlay and ornamentation in Tassilokelch style (centre); Carolingian strap end with silver and gold plating (bottom right); Trimisses with secondary eyelet and cross-shaped ornament (top centre); golden arm-ring (top right). Maximum length of the arm-ring 73 mm (Photo: the author).

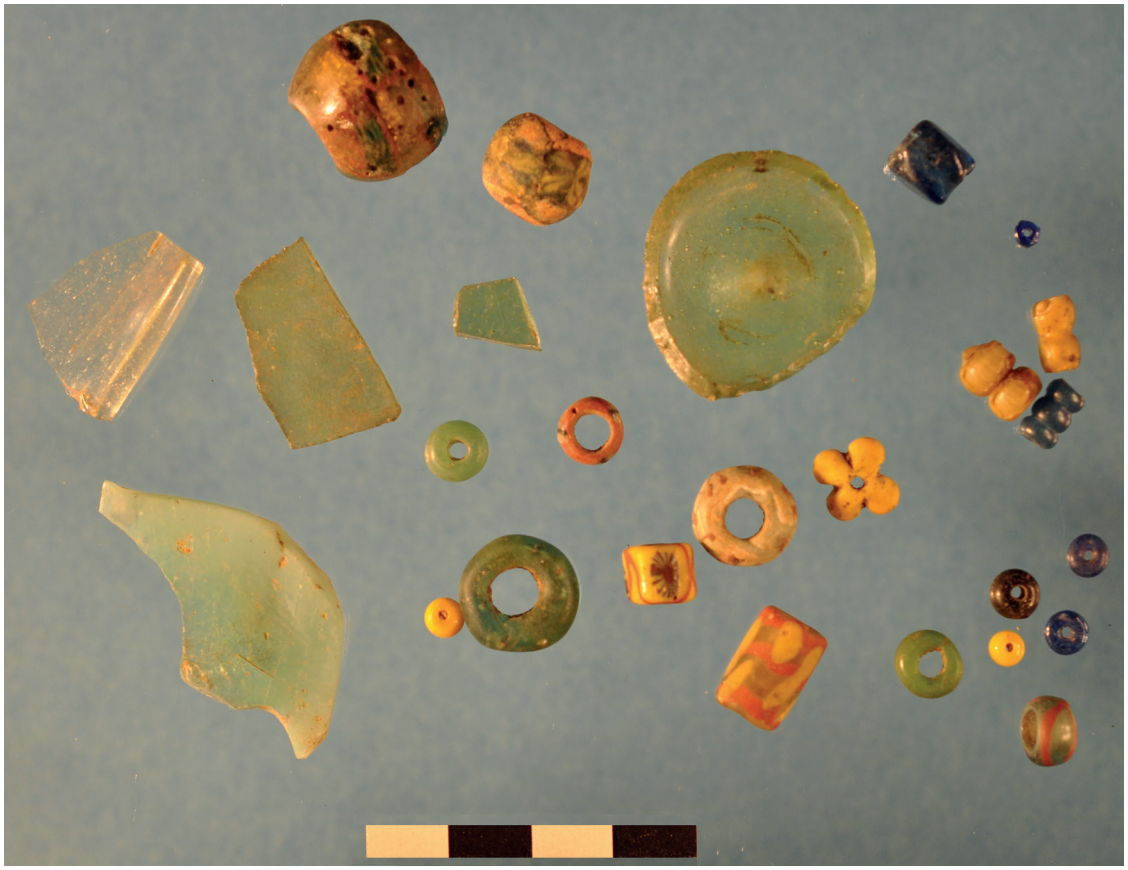

Figure 9. Glass finds. Vessel shards and flat glass (left) and beads (right) from the filling material of pit houses (Photo: the author).

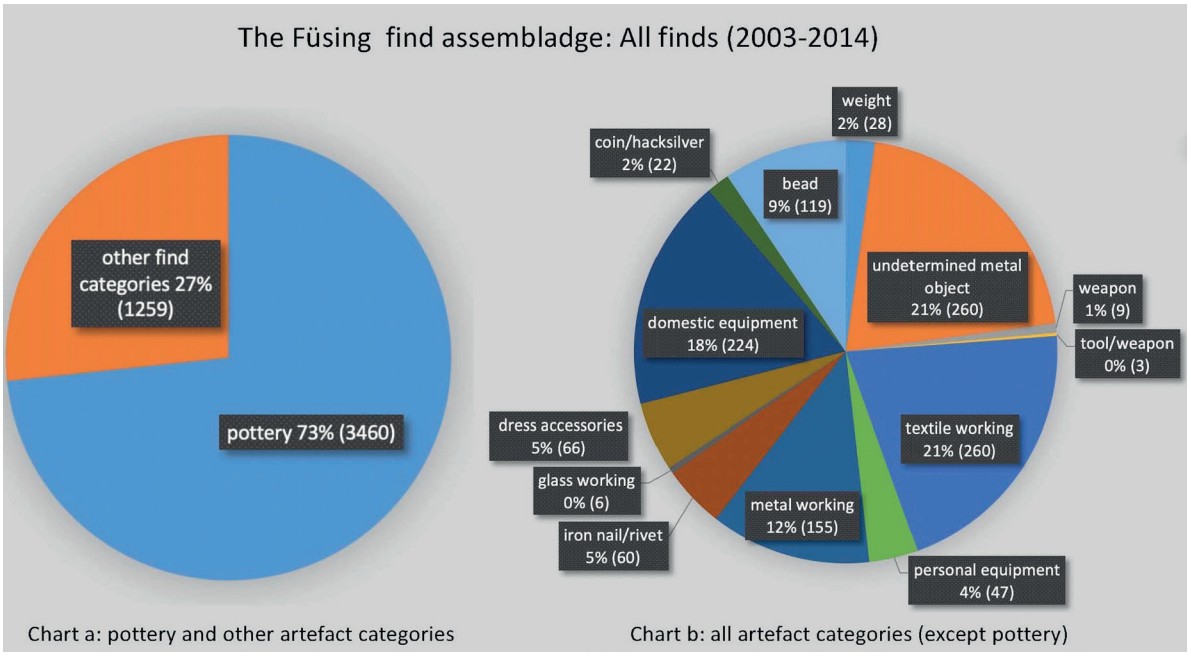

Figure 10. The Viking Age finds assemblage recovered at Füsing between 2003 and 2014. Chart a: all finds; chart b: all finds except pottery from plough-soil context and excavated features (Graphics: the author).

concepts, this and comparable artefacts represent the highest standard of craftsmanship in figurative metalwork in Viking Age South Scandinavia. Parallels to the Füsing piece are known from a small number of graves or hoards, which all seem to have been associated with the aristocratic sphere of 10th-century Denmark (Dobat 2004, 288). A gold arm-ring (2003-X1307) presumably derives from a disturbed hoard from the settlement area. Not least due to the rareness of gold objects compared to silver objects in the Viking Age, the piece has to be connected to the highest social level of the Scandinavian societies. Another special piece is a gold tremissis, minted in the 7th century, presumably in modern-day Holland (2005-X1184). It was secondarily used as a pendant, with a Christian cross on the obverse side, making it one of the oldest known cross amulets in Northern Europe.

Excavations of the pit houses yielded not only a large assemblage of ordinary settlement waste, i.e. animal bones/teeth (including fishbone) and pottery, but also iron implements, the majority being knives, nails, rivets and rivet plates used primarily in clinker-built vessels (Figure 10b). The repair and possibly even building of ships, obviously, was an important element at the site. Among the iron objects are a comparably large number of finds which underline the site's martial character, e.g. at least seven arrowheads (2012-X121; 2010-X574), axes or axe fragments (2010-X1; 2012-189-X182; 2012-189-X366) as well as a single iron sword pommel (2005-X1244). A military background can also be assumed for a number of artefacts of British/insular origin, most probably representing booty from raiding campaigns. Among these are also four lead gaming pieces (e.g. 2012-X165; 2014-X129), which can be linked to the material world of the Great Heathen Army operating in England during the 860/70s (Dobat 2017).

Somewhat surprising is the large amount of glass artefacts (Figure 9-10). In total, the 25 pit houses have produced 110 glass beads of varying sizes and shapes and around 30 shards from at least 15 individual drinking vessels. Especially the presence of glass drinking vessels underlines the high social status of the site, given its relative rareness in 'rural' settlements in general.

Weights, hacksilver and complete or fragmented silver coins (dirhams) suggest trade and exchange. This is supported by the many glass beads and vessel shards found, which probably functioned as a form of currency in the period prior to the hacksilver economy of the 9th and 10th centuries (compare Sindbæk 2012, 7). With respect to the evidence of craft and production, one must question whether

these finds are indicative of the site's function as a trading place or whether they are merely a natural by-product of the presence of people, notably warriors, at the site (compare Hadley and Richards 2018). The site's integration into the contemporary supra-regional and regional trade networks is also underlined by the large number of quernstone fragments of Rhinish basalt (< 157 fragments weighing 8.1 kilo, from 18 features), which probably reached Scandinavia as a by-product of the continental trade in the form of ballast material in the hull of trading ships. Continental/Frisian type brooches (e.g. 2003-X1251; 2005-X1187) are indicative of the presence of people of Western European origin, at least during the early phase of the site. In comparison with nearby Hedeby, however, imported finds and notably Rhinish pottery or later Slavonic/Baltic pottery are underrepresented in the Füsing material, suggesting that overall, the site did not have a central role in international trade.

Chronological development

The settlement was established at some point during the second half of the 7th century and at the latest around 700, according to metal finds. Altogether, 15 individual brooches can be assigned to the chronological horizon of the 7th and 8th centuries, among these a classic beak-shaped brooch, early oval brooches and rectangular plate brooches (e.g. find numbers: 2014-X174; 2011-X79; 2012-X67). A significant part stems from the pit house floor layers, for which also other finds and carbon-14 dating (see appendix 1) indicate a comparably early date, which cements the chronological significance of these objects as marking the beginning of the Viking Age settlement at Füsing.

The early beginning of the settlement activities is further substantiated by carbon-14 dating of carbonised grain, burned bone or charred nutshells from pit houses and longhouses (see appendix 1). Of 30 available analyses, one third have provided date ranges covering the 7th and 8th centuries. The majority stem from pit houses, but also at least two of the three-aisled longhouses can be assigned to the earliest horizon of settlement activity in the 7th century, with due reservations (see appendix 1). In conclusion, finds and carbon-14 dating of settlement structures provide a somewhat surprising but nevertheless well-founded dating frame for the beginning of the Viking Age settlement activity at Füsing around 700 at the latest, probably already during the second half of the 7th century. Füsing is thus one of the first sites in the region with direct evidence of settlement activity during the 7th and early 8th centuries, which invalidates earlier ideas of the migration period settlement hiatus in the region of Angel (the continental equivalent of East and West Anglia) lasting until the 9th century (see also Lemm 2018, 55). The site's foundation clearly corresponds with the earliest building phases of the Danevirke and the Reesholm barrier in the 7th century and around 737. It also corresponds with the earliest indications of settlement activity around Haddeby Bay (Südsiedlung), later Hedeby (Hillberg 2018, 135-140).

Finds and carbon-14 dating of settlement structures indicate continuous occupation throughout the Viking Age with a focus on activity in the early settlement phase, during the 7th and 8th centuries and the 10th century, respectively. While pit houses were the dominant element of the site during its early phase, the ^{14}C dates obtained from the longhouses are more evenly spread across the settlement's entire lifetime. All available data suggest that the settlement at Füsing was abandoned – or moved to a new location – at some point during the last decades of the 10th century and at the latest around 1000.

Structure, function, and social background

Structurally, the Füsing site appears to have been divided into two areas: a permanent residential area with longhouses and auxiliary buildings occupying the elevated part of the settlement plateau and a more seasonal activity area, dominated by pit houses in the lower terrain. Most of the pit houses belong to the site's early phases, the 7th and 8th centuries, suggesting a more seasonal/periodic usage of the site during this period. By the 9th and 10th centuries, the site's permanent nature and 'farm-like' character emerge more clearly. Despite its rural character, there is no indication of the site being an active agrarian farmstead. On

the contrary, the limited zoological material indicates that animals were not held at the site but only brought in for consumption.

Füsing apparently also functioned as an assembly place (compare Jørgensen, Jørgensen and Thomsen 2011). As such, the site fulfilled various functions, including economic transaction, jurisdiction, religious and political meetings and military/defensive purposes. The intensity of activity at Füsing, and hence also the number of residents, probably varied considerably, with a high level of activity on special occasions (market, religious/political gatherings, etc.) and in situations of acute need (military threat, royal presence, etc.).

For a sailor passing through the bottleneck between the southern shore and the Reesholm peninsula, the plateau of the Füsing settlement would have been visible from a considerable distance (Figure 1). The importance of this aspect and the intentionality of the site's commanding setting is underlined by the evidence of whitewashed buildings. The outer walls of at least some of the longhouses would have made them stand out even more against the skyline above the fjord's northern shore. Bearing in mind the central role of the longhouses in religious, political and military aspects, and their significance as elements of rulership identity in Viking Age Scandinavia, the prominent position of the buildings at Füsing should also be seen as signalling rights and authority on behalf of their residents (Roesdahl 1997).

There is a clear Scandinavian footprint in both the structural remains and the finds assemblage. The site and the majority of its inhabitants (with few exceptions notably during the site's early phase) were obviously firmly embedded in a Scandinavian cultural context. With regard to the site's social background, especially the prestigious metal objects suggest an association with the upper strata of the social hierarchy of Viking Age society.

The longhouse complex in the settlement's northern part, which has to be regarded as an example of high-status architecture, obviously supports this reading of the material. Füsing does not match the scale and magnitude of hall buildings at contemporary royal sites such as Tissø or Lejre. However, its architectural traits, spatial continuity and prominent position in the landscape make it similar to hall buildings in estate centres all over South Scandinavia (e.g. Christensen 2016, 133-150; Jørgensen 2009). The leading protagonists residing at the site on a permeant basis were members of an aristocratic elite and participated in a network of social relations that also involved the changing royal powers. This is further substantiated by the special ownership constellations and juridical status of the nearby village of Kahleby (on the possible significance of the place name, see Dobat 2011, 65), suggesting that Füsing and the surrounding area originally belonged to the king's personal land holdings (patrimonium) or the crown estate (*kongelev*) (see Andrén 1983). The clustering of 10th-century chamber and weapon graves with close links to the 10th-century Jelling dynasty in the immediate hinterland of the site points in the same direction. At the same time, the site was characterised by a high level of social diversity, with the occupants comprising both a permanent household and presumably changing numbers of short-term visitors. Among the latter, we must assume that there were a significant number of warriors/naval forces, which is highlighted by the evidence of shipbuilding or repair.

Probably the most convincing parallel to the Füsing site, not only in terms of social background and status but also in terms of structure and function, is the 8th- to 10th-century settlement at Aggersborg, Northern Jutland. The site has been interpreted as a royal estate centre (*kongelev*), established with the special purpose to monitor the strategically significant naval passage through the Limfjord (Roesdahl, Sindbæk and Pedersen 2014, 133-137). The newly discovered estate centre at Munkebo at the Kerteminde Fjord in the north-eastern part of Funen (Beck 2016) provides another parallel in this respect, as both were overlooking important naval waterways – and in the case of Munkebo also a defensive naval barrier. The estate centre at Erritsø, situated in direct proximity to the passage between Jutland and the island of Funen (Pedersen, Ravn and Lindholm 2019) or the settlement at Bejsebakken in the eastern part of the Limfjord in Northern Jutland (Sarauw and Enevold 2019), can be drawn upon as other fitting comparisons.

Discussion

The starting point of settlement activity at Füsing around 700 corresponds with the construction of the barrage or barrier at Reesholm and the large-scale refurbishing and extension of the Danevirke around 737 (Kramer 1994; Auer and Nakoinz 2017). It is likely that the site's foundation is somehow related to this massive investment into the Danevirke as the main defensive line for the Jutland peninsula (Dobat 2008; Tummuscheit and Witte 2019). The establishment of Füsing also coincides with the earliest indications of settlement activity around the Haddeby Noor, which marks the earliest nucleus of the later emporium Hedeby (Hilberg 2018; Kalmring and Holmquist 2018); and throughout the 9th and 10th centuries, Füsing flourished simultaneously with this international nodal point of global trade and precursor of medieval Schleswig (Hillberg and von Carnap-Bornheim 2007; Schultze 2008; Radtke 2009; Kalmring 2010; Hillberg 2016).

All this begs for a discussion of the possible role and significance of Füsing in relation to both the Danevirke and Hedeby/Schleswig.

Hedeby and Füsing

The coexistence of Hedeby and Füsing as places of production and exchange until around 1000 underlines the fact that Viking Age urbanism, in contrast to later periods, did not entail urban monopoly on economic functions, even within a narrow regional context. The two sites' concurrence can be seen as reflecting a functional specialisation rooted in the orientation towards different cultural and economic spheres: While Hedeby was orientated first and foremost towards the continent, functioning primarily within a superregional context (e.g. Jankuhn 1986; Sindbæk 2005), Füsing appears to have been deeply rooted in a traditional Scandinavian context and focused on its regional hinterland.

Füsing thus also highlights the special character of the economic networks in Viking Age Scandinavia until the 11th century, when the new urban centres of international trade, the emporia, existed in parallel with a traditional system of economic relations based on manorial centres. As a Scandinavian counterpart to the multicultural emporium Hedeby, the site may have served as a distribution centre for import goods within the regional exchange networks, thus linking the traditional Scandinavian 'manor economy' and the new urban economy. It is these two different economic networks, which at a later stage during the 11th century merged to form the first medieval towns, in which political and religious power with a monopoly over economic functions were unified.

As another possible approach to the background of the close spatial proximity of Füsing and Hedeby (Figure 1 and 2), one must incorporate the aristocratic residences at other emporia in Scandinavia and the southern Baltic coast. Especially transparent is the case of Adelsö/Hovgården on the island of Adelsö, located directly north of Birka or Skiringssal/Husby at the Viksfjord, in the northern hinterland of Kaupang (Hedenstierna-Jonson 2016; Skre 2007, 223). Situated only a few kilometres away, though still in close proximity of the trading sites, these elite residences were essential components of the emporia's topography and a presupposition for the chief's/king's obligation to secure market peace, while at the same time being the base from where he/she exercised the right to demand a share in the economic transactions at the sites. Not least the frequent mentioning of royal visits or the reference to a royal representative named Hovi (*comes praefati vici*) in the 9th century *Vita Ansgarii* (Life of Ansgar, 104) indicates a similar setup for Hedeby.

Another, and possibly more fitting, parallel to the proximity of Füsing and Hedeby may be the so-called Birka garrison. Established during the 10th century, at a distance from the harbour and the early town, this site comprised a three-aisled longhouse on a high plateau, surrounded by defensive earthworks. A distinct finds assemblage connects the complex with an elite troop of warriors, stationed here to both secure and control the economy and the movement of people and valuable goods at the site (Hedenstierna-Jonson 2016).

Viewing the commanding position of the settlement at Füsing, in eyesight of Hedeby and vice versa, and considering the strategic significance of the peninsula Reesholm for the control of this waterway, Füsing might have fulfilled a similar role as the

above-mentioned royal estate centres in the vicinity of other emporia – at least until sometime in the second half of the 10th century (see also Schietzel 2014, 32).

Füsing could have been the residence of a royal representative, a steward or jarl, together with his retinue, similar to the later 'husebyer' in Scandinavia (Christensen, Lemm and Pedersen 2016). As such, the site would not only have signalled royal presence and responsibility in the area. From the site, the early kings would also have secured peace and asserted royal interests and involvement in the emporia's mercantile activities. Warriors were the basis of the early king's power and of the royal patronage over the early emporia. Since the economic success of the early towns was dependant on their status as neutral zones, military forces would ideally have been stationed outside the spatially demarcated urban area. In its strategic position on the way to, and in eyesight of, the urban settlement area at the Haddeby Bay, Füsing would have been ideally placed as a military base, a garrison, in connection with Hedeby.

Füsing also underlines the special character of Hedeby/Schleswig as one of the Scandinavian emporia which, unlike the later medieval towns, had a more dispersed structural appearance, with the different institutions and functions, notably royal representation and military presence, being scattered over a larger geographical area.

Füsing, Reesholm and the Danevirke

With the contemporary barrage or barrier at Reesholm, the Füsing site is placed in direct proximity to a central element of the Danevirke system; a system of linear earthworks between Eckernförde Bay and the Schlei Fjord in the east and the rivers Treene and Eider in the west. This massive defence work dates back to as far as the second half of the 7th century, possibly even earlier. Its primary function was to control and, if necessary, block the natural bottleneck of the Schleswig Isthmus, and to prevent hostile forces from penetrating deeper into the Jutland peninsula (Dobat 2008; Tummuscheit and Witte 2019).

As outlined above, the barrage or barrier at Reesholm was an integrated element of the Danevirke system. Situated at the narrow bottleneck south of Reesholm, where the fjord's northern and southern shores originally would have been less than 150 m apart, one of its functions was probably to prevent hostile forces from crossing the fjord and thus bypassing the Danevirke ramparts. However, it may also have been used as the fortification of a naval base and harbour or as a navigational barrier, facilitating the control of the waterway.

There is a clear chronological overlap between the establishment of Füsing and the earliest Danevirke in the second half of the 7th century as well as the barrage or barrier at Reesholm from around 737. Beyond that, ship rivets together with arrowheads and other examples of weaponry as well as other finds in the assemblage at Füsing suggest military functions and the presence of warriors. The Danevirke, at least during its early phases, most probably was not manned with a corps of troops guarding the structure on a permanent basis. Activity at and around the defensive structure was most likely limited to periods of acute crisis (Dobat 2008, 55-56). In this light, also the many pit houses at Füsing, suggesting seasonal occupation and a high level of activity on special occasions, could point towards a relationship between Reesholm/Danevirke and the Füsing site.

Geographically, Füsing and Reesholm are situated at the very centre of the Danevirke system, with its western flank (the main wall) and its eastern flank (eastern wall) roughly six kilometres away across the open water of the fjord. In this strategic setting, Füsing may have fulfilled a key role in the defensive system, not only as one of the strategic nodes in the organisation and defence of Danevirke but also, in times of acute crisis, as a garrison behind the Reesholm blockage. Apart from blocking the crossing over Reesholm, the barrier would, in combination with the natural harbours east and west of the peninsula, have constituted a perfect naval base. In the event of a military attack, both the western and the eastern sections of the Danevirke were within reach via the open waters of the fjord. This would have been of vital importance, given the significance of ships and naval transportation in warfare at the time. Even though the Danevirke is a terrestrial defensive system, military organisation in the Viking Age was still primarily

centred on naval warfare and ships. This is indicated not least in the Frankish Annals' account of the events in 804 and 808.

The existence of a strategic node in the organisation and defence of the Danevirke, possibly in combination with a periodic garrison, is indicated in the Frankish Annals with the reference to the year 817 and a certain Gluomi as the Danish border guardian (*custos Nordmannici limitis*) (Frankish Annals, 114). This Gluomi must have been living somewhere in the hinterland of the Danevirke. It is possible that he was one of the magnates residing at Füsing during the early 9th century, together with a group of military personnel with a special obligation to watch over the Danevirke.

Sliesthorp

The reference to King Godfred's Sliesthorp in the Frankish Annals for the years 804 and 808 is traditionally seen as relating to the so-called Südsiedlung – until recently the only known settlement in the vicinity of Hedeby dating back to earlier than 800. Situated immediately south of the semi-circular rampart, the Südsiedlung is characterised by square-shaped pit houses. The archaeological evidence indicates production and trade and a population with close links to the Continent and the North Sea region (Steuer 1974; Hillberg and von Carnap-Bornheim 2007). The Südsiedlung, hence, does not necessarily echo what could be expected from a site with close relations to Danish royal power and its military troops/naval forces. Also, when it comes to settlement structure, the Südsiedlung with its clear coastal orientation and the lack of longhouses, does not resonate with the concept of a manor or farm, as implied in the place name Sliesthorp (see also Hillberg 2018, 140-142). Unlike the form [Slies]-vic, which is used in all written references after 808, the specific place name component [Slies]-thorp is rather untypical for a coastal settlement and a trading site. In the perspective of the Frankish author and his audience, Sliesthorp would probably have denoted a village, farm or manor. Only with the reference to the site as 'portus' in 808, the name would have been understood as denoting a coastal trading site (see also Laur 1955, 67-83).

The Südsiedlung, however, is not the only early settlement around the Haddeby Bay. More recent investigations around the Hedeby settlement area and the so-called 'Hedeby Hochburg' suggest that the earliest roots of the settlement at Hedeby go back to at least the early 8th century (Kalmring and Holmquist 2018, 282; Hilberg 2018). However, the indications of an early settlement horizon at the Haddeby Bay (Hedeby) are still more or less anecdotal, compared with the direct evidence of settlement activity during the 7th and early 8th centuries at Füsing. This naturally begs the question whether Sliesthorp in the Frankish Annals may be associated not with the early settlement phase at Hedeby, but with Füsing.

According to the few details extractable from the Frankish Annals, the historical Sliesthorp was:

1) a farm- or manor-like settlement;
2) providing harbour facilities for a large unit of naval forces and access to the sea;
3) situated at the border between a Danish kingdom and Saxony and
4) placed in geographical connection to both Hedeby and the Danevirke (Frankish Annals, 79, 89).

All these factors are met by the Füsing site. At the time of the events around 804 and 808, it obviously was a well-established settlement. It was strategically well-placed, naturally protected against land-based attacks from the north and at a perfect natural harbour around the mouth of the Füsing River and the north-eastern shores of the Kleine Breite. Last but not least, the site was situated in direct proximity to the Reesholm barrier, which was established 70 years before Godfred rallied his naval forces in the Schlei Fjord. In this geographical position, Füsing/Sliesthorp would have been strategically well-placed at the very centre of the Danevirke defensive line (see above). By the time of Godfred's campaigns, the Reesholm barrage or barrier would probably still have been in place and would have provided harbour facilities on both sides of the Reesholm peninsula.

Another strategic advantage of the location of Füsing would have been its position in the northern hinterland and behind(!) the Danevirke and the natural barrier of the fjord. In comparison, the early settlements around the Haddeby Bay would have been in a more vulnerable position, more

than 2000 m south and in front of the Danevirke – in 'no man's land'. In addition, Hedeby is exposed towards the 'Oxen or Army Road' only a few kilometres to the west, which would have been the preferred passageway for an invading force penetrating from the south (as proved to be the case during later conflicts in the 19th century, when the Danevirke was also used as a defensive line) (Dobat 2008, 43-44). Such strategic considerations do not provide definite answers. Nevertheless, the Frankish Annals inform us that king Godfred and his forces in the years 804 and 808 were manoeuvring under acute threat. Immediately prior to both events leading to the mentioning of Sliesthorp, Frankish forces had crossed the Elbe River. And although Godfred's military power obviously was based on highly manoeuvrable naval forces, it simply seems odd that he would have opted for a military base in the vulnerable and exposed strategic position south of the defensive line of the Danevirke.

One can conclude that Füsing resembles the report in the Frankish Annals referring to Sliesthorp as the centre of Danish King Godfred in 804 and 808: the geographical position at the border between a Danish kingdom and Saxony; the perfect natural harbour of the Füsing River and direct access to a major waterway; the proximity to Hedeby; and finally, its strategic location at the centre and in the northern hinterland of the Danevirke system. On this background, it is possible – as already suggested by Skre (2007, 459) – that the settlement at Füsing was Godfred's '*manor/village at the Schlei fjord*' from where he or his representatives not only administered the refurbishment of the Danevirke, but also laid the foundations for the development of Hedeby as a trading centre in 804 and 808.

To provide a balanced reading of the data at hand, it needs to be emphasised that the available ^{14}C data for building structures (longhouses and pit houses) clearly point at the 7th and 8th as well as the 10th century as the main period of activity at Füsing. The 9th century remains somewhat elusive, at least in the ^{14}C data, possibly due to the periodic nature of Godfreds military campaigns in 804 and 808.

Füsing and Schleswig

Finally, it is striking that the end of the settlement activity at Füsing corresponds to the supposed beginning of Schleswig as a royal and ecclesiastical centre at the northern shore of the Schlei Fjord – at a certain distance from Hedeby (Figure 1). The earliest absolute chronological dates indicate the establishment of the medieval town of Schleswig in the second half of the 11th century. Both archaeological and written sources, however, indicate an earlier foundation (Schlesinger 1972, 87-91; Lüdtke 1985, 131-138; Radtke 2009, 151-156). The spatial separation of the ecclesiastical and political institutions in Schleswig (civitas) from the commercial activity at Hedeby (emporium) was maintained until the middle of the 11th century, when Hedeby was abandoned, and the economic functions were moved to the northern shore of the Schlei Fjord (Hilberg 2016, 75).

The establishment of Schleswig at the beginning of the 11th century has to be seen against the historical background of the establishment of a second generation of towns (Civitates) in South Scandinavia. These new towns evolved from older chiefly or royal estates, and it is primarily the function of these older sites as mainly religious and political centres that the new generation of towns take over (Hodges 1982, 171-173; Skre 2007, 455). Examples of these developments around 1000 are Uppåkra in Southern Sweden, which is replaced by Lund or Lejre on Zeeland, which is replaced by Roskilde (Hårdh 2010; Christensen 2016, 275-285; Jørgensen 2009). It is possible that the end of Füsing and the corresponding rise of Schleswig have to be seen against a similar background. With the establishment of Schleswig as a royal and ecclesiastical central place, Füsing might have lost its functional raison d'être. The rise and decline of Füsing can thus also be seen as exemplifying the long-term transformation of the Viking Age emporia from urban islands in a rural sea, into towns within an urbanised society.

Conclusions

Finds and features suggest that Füsing was an estate centre and assembly place that flourished from the

early 8th to the late 10th century. As such, however, the site cannot immediately be placed inside a fixed template of high-status settlement types in Viking Age Scandinavia. Throughout its existence, it developed from a partly seasonal assembly place to a more permanent settlement and estate centre. Its later phase certainly comprises the structural elements of a manorial estates. It is, however, more questionable, whether the site ever functioned as such. As an estate centre, the site would have been supplied and sustained by the surrounding agrarian communities. However, in contrast to the large chiefly and royal manorial estate known all over Scandinavia, the primary function of the Füsing site was of a military/defensive and strategic nature. As a garrison and naval base in the southern borderland of the early Danish kingdom, it was primarily related to the Danevirke. Beyond that, it may also have served as the seat of a royal representative in the region, notably in connection with the emporium Hedeby. Füsing was probably the residence of a royal representative, a steward or jarl, and in its commanding position high above the fjord, the site would have signalled royal presence and responsibility in the area. As a regional centre of production and trade/exchange, Füsing may also have fulfilled the role as reloading point, linking supra-regional and regional exchange networks. Until future discoveries in the region prove otherwise, it is possible that Füsing is identical to King Godfred's Sliesthorp, mentioned in the Frankish Annals. All these hypotheses are based on the current state of the archaeological evidence regarding the contemporary settlement landscape around the inner fjord. Future discoveries (for example the discovery of another candidate for the site of the historical Sliesthorp or a royal estate in connection with Hedeby) will most likely change this interpretation.

What in other circumstances would have been merely another productive site and estate centre hence takes on a different significance because of its connection with the Schlei Fjord, the emporium Hedeby, medieval Schleswig and the defensive structure of the Danevirke. With these manifestations of the development of supra-regional trade relations, urban culture and centralised military/political power in Northern Europe, Füsing is embedded in a unique geographical context. In this special setting, Füsing positions itself in the wider context of estate centres in Scandinavia; places such as Aggersborg, Munkebo and Erritsø, which are all situated at strategic points along important waterways. As estate centres within a network of royal landholdings, these sites, like Füsing, held special significance in the contemporary geo-political and military/defensive organisation of the early Danish kingdom. Not least during the politically troubled times of the early 9th century, when strong warrior kings, among them Godfred, saw their maritime kingdoms around Jutland threatened by the expansion of the Frankish Empire.

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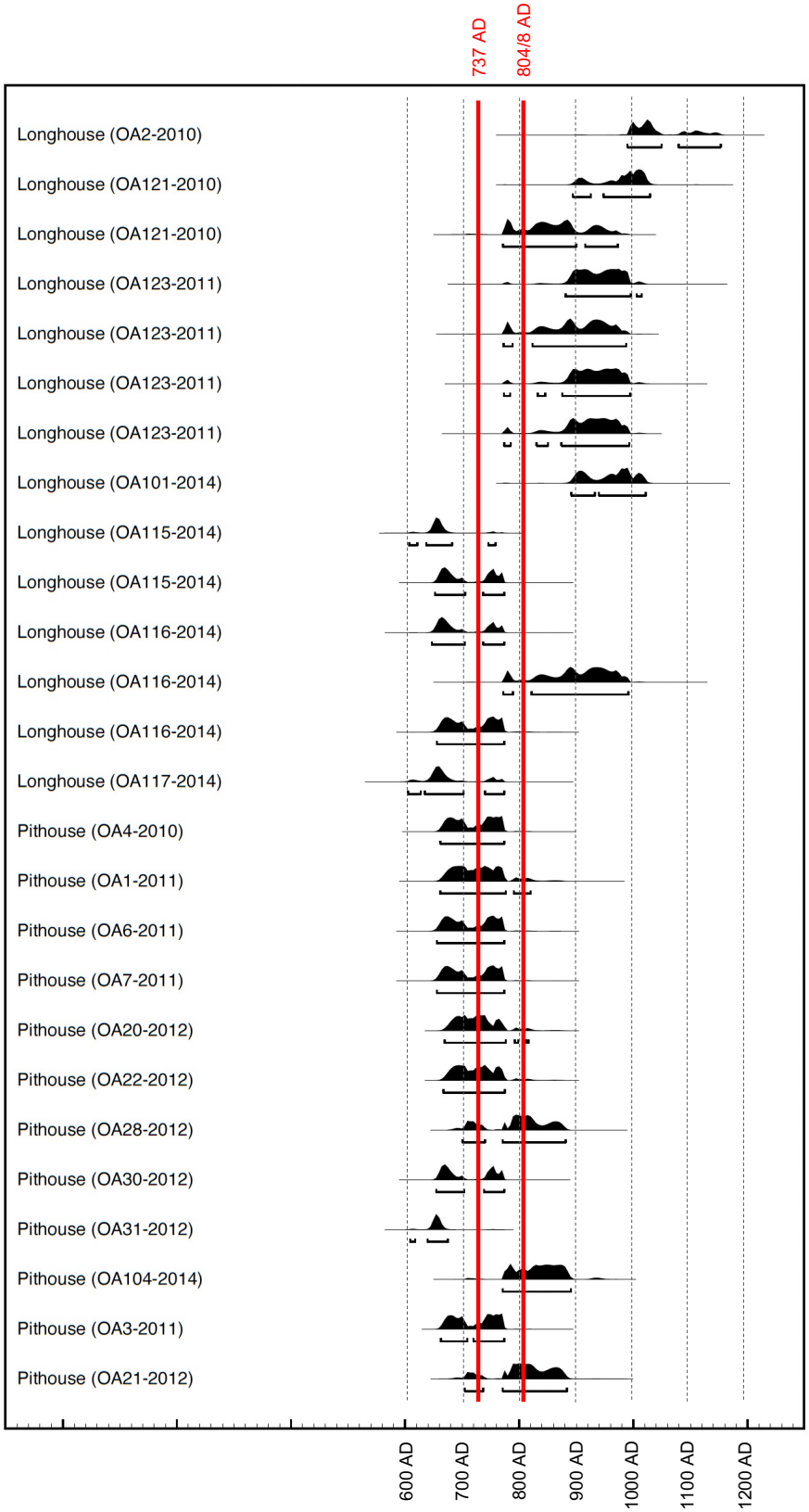
Supplementary



Appendix 1. Multiplot of calibrated radiocarbon dates for individual archaeological structures (long houses and pithouses) from Füsing. Dates have been calibrated in OxCal 4.4 using the IntCal 2020 calibration curve (Reimer et al. 2020). Red lines represent 1) the 737 AD event of the construction of the Reesholm blockage and the Danevirke refurbishment and 2) the references to Sliesthorp in the Frankish Annals for the years 804 and 808 AD (Graphics: OxCal 4.4 and the author).

When God came to Town – Urban Development and Religious Practices in Early Medieval Odense, Denmark

Kirstine Haase[1, 2, 3] and Mikael Manøe Bjerregaard[1]

[1] Museum Odense, Overgade 48, 5000 Odense C, Denmark
[2] Current affiliation: Centre for Urban Network Evolutions (UrbNet), Aarhus University, School of Culture and Society, Moesgård Allé 20, 4230-221, 8270 Højbjerg, Denmark
[3] Corresponding author (kirha@odense.dk), ORCID: 0000-0002-4288-3169

ABSTRACT
This article presents a contextual approach to studying the role of the urban environment in introducing Christianity to Denmark between 900 and 1250. We consider sensory experience and apply the concept of lived religion to the highly varied and sometimes limited archaeological material from St Alban's church in Odense, its cemetery, and the surrounding settlement, to show that the urban environment played an active role in integrating Christianity into everyday life. The church and king used the urban environment to stage their authority. The message of Christianity was propagated through religious practices, such as celebrating Saint Cnut with spectacular processions, and dress accessories with religious motifs. These practices facilitated the transformation from an elite-oriented missionary religion promoted by the king and the elite to a widely accepted religion integrated into the everyday lives of Odense's inhabitants.

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Lived religion; urbanisation; Christianisation; Early medieval; Denmark; Social practice theory.

Introduction

In Denmark, the transition from the Viking Age to the Middle Ages around the middle of the 11th century was marked by two defining events: the rollout of Christianity and urbanisation. Christianity significantly influenced the design of cities, with its establishment of churches, monasteries and cemeteries (Figure 1). However, religious life was not confined to official religious spaces, such as churches and cemeteries. Burial practices, baptisms, religious processions, and communal and individual religious practices made up a patchwork of religious expression that constituted religion during the medieval period. Even though these expressions were intangible or spiritual, medieval religion had a very concrete and material side. It affected the landscape, material culture (and its use), and even set people in motion as pilgrims. The materiality of religious practices was represented in texts, liturgical objects that survive in churches and museums to the present day, and archaeological evidence such as objects and structures. Mainly, the archaeological evidence can shed light on the religious practices of everyday life.

In this article, we examine the role played by the urban environment in the Christianisation of Denmark in the period *c.*900-1250. Although religious practices were also present in rural settings, we argue that the urban environment as administrative centres had specific attributes affecting the population and settlement density, which created a unique physical setting where religious practices may be studied on their own. Therefore, we present a contextual approach that includes archaeological evidence of religious practices related to the church, the cemetery and the city. We develop our argument by considering sensory experience and by applying the concept of lived religion to the archaeological record related to the first Cathedral in Odense, St Alban's church, its cemetery and the surrounding settlement during the period of *c.*900 to *c.*1250.

Research History

Religious expression was an integrated part of medieval life, but in Denmark it is rarely studied as

such. Often, studies of medieval religion are based on either religious objects (both secular and ecclesiastical) or ecclesiastical structures such as cemeteries, monasteries and churches (e.g. Christensen 2019; Jensen 2019; Søvsø and Knudsen 2021). In a recent overview of the Danish research on materiality and religious practice, Morten Larsen states that until the 1970s, these studies emphasised the descriptive presentation of objects and monuments (Larsen 2021). Only in recent decades have works with a contextual and interpretive focus gained a foothold. Archaeological studies of urbanisation have developed along the same lines (Bitsch Christensen 2004). Nevertheless, studies that combine religious practices and urban development – and consequently, objects and structures from both spheres – are rare (e.g. Tesch 2014). This lacuna is also rooted in the Danish research tradition, where disciplines such as church archaeology and urban archaeology are specialised branches. When the two have been combined, it has often been to draw overarching and general conclusions regarding urban *or* church history (Kristensen and Poulsen 2016; Nyborg 2004, 114; Wienberg 1993). One exception may be Lars Bisgaard's work on guilds and their role in medieval religious practice (e.g. Bisgaard 2001). However, as a historian, Bisgaard primarily draws on written sources, and less on material culture.

The lack of studies that take a more interdisciplinary and social approach to the relationship between early urban centres and the church may also be due to limited source material. The first churches in Denmark were wooden structures. Often, they are known only because they are mentioned in written sources, or as sporadic archaeological traces in rare and fortunate cases (Bertelsen 2016). In modern-day cities, the traces of the earlier town and the first churches are usually buried under several meters of later stratigraphy or still-standing churches. Moreover, early church organisation was characterised by great diversity until Svend Estridsen's church reform, around 1060. Churches could be private churches, magnate churches, missionary churches or cathedrals. This complex situation is also the reason a doctoral thesis on the church's organisation in medieval Denmark excludes the early churches (Kieffer-Olsen 2018, 12). Here, a broader and international characterisation of the research history would be too extensive. However, a strand of research in archaeology that addresses Antiquity aims to integrate religion into urban studies, inspired by contemporary ethnographic studies of religion in modern cities (Lätzer-Lasar et al. 2021; Raja 2019; Rüpke 2020; Urciuoli and Rüpke 2018). This research is part of this study's theoretical background.

An interdisciplinary approach that bridges religion studies, church archaeology and urban archaeology is needed to meet the apparent challenges of limited source material, and to gain insight into the social aspects of the interplay between religion and the urban environment in the medieval period. This study does not attempt to fully map this subject. Instead, it focuses on an in-depth case study of Odense and St Alban's church. Comparing these with other examples in Denmark and elsewhere in Scandinavia will support more general conclusions. An empirically well-founded case study provides insights into the specific societal and social context of Odense's early medieval church and town. At a broader scale, such insights may contribute to an understanding of the dynamics between church and town – between religion, the urban fabric and people in the constitutive period of urbanisation and Christianity.

Theoretical Framework

In this article, religion is understood as 'lived religion', in contrast to institutional or state religion (Knibbe and Kupari 2020). Lived religion is defined as religion shaped by repeated daily practices encountered, expressed and experienced in various environments – public and private, sacred and secular – as it permeates every aspect of society. It is practised by individuals or groups of individuals, interacting with overarching structures and conditions. The way religion is practised is the key to understanding how religion affected and shaped people's lives and world views in the past. Consequently, the study of lived religion is part of an empirical approach to individual experience and practice, rather than official ecclesiastical rituals and liturgical texts (Heilskov and Croix 2021, 14; Knibbe and Kupari 2020, 7). The concept of lived

religion was developed in the 1990s, in the contemporary field of the sociology of religion, based on an interest in ordinary people as religious practitioners, and as a reaction to religious texts being the dominant source of information (Knibbe and Kupari 2020). Since then, it has been applied to a wide range of disciplines, including the study of urban religion in Antiquity (Rüpke and Raja 2015).

Lived religion draws on the same theoretical sources as another approach identified in recent archaeological research: social practice theory, promoted by Elisabeth Shove, Mika Pantzar and Matt Watson, and adapted to archaeology by Axel Christophersen (Christophersen 2015; Shove et al. 2012). Practice theory has its roots in social anthropology. As Shove et al. understand it, social practice theory offers a bottom-up framework for analysing societal change through the dynamics of everyday life. Shove and Pantzar (2010, 19) define practices as:

> (…) something that actual and potential practitioners can participate in or from which they can withdraw. Equally, they also exist only so long as practitioners keep them alive, and it is through recurrent performance that the contours of individual practices are formed and transformed.

Axel Christophersen (2015, 2019) has advocated this approach to gain a different perspective on the study of medieval towns. Practices and materials connect people in the town, bind them together and establish a sense of community. Christophersen points out that we see the routinised or repeated practices as a material imprint in the archaeological record (Christophersen 2015, 118). Shove et al. have defined Material, Competence and Meaning (2012, 40) as the core elements of practice. Practices emerge, persist and disappear, as connections between these defining elements are made and broken.

The material focus is particularly relevant to the study of urban religion, as that religion was practised using a wide range of objects, spaces and structures (Heilskov and Croix 2021). Since Christophersen introduced Shove et al. to archaeology in 2015, it has been applied to various studies that have contributed new insights into social aspects of life in the medieval town (Christophersen 2019, 2021; Haase 2019; Kjellberg 2021). However, it has not yet been applied to religious studies in archaeology, even though the concept has much in common with that of lived religion. Tracing practices related to the expression of religion in all aspects of the medieval town will lead to a broader understanding of how religion was integrated into medieval life and how it shaped life in the town. How did the practices of the town dwellers change in their encounters with Christianity and the Church?

An inevitable part of lived religion is the sensory experience related to religious practices, monuments and the urban environment. Sensory experience defines urban religion as much does the materiality of urban religion. Sensory experience is a physical reaction to visual, tactile, olfactory and audible stimuli. In most cases, these reactions are culturally independent. However, the emotions or reactions evoked by sensory experiences are affected by cultures (Fahlander and Kjellström 2010). Sensory experiences of the past may be understood through the materiality of the past. By examining sensory experience through a wide range of archaeological evidence, it is possible to understand the sensory impact of religion on urban life, and vice versa. However, our understanding of the sensory experience of the medieval town will probably remain general, as the personal emotional experience is very difficult to argue for based on archaeological evidence (see also Fahlander and Kjellström 2010).

The following case study of the early medieval period in the town of Odense on Funen, Denmark, will analyse religious practices and sensory experience in an urban setting. First, the site and the empirical data set are presented.

The Case of Early Medieval Odense

Odense is mentioned for the first time in 988, when a letter signed by the German emperor Otto III states the privileges of the bishop of Odense (Christensen and Nielsen 1975 I, I nr. 343). Odense and St Alban's church were the site of the martyrdom of King Cnut IV. The king was killed in 1086 while seeking refuge in St Alban's church

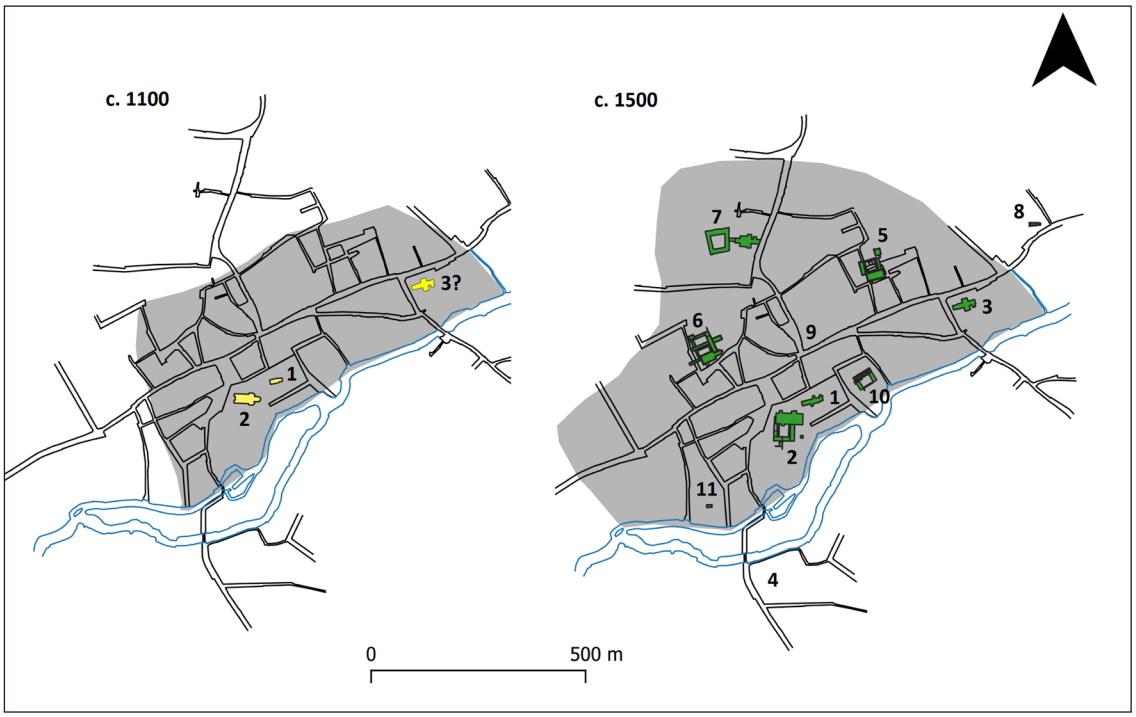

Figure 1. The development of the ecclesiastical institutions in Odense shown as the situation around the years 1100 (left) and 1500 (right). Note that the cemeteries are not shown. The grey area marks the approximate extent of the town, and the late medieval streets are shown as black lines. The river is marked with blue lines. The number of inhabitants probably grew to between 3000 and 4000 in the 16th century.
1. St Alban's Church. 2. St Cnut's Cathedral and Benedictine Monastery. 3. Our Lady's Church – possibly founded in the 12th century. 4. Benedictine Nunnery – the nunnery is mentioned 1193 but moves outside Odense before 1249. 5. Dominican Friary. 6. Franciscan Friary. 7. St Mikkel's Church/St John's Monastery (Knights Hospitaller). 8. St George's Church and Hospital. 9. Hospital of the Holy Spirit. 10. The Bishop's Palace. 11. St Clara Nunnery (founded 1521) (Graphic: K. Haase; Street layout based on Christensen 1988, 12).

in Odense after a failed raid on the British Isles. In 1100, King Cnut was officially canonised, and his bones were enshrined on the high altar in the newly built St Cnut's Cathedral (Figure 1, left). These events gave 10th- and 11th-century Odense a central position in Denmark's lengthy Christianisation (Christensen and Hansen 2017). Beginning in the 8th century, Denmark was a missionary field for foreign clerics, and King Harald Bluetooth's proclamation of Christianity as the Danes' official religion, around 965, on his runestone in Jelling is only a milestone in that process, which lasted at least another hundred years. In the 1060s, King Svend Estridsen stabilised the organisation of the Danish Church in eight dioceses, which in turn probably prompted the establishment of numerous parish churches across the country (Lund 2004; Sanmark 2004, 81-90).

In the 10th century, Odense was a royal and ecclesiastical power centre. In the 980s King Harald Bluetooth had a ring fortress built on the southern side of the river running through Odense (Figure 2) (Runge 2018). North of the river was a contemporary settlement. Our knowledge of this settlement is scarce, as modern Odense covers it. However, Runge and Henriksen characterise it as urban from around 900 (Runge and Henriksen 2018; see also Christensen et al. 2019). The archaeological evidence indicates a settlement of approximately 10 ha, with large farmsteads, craft production and possibly trade. The settlement was oriented towards two main roads; the north-south oriented road, running past the ring fortress, crossing the river, and an east-west road that was the main road across Funen.

After the Protestant Reformation of 1536, St Alban's church was torn down, and the area on which it stood was transformed into a market square. A renewed interest in rediscovering St Alban's church emerged on the 800th anniversary of the slaying of Cnut IV, when a small excavation recovered the remains of the 12th-century stone church (Peter-

Figure 2. Map from *Civitates Orbis Terrarum* by Braun and Hogenberg showing Odense in 1593. The late Viking-Age ring fortress is visible near the lower edge of the map as circular ramparts (Braun and Hogenberg 1572-1617. Public Domain).

sen 1886). Over the next 150 years, there was periodic construction work on the church and cemetery site, and various archaeological observations were made. The most important discoveries were made in 1980-83 and 2015 (Arentoft et al. 1985; Christensen and Hansen 2017). In the 1980s, it was established that two wooden churches preceded the stone church, and in 2015 it became clear that St Alban's church was Odense's cathedral until around 1100, when the new church, St Cnut's, became the cathedral (Christensen and Hansen 2017, 24). This suggests that St Alban's church may be the cathedral mentioned in 988.

A recent research project has collected all the archaeological evidence regarding St Alban's cemetery and church, focusing on the period 900-1250 (Haase 2022). Next, the main results of this project are presented, as they comprise the empirical data for this article (for the full report, Haase 2022); contemporary archaeological material from the adjacent settlement is also presented (Bjerregaard 2020; Haase 2017).

Finds from the Cemetery – Finds from the Settlement

St Alban's Church(es) and Cemetery

Since 1886 there have been fourteen excavation campaigns of varying extent at St Alban's church and cemetery (Figure 3). The church and cemetery were founded in an existing settlement, possibly on its eastern periphery (Bjerregaard 2020; Runge and Henriksen 2018, 61-62). Written sources from the 12th century describe the church as close to the royal residence, which has never been located archaeologically (Runge and Henriksen 2018, 46). However, it was probably the king who donated land for the church, or it may have been built on land owned by a member of the elite (Haase 2019, 51).

The first cemetery was delimited by a ditch or a fence and seems to have covered an area of 9000 m^2. The early Christian cemetery in Ribe, Denmark, also measured about 9000 m^2 (Jensen 2017, 33). Other examples of cemeteries in medieval Denmark suggest that St Alban's cemetery was among the larger (Arentoft 1999; Bendtsen 2009;

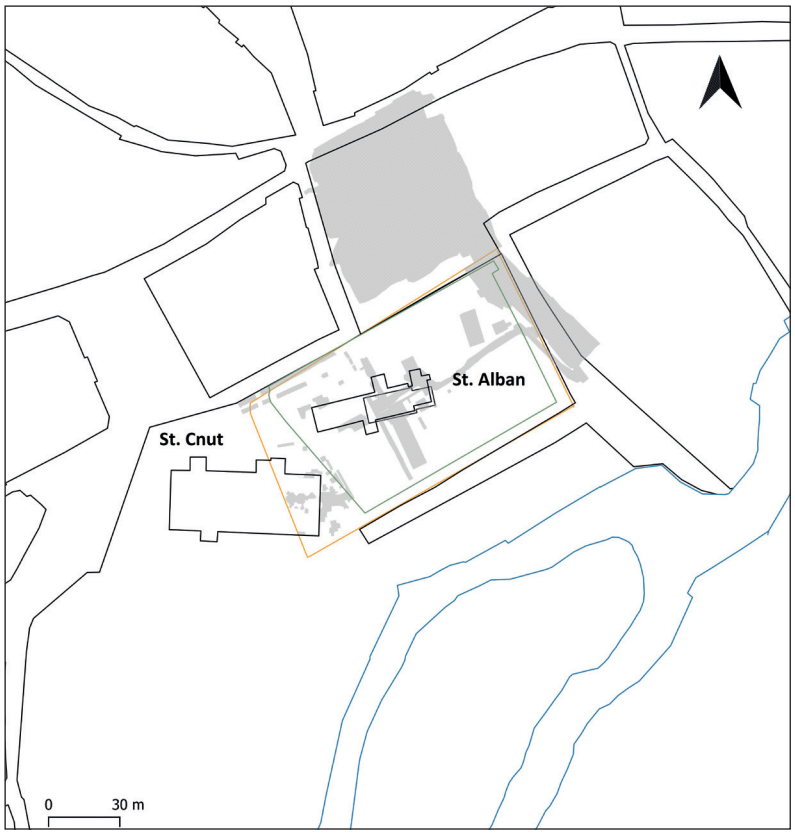

Figure 3. Map showing the central part of Odense with the medieval roads (black), the river (blue) and the excavated areas (grey). The extent of the cemetery in the 11th century is shown in yellow and the late medieval extent of the cemetery is shown in green. St Alban is shown as the outline of the youngest wooden church and the stone church (Graphic: K. Haase).

Kieffer-Olsen 1993). The medieval cemetery was usually dimensioned according to importance (Nilsson 1989, 123; 125). The size of the first cemetery may also be related to the church's possible status as a minster, which served an area larger than the town, as has been suggested as a model for the first church organisation in Scandinavia (Ersgård 2006, 54-57; Tveito 2011, 20-23). Whether this is the case for St Alban's remains unanswered, but the system required robust royal power, demonstrated in 10th-century Odense by the presence of a ring fortress on the opposite side of the river.

As mentioned above, the oldest St Alban's churches were two wooden churches built one after the other on the same site. The first was about 7 m wide and of unknown length. A bell casting pit was found below the church floor. The second church seems to have been a basilica with a choir and measured at least 28 m in length and 11.5 m in width (*Danmarks Kirker* 1998, 1737). For comparison, the largest wooden churches of contemporary Lund were 24 to 26 m long and between 10 and 11 m wide (Mårtensson 1983, 146-150). Remains of lime plaster were found at St Alban's, suggesting that the church was white either interior or exterior. A coin found in a posthole of the younger wooden church and radiocarbon dates indicate that the older wooden church was built in the late 10th century and replaced by the younger wooden church around the middle of the 11th century (Haase 2022, 31-39). The wooden church was replaced by a stone church, presumably in the 12th century. When St Cnut's cathedral was built in the late 11th century, just 40 m to the southwest, St Alban's cemetery was reduced to around 7600 m^2. The size may also indicate the church's changed status, from cathedral to parish church. The annexation of parts of St Alban's cemetery may also be symbolically related to the transfer of the role of cathedral from St Alban's to St Cnut's, and the transfer of St Cnut's bones from St Alban's to the new Cathedral crypt in 1095. Later in the medieval period, the cemetery was further reduced in size to the north and east.

A total of 844 burials have been recorded at St Alban's cemetery. Radiocarbon dates and a pendant made from a Cnut the Great coin (1014/18-34) (Figure 6s) found in a grave suggest that the cemetery was in use in the early 11th century (Bjerregaard 2020, 59). Based on stratigraphy, arm positions and other chronological information, 489 burials are dated to the period before *c*.1250 (Figure 4) (Gilchrist and Sloane 2005, 8-17; Haase

2022; Kieffer-Olsen 1993). All are supine burials with the head to the west. The dead are buried either with or without shrouds or in coffins, indicated by the remains of wood or coffin nails.

Of the 489 burials, 25 % were children, 25 % were women, 28 % were men, and the sex of 22 % could not be determined. They were distributed almost equally throughout the cemetery. It has been suggested that medieval cemeteries were divided according to sex, based on the Norwegian Eidsivating law, drawn up in the 12th century (Kieffer-Olsen 1993, 99-121). However, only a few cemeteries seem to display segregation according to sex, and St Alban's cemetery in Odense is not one of them (see also Jürgensen 2009 for a critique). Other towns, such as Lund (part of the old Danish realm, now in Sweden), Tønsberg, Trondheim (both in Norway) and Viborg (Denmark) also show an absence of cemeteries segregated according to sex, perhaps suggesting that this type of segregation was not common in towns (Mejsholm 2017, 167-169).

The location of two burials may be related to the social status or identity of the deceased. These are two men buried with scallop shells on their upper bodies, in the northern part of the cemetery, on the periphery (Haase 2022, 101). The scallop shells probably indicate a pilgrimage to the grave of St James in Santiago de Compostela in Spain, which was important from the 11th century on (Rasmussen 2021, 9). The pilgrims' graves may be close to the entrance or a pathway across the cemetery. This has not been established archaeologically, but gates and paths have a symbolic meaning in the Christian tradition. They are 'conduits between the landscapes of the dead and those of the living' (Gilchrist and Sloane 2005, 35). Being buried here meant being close to the people's prayers, entering the cemetery or the church, and the processions that passed during the holidays. Passing by the pilgrims' burials may also have meant something for people entering the cemetery. They would pass close by someone who had made the sacred journey and therefore represented a deeper religious and spiritual connection to God and the Saints.

Inside the church, two stone cists have been excavated (Christensen and Hansen 2017): one in 1917 and one in 2015. These are also burials of people with high social status. The man found in 2015 was probably a bishop, as he was buried with a silver chalice and paten. The bishop's burial dates to the 11th century.

Before 1250, most burials at St Alban's did not include personal or symbolic objects. A total of six pins have been found, and these are probably from shrouds or headdresses. Only a few stand out, such as the pilgrims' burials and the stone cists. The burial with the Cnut the Great coin has already been mentioned, and there are four graves, east of the site of the oldest wooden church, with significant remains of charcoal or charred planks (Haase 2022, 91-93). According to the excavation report, charred planks and charcoal were lying on top of the skeletons and along the sides of the graves (Arentoft 1983). Charcoal in graves is seen in the early medieval cemeteries in Roskilde (one grave), Copenhagen (twenty-three graves), Lund (ninety graves), and in German, British and French cemeteries (Andrén 2000; Cinthio 2002, 88; Jensen

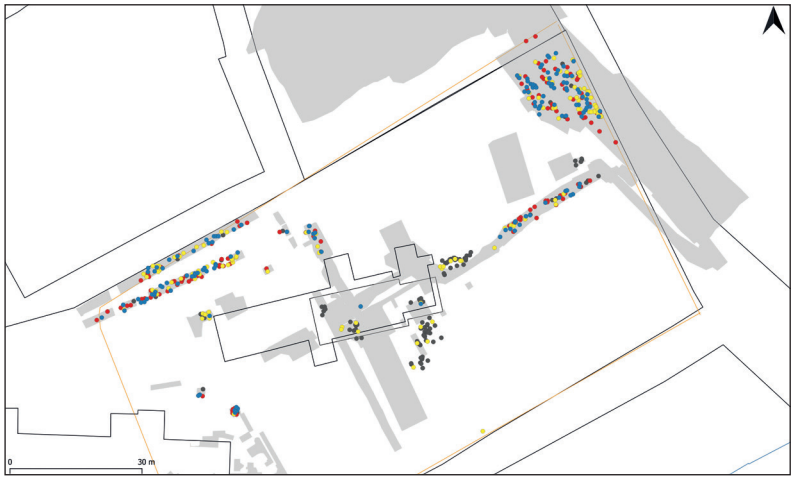

Figure 4. Map showing the distribution of burials from before 1250 according to sex and/or age in St Alban's cemetery in central Odense. Men (blue), women (red), children (yellow), and unknown adult (grey). The yellow line indicates the extent of the cemetery in the 11th century. The grey areas are the excavated areas. St Alban's church is shown as the outline of the youngest wooden church and the stone church (Graphic: K. Haase).

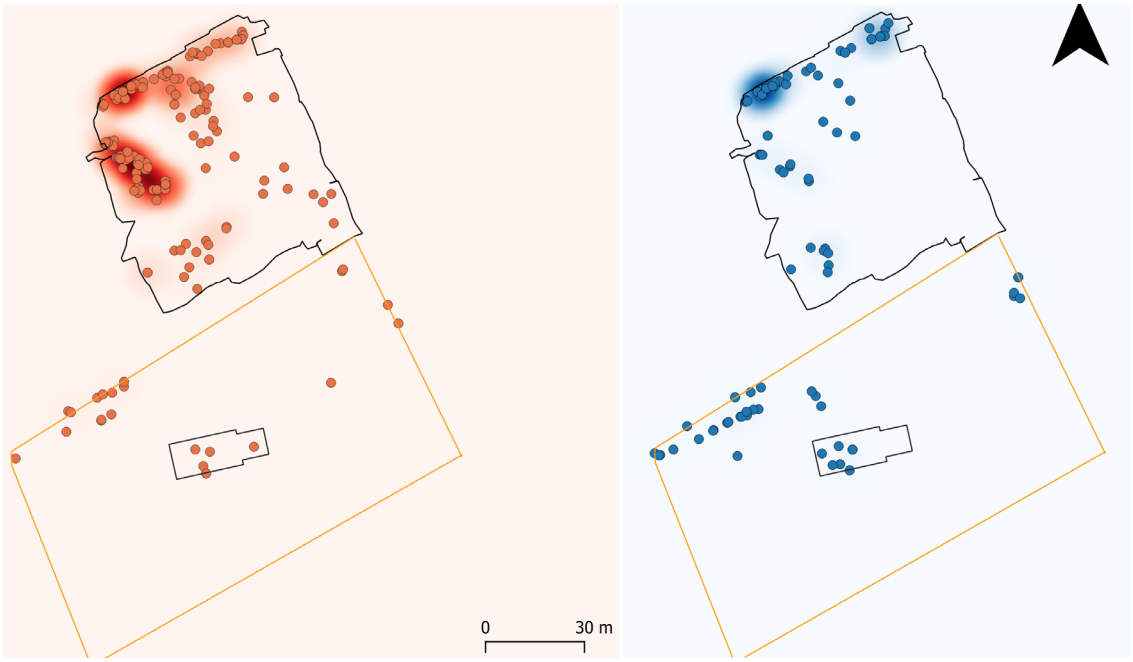

Figure 5. Heat maps showing the distribution of grey ware pottery (left) and finds related to non-ferrous metalwork (right) at St Alban's cemetry and the settlement area in central Odense to the north. The dots represent a finds assemblage (often containing more than one sherd or metal fragment), and the intensity of the colour indicates the number of individual objects (number of sherds/fragments). The black outline is the excavated area north of the cemetery. The cemetery is shown in its 11th-century extent (Graphic: K. Haase).

and Dahlström 2009; Jonsson 2009, 122-126; Kieffer-Olsen 1993, 166; Mårtensson 1981; Rensbro and Høyer 2014, 246). The British burials on beds of charcoal date to the late Saxon and early medieval periods and are usually related to high social status (Rodwell 2012, 310). This forms the basis for the suggestion that the charcoal burials in Lund were influenced by British tradition (Cinthio and Ödman eds. 2018, 60). The custom of using charcoal or charred wood is not yet explained, but there is a possible connection to monastic traditions of laying the dead on ashes (Gilchrist and Sloane 2005, 23). The explanation may also be aesthetic (the black colour), practical (charring preserves wood) or symbolic (representing resurrection). Given the examples just mentioned, and the location of the charcoal or charred burials at St Alban's in Odense, close to the high altar, it may be suggested that they were either priests of the church or people of high status. Apart from these few graves that stand out, the general impression is that burials prior to 1250 in St Alban's cemetery were very uniform, and individual regards or markers of social status and identity are absent.

Signs of a few other activities may be observed in the cemetery. Areas with the remains of what may have been paving have been recorded but are difficult to date with certainty. However, a group of deposits and features have been identified as older than 1250. There were finds usually related to domestic activities in these deposits, such as pottery sherds and whetstones. A total of 182 sherds have been recovered from this area. In contrast, over 5000 sherds have been collected from the contemporary domestic area north of the cemetery – the excavated area is twice the size as the excavated area in the cemetery (Figures 3 and 5). Moreover, most of the sherds were found on the cemetery's periphery, indicating the possibility of waste being deposited in an area where the cemetery's borders tended to shift, and thus, their being deposited during settlement activity. Pottery finds in other areas may come from activity that predates the cemetery, or from soil transported to the cemetery to fill in depressions.

A significant number of finds relate to metalwork. Most of these were found around the bell-casting pit, and some near the cemetery's borders. The lat-

ter may be explained in the same way as the pottery sherds. In a pit west of the church, there is a small concentration of objects related to metalwork. They are mainly debris, such as iron slag, smelted copper alloy and lead. None of the objects could be identified in detail, and it is difficult to say what activity they suggest. Some may be related to repair or construction work on the church. However, excavations in Ribe and Aalborg show that casting brooches with religious motifs close to churches and cemeteries was a known phenomenon. Still, similar origins of the metal debris in St Alban's cemetery remains a suggestion (Søvsø and Jensen 2020).

Finds from the Settlement

North of the cemetery, approximately 4400 m^2 have been excavated. As this area lies in the centre of the modern city, large parts were truncated by modern construction work. However, up to 3 m of archaeological stratigraphy were preserved in some areas. The earliest remains in this area date to the 8th-10th centuries, and mainly come from houses and pits (for a detailed description, see Haase 2017; 2019). The finds were mostly evidence of household activities, indicated by pottery sherds of local ware, iron nails and a whetstone fragment.

Several houses were built around 1000 to 1150, and to the north, a broad, paved market street was established as part of the overall street layout. Radiocarbon dates and dendrochronological analysis suggest that the street was used between the late 11th century and the early 12th century (Haase and Olsen 2021; Runge and Henriksen 2018, 46). The street debris reveal remains of leatherwork, non-ferrous metalwork (crucible fragments, copper alloys and lead) and bone/antler work (Haase 2017, 99; 132; Jouttijärvi 2015). No actual workshops are associated with the debris. Trade is suggested by lead weights, and was probably carried out during specific events, such as markets held to celebrate St Cnut. This may also be the case with some of the craft activities.

In the second half of the 12th century, the streetscape changed dramatically. Instead of the vast, open area in front of the houses, twelve booths were built along the street's south side (Haase 2019, 59-61). The finds show that non-ferrous metalwork, leatherwork, and bone or horn work were carried out (Bjerregaard 2020; Haase 2017). Coins and weights have been found in the street debris, indicating the presence of trade, which is also suggested by the location of the booths lining the street. Behind the booths, the plots were still occupied by scattered buildings, stables, wells, workshops and pits. Furthermore, brick was introduced as a building material, resulting in the construction of a two-storey brick house, 7 m south of the street (Haase 2017, 119; 2019; Haase and Olsen 2021). The finds from this period are similar to those of 1000 to 1150. In contrast to the preceding period, the booths and workshops were located in the street.

Objects related to Religious Practices

A few objects from the two phases mentioned above – 1000 to 1150 and 1150 to 1300 – have been interpreted as religious objects or related to religious practices. These are mainly dress accessories (brooches) and amulets. There are eighteen of these objects (Figure 6). Eleven were found in the deposits associated with the street area, two were stray finds, and five were found in the domestic area between the street and the cemetery. Two were found in deposits younger than 1300, but the objects may be dated to the 11th through 13th centuries. Some objects indicate their religious association by being decorated with a cross, religious images or inscriptions, whereas others are less apparent. Among these are the Alsengems and rock crystals (Figures 6d, e, q and r). The Alsengems are made from black and blue glass layers with an incision that usually depicts a person or persons (Figures 6d, e). They are interpreted as imitations of Roman Intaglio, and the types found in Odense have been dated to the 11th to 13th centuries (Imer et al. 2017). Previously, they were believed to be pilgrims' badges associated with Cologne, but now they are usually understood as amulets (van Vilstern 2014). Intaglio and cut rock crystals often decorate liturgical objects such as The Cross of Mathilde, an Ottonian procession cross from the

Figure 6. Objects related to religious practices. a) Circular animal brooch, x1672, b) Urnes-style brooch, x4827, c) A ring brooch, x5661, d) Alsengem, x9683, e) Alsengem, x4912, f) Wooden runic amulet, x7300, g) Circular foil brooch, x10383, h) Circular foil brooch, x10385, i) 'Pseudo-coin' brooch, x11412, k) Circular foil brooch, x11970, l) Circular foil brooch, x11724, m) 'Pseudo-coin' brooch, x7683, n) Circular foil brooch, x5434, o) Circular foil brooch, x9044, p) Circular foil brooch, x12568, q) Rock crystal, x4468, r) Rock crystal, x7052, s) Cnut the Great coin pendant, x8969. All finds from site no. OBM9776. (Photo: N. Hasic, Museum Odense and K. Haase. Not to scale).

11th century (Falk 2008, 86). A similar oval fitting for a gemstone is seen on the shrine of St Benedict (Cnut IV's brother) in St Cnut's Cathedral, and dates to the 12th century (Bjerregaard 2019, 32). It was probably believed that when Alsengems and crystals came in contact with religious objects, they were imbued with their spiritual power, which persisted even when they were removed from those contexts, and they functioned as amulets (Søvsø and Knudsen 2021, 207-209). Moreover, it was believed that certain stones, such as rock crystal, had specific powers (Gilchrist 2020, 113). Among other things, rock crystal symbolised purity, water and baptism (Heilskov 2021, 160).

One group of finds with religious connotations comprises circular foil brooches with animal motifs (Figure 6). The surface of most of these badges is very corroded; however, on one of them, a bird-like shape is visible (Figure 6n). This bird resembles the holy dove seen on contemporary coins (Malmer 2004, 83). At least two other circular foil badges resemble coins. These are also called 'pseudo-coin' brooches (Baastrup 2009, 217). A consecration cross, shaped by four double-lined bows, is shown in Figure 6m. This cross resembles the obverse of a Cnut IV coin from Odense, and other coins from the 11th century. The motifs on coins of this period were influenced by English coins, as Figure 6i shows, with a short-cross coin imitation (e.g. Æthelred II). In Figure 6i, markings along the rim are probably an imitation of writing. Three circular foil brooches were stray finds, but typologi-

cally they date to the 11th and 12th centuries. The remaining six circular foil brooches were found in the deposits from 1000 to 1150, and not later.

An Urnes-style brooch and a circular animal brooch were found in the domestic area between the street and the cemetery (Figures 6a, b). The circular brooch depicts an animal with its head looking backwards. These well-known types are interpreted as early Christian badges produced and sold in Danish towns (Søvsø and Knudsen 2021, 189). It is not known whether there was similar production in Odense. Although casting is indicated by metal debris and fragments of crucibles, the types of objects produced is unknown. Analysis of the residue in crucibles confirms that a copper alloy was melted, and the finding of a lead ingot may indicate that lead models were produced, as seen in the Ribe workshop (Jouttijärvi 2015; Søvsø and Jensen 2020, 8).

A fragment of a ring brooch (Figure 6c) dated to the period between 1150 and 1300 may also have religious decoration, as the frame is decorated with heads of bearded men alternating with chalices or trees (the tree of life?). However, it remains unknown whether this is an actual Christian reference, as a parallel to the ring brooch is not found. A rare religious object is a wooden runic amulet found in the street, dating to the 13th century (Figure 6f). The inscription is fragmented, but parts read, 'God's servant', a phrase often seen in apotropaic objects (Imer et al. 2017).

As demonstrated above, the religious objects found in the settlement area demonstrate that religious activities were not restricted to the consecrated area of the cemetery and the church. In the following we will examine the interplay between the religious objects, the practices they represent, the religious practices related to funerals and physical structures and how these interact with overarching societal structures and conditions.

Performing Urban Religion

Both church and king were establishing their position in early medieval Danish society in the 11th and 12th centuries (Engberg 2018, 66-88). The monarchy was electoral, and the king travelled about the country to establish alliances and legitimise his claim to the throne. The king would uphold his local authority by distributing privileges and rights to local magnates and the local church. Moreover, royal power in Odense was strengthened through the patron saints of St Alban's church, St Oswald and St Alban. *Passio Sancti Kanuti* describes how Cnut IV transported the relics of St Alban (an English proto-martyr) to Odense (Missuno 2019). Perhaps the relics of St Oswald were added to the narrative to draw a parallel between Cnut IV and St Oswald, who was also a royal martyr, legitimising Cnut IV as a royal Danish proto-martyr, and portraying him as an enthusiastic supporter of the Church.

The alliance between divine and earthly power is clearly illustrated on early medieval coins. Harald Bluetooth (958-985/87) was the first to use iconography on coins as a tool for promoting Christianity, and Svend Forkbeard (986-1014) illustrated the union between king and church by putting his name and image, as well as the cross, on coins (Moesgaard et al. 2015). With the monetisation process during the 11th century, coins were an effective form of propaganda, as they were small, portable items that would circulate on most levels of society. Furthermore, this is illustrated in the transformation of coins into jewellery, as seen with the Cnut the Great coin in the grave at St Alban's. It is possible that it was believed that wearing the symbols of the two most powerful forces in society – God and King – would serve as a potent protective amulet.

The pseudo-coin brooches found in Odense are mainly from 1000 through 1150. These brooches adopted the propagation properties from the coins. Being wearable, it was possible to demonstrate one's beliefs and display allegiance to the king and church. The foil brooches were probably quick and cheap to make, making them accessible to the majority of the population. They could be mass-produced for special purposes or occasions. The foil badges, with their resemblance to coins, would mediate between everyday life and the religious sphere. The Ribe workshop shows that the Church was the principal agent in this production, as it was located on land owned by the Church

(Søvsø and Jensen 2020, 25). The possible location of the workshops in Odense in the street area suggests that artisans, and not necessarily the Church, initiated production. However, it is also tempting to see these badges as baptismal tokens, or related to the celebration of Cnut the Holy, as their use coincides with the canonisation of Cnut IV. In that case, the king or the Church probably initiated the production of tokens. To establish and popularise the cult surrounding St Cnut, King Erik the Good (1095-1103) had to use all available tools to gloss over the legacy of Cnut IV, bearing in mind that he was an unpopular king who was killed by rebels. For Erik the Good, this was a matter of strengthening his position and claim to the throne. The establishment of a paved processional road (see below), the writing of hagiographies, and the official canonisation of St Cnut in 1100, authorised by the pope, may also be seen in this light, as the authorisation of the canonisation was not strictly necessary at the time (Hope 2019, 100).

Wearing ornamented brooches to display social status and social identity did not originate with Christianity. Manufacturing (pseudo) coin brooches dates back to the Roman Empire, and Carolingian 'pseudo-coin' brooches were known in Denmark since the 9th century (Baastrup 2009; Horsnæs 2017). The connection to past traditions may be even more evident in the circular animal brooches. Scholars agree that the Urnes-style brooch and the circular animal brooches display Christian symbols, but the motifs have their roots in late Iron-Age and Viking-Age art (Søvsø and Jensen 2020, 2). Thus, the animal motif may be seen as a vehicle for translating old Nordic thinking into a new Christian European tradition, and the pre-Christian religious connotations seem unproblematic (Bertelsen 1992, 249). Following Shove et al. (2012), the social practice of demonstrating religious affiliation through dress accessories comprises three elements: material, meaning and competence. As we have seen, material and competence were familiar from the manufacture of brooches, and the general meaning of the brooches as identity markers was also familiar to people in general. This emphasises that the dress accessories showed a continuity with pre-Christian religious forms, and their adaptation to Christian ones, rather than revealing a break with, or change in practices.

Another example of a religious practice that would have been in evidence in Odense is the procession as a marker of holidays and celebrations. In the 12th century *Gesta Danorum*, King Svend receives King Cnut V with a procession that displays the relics of St Cnut the Holy, when they meet at St Alban's church (Saxo 2000, bk.17, 14, 10). Later sources describe how wax candles were donated for processions in Odense (Petersen 1886, 377). In Trondheim (Norway), processions for the celebration of St Olav in the 12th century are attested (Christophersen 2020). Processions were probably an essential part of St Cnut's rituals in Odense as well. Perhaps one of the purposes of the paved street dating to the late 11th century was to facilitate and guide religious processions (Haase 2019, 52-54). As in many cultures, ceremonial processions are also an old Nordic tradition, as illustrated in the Oseberg Tapestry (*c.*834) and the Gotland picture stones, and as described in Ibn Fadlan's accounts (Deckers et al. 2021, 50; Nygaard and Murphy 2017; Price 2022). Some of these processions are understood to have related to burials, as were Christian processions. A burial procession is depicted in the Bayeux tapestry, where the shrouded body of King Edward is carried on a bier to the church (Figure 7). Two boys with bells in their hands walk below the bier. Bells, candles, torches, and perhaps incense burners and singing were part of these processions, making them an elaborate sensory experience through sound, vision and olfaction (Lepine 2010). The experience would have been reinforced by it taking place on the paved street among the houses of the town, where sounds would be reflected, and light and shadow would create an intense atmosphere.

The bell casting pit found under St Alban's church evokes the way the introduction of Christianity dramatically changed the town's soundscape. Bell ringing would have marked out the day according to the ecclesiastical rhythm and events, celebrations and funerals would have been accompanied by sound, establishing a shared perception of time for the inhabitants, with a strong sensory impact associated with Christianity. In

Figure 7. The funeral procession of Edward the Confessor, from the Bayeux Tapestry, scene 26 (Wikimedia Commons, Public Domain).

contrast to the use of processions and dress accessories, bell ringing was a new religious practice that included a new materiality, competence and meaning.

The production of foil brooches, the establishment of a cult surrounding St Cnut the Holy, with processions and markets, and the involvement of the town and its inhabitants in religious rituals and practices, suggest that during the 11th century, Christianity was transformed from an elite-oriented to a more popular and widely accepted religion, a process primarily initiated by the king. By continuing pre-Christian social practices Christianity was recognisable and engaging to people.

Funerary Practices in the Viking Age and the Early Middle Ages

The introduction of Christianity changed the existing funerary practices dramatically. The funerary practices of the Viking Age were characterised by their variety (Ulriksen 2011, 163-164). As mentioned above, the burials at St Alban's cemetery in Odense showed a very high degree of homogeneity. The Christianity introduced to Denmark attained a high degree of consistency and prescription in its burial rituals, compared to those of 8th-century England, for example (Gilchrist 2015). The uniformity of burial rituals in Odense may be seen as the institutionalisation of burial practices, leaving very little room for individualisation. The only exceptions are the eight burials that include the bishop's burial, the charcoal burials, the men with pilgrims' badges, and the burial with a coin pendant.

Viking-Age inhumation graves with grave goods suggest that the tombs were open and its content visible to those who attended the burial. The use of either shrouds or coffins during the Christian period changed the visual aspect of the funeral. The last time the family saw the deceased was in the home when they wrapped the body in the shroud or put in the coffin. This marked a transition, and professional clergy performed the ritual when the procession arrived at the cemetery. The commemoration was professionalised, and the focus shifted from the body and grave to remembrance through masses in the church. Nevertheless, the body still played a role, as early Christianity included the idea of a literal bodily resurrection, which emerged in the 2nd through 5th centuries, and was formalised in 1215 by the Fourth Lateran Council (Gilchrist 2015, 379). However, enclosing the cemetery, and the spatial restrictions imposed by its being part of the urban environment meant that intercutting burials and post-burial disturbance became a common phenomenon, which seems to conflict with the idea of literal bodily resurrection (Cherryson 2007, 136). In St Alban's, the concentration of burials was high, and it is rare to find an un-

touched burial. In 1279-80, synods in Munster and Cologne made it mandatory to have a place (ossuary or charnel house) for excavated bones within the cemetery enclosure. Often, this was a simple pit, as seen in several cases of reburied human remains in St Alban's in Odense. Thus, the cemetery's location in the urban settlement made it necessary to find a practical solution, and compromise with Christian principles. In fact, the practical challenge of cutting into older graves may have swayed the Church from initially seeing the grave as a resting place for the body until its resurrection, to a belief that God would inevitably recompose the body for resurrection, regardless of how scattered or decomposed it was (Bynum 1994, 205-214; Christensen and Bjerregaard 2021, 251-252). Moreover, the close proximity of domestic spaces and cemeteries meant that people lived among the dead. This proximity would probably also have made death and the dead more present in everyday life, and may have changed the attitude to the dead, from fear to concern for their fate after death (Cherryson 2007).

The uniformity of Christian graves changed during the late medieval period, when death and burials became increasingly individualised – for example, rosaries were placed in graves and there were burials below the church floor. There was a rising concern with the persistence of the body and of social identity despite physical decay. This development may be explained by the concept of Purgatory gaining traction in the late 12th century, increasing the focus on individual salvation (Gilchrist and Sloane 2005, 215-216). This focus is also reflected by the presence of a runic amulet from 13th-century Odense (Figure 6f).

Structural Practices

In the 6th century, Emperor Justinian I renewed an interdict against burials within city walls, but by the 8th century this was discarded, in practice (Kolnberger 2018, 123). Locating graves and the place of worship within a settlement became a unique feature of Christianity, demonstrating a break with religious practices of the pre-Christian period (Andrén 2000, 8; Engberg 2018, 77; Hansen 2022, Appendix 5; Nilsson 1989, 37). Although there are a few early examples of cemeteries without churches in Denmark (Grødby, Bornholm), and more in the Mälaren area of Sweden, these seem to be exceptions (Engberg 2018, 63; Tesch 2014). In the case of Sigtuna, where there are cemeteries without churches, Sten Tesch (2014, 116-118) has suggested that the religious rituals took place in main halls, locating settlement, place of worship and burial in close proximity, after all. Such examples are probably related to specific, local exceptions, and the transition from pre-Christian to Christian religion. It was not a general rule that a church and cemetery were part of the settlement. Still, this unique combination provided new potential for performance and practice, for the church and the inhabitants.

Religion became part of life in the town, where religious images on everyday objects, such as brooches and prayers in protective amulets worn by individuals, reveal how religion transcended the boundary between the ecclesiastical and secular worlds. On the other hand, mundane activities did not unfold within the sacred spaces of the church and cemetery. The consecrated cemetery was a separate area marked by a fence, ditches or a wall that identified its legal and spiritual status. In Odense, this space seems to have been generally respected, as the only traces of activity in the cemetery, apart from burials, are related to construction work on the churches. It is possible that fairs and holiday celebrations took place in the cemetery, as evident in other cases, but the evidence is hard to find (Gilchrist and Sloane 2005, 44-46). Coins found in the cemetery soil (twelve coins predating 1250) may be evidence of market activity, but they may also be offerings or accidentally lost coins (Haase 2022, 115). However, as the pottery sherds and metal debris patterns show, the physical boundary between the town plots and cemetery was contested (Figure 5). Over time, the more secular aspects of urban life indirectly influenced the church's position. Being located in the town came at a price, and the town encroached on the cemetery. A house was built in the northern area, on top of graves, and the cemetery wall was moved south sometime in the 14th century (Bjerregaard 2020). Moreover, the settlement area north of the cemetery became more densely

built, and in the early 13th century, a two-storey brick building was erected. Consequently, the view from the east–west main road to St Alban's church was obstructed. This may indicate the demise of, or a change in ecclesiastical influence and power, and the increased impact of secular society.

The church building itself was also a way of demonstrating the Church's status. The wooden St Alban's church did not distinguish itself much from the surrounding (mainly wooden) houses, but the new cathedral's size and materials were striking. In Denmark, the only cathedral larger than St Cnut's was the cathedral in Lund (Scania). The white travertine used as a building material added to its monumentality. Scholars agree that the cathedral in Odense was erected to provide a suitable burial site for the martyred King Cnut, with the canonisation and subsequent position as a shrine in mind (*Danmarks kirker* 1990, 133). It was the result of the Church's and the king's joint effort to strengthen their positions. In the Viking Age, kings or magnates would erect burial mounds or similar monuments as memorials, as the mounds at Jelling (Denmark) illustrate (Pedersen 2017). With the advent of Christianity, churches took over this role and locating the church in a town; they had a daily audience to behold the grandeur of the king and the Church. At the same time, the building style of St Cnut's Cathedral referenced a European building tradition, signalling a new cultural affiliation.

Discussion

In 11th-century Odense, Christianity was manifested outside the ecclesiastical sphere as a change in the motifs of dress accessories. Wearing dress accessories with symbolic elements was not new, but with the shift in motif, it becomes clear that Christianity was an integrated part of everyday life in 11th-century Odense. To the inhabitants, the impressive monuments and the religious processions realised by the king and Church were also recognisable elements, even though they represented a new religion.

Elements such as funerary practices moved away from earlier traditions. They represented a new materiality, and the uniformity with which funerals were initially performed suggests that it was institutionalised and prescribed by the Church. This change in burial practices emphasises that in Christianity, death had a different meaning than that of a pre-Christian worldview. Death was not the transition to an afterlife, but a liminal state where the soul waited for resurrection on Judgement Day.

To the king and Church, the town served as the perfect stage for displaying power and performing religious rituals. Markets held during holidays would attract trade, and processions could pass the streets, attracting the inhabitants' attention by stimulating their senses through sounds and scent. However, even though the church benefited from its urban setting by being close to a congregation and serving a larger public, this also meant a limited and sometimes contested space. As a result, the cemetery borders were not fixed, and post-burial disturbance had to be accepted as a fact of the existence of an urban church, inevitably leading to a less literal view of bodily resurrection. When established in an already occupied area, the church and cemetery also affected life in the house plots. These plots were reduced in size where the cemetery was located, and activities such as gardens and orchards were eventually relocated to the town's periphery (Haase 2019). Over time, domestic occupation in turn encroached on the cemetery. Houses blocked the view of the church, a metaphor for a shift in the power structure in favour of the secular world during the late medieval period.

Shove and Pantzar (2010, 22-23) have described social practices as either co-existing bundles or co-dependent complexes. Practice bundles share time and place as common resources and become entangled through the shared space. On the other hand, complexes of practices depend on the same competence, material or meaning; through this, they support and reinforce each other. Religious practices in early medieval Odense may be described as co-existing bundles. The co-existence of religious practices creates a synergy that strengthens the position of Christianity to a degree that it affects many aspects of daily life – from dress accessories to adding a new structure to the day through bell ringing.

There are indications that during the 13th century, religious practices became interdependent, as exemplified by the personalisation of religious practices through personal amulets and more personalised funerals (Gilchrist and Sloane 2005, 230). Such a transformation from practice bundles to practice complexes suggests that Christianity's formative years were over. It entered a more mature phase, with a closer integration of the official ecclesiastical rules and rituals, and the townspeople's perception of religion.

Approaching the archaeological data from a social-practice perspective has enabled us to see past the religious monuments, structures and objects, and to instead turn our attention to the actions and practices that took place in relation to these monuments and objects. By focusing on the relational aspects, it has been possible to study and draw meaningful conclusions about highly varied and sometimes limited data sets, such as those related to burials, dress accessories, remains of paved streets, metal debris and pottery. The data set and the theoretical approach have limitations, because it has been impossible to identify the individual actor. All levels of society engaged in religious practices. The material (dress accessories, church, streets, cemeteries etc.) discussed in this analysis was accessible to, or used by, most levels of society. For example, the burials represent all levels of society. Still, the absence of grave goods, the uniformity of burial practices and the very few identity markers (two pilgrim badges and a coin pendant) make it challenging to identify specific social groups or individuals. Therefore, discerning who the 'town-dwellers' were, and who the drivers of religious practices were as individuals is difficult. However, we may conclude that the King and Church played significant roles in creating the framework for religious practices. The churches, the paved street and funerary practices resulted from top-down processes. Still, within those structures, people practised their religion, including familiar elements that predate the introduction of Christianity. From the 13th century onwards, we see a secular social group – mainly the well-off burghers – proclaiming its position in society by encroaching on the cemetery and building houses that block the view of St Alban's church from the main street.

Conclusions

In this article, we have shown that focusing on the practices and performance of religion as reflected in objects or structures leads to a greater understanding of the impact of Christianity on medieval life, and specifically on urban life. The concept of lived religion has made it possible to meaningfully consider the highly varied and sometimes limited archaeological material. The evidence of religious practices in Odense shows that the urban environment played an active role in anchoring Christianity in people's everyday lives. The Church and King used the urban environment to stage their authority through monumental buildings such as St Cnut's Cathedral, secluded spaces, an infrastructure, and spectacular events, such as canonising and celebrating a royal martyr. These often-recurring events and celebrations would have attracted people to the town, creating opportunities for the inhabitants to manufacture and sell products such as dress accessories – perhaps prompted by the king. The inhabitants became active participants in propagating the message of Christianity through new motifs on brooches and the use of coins. At a more structural level, the introduction of Christianity meant that funerary rites changed dramatically, and the areas occupied or managed by the Church (and king) probably limited movement and activity in the town. This balance changed during the medieval period, when the town encroached on the cemetery, and burials became less uniform and more personalised.

Urban settlements were not essential to introducing Christianity to the Danes. Still, as the case of Odense suggests they may have played a role in influencing, and being accepted and integrated into, people's everyday lives. Moreover, this study demonstrates the potential of comparing religious practices observed in Odense to practices in other towns or villages with parish churches. Even though archaeological records will probably have different properties and present fresh challenges, the theoretical framework of lived religion will facilitate comparison with other cases and broaden our understanding of the impact of Christianity on the everyday lives of people in the Middle Ages.

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Contextualizing an early medieval village: An aristocratic family in Southern Jutland, its landed wealth, and its connection to a central Danish *thing* place

Anders Hartvig[1,3] and Bjørn Poulsen[2]

[1] Museum Sønderjylland, Dalgade 7, 6100 Haderslev, Denmark
[2] Aarhus University, School of Culture and Society, Jens Chr. Skous Vej 5, 8000 Aarhus C, Denmark
[3] Corresponding author (anha@msj.dk)

ABSTRACT

The remains of a 12th to 14th century village, Petersborg, were recently excavated at the foot of Urnehoved Bank in Southern Jutland near the famous regional Urnehoved Thing, known from the 12th century onwards. It is suggested that a large farm in the village was inhabited by a bailiff, and that the settlement was owned by an aristocratic family named Urne. One of the members of this family is documented by an inscription on a tombstone in the church of Bjolderup, 5 km from the site. The family and its surname can be followed for centuries, and a high medieval seal matrix with their arms, found in St Clemens Church in the town of Schleswig, indicates that they were close to royal power. Written sources show that they had land in mid- and west-Schleswig. We point to a number of high-medieval settlements with the suffix 'bøl' in the parishes of Uge and Bjolderup near the site and suggest that the Urne family founded these clearance villages. In conclusion, we argue that Petersborg, the Urne family and the Urnehoved Thing should be seen together, thus contributing to our understanding of aristocratic elite groups in the early and high Middle Ages.

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The focus of this article is the excavation of a deserted and unnamed village in Southern Jutland, dating to the period *c.*1100-1300. We place this settlement excavation, which we here name Petersborg after the nearest present-day farm, in its broadest possible context, focussing on an aristocratic elite group, which presumably owned the village.

The questions of who lived in the village and how it was established are explored taking inspiration from the work of the Swedish archaeologist Anders Håkansson. By applying a model in which the size of the farms is combined with the material evidence, Håkansson suggests the existence of a social hierarchy within the rural settlements from the Viking Period to the high Middle Ages in Halland, Sweden (Håkansson 2012).

We identify the elite group of founders and owners of the village as a family associated with the area west of the present-day town of Aabenraa, in particular to the parishes of Bjolderup and Uge. In contrast with previous research, which has described early medieval Southern Jutland as dominated by a large group of relatively free farmers with farms of equal size (Poulsen 2003a, 424; Søvsø 2020), our analysis of the archaeological material suggests that our aristocratic family was not the only elite family in Southern Jutland in the 12th and 13th century, thus contributing to further understanding of the inequality of the social landscape of early medieval Denmark (Poulsen 2023).

In this article, we also place our investigation in a wider regional and national context. The members of the family in question had the surname 'Urne', as documented by a runic inscription on a tombstone in the church of Bjolderup and by a number of written documents presented below, and the fate and identity of the Urne family was evidently closely connected to the large Urne Wood, which covered the Urnehoved Bank between Bjolderup and Uge. We argue that the central north-south road in Jutland, the so-called *Hærvej*, went across this marked barrier of moraine clays and that central assemblies, *thing*, were held at the Urnehoved Bank.

We further argue that the position of the Urne family was achieved exactly through the possession of this central place. The site of the Urne-

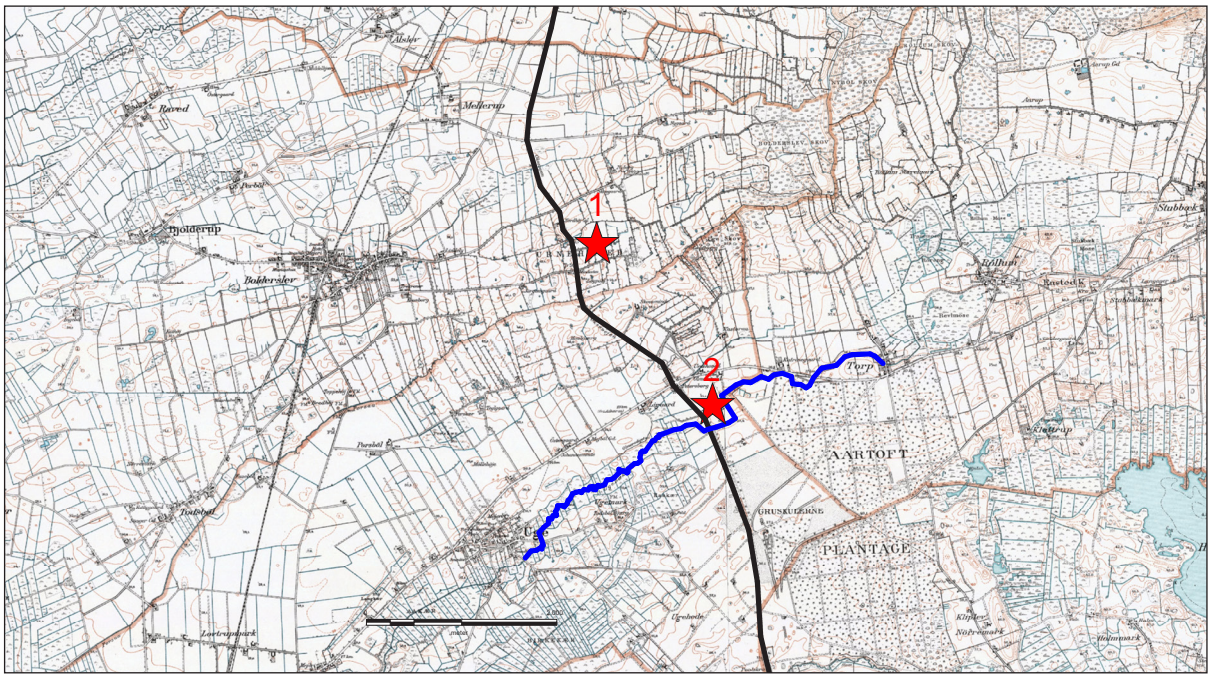


Figure 1. The presumed location of the Urnehoved Thing (1) and the excavation site of Petersborg (2). The central route of Jutland, the so-called *Hærvej*, is outlined in black, and the brook, Uge Bæk, in blue (Reproduced with permission, Styrelsen for Dataforsyning og Effektivisering (De lave målebordsblade). Additions by the authors).

hoved Thing ties our case study to national Danish history in the 12th and 13th centuries and to the government of the Danish kingdom. In this way, we hope to contribute to the general North European debate on the nature of Viking Age and early medieval regional assemblies, the development of landscapes and manorial structures, as well as the rise of early Danish aristocratic families and their transformation from magnates to knights.

The deserted village at Petersborg

First, we present the excavated settlement, which we argue was owned by the aristocratic Urne family. During excavation campaigns spanning several years, Museum Sønderjylland – Arkæologi has excavated the remains of a deserted village situated at the foot of the Urnehoved Bank in Southern Jutland, some two kilometres south of the modern memorial site of the Urnehoved Thing (Figure 1; HAM5318 Petersborg, Uge sogn Sb. 95, Hartvig unpublished). The village is not mentioned in written sources, and its name is therefore unknown. We employ the name Petersborg here as the archaeological case name.

The oldest phase of the village dates to the 12th century, and it was deserted or moved during the 14th century (Hartvig and Sørensen 2021). The village was situated in the eastern part of Uge Parish. Today – and assumedly also in the Middle Ages – the so-called *Hærvej* runs just west of the settlement. The brook Uge Bæk runs south of the excavated area, but it had a different course originally. On the oldest map of the area, the *Videnskabernes Selskabs* map from 1805, we can see that Uge Bæk runs east-west through the excavated area. The map details a small crescent stream of the Uge Bæk running north of the area. During the excavation, it became clear that the Uge Bæk originally had the same course as on the oldest map – but also that it had been moved when the village was founded. Perhaps the crescent-formed stream to the north was established at that point in time. The excavations have revealed the remains of two settlements: an older, northern settlement dating to the 12th century, which was replaced by a younger settlement further south dating to the 13th-14th century (Figure 2).

In the beginning of the 12th century, 'the founder's farm' was erected on the highest elevation in the landscape (Hartvig unpublished; Hartvig and Sørensen 2021). This farm (G1)

Figure 2. General plan of the Petersborg excavation, shown on the Prussian map from the 1880s. Medieval buildings consisting of rows of postholes are marked in black. The dark green shades indicate ditches, the dark blue shades wells; red shades indicate fireplaces (Reproduced with permission, Styrelsen for Dataforsyning og Effektivisering. Additions by the authors).

consisted in its first phase of a relatively large main building with slightly curved walls and had an aisled section along the northern wall. The building was 24 m long and its maximum width including the aisled section was 7.5 m. One or two secondary buildings belonged to this farm with a ditch and a fence marking the farm's croft. The remains of the ditch and fence structure were recorded during the excavation: from the brook northwest of the farm, it ran straight south, parallel to the present-day course of the *Hærvej*. After some 250 m, the ditch turned east, ending after another 260 m at the brook Uge Bæk. How and where the farm was enclosed towards the east is unknown (Figure 3).

Figure 3. Detail plan of the northern and oldest village at the Petersborg site. The large ditch is seen west and south of the village.

The excavation of 'the founder's farm' (G1) revealed three main buildings reflecting three phases. The main building was rebuilt on almost the same spot, *i.e.* the western gable was facing the large ditch. Shortly after the construction of G1, another six farms were built around it (G2, G3, G4, G16, G17, and G18). The farms G2 and G17 existed in two phases, while the remaining farms existed in one. All these farms were situated along the present course of the *Hærvej*, indicating that the road had its present-day course. Furthermore, it is clear that the layout of the village in this phase was a road village, situated along a road (Hastrup 1964, 175).

That the farms existed in one, two, or three phases may be the result of the division of farms, or of a successive establishment of new farms. We believe that what is seen here is the division of a farm. In this way, farm G1 was divided into three after one generation, *i.e.* G2, G17, and a second phase of G1. After another generation, G1, G2, and G17 were divided again, and the remaining four farms (G3, G4, G16, and G18) were erected. Whether the division of the farm is a result of division of inheritance or relocation is not clear. In this way, these four farms existed at the same time as the second phases of G2 and G17, and the third phase of G1. The large enclosure may be interpreted as a demarcation of the settlement's infield.

In its last phase, the northern settlement consisted of seven farms all placed along the present-day course of the *Hærvej*. During all phases, the main building of G1 was larger than the main buildings of the other contemporary farms. The difference in size shows that G1 retained a certain superior position towards the other units, which we will come back to. Assuming that a post-built construction on sand lasts some 25-30 years, the oldest settlement would have been abandoned during the period 1175-1190 (Sørensen 2011, 229). After this first phase, the settlement moved *c.*200 m further south (Figure 4). Its layout changed in this phase, and the farms were now arranged in a horseshoe-shaped layout around an open central area. Towards the south and the east, the extent of the settlement was confined by a wetland, whereas the already mentioned ditch marked the northern limit, and the present-day course of the *Hærvej* marked the western.

The excavation of the southern settlement revealed the remains of eleven farms. Several of these farms existed in only one phase, whereas other farms existed in up to five phases. The farm with five building phases (G12) also stands out in terms of its size: the croft and the main buildings belong to the largest of the settlement's farms. Differences in the building phases of the individual crofts re-

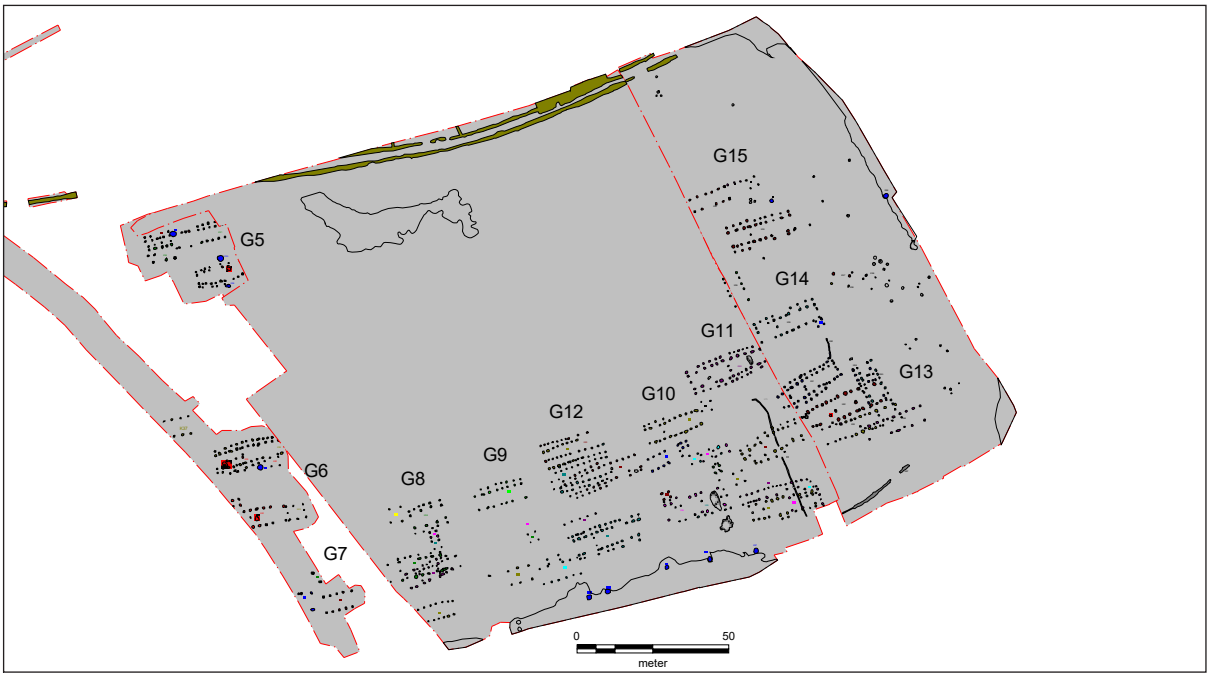


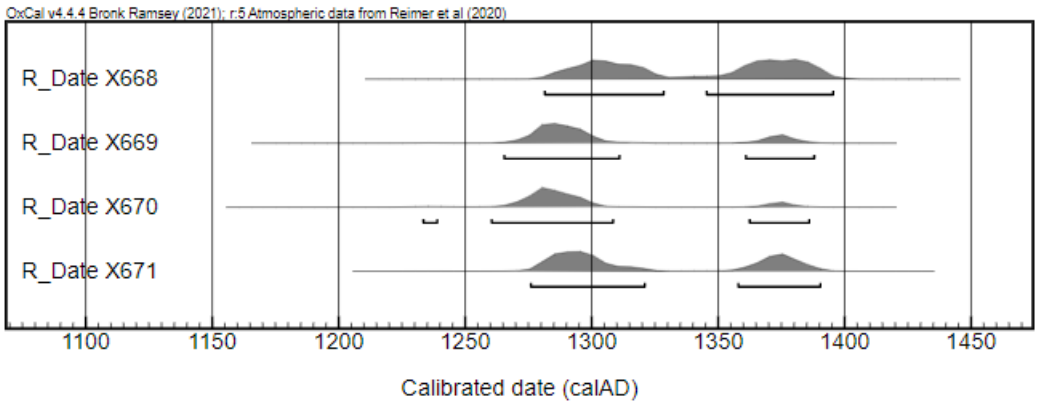
Figure 4. Detail plan of the southern and youngest village at the Petersborg site. Wetlands are situated south and east of the village. They must have functioned as natural boundaries for the settlement.

veal that not all crofts were in use at the same time. Instead, some crofts must have been left unsettled. It is uncertain whether this reflects a successive process of settlement, or whether some farms relocated away from the settlement or were deserted earlier than others. The farms consisted of a main building, one or two secondary buildings, and a well. Despite the lack of fences or ditches, the set position and orientation of the main buildings, of which the gables respected that of the predecessors and the neighbours, suggest the presence of a set structure of the village croft. The east-west orientation of the main buildings was almost identical. Five main buildings, each on their individual croft, stood out by their slightly southwest/northeast orientation, thus infringing on the 'invisible' border of the croft. This change in the location of the buildings represents a new phase and implies a change of the layout of the crofts and of the settlement's overall structure. These five main buildings all belonged to farms with a long continuity. The abandonment or resettlement of the village is assumed to have taken place during the 14th century. This date is based on four radiocarbon dates from wall posts of the main building K63, which has been dated to the period 1269-1381 (Table 1).

The date is supported by evidence from farm G12 for which the main building existed in five phases. Assumedly, each phase lasted 25-30 years, and the last phase must have been constructed around 1300 and abandoned 25-30 years later. The disappearance of the settlement fits very well with the comprehensive regional changes and contraction of the settlement structure which took place during the difficult years of the 14th century (Poulsen 2003b, 493f).

Turning to the artefactual evidence, the pottery constitutes a homogeneous group of locally produced wares consisting of almost exclusively globular grey ware pots; only very few glazed sherds from jugs were found (Figure 5a). No other imported wares were found. Other large groups include slag

Figure 5. Selected finds from the Petersborg excavation. A. "Kugeltopf" ritually placed upside down under the floor of farm G2. Height 18 cm. B. Gold plated ring, detector find at farm G1. C. Pfennig (denar) minted around 1180 in Aachen by Emperor Friedrich Barbarossa. From farm G12. D. Pfennig (denar) minted 1168-1175 in Cologne by Archbishop Philipp von Heinsberg. From farm G12.



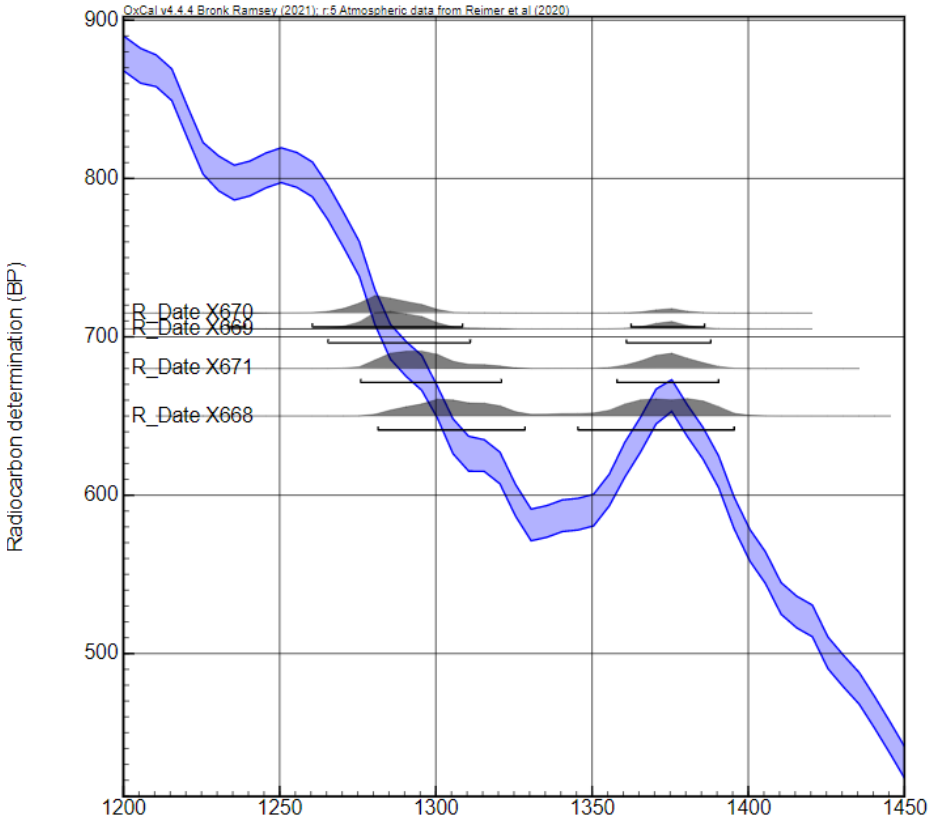


Table 1. Data for the four radiocarbon dates from house K63.

from smithing and fragments of basalt quern stones. In collaboration with Museum Sønderjylland, intensive metal-detecting campaigns were carried out during the excavations resulting in a large amount of metal finds. The exact location of each metal find was recorded with a GPS, and it appears that the majority of the finds derive from the plough-soil above the farms. This suggests that the finds may be related to the underlying buildings, and that they are not the result of redeposition in relation to the manuring of fields. Apart from iron and copper alloy fragments, spindle whorls of lead and different D-shaped belt buckles constitute a large part of the small finds. Two find groups stand out: one group of finds relates to trade, such as the arm of a set of scales and four weights; another group is made up of a twisted, gilded silver finger ring, two horse-harness fittings of which one is gilded, and a coin hoard consisting of German coins (Figure 5b-d). This latter group indicates the presence of persons belonging to the elite. The finger ring is found ten meters west of the 'founder's farm', G1, and may thus be related to its inhabitants. This type of twisted finger ring is known from hoards

dating to around 1100 (Lindahl 1992, 57-76). The hoard consists of fifty-two coins, partly fragmented, minted in the towns of Cologne and Aachen during the years 1175-1181. All the coins were found within the plough-soil in a concentration above farm G12, suggesting that the coins were deposited or lost near this farm (Table 2).

In his analysis of farms in Halland, Sweden, Håkonsson divides farms into five groups according to size (Håkonsson 2012). Some very large farms appear besides smaller farms, which is interpreted as reflecting a system where the owner's bailiff (Danish *bryde*, Latin *villicus*) lived in large farms, while the smaller farms were inhabited by dependent tenants (Danish *landboer*). The bailiff system was common throughout Denmark during the 12th to 14th centuries (Christensen 1963-66). Compared to the results from Halland, where a clear difference in size between farms can be seen, there is no marked difference in the size of the farms at Petersborg. However, the two farms G1 ('the founder's farm') and G12 differ from the other farms in terms of size and number of phases. As mentioned, the silver ring and the coin hoard were found near these two farms. Based on this, it may be suggested that farm G1 was inhabited by a bailiff who was the first settler of the village. The village grew over time and, as it was moved south, the farm G12 became the bailiff's farm, possibly with a reduced status in this phase. This interpretation is supported by the fact that G12 existed throughout the southern settlement's period of use.

Three members of the Urne-family: Ketil, Mads, and Jens

We now move to the question of who owned the farms of the Petersborg settlement and who might have dominated the region around it. Most important here is the occurrence of the family surname Urne. It is documented on a tombstone or coffin lid (convex stone of granite, 186 cm long) in the church of Bjolderup, about 5 km from the Petersborg excavation (Figure 6). At the top of the stone, an inscription shows that this is a grave, 'ketil urnæ ligir hir' ('Ketil Urne rests here', our translation). The motif on the stone depicts a flowering cross, a so-called tree of life, with three roots and four leaves (Mackeprang 1941, 58-59). Originally, it must have been placed on the churchyard of Bjolderup, or inside the church. The tombstone is dated to around 1200.

Urne is a family name. Family names identify people who have the same ancestor and gives them an identity. In general, it was only in the last part of the Middle Ages that Danish noble families had fixed surnames (Dahlerup 1971; Nielsen et al. 1899). Some families, however, achieved fixed names earlier. During the 13th century, Holstein noble families named after settlements in the southernmost part of Schleswig (Southern Jutland) spread in the Duchy of Schleswig and became vassals of the duke. Certain Danish families had fixed family names from an early date, amongst others the aristocratic family of Abildgaard. The first known man of this family, Tyge Abildgaard,

Frederik Barbarossa (1152-90), mint Aachen. Denars
The emperor sitting with sceptre and orb / Building with four towers. Menadier 1891-1898, no. 33, 1 pc.
The emperor sitting with sceptre and orb / Building with four towers. Krumbach 1995, no. 22.1, 1 pc.
The emperor sitting with sceptre and orb / Building with four towers. Krumbach 1995, no. 22.3, 1 pc.
The emperor sitting with sceptre and orb / Building with four towers. 3 curves. Krumbach 1995, no. 24.3, 1 pc.
The emperor sitting with sceptre and orb / Building with four towers. Krumbach 1995, no. 30.2, 1 pc.
The emperor sitting with sceptre and orb / Building with four towers. Krumbach 1995, no. 30.?, 2 pcs.
Philipp I von Heinsberg, archbishop of Cologne 1167-1191, mint Köln. Denars and obols.
Bishop sitting with crosier / Building with three towers. Denar. Hävernick 1935, no. 506, 16 pcs.
Bishop sitting with crosier/ Building with three towers. Obol. Hävernick1935, no. 509, 3 pcs.
Bishop sitting with crosier/ Building with three towers. Denar. Hävernick 1935, no. 541, 22 pcs.
Non-identified denars.
4 pcs.

Table 2. Coin hoard from the plough soil around farm G12 at Petersborg. Identification of the 52 coins.

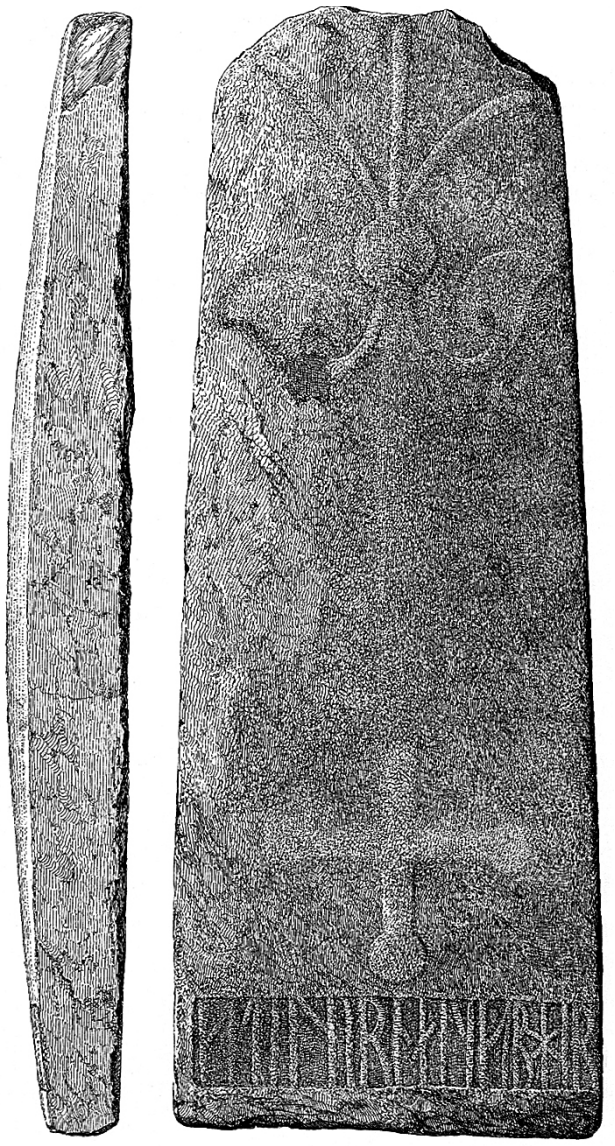


Figure 6. Tombstone or coffin lid of stone from the church of Bjolderup. The runic inscription reads 'Ketil Urne rests here' (Drawing by Magnus Petersen, 1892).

served the Danish king in 1230 (DD 1 ser., vol. 6, no. 109). The name Urne on the Bjolderup stone was also carried on as family name: documents from 1238 and 1245 mention a Mads Urne, while Jens Urne appears during the period 1279-1290. The family and its surname can be followed in the following centuries (Thiset 1904, 463ff).

The first appearance of Mads Urne is in 1238, where he participated in giving a verdict from the court, *thing*, of Slogs Herred. He was then member of a board of six men who were termed 'the best of the *herred*' (DD 1. ser., vol. 7, no. 13). The *herred* was a local territorial unit, and this role means that Mads Urne evidently belonged to the most highly regarded men in his community. In the document, he, alongside the five other members of the board, was termed *dominus* (lord), a title that among lay people was generally reserved for knights (Ljung 1981). In 1245, we meet him again in a document written in western Schleswig, this time negotiating a settlement between a local lord and the rich Løgum Abbey (DD 1. ser., vol. 7, no. 184).

In the year 1279, the knight Jens Urne travelled to the Jutland town of Vejle because the archbishop of Lund passed a judgment in a case between Jens and the bishop of Ribe. The case was won by the bishop of Ribe (DD 2. ser., vol. 2, no. 375). In May 1288, Jens Urne functioned as arbitrator in a court case between Løgum Abbey and the owners of a west-Schleswig village (DD 2. ser., vol. 3, no. 290). A compromise was found, and Duke Valdemar II, who stressed that it was he who had appointed Jens Urne and other 'good men', affirmed the settlement so they could solve the conflict (DD 2. ser., vol. 3, no. 292).

The case of Knud Snubbe's will

Another case, in which Jens Urne became involved, moves the focus towards the parishes of Bjolderup and Uge – the area of the excavated Petersborg village. This case, documented by a will, gives us some interesting insight into Jens Urne's family and their internal discussions about land possession, but also renders very concrete knowledge on high-medieval land reclamation in the local Urnehoved area. This includes documentation of the actual local existence of the bailiff (*villicus*) system, used above to interpret the excavated settlement structure of Petersborg.

At a time between 1279 and 1283, two men of the west-Schleswig parish of Vodder, the parish priest and a man named Knud Degn (Dean), attested a will together with Kristine, widow of Knud Snubbe, and the son of the same Knud, Mads (DD 2. ser., vol. 2, no. 389; Gregersen 1975; 1978, 41; 2000). It was confirmed that Knud Snubbe had the will read to him on his deathbed in the presence of the abbot of Løgum Abbey and a monk from the same monastery. The will itself, cited in the preserved document, was composed and sealed by Knud together with the priests of Bjolderup and Uge (DD 2. ser., vol. 2,

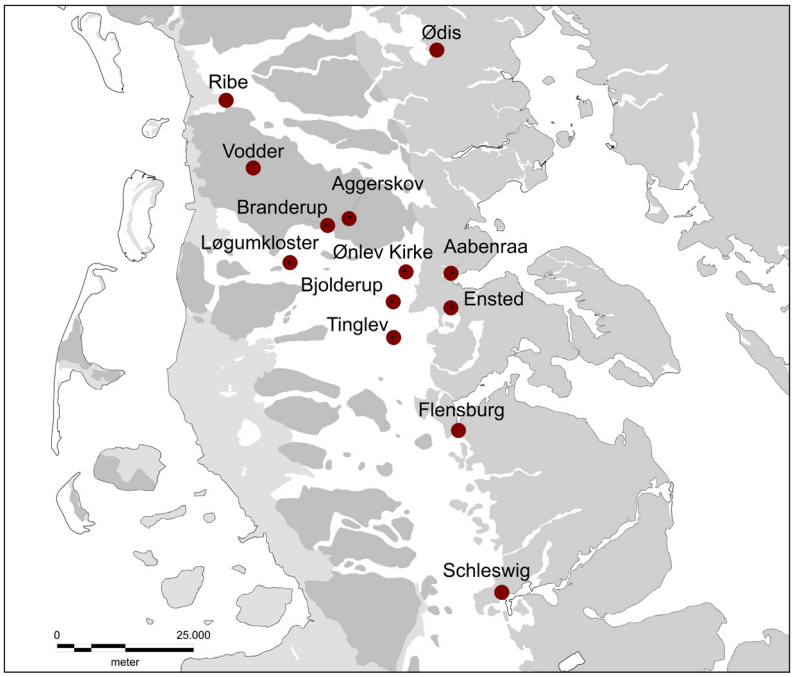


Figure 7. The geographic world of Knud Snubbe as revealed by donations in his preserved will from 1279-1283. Marked are the churches and institutions, which received gifts from the aristocrat Knud Snubbe (Drawn by the authors).

no. 389). Here, we are clearly at the core of the world of Knud Snubbe (Figure 7). The will confirmed that 29 marks had to be given to the Holy Land, *i.e.* to the papal collection for the crusade (Jensen 2000, 42-45). Among the local churches, Bjolderup and nearby Tinglev received the most, namely two marks and further monetary gifts for the priests. A number of churches received smaller monetary donations, namely in the towns of Schleswig, Ribe and Aabenraa, and in six villages in the area. In addition, priests and acolytes received their share together with church institutions and mendicant houses in Ribe, Schleswig and Flensburg. Finally, there were donations to the leprosy hospitals in the local towns. In this way, the donator, Knud, secured masses for himself for a sum of 60 marks. The abbey of Løgum, nevertheless, was the most important recipient of the will: its monks were given land in the field of Bolderslev. They received shares in two so-called *bol* (corresponding to the English hides): three eight-parts (Danish *ottinger*) in 'Haldensbol' and three eight-parts in 'Ættebol', which where situated 'to the west'. To this was added 'all the wood in Urne belonging to me [Knud Snubbe] with the exception of three eight-parts which is possessed by my bailiff (Latin *villicus*, Danish *bryde*) Ketil Streng, and which shall be passed to my son Mads as paternal inheritance'. It is also clear from the document that Knud Snubbe owned more land (DD 2. ser., vol. 2, no. 389).

It soon became apparent that Lord Jens Urne in no way accepted Knud Snubbe's land donations to Løgum Abbey. A fight broke out, which is characteristic for the period and its perception of landed wealth possession as loaded with honour and as something that could be negotiated (Esmark 2004; 2013). In 1283, Jens Urne had taken control of the land in the field of Bolderslev and Urne Wood by use of violence (DD 2. ser., vol. 3, no. 78, 79). Therefore, the abbot of Løgum Abbey complained to the Danish archbishop, who installed the bishop of Ribe as judge in the case. As the bishop of Ribe was a close friend of Løgum, it was evident that Jens Urne would lose the case, but he managed to secure another judge, namely the bishop of Schleswig. After negotiations, Jens achieved a favourable judgment that stated that he should either have 100 marks from Løgum Abbey and refrain from persecuting this institution – or he could give the monastery 500 marks and then the land was his (DD 2. ser., vol. 3, no. 410). Jens Urne paid the full amount, and the fight was over.

As the will shows, parts of the villages of Bolderslev and Uge were not in the possession of the Urne family, but of Knud Snubbe. It is reasonable to assume that Knud had achieved his land here through marriage with a woman from the Urne family, Kristine. The name of their son, Mads, could well have been given to him after Mads Urne, who then was perhaps Kristine's father – and Jens Urne her brother. It may also be the case that Knud Snubbe

gave his land in the Bolderslev region to a local monastery because his other landed estate was situated elsewhere in Denmark. Part of it was, as the will states, cultivated by a bailiff, not by Knud directly. On the other hand, Knud dictated his will in the presence of priests from Bjolderup and Uge: we might therefore reasonably assume that he died on a manor in the parish of Bjolderup. In addition, Jens Urne, presumably contemporary with Knud Snubbe, held land in Bolderslev and the surrounding area.

Close to king and duke

The documents in which Mads and Jens Urne appear show that the two had their landed possessions in mid- and west-Schleswig. Parts of their land around Bjolderup, Uge and the Urne Wood were in their lifetime given to Knud Snubbe and his wife, but there was something special with this possession. The central Urne Wood, with 'urne' meaning uncultivated land / outfield, had given the family its name (*Danmarks Stednavne* 6, 349; Jørgensen 2008, 317). A family identity must have been built up around it, and it was clearly important to Jens Urne to get the land back.

It is impossible to state with absolute confidence that Ketil (*c.*1200), Mads (-1238-45-) and Jens (-1279-1288) constituted three generations of the same family, but this is very likely. Ketil and Jens are tied together by their connections to Bjolderup, and Mads and Jens are connected in several ways, including their titles as knights. Moreover, as mentioned above, it is quite likely that Kristine was the sister of Jens.

The tombstone in the church of Bjolderup demonstrates that Ketil was an important man in the parish, presumably the owner of the church and most probably its founder. The knight titles of Mads and Jens are certainly interesting and indicate their positions. They represent some of the earliest documented knighted Danish men. Already in 1187, the Danish king knighted Duke Valdemar (later King Valdemar II) (Heebøll-Holm 2009). However, knighted Danish aristocrats that were not royals or princes do not appear in the sources before the reign of Valdemar II (1202-41) (*Sønderjyllands Historie* 1937-39, 450). In 1232,

Figure 8. Seal matrix found during excavations of St Clemens Church in the town of Schleswig. It shows an eagle leg standing over waves, and the legend reads SIGILLUM HAQUINI DE SLESWIC (seal for Håkon of Schleswig) (Photo: Linda Hermannsen, Archäologisches Landesamt Schleswig-Holstein).

Abel became duke of Schleswig and among his knights were Mads Urne. It seems only natural that the succeeding duke of Schleswig, Valdemar IV also knighted Mads's son, Jens (DD 2. ser., vol. 3, no. 292).

From seals from the 15th century onwards, we know the coat of arms of the Urne family: an eagle leg with claw (Thiset 1898, 33, XLV, 1). This sign is much older as shown by a seal matrix found in 2003 during excavations of St Clemens Church in the town of Schleswig (Figure 8). The matrix, found in the chancel, is of bronze and with an eye on the back. Its picture is an eagle leg standing over waves, and the legend is SIGILLUM HAQUINI DE SLESWIC (seal for Håkon of Schleswig). Radtke has attempted to identify the Håkon mentioned. Firstly, he assumes that with the title 'of Schleswig' and the distinguished resting place in the chancel, Håkon must have been lord of Schleswig – *i.e.* after the murder of Duke Knud Lavard of Schleswig in 1131 (Radtke 2019). The possession of this title, according to Radtke, is underlined by the waves on the matrix, which he interprets as parallel to the town seal of Schleswig and the guild seal of the town's Knud guild. Here it is

a symbol of the inlet Schlei. Somewhat more speculative, Radtke proposed that Håkon is identical with Håkon Jyde (the Jutlander) who lived in the first part of the 12th century and died sometime after 1131. He is also named Normand (the Norwegian) as he was grandson of the Norwegian King Magnus (died 1047), and his mother was daughter of a Norwegian aristocrat. He was married to the daughter of a king, moved in royal circles, and participated in the preparation for the killing of Knud Lavard in 1131. His son became king in 1137 under the name of Erik III Lam.

If the interpretation of Radtke is correct, then the Urne family – in line with other aristocratic 'collectives' in the 12th century – was of royal descent. The Urne family thus constituted a parallel to the wealthy Jutland family of Thrugot and the famous Hvide family (Hermansson 2000). It enjoyed its golden moment after the murder of Knud Lavard, where one of its members achieved the highest office of the realm: he was elected king (Radtke 2019). We cannot be sure that the seal matrix points to Håkon Jyde of the Urne family (buried around 1140 with his wife, the princess, in the chancel of a church which he had presumably founded). One of the problems is that the seal is not earlier than 1180, predating the death of Håkon Jyde. Radtke solves this problem by interpreting the seal as a memorial seal later deposited in Håkon's grave. If the identification proves false, it remains certain that members of the Urne family were active in the largest town of the area, Schleswig. They were not only rural aristocrats but acted in urban contexts. If the members of the Urne family were not members of the royal family (or even kings), the connection to the towns of Schleswig shows that they were close to kings and sons of kings. The development of the family from magnates to knights, and its constant proximity to princely power, therefore forms part of our interpretation that its members must have exercised control over the Urnehoved Thing.

Urnehoved Thing in history

The early and high medieval *things*, where all armed men met and debated and decided in matters of public interest, as well as carried through court sessions, have been the subject of significant research. In Denmark, the judicial procedures have been described and it has been documented how the *things* were central for the king's acclamation. The regional *thing* of Viborg was clearly the most important and in the 11th century appears as the normal place for the election of kings (Snorri, 21, 67; Saxo, book XIV. 16.4.). This rule was, however, not without exceptions, and Urnehoved could also be used for the same purpose. The general lines are well-known, but new Danish research is limited (Christensen 1969; Hansen 2019; Hvidtfeldt 1941; Jørgensen 1974, 238-251; Jørgensen et al. 2010).

On a North European level, however, there is considerable interest among both archaeologists and historians in such Viking Age and Early Medieval assemblies (Bornfalk 2021; Iversen 2017; 2020; Sanmark 2017; Sanmark et al. 2020; Semple and Sanmark 2013). Research has proved that the *things* frequently moved geographically during the constitution of kingdoms. The importance of interplay between the large regional assemblies and the smaller local ones, in Denmark corresponding to the difference between the *thing* of regions (*lande*) and local districts (*herreder*), has also been underlined. New research on the *things* of southern Norway shows that accessibility was not the sole explanation for their location. Other factors also played a role and, of interest in our context, it is clear that kings built a more robust basis of power by delegating power to local elites in the *thing* districts (Ødegård 2018). There is no doubt that the *things* functioned as means to strengthen royal power. On Gotland, for instance, the central *thing* was seemingly linked to the royal residence of the island (Östergren 2005), which is of note in relation to Urnehoved Thing.

Urnehoved Thing was situated in Urne Wood. A longstanding debate centres on the exact place of this *thing* (Clausen 1949; Matthiesen 1961, 97). There is now at least some agreement that this was not the locality of Løgpold where, in the 1940s, a memorial park marking the *thing* was laid out. Gregersen, instead, reasonably points to a locality in the eastern part of Bolderslev field. Here, on a hill 54 m high, is located the so-called Hestehaven or Baldersborg to which a direct road from the church of Bolderslev leads. As documented by

Gregersen, Bolderslev Church owned this demarcated area in 1443 (Gregersen 1951; 1978; 2000; Gregersen and Iversen 1951). The connection of the *thing* to a church may be relevant to the ongoing debate on the relation between cult and the *things*, but we do not have textual sources to follow that trail.

In relation to the dating of Urnehoved Thing, Andersen has argued that the creation of this special *thing* place in Southern Jutland as a counterpart to the central *thing* of Viborg did not take place before a royal decree was issued at some point during the years 1192-1197 (Andersen 2005, 53, 70). To date the Urnehoved Thing so late, however, necessitates ignoring a number of sources. It is often mentioned that King Svend Estridsen attended Urnehoved Thing just before his death in 1074 in nearby Søderup (Gregersen 1978, 37; Olrik 1968, 39). This is, however, uncertain as it is derived from the late 13th century *Knýtlinga saga* (trans. Ægidius 1977). In 1134, Urnehoved Thing appears in more reliable sources. According to Saxo, Harald Kesja, the son of King Erik Ejegod, was elected king at 'Urne' in 1134; however, he only benefitted shortly from this as Erik Emune soon liquidated him (Saxo, book 14, 1, 4). In 1137, an aristocrat named Sorte Plov killed the same Erik. *The Chronicle of Roskilde*, which was written at the time of the murder, simply states that it took place at a *thing* outside Ribe; however, not much later, Svend Aggesen states that the place was Urne Thing (Geertz 1917-18, 31, 136-7). The murder was followed by the election of King Erik Ejegod's soldier Erik Håkonsen as king. As mentioned, this man might have been from the Urne family, but it remains unclear if his election took place at Urnehoved Thing. In 1182, however, Saxo describes how, after the death of his father Valdemar I, Knud rushed to Jutland to take oaths from his father's soldiers. The royal homage at the regional *thing* of Viborg was without problems but apparently, events were less smooth at 'the gathering at Urne Wood', where there was a revolt, which was ultimately pacified, and Knud achieved the throne (Saxo, book 16, 1, 1). There seems to be no reason to doubt that from the early 12th century Urnehoved Thing was a meeting place between king and people.

Through the rest of the Middle Ages, Urnehoved Thing functioned as an important assembly. In 1254, King Christoffer gave Valdemar III the Duchy of Schleswig as a fief, and it was laid down 'that from Urne Thing there could be appealed to the realm' (DD 2 rk., 1, 151). In 1306, King Erik VI Menved entered into a compromise with Duke Valdemar IV of Schleswig and his brother. It was determined that the duke should not persecute the peasants of the king in the Duchy – and if it did happen, that the peasant should be able to obtain royal protection and judgement at Urne Thing (DD 2. ser., vol. 6, no. 35; Gregersen 1978, 39; Windmann 1954, 151).

From the last decade of the 14th century, there is evidence of two high political meetings at Urnehoved Thing, proving that the *thing* still functioned. On 18 October 1393, the Duke of Saxony met here with the Dukes Claus and Albrecht of Holstein and Duke Gerhard VI of Schleswig (DD 4. ser., vol. 5, no. 85). From 1397, we have documents issued at Urnehoved Thing, '*op deme landesdinghe to Vrenhouede*', in which Duchess Elizabeth gave up her rights to the Duchy. The documents prove that the Schleswig elite was present: all important men of the clergy, nine knights and 26 squires as well as representatives from the towns of Sønderborg, Schleswig and Flensburg (DD 4. ser., vol. 6, nos. 385, 386, 387). Later on, little is heard of the *thing*, except that in 1460 the newly elected Duke (and King) Christian I promised that he would meet the Schleswig nobility annually at Urnehoved (von Rumohr 1960, 39).

Urnehoved Thing is at the centre of three medieval districts, *herreder*: Slogs, Rise and Lundtoft (known as Kliplev in the 13th century), each with their own *things* (Figure 9). Urnehoved Thing was more than such local *things* and possessed a special elevated character, which actualized when the entire territory of Schleswig met. The large 14th century meetings document that the *thing* marked the unity of the Duchy of Schleswig, while important exercise of justice had been taken over, presumably already by the 13th century, by the duke (Windmann 1954, 152-155). It is an interesting question whether the existence of the Urne Thing during the 12th century could mark an early Schleswig territoriality, predating the creation of the Duchy in 1232.

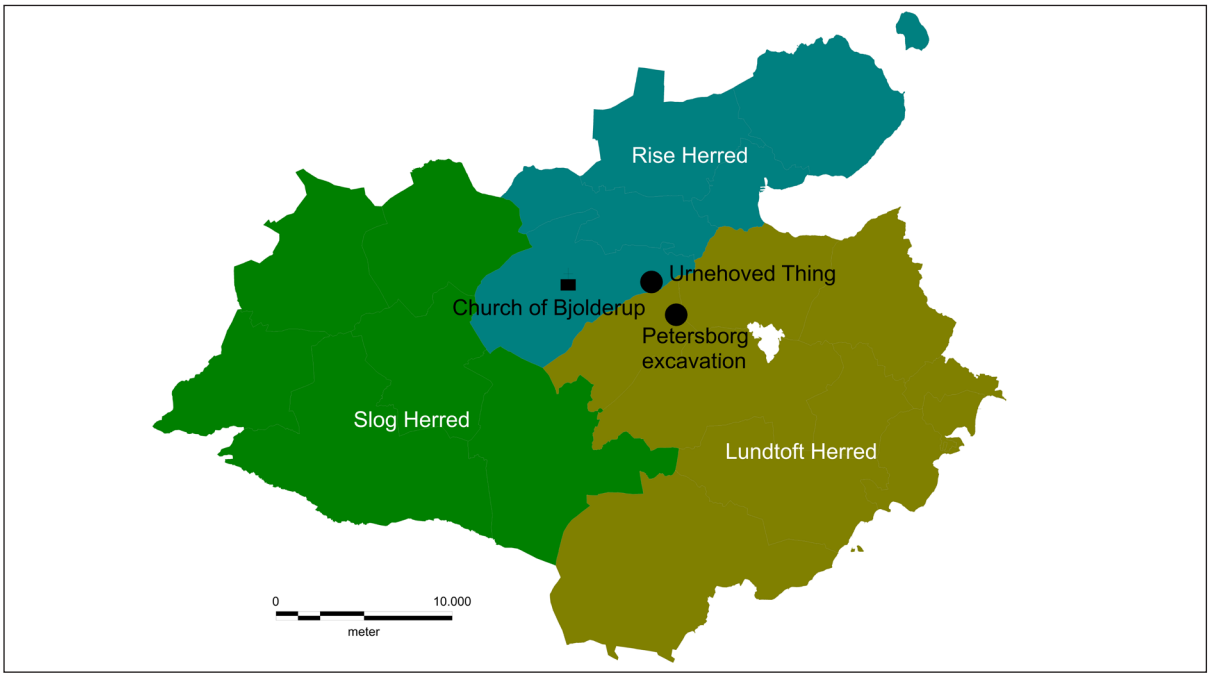


Figure 9. Map of the three territorial districts, *herreder*, of Lundtoft, Rise and Slog with the location of the assembly site of Urnehoved Thing, the church of Bjolderup and the excavation at Petersborg (Drawn by the authors).

Urne-thorps

We can now ask if medieval clearance villages, so typical for the ongoing clearance and enclosure of North European woodland during the 11th to 13th centuries, and which probably are related to our Urne family, can be found in the wooded region around the Urnehoved Thing. First, the excavated village at Petersborg has a peripheral location, behind the *Hærvej* and on the border of the parish of Uge – and between the *herreder* of Rise and Lundtoft. This must mean that it was a settlement placed in the outfield. As mentioned earlier on the oldest reliable map of the area from 1805, it is evident that the brook Uge Bæk was in its natural bed. However, today we can also see a bed north of the deserted settlement. It seems likely that this replacement of the brook was made in connection to the establishment of the village, and this points to a founder with considerable resources at his disposition (Hartvig unpublished). As already made clear, in the area, only the members of the Urne family mastered this: it seems to have been absolutely dominating in the parishes of Bjolderup and Uge. Based on this, it is our thesis that the foundation of Petersborg village – and all early medieval colonization in the area – were directed by the Urne family. No written sources mention the deserted Petersborg settlement, and it is not possible to know how farms here were operated. Inspired by the model of Håkansson (2012) – and in light of the fact that the Urne family employed a bailiff on one of its farms in the parish of Bjolderup – it is, however, perhaps reasonable to assume a similar situation in Petersborg.

It has been argued that in the early medieval period the Urnehoved Bank was still a no man's land, covered by the woods stretching from the east coast (Gregersen 1978, 15). Apart from the excavation at Petersborg, our archaeological knowledge of the two parishes of Bjolderup and Uge is limited to four minor investigations and a handful of detector finds. The detector finds are mostly late medieval, even if a Viking Age trefoil brooch has been found near Bjolderup Church.[1] In 2022, a small excavation at Uge Mark, some 500 m east of the village of Uge and only 150 m from the hamlet of Todsbøl Bjerg, revealed three wells and two buildings.[2] The pottery finds date the site to the 13th century. There can be good reasons for the lack of Viking Age finds, but much indicates that the theory of an early medieval wood-covered area is correct. The fact that the village of Torp, just east of Petersborg, was termed 'Urnetorp' when it appeared first in 1543 (Trap 1967, 933) supports this assumption. This name could derive from the location in the wood, but

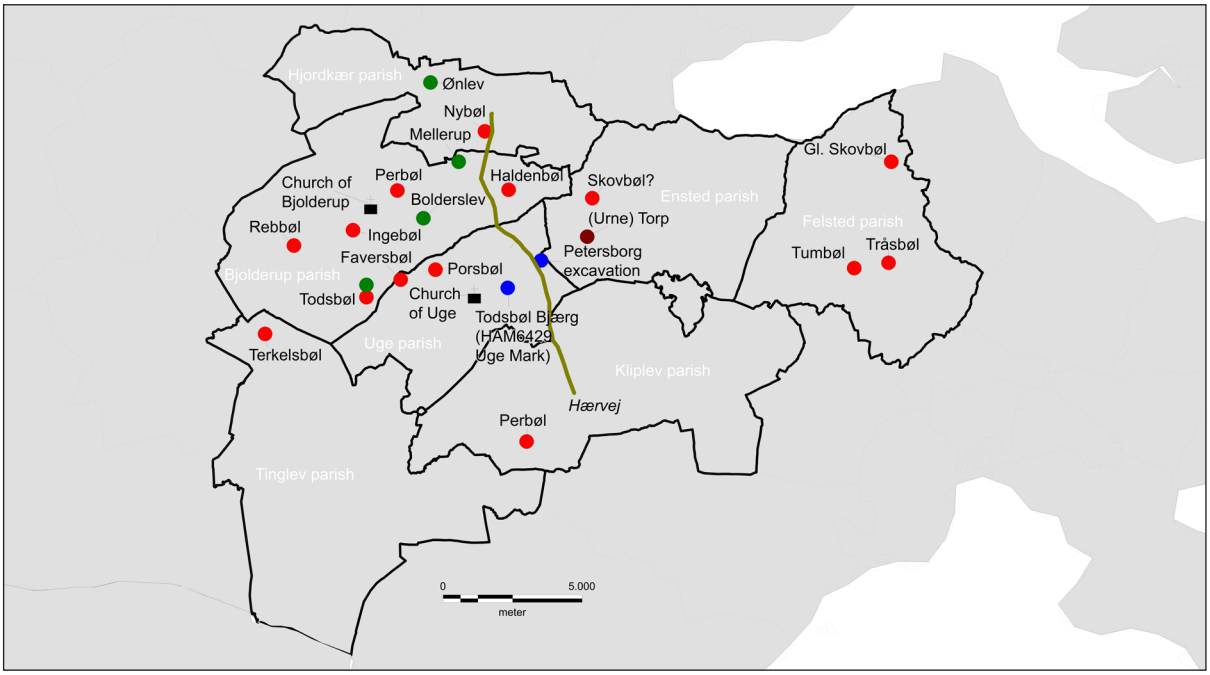


Figure 10. Map of the area around Bjolderup / Urnehoved Thing. Shown are the two churches of Bjolderup and Uge (black) as well as secondary settlements, indicated by the the suffix 'bol / bøl' (red). Further, the two excavations mentioned in the text at Petersborg and Uge Mark are marked by blue dots, and a purple dot marks the settlement of Urne Torp. The green dots show the four places belonging to the ducal district of Flensborg in 1483.The main road, the *Hærvej*, is shown by a green line (Drawn by the authors).

it may also be that it came from the Urne family – and, if so, it is a marker of the 12th-13th century land-clearance and spatial dominance by the Urne family in the area. The sources cited above made it clear that, in the 13th century, the Urne family had shares in so-called *bol* (hides) in the Urne Wood and that these had names: Ættebol and Haldensbol. The suffix *bøl(le)* in Danish place names is the same as *bol*, meaning dwelling or farm (in the outfield) and dating to the last part of the Viking Age or the early Middle Ages (Jørgensen 2008, 87; Poulsen 2003a, 378-80). It is interesting that we find a number of settlements with the suffix *bøl* in the two parishes of Uge and Bjolderup (as well as a few in the surrounding parishes)(Figure 10). Among the *bøl*-names around Bjolderup, only Porsbøl is not formed with a personal male name. Two of the remaining six have a Christian name (Peter) and thus must date from after the year 1000. The concentration and distribution of *bøl*-settlements must be said to indicate a large-scale colonization in uninhabited areas, presumably by clearance of the Urne Wood.

It is not possible to prove that the Urne family was behind this project, but we believe it to be highly plausible given the background of the family's later documented dominance in the area and our assumption that the family did establish the settlement of Urnetorp. On the background of this colonization, we can explain the existence of a large complex of land around Bjolderup that enters the sources in 1483. At that time, according to a tax register this complex was sorted under the ducal district of Flensborg Amt (and not Aabenraa Amt as one might think), and it consisted of 19 farms in Bolderslev, five in Todsbøl, five in Mellerup and one in Ønlev (Falkenstjerne and Hude 1895-99, 223-224). We suggest that this complex was once the property of the Urne family (which had been confiscated by the duke, perhaps around the year 1300) and note that here we have a centre (Bolderslev) with satellite settlements (Todsbøl, Mellerup). Such a pattern of clearance villages around the manors of aristocrats is typical in 12th and 13th century Denmark (Poulsen 2023; Ulsig 1968).

A landscape of power

A picture of a landscape which, during the period 1000-1200, was created by working people led by an elite thus emerges. A manor, presuma-

bly in Bjolderup, sent out settlers in its vicinity, a manor at the central road in Denmark, *Hærvej*, and the key to a place of central political decisions, Urnehoved Thing. A family with high status, the Urne family were owners of the manor. While this building has not yet been located, the gravestone in Bjolderup Church shows that the family was connected to it – presumably as its builders.

The church of Bjolderup is situated high in the landscape on the south bank of Søderup River. In terms of size, it is larger than other village churches of the area. The church was built around 1200 in stone with the later addition of a tower. Investigations have shown that before the erection of the standing tower, the church had a west gallery from where it was possible to overlook the nave (DK vol. 22, 1833). Interpretations of such 12th to 13th century western towers have been published in previous research, with most authors agreeing that towers with galleries are an indication of a church built by aristocrats (Hansen 2013, 179; Søvsø 2011, 119; Wienberg 1994, 82). We assume that a manor lay near the church of Bjolderup, quite isolated and thus marking spatial and social distance to villages and hamlets, including to the large village of Bolderslev which the Urne family presumably owned totally (Falkenstjerne and Hude 1895-99, 223-224; Hansson 2006). It was a dominant factor in the area and became the core of the parish from the late 12th century onwards.

South of Bjolderup Parish, in the parish of Uge and at its border, we find the excavated Petersborg village. According to the will of Knud Snubbe from around 1280, the two most important churches in his world were Bjolderup and Uge: the two priests who signed his document came from here. Uge Parish, compared to Bjolderup, is small and with its few and small villages it must be secondary. Uge Church is also small, and its early medieval parts are built of rough-hewn stones (DK vol. 22, 1845-1853). This leads us to the conclusion that at least part of the population growth, which made the parish and church of Uge possible, came after land reclamation deriving from the old Bjolderup Parish in the north.

The north-south road of *Hærvej* which went through Jutland up to the Limfjord and through the parishes of Uge and Bjolderup without doubt constituted the reason why the Urne family resided here, where a crossroad led directly to the old town of Ribe to the west. Certainly, such a place could generate contributions and tolls from travellers, as we know from early modern sources. It has been stressed that it was generally dangerous to build settlements near the *Hærvej* due to the threat of plunder and war (Gregersen 1978, 15). The very fact, therefore, that a village such as the Petersborg settlement was situated so near the much-trafficked road must indicate that it had protection. Again, we must think of the aristocrats and knights of the Urne family who no doubt could supply military assistance.

The roads conditioned the Urne Thing. The *thing* took place where roads from south, north, east and west met. However, this was not the pre-historic situation as there is general agreement that the course of the *Hærvej* changed at some date. In the Bronze Age, the road was much more western and went via Bolderslev as indicated by the place of burial mounds (Becker-Christensen 1981, 150; Gregersen 1978, 14). At that early point in time, the traffic did not go through the Urne Wood. It is much discussed when the road was redirected and took a short cut over the bank. Becker-Christensen, however, convincingly states that it is tempting to connect the new road course with land clearance in Bolderslev field and in the Urnehoved Wood (Becker-Christensen 1981, 158). The will of Knud Snubbe showed that such clearance had already taken place before *c.*1280 (DD 2. ser., vol. 2, no. 3, no. 389; vol. 3, no. 78). The excavated houses at Petersborg, situated as they are at the foot of the Urnehoved Bank and just at the *Hærvej*, must be seen as a new argument here: the first houses of the Petersborg locality mark a *terminus post quem* for the road leading across the Urnehoved Bank and thus give the date for the Urnehoved Thing.

We can only speculate on the relation between the inhabitants of the Petersborg village and the travellers on the *Hærvej*. The location so close to road and *thing* could have provided possibilities for monetary income by selling food. Only the coin hoard from farm G12, however, indicates such contact. As mentioned, the hoard consisted of 52 coins, denars and obols. They were struck by Archbishop of Cologne Philipp von Heinsberg (1167-1191), who was closely connected to German-

Roman Emperor Friedrich Barbarossa (1155-1190), from whom there are seven coins in the find minted in Aachen. The hoard dates to 1175-81 (Nau 1977, 92-93).

Coin circulation in this period was dominated by Danish coins. Only coins produced by Danish mints were legal and, consequently, finds of German coins are extremely rare (Grinder-Hansen et al. 2013; Jensen 1980; 1988). There is little doubt that the coins of the Petersborg hoard must have belonged to a German traveller and that they represent a selection of coins he brought from the Cologne area. He might have been a merchant or pilgrim, but he could also have been a person heading for political debates at the Urnehoved Thing, possibly the election of King Knud in 1182. Also in 1181, there were negotiations between King Valdemar I and the German emperor resulting in a royal marriage in the town of Schleswig (Skyum-Nielsen 1971, 185). At the time when the coins were lost, there were intense, high-level German-Danish debates that could conveniently take place at Urnehoved.

The Urne-aristocracy in a southern Jutland context

As already mentioned, early medieval Southern Jutland has been described as dominated by relatively free farmers with farms of equal size (Poulsen 2003a, 424; Søvsø 2020). Based on written sources, however, it has been documented above that a stratum of knights existed in the area in the 13th century. If we move back in time, it becomes clear from the archaeological material that the Urne family was not the only elite family in Southern Jutland in the 12th and 13th century.

Royal manors in Southern Jutland are normally not localized, but Huseby in the area of Angeln constitutes an interesting example where field investigations point to the existence of a royal centre functioning at least in the late Viking Age (Christensen et al. 2016). Near Bjolderup, in the area on which this investigation centres, royal power was also manifest. In or near the present settlement of Søderup, northeast of Bjolderup, a royal manor was situated. The sources tell us that here King Svend Estridsen died in 1074 (Olrik 1968, 39). King Valdemar's Survey from *c.*1231 also mentions the king's land in Søderup, valued at two marks of silver. This is a small amount, and the text explicitly states that the settlement consisted of tenants (*Kong Valdemars Jordebog* 1, 98). It is therefore reasonable to believe that a larger royal farm had been dismissed, but that the manor in Bjolderup and the royal farm in Søderup most probably co-existed during the 12th century. As mentioned above, the Urne family was probably royal, and it is not necessary to imagine the two manors as competitors: they likely constituted a two-tiered structure, influencing the assemblies at Urnehoved Thing. It is certainly possible that several centres, *i.e.* manors, existed in the same area (Lihammer 2008, 19). The royal manor of Søderup has not been archaeologically located but, in 2008, aerial views localized 23 pit houses here.

Localities of elite character from the 11th to 13th century also exist elsewhere in the Southern Jutland area. One is at Sebbelev Mark, 800 m south of Ketting church, on the island of Als. The farm here, excavated in 2005, was presumably built in the early 12th century and fortified with a moat (Nielsen 2008)(Figure 11a). According to King Valdemar's Survey, *c.*1231, the king owned Ketting, so it is possible that this is a royal administrative centre (*Kong Valdemars Jordebog* 1, 117). Explicitly aristocratic is the mid-Schleswig site of Østergaard near Hyrup in the parish of Bevtoft (Figure 11b). Here, an isolated late Viking Age farm has been excavated, which in time developed into a village. Around 1100, it was divided into two farms. At one of these, in the main house, two pieces of jewellery were found. One of these was of gold with enamel and a large rock crystal, and the other was in silver filigree-work and likewise included a rock crystal (Sørensen 2005; 2011). They were made by goldsmiths working for the German emperor and can hardly be interpreted as anything other than expressing personal relations to royal Danish circles. At Starup on the south side of Haderslev Fjord, Sønder Starup Church is situated. In the church, a rune stone was found with the inscription, 'Æirīks kumbl' (Eiríkr's monument, our translation) (Englert et al. 2016, 195). The church was a three-aisled basilica with a broad west tower and presumably a gallery. Timber from the choir dates from the last decades of the 11th century

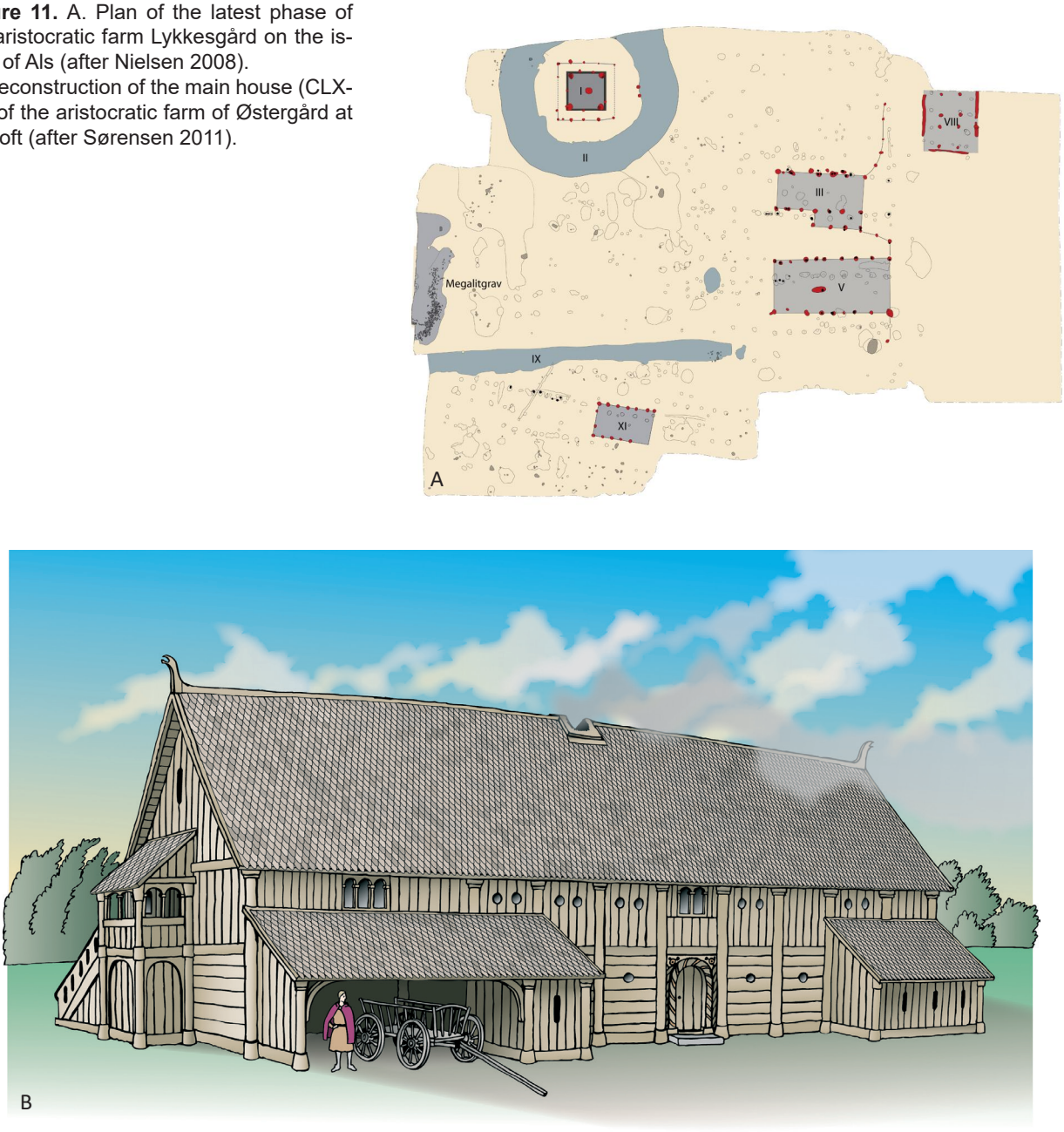


Figure 11. A. Plan of the latest phase of the aristocratic farm Lykkesgård on the island of Als (after Nielsen 2008).
B. Reconstruction of the main house (CLX-XII) of the aristocratic farm of Østergård at Bevtoft (after Sørensen 2011).

(Bertelsen 2016), and it has been established that a broad moat existed around the church. Excavations near the church have revealed a settlement with metalsmiths from the late Viking Age and the early medieval period (Hartvig 2016). With the rune stone, the large 11th to 12th century church, the gallery and the moat, Starup appears as a home for elite members of society.

Thus, the elite group in Bjolderup was apparently not alone in Southern Jutland. A broad group of aristocrats existed in the area, distancing themselves from the rest of the population with large buildings, moats, and proprietary churches with galleries. They were not just wealthy peasants. Among these elite families, the Urne family likely constituted the group that was closest to the king as a consequence of their control of the regional *thing*, but their power and influence should always be seen in connection with other aristocrats.

Conclusion

It has been argued that the excavations at Petersborg and evidence concerning the Urne family and the Urnehoved Thing should be seen together. This, in connection with other elements such as proprietary churches with early medieval galleries, gives us an understanding of early elite groups in the part of Denmark which in the 13th century

became the Duchy of Schleswig. The Urne family probably welded power in their own right in this region in the years before 1200. This position may have been achieved in the 12th century, perhaps in part because the Urne family members were relatives of the royal family, and in part because of land ownership at a central place. Their domination of an assembly, where central decisions were taken, in addition to their control over a central Danish road, are factors that should be taken into consideration when explaining the place of the family in the social hierarchy. The *thing* lay on the lands of the Urne family and, undoubtedly, the family could guarantee peace during the negotiations here. The *thing*, the land reclamations in Urne Wood, the foundation of the village of Petersborg and other villages, as well as the establishment of the *Hærvej* through the Urne Wood, all explain why Urne became the name of the family. Its members were not alone in belonging to an aristocratic group in Southern Jutland, but they were presumably at the top of this group. Therefore, they marked themselves as a distinct group with their own family name and heraldry.

Notes

1 HAM1833 Amalienborg, Uge sogn Sb. 74. og HAM5766 Almstrup, Uge sogn sb. 103. HAM2972 Bolderslev Frigård, Bjolderup sogn Sb. 99. HAM6425 Uge Mark, Uge sogn sb. 113.HAM5135 Bjolderup Kirke, Bjolderup sogn, Sb. 142.

2 HAM6425 Uge Mark, Uge sogn sb. 113.

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Hunters of the Past – A Study of Demography, Attitudes, and Values among Danish Metal Detector Users

Mette Lykkegård-Maes[1,2] and Andres Siegfried Dobat[1]

[1] Department of Archaeology and Heritage Studies, School of Culture and Society, Aarhus University, Moesgaard Allé 20, 8750 Højbjerg, Denmark
[2] Corresponding author (mettelykkegaard8660@gmail.com)

ABSTRACT
This article presents the results of a questionnaire–based survey on demographic aspects, prevailing attitudes, motivations, and values among members of the Danish hobbyist metal detector community. The objective of the study is to take an initial step towards a scholarly appraisal of the sociological dimension of the Danish metal detector phenomenon – e.g., its practitioners as members of a community with its own specific and oftenly diverging characteristics and dynamics. By this we wish to contribute to shaping a best practice framework, which can be used for interacting and cooperating with detectorists in Denmark and internationally.

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Introduction

In Denmark, as well as in other European countries, hobbyist metal detecting has developed into one of the most prominent ways in which the public engages with archaeological material and the hobby has seen a continuously growing number of active practitioners. In Denmark, the use of metal detectors as a tool to find archaeological items by non-professionals is legal, except on scheduled sites and presupposed landowners' consent. A combination of several factors, including the long tradition of voluntary contribution in archaeology and the legal basis of the Danish treasure trove scheme (Danefæ), have paved the way for a (by and large) constructive cooperation between hobbyist metal detectorists and the professionals.

When dealing with hobbyist metal detectorists, Danish museums focus mainly on the results of metal detecting in the form of finds and sites – in accordance with their obligations as specified in the Consolidated Act on Museums (2006). As a resource for cultural historical research, there is great evidence of hobbyist metal detector finds having radically altered traditional views and leading to completely new pictures of Danish pre- and protohistory (for examples see: Christiansen 2019; Dobat 2013). On the other hand, when it comes to the social dimension of metal detecting, our knowledge is comparably limited. This is mainly due to the fact that until now no systematic analysis of the detectorist community has been conducted. Archaeologists – and other heritage stakeholders – have shaped their own intuitive understanding of the community and hobby based on practical experience, netnographic studies or personal observations (Baastrup and Feveile 2013; Hansen and Henriksen 2012; Ulriksen 2014). But does this largely anecdotal knowledge among professionals reflect the phenomenon's true complexity? Who are the detectorists? Why are they doing what they do? How do they practice their hobby? And how do they perceive their role?

Like many other questions related to this topic, these questions have until now remained fairly unanswered.

Figure 1. As a community and as individuals, detector users are just one interest group acting within a complex network of other stakeholders, institutions and domains, including museums, legal frameworks, the public and others.

Research Agenda

The objective of the survey presented in this article was to take an initial step towards a scholarly appraisal of the human dimension of the Danish metal detector phenomenon – e.g., not the finds but the finders. This paper is therefore based on data generated through an online questionnaire which was distributed through selected Facebook groups (see acknowledgements).

With the survey and this presentation of the obtained data we would like to gain a better understanding of the metal detector community as a stakeholder group with its own specific characteristics and dynamics. Through closed- and open-ended questions, the survey targeted not only basic demographic data and characteristics but also tried to capture the practitioners' attitudes towards archaeological heritage. Furthermore, we aimed to get an idea of the basic motivations and values underlying their engagement with metal detecting. Beyond that, the survey also tried to address how the individual practitioners perceive their role within the Danish heritage landscape. A landscape which consists of a variety of stakeholders, institutions, and domains (including museums, legal frameworks, the public, etc.) (Figure 1).

More specifically, the survey touched upon the following topics:

- The demographic data and characteristics of Danish metal detector users (age, gender, education, profession, etc.).
- Practitioner's level of experience and expertise.
- Motivating factors and attitudes concerning metal detecting and the archaeological past
- The significance of the treasure trove payments and the financial incentives for reporting finds.
- The relationship and cooperation between detectorists and between detectorists and the museums.
- The detectorists' view and opinion(s) concerning current and future challenges related to the use of metal detector in Denmark.

The aim of this paper is not to provide a full analysis and contextualization of the data generated through our online survey. Instead, it is our ambition to present some of the results and provide

an entry point to the data for practitioners and the research community (nationally and internationally).

Why study Metal Detector Users?

One might ask why archaeologists and museum professionals should use resources on studying and understanding the sociological dimension of metal detecting.

In response to this, one reason would be that the growing community of detectorists has a profound and very direct impact on the archaeological heritage as it is they who are making most of the archaeological discoveries outside a controlled environment. This alone should legitimize the quest for knowledge of the community, since it is a basic prerequisite for establishing a best practice framework which can be used for cooperating with detectorists. Furthermore, while the community until around the early 2000s was a small and homogeneous group, it has, over the past years, not only become much larger but also increasingly heterogeneous in character. Gaining a basic idea and understanding of the community is therefore also a timely matter.

Most importantly, however, we wanted to talk with metal detectorists instead of talking to metal detectorists. The relationship between, on one hand, museum professionals representing the authoritative heritage sector and, on the other hand, amateur archaeologists is, per se, asymmetrical in character. Hence, mapping attitudes and motivations among detectorists (and acknowledging them) is also a matter of ethics. In the same way as professionals demand of detectorists to respect and act according to their standards and values when engaging with archaeological heritage, members of the professional sector also ought to be empathic towards their amateur counterparts. Not least should professionals be aware of the values and meanings which detectorists project on the archaeological heritage even if they differ or perhaps even conflict with traditional academic approaches.

Across Europe, very much in contrast to the Danish experience, non-professional metal detecting is a subject of great controversy and heritage professionals' opinions and attitudes towards the subject are often polarized and based on ethical and/or emotive arguments. This is not least due to the fact that we lack reliable data on the scale, the motivations of the practitioners, and the impact of the practice. Especially in countries with restrictive policies, detectorists are often difficult to reach out to and even more reluctant to divulge details about their hobby as they often fear incrimination. In Denmark though, we are in the fortunate situation to be able to establish empirical data due to our permissive context. In light of this, mapping the landscape and establishing knowledge of the metal detecting phenomenon in Denmark can be of global significance and might contribute to current international debates.

Private metal detector use in numbers

A total of 330 participants responded to our survey and 262 completed the survey in its entirety. In light of the 6522 members (status December 2020) in the largest Danish Facebook (FB) group (Detektor Danmark), this number appears to be a comparably small sample of the community. But what is the scale of detecting as a leisure activity? How many active detectorists do we have to reckon with? And how representative is our survey? In order to at least establish a rough estimate on these measures, we must draw on a variety of sources (Figure 2).

In 2016, local museums within Denmark accessed the number of active detectorists within their respective area of responsibility. According to these data, museums reckoned with a total of 1224 detector users (cooperating with museums) in Denmark (Pedersen et al. 2018). Since then, this number has increased considerably. As of February 2020, approximately 3000 detector users have registered themselves as users of the DIME portal which is currently the most widely used tool for the registration of metal detector finds. However, not all registered detectorists in DIME use the system. Furthermore, there is an enormous variation in the numbers of recorded finds between the individual finders. It can, for example, be seen that the vast majority has uploaded less than a hand-

Year	Σ Unique finders*** (who received Danefæ compensation)	Σ treasure finds*	Σ Danefæ compensation (DKK)	Σ members FB group 'Detektor Danmark'	Σ members FB group 'Detektor Danmark' (with detectors)****	Σ Unique finds(sent to the NM for Danefæ evaluation)
2011	202	3,001	?	?	?	?
2012	?	3,412	856,600	100	?	3,061
2013	?	4,367	1,184,373	?	?	4,333
2014	?	5,312	3,044,100	1,000	?	7,176
2015	?	3,516	4,231,775	2,000	?	9,756
2016**	251	5,004	3,661,950	3,000	652	17,055
2017**	379 (?)	9,634	3,160,000	4,000	653	14,364
2018**	447 (?)	21,971	7,680,000	5,066	655	17,385
2019	822	15.029	4,951,535	5,908	695	8.537
2020		12007	8,062,285	6,517	631	7.703

Figure 2. Various sources used here to assess the scale of private metal detecting in Denmark. *Σ treasure finds does not necessarily relate to Σ unique finds but reflects more institutional priorities on Danefæ evaluation (Σ closed Danefæ cases) in a given time interval; ** All numbers are subject to change due to the backlog of the Danefæ treatment at the NM; *** As Danefæ legislation also applies to non-metal finds, an unknown (though very small) part of unique finders are not metal detectorists; **** according to polls conducted among group members.

ful of objects which is contrasted by a small group of 260 users, who each have registered more than hundred artefacts.

Probably one of the most reliable figures concerning the number of active detectorists can be obtained from the Danish National Museum's count of treasure trove transfers. Taking into consideration the comparably broad selection criteria applied by the National Museum (in contrast to more selective criteria in for example England) even detectorists practicing their hobby on a more sporadic level have a fair chance of producing treasure finds. As the clear majority of treasure trove is produced through metal detecting, the number of individual beneficiaries can be taken as an indicative for the number of active detectorists. Somewhat surprisingly, the annual cohort has, until today, been small, adding up to less than 500 people. Only in the latest tally for 2019/2020, the number has risen to 822. However, this low number is aligned with the result of an annual survey conducted by the administrators of the FB group, *Detektor Danmark*, indicating that only a consistently small proportion (around 650 individuals) of the several thousands of members possess a metal detector.

The numbers above suggest that there is a considerable gap between the perception concerning the scale of private metal detecting in Denmark and the actual number of active and find-producing practitioners. Combining all the above indications and figures, we suggest differentiating between three, in reality, overlapping groups:

1. a large number of between 2000-4000 '*hang arounds*' who may be interested in the hobby for various reasons. These may own a detector and might occasionally produce archaeological finds;
2. an estimated group of between 1000-2000 '*regular detector users*' who practice metal detecting on a regular basis and who produce archaeological finds;
3. a comparably small group of between 200-400 particularly dedicated and productive '*super users*' who produce the majority of archaeological finds registered by museums.

According to these numbers we may be able to assume that the number of people practicing the detector hobby is somewhere between 200-4000 users. In order to determine what would then be an approximate number of responses needed in order for the survey to be representative, a confidence level of 95% has been applied together with a margin of error on 5% and a variance of population at 50%. From this, it has been determined that 150-350 answers are needed (Taherdoost 2017, 237-39; Gill et al. 2010, 130). Thus, with the survey's 330 participants, it may be safe to conclude that this study can be seen as fairly representative of the Danish hobbyist metal detectorist community. However, we have to be aware of the fact that more experienced users, characterized above as particularly dedicated and productive '*super users*', most likely are overrepresented in our survey.

Survey Method and Limitations

A number of biasing factors have to be taken into account prior to the presentation of the results.

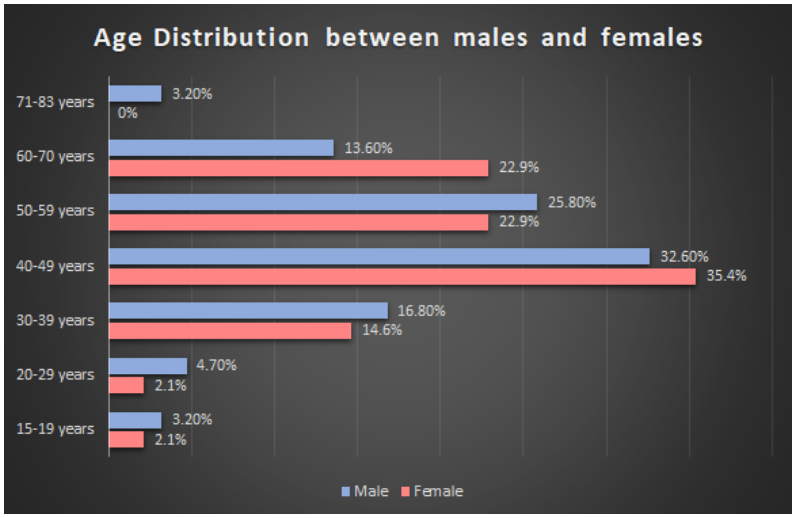

Figure 3. Graph showing the age distribution for men and women.

Portraying communities through the accounts and information given by the communities themselves naturally carries the risk of a heavy representation bias. This is even more relevant in online surveys where participants might tend to provide selective information. Outspoken members of the metal detector community could be conscious about the communities' image in the public and among professionals. And especially when asked about underlying motivations and attitudes, practitioners, and notably the group of more experienced '*super users*', might be aware of what the public and professionals consider to be the 'correct' answers. Therefore, despite the questionnaire being anonymous, it needs to be considered whether only few participants can be expected to have made statements not reflecting the general moral consensus within the detector scene, or among museum professionals.

Metal detectorists, hence, respond from the perspective of what Jackson (2014, 357) has termed respectively the vowed identity and the ascribed identity, framing what respondents think they are and what they believe they ought to be in the eyes of the researcher.

For similar reasons we deliberately chose not to include a number of contentious topics, e.g., irresponsible conduct in the field or heritage crime and/or fraud. Further biasing factors have to be considered when detectorists' willingness to cooperate with the professional sector is concerned as those practitioners who already are inclined to enter a dialogue with museums and professional archaeologists most probably are overrepresented in the pool of respondents.

Survey results

The Danish Hobbyist Metal Detectorists

A central aim of the survey has been to create a demographic overview of the Danish hobbyist metal detectorists. Therefore, the focus of the survey was placed upon age, gender, education, and profession. In connection with this, the survey also included questions in relation to how often the detectorists visit museums and whether they are members of a metal detectorists association.

Overall, the survey showed that the majority of the Danish hobbyist metal detectorists are men (85 %) while women are still much less represented (15 %). Concerning age, the Danish detectorists are often above 40 years, while only few young people (defined as being under 30) seem to be practicing the hobby. This makes the average age 47.6 (Figure 3). Looking further into gender and age, the survey indicated that men seem to start practicing the hobby at an earlier age than women who seem to be taking up the hobby when they are above 60.

Concerning education, the majority of the detectorists have a vocational (43 %) or higher education (35 %). Very few detectorists are uneducated (Figure 4).

The survey further showed that almost one fourth of the detectorists are working as craftsmen whilst another big group are represented as academics. Quite a few of the detectorists are either retired or on early retirement (15.4 %). Less than 5% are either unemployed, working subsi-

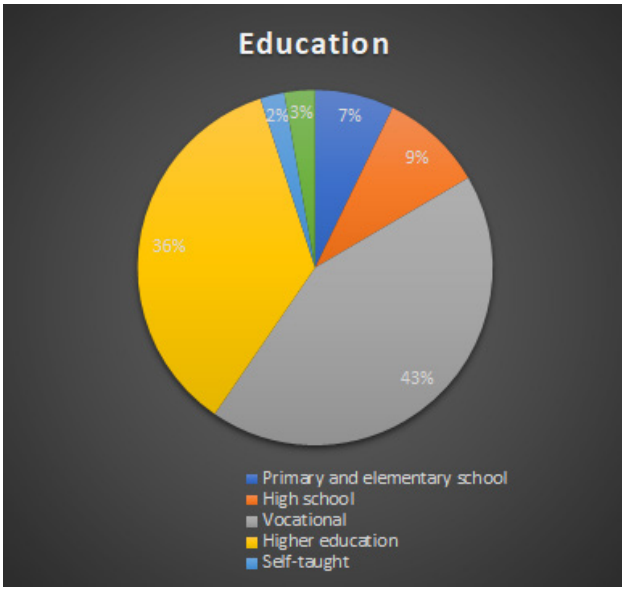

Figure 4. Education level among the Danish hobbyist metal detectorists.

dized jobs or receiving sickness benefits. This is a somewhat lower number than the general Danish population (www.dts.dk n.d.; Hansen 2019) (Figure 5).

The survey also provided information in relation to how often detector users visit museums (with no distinction between the type of museum). A clear majority (75 %) of the participants visit a museum once or twice a year. 12% stated that they go once or twice a month. Very few (3 %) answered that they do not visit museums and only one person answered that they visits museums 1-2 times a week. Comparing these numbers to the general pattern of museum-use in Denmark (e.g., Bak 2013; www.dts.dk 2019) detectorists as such, are not overrepresented among Danish museum users in terms of number of visits per year. On average, Danes visited museums approximately 2.7 times a year while the majority of the detectorists visit museums once or twice a year (www.dst.dk 2019). This may seem a little surprising at first, since it contrasts the widespread conception of detectorists being museum 'super users'. Yet, it resonates well with the results being presented below, which suggest that detecting, for many, first and foremost is about being outdoors, finding relaxation, and establishing a hands-on and personal relationship with the past – a dimension which many museums might struggle to provide for a variety of reasons. Despite this, there are very few detectorists who do not visit a museum compared to the average Dane, where, in 2012, between 12-24 % had never been to a museum (regardless of this being an art, cultural or natural history museum) (Bak 2013, 10-19).

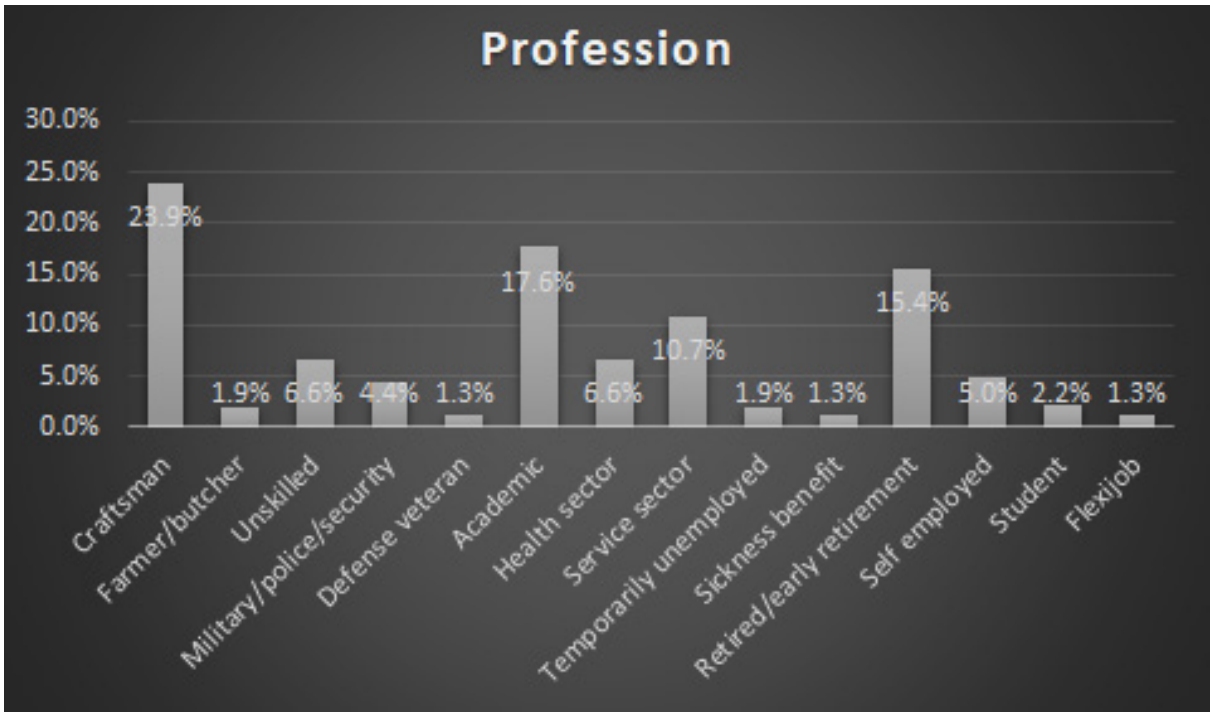

Figure 5. Distribution of the different professions among the Danish hobbyist metal detectorists.

Novices and Super Users

In general, detectorists may be considered to practice the hobby on very different levels depending on personal preferences, priorities, time, possibilities, dedication, and so forth. The survey showed that one third of the survey respondents have been practicing the hobby for 2-5 years followed by 5-10 years or more. These numbers could indicate that more experienced ('serious') practitioners might be overrepresented in our survey. The background for this could be that the growing number of newcomers to the hobby were either not members of the social media fora or the associations were the survey was distributed or that they might not have considered themselves to be a part of the target group (Figure 6).

The fact that experienced users are overrepresented in the survey is underlined by the data on intensity of detecting (during season). The biggest group of participants answered that they tend to be practicing the hobby 1-2 times a week, while around one fifth answered that they are even more active and go metal detecting more than twice a week. Only few people are practicing the hobby on a more irregular basis (Figure 7). This resonates well with the comparably high number of people who have handed over finds to the responsible museum, including treasure trove (Figure 8 and 9).

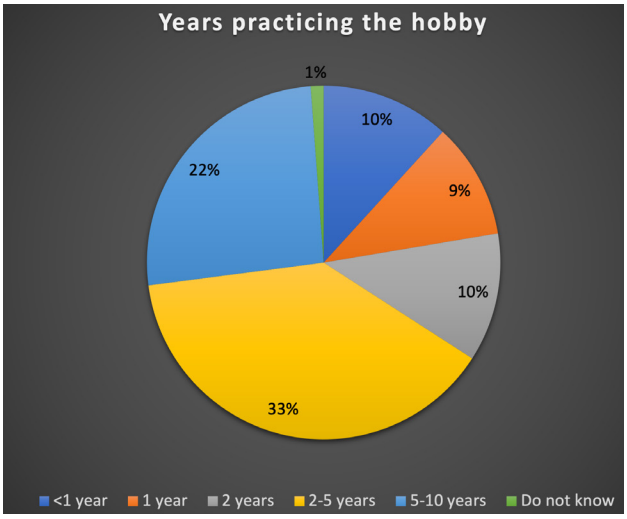

Figure 6. Amount of time the Danish hobbyist metal detectorists have been practicing the hobby.

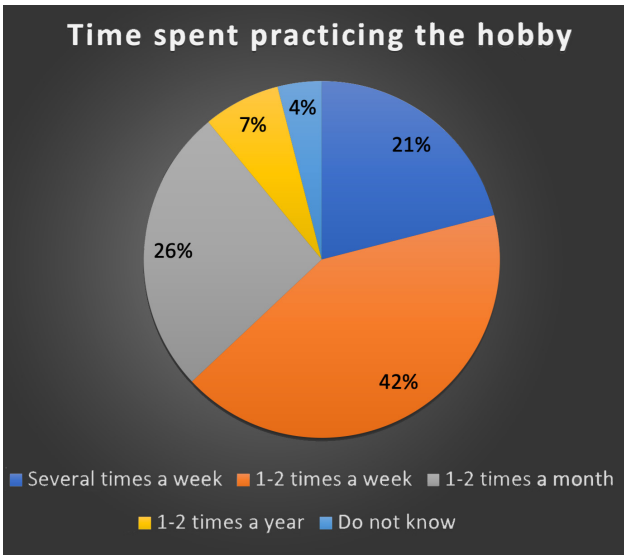

Figure 7. Graph showing how often the Danish hobbyist metal detectorists are out searching in average during a season.

What's Their Motivation?

Detectorists' motivation is an important element of the debate on hobby detecting among heritage professionals – both in Denmark and internationally (e.g., Fergusen 2016; Hardy 2017; Scheschkewitz 2013). Often, the discussion on this issue is somewhat entrenched in a simplistic dichotomy. On one side, the 'good' detectorists who are motivated by a desire to contribute positively to archaeology and who strive towards professional recognition of their findings. On the other side, the 'bad' detectorists, who are nothing but 'treasure hunters' motivated by financial interests in the form of treasure trove compensation or the income from the sale of artefacts on the antiquities market. While it might be argued that both of the above-mentioned stereotypes do

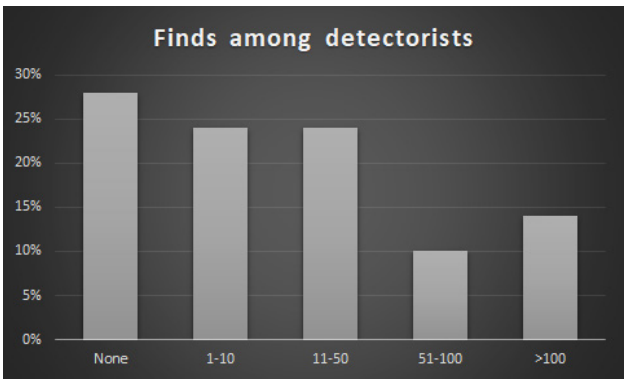

Figure 8. Amount of finds the Danish detectorists have been handing over to local museums the past 12 months.

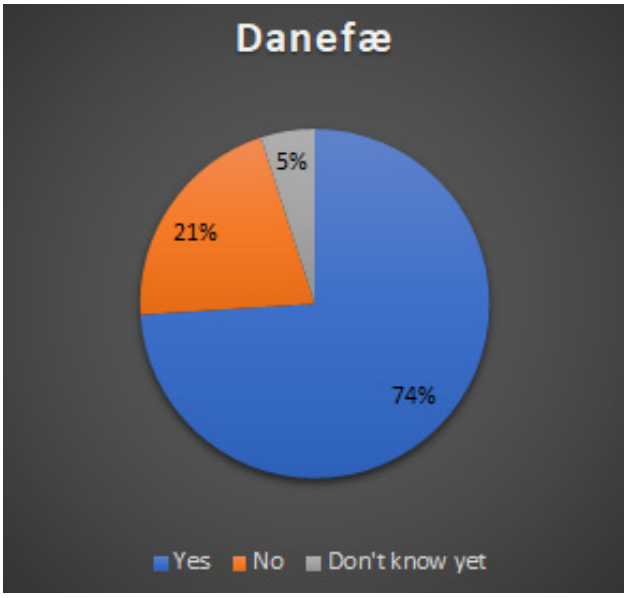

Figure 9. Distribution of whether people have experienced finding Danefæ.

exist, studies have shown that reality is far more complex. Detectorists are a very heterogeneous group with very different motivations for engaging with metal detecting. In order to understand the detectorist's motivation(s) and to provide data for a more qualified discussion, our survey was designed to contain a number of questions which directly – or indirectly – related to the motivations and meanings that the hobby might hold for its practitioners. Concerning the questionnaire, we were aware of the shortcomings of an online survey as a method to generate a representative image of such aspects. In Denmark, both public media and heritage professionals routinely portray detectorists as a sort of 'culture-heroes' driven by a desire to rescue our shared cultural heritage and to contribute to the writing of Danish national history. This profile certainly applies to many. However, the community as such has also embraced this positive narrative and made it the central element of their group identity and public image. Hence, the jargon within the community (and the responses given in our survey) may also be seen as a result of an adaptation to professional's expectations and the public perception.

Figure 10. Selection of most common keywords used to describe the meaning of the detector hobby for survey participants.

Meaning

Respondents were given the possibility to describe what the detecting hobby means to them using their own words. In order to allow the respondents' personal attitudes to reflect in the survey, the free text field preceded a similar second question with a number of already defined choices.

The more than 230 individual answers to this question, provide a complex and multifaceted picture of the practitioners' motivation(s). Most answers highlight multiple factors concerning the engagement with metal detecting. For most, a clear priority is the possibility of being out in nature, relaxing, being active, and being part of a social community. Many also referred to the excitement of the search for archaeological/historical artefacts. However, the historical dimension of the finds, often expressed as a fascination/interest for local or national history, is only one among many other aspects, which in combination seem to constitute the detector hobby's special appeal to the participants (Figure 10).

When asked to select maximum three items out of a number of predefined categories describing why they have chosen the hobby, the most frequently chosen response-option is the wish to participate and contribute to writing Danish history and secure cultural heritage. An equally large number of respondents indicated that they practice metal detecting in order to enjoy some tranquillity and to

Nature:

- *I enjoy walking over the fields, there are roe-deer, birds of prey, etc. etc. Plus, the landscapes are often beautiful.*
- *Like my other interests, hunting and angling, it gives me the possibility to be out in nature*
- *(...) I also use my detector to get out into nature and get some fresh air and exercise*
- *Freedom and various nature experiences.*
- *I enjoy nature and everything around me, disregarding the weather and wind. I relax in my own company...*
- *I get to walk a lot out in nature where my walks have a purpose.*
- *(I) Love to get out in the field then I relax completely, (I) release from all the hustle and bustle and (I) just enjoy wandering in my own world (...).*

History/archaeology:

- *Detecting gives me the possibility to feel close to history. One feels connected with the people whose objects I find.*
- *Exciting. Hands-on-history.*
- *You feel closer to history when you find an old artefact which has not been touched for centuries.*
- *Connection with the ancestors, being part of something bigger.*
- *The historical DNA is for me inseparable from being Danish. I have taken a DNA test in order to verify my ethnicity. I am completely Viking in my DNA. To save our cultural heritage and put it into its historical context is crazy exciting.*
- *You get to hold history in your hands instead of just seeing it behind glass.*

Excitement:

- *History, excitement and nature all on one. I can enjoy nature and relax and at the same time there is an element of excitement to it.*
- *It is exciting at the time as you get exercise and experience the nature*
- *The metal detector hobby can be described by three words: Freedom, excitement and exercise.*
- *Relaxing, but also exciting when the detector beeps.*
- *The excitement of uncovering the past.*
- *Freedom, hunt, excitement, adrenalin, history.*

Community:

- *I have gotten quite a few acquaintances who shares the hobby with me and it is also a big plus that we can talk about our finds and be social together*
- *(I) Meet a lot of new people - both land owners and through the detector association. There are also many curious (people) who are asking what I am doing.*
- *(...) (It) Means 'everything' to get out into the fields. Pure therapy where relaxation and total stress release is a part of maintaining the good mood and good friendships.*
- *(...) Among other things it has been the beginning of new and good friendships. Good friends who are equally dedicated and nerdy.*

Relaxation:

- *It makes me relax after a stressing day to walk under the open sky*
- *Peace and serenity on the fields*
- *A break from a hectic everyday life with children and work. And quiet alonetime with the possibility of walking and thinking.*
- *The tranquility is the primary reason why I go detecting.*
- *With PTSD it is for me a really good way of letting out all thoughts and get peace of mind while at the same time getting fresh air and exercise.*
- *It gives me freedom and relaxation in a busy everyday life. You get the possibility of relaxation and peace of mind.*

Figure 11. Selected free text responses representative for the five key factors for detectorists' motivation. Responses have been translated and shortened.

calm down. Slightly less answered that they practice the hobby because it offers them a possibility to be out in nature. For one third of the respondents, it is a way to spend time with other detectorists, whilst a bit more than one fifth also seem to be motivated by the chances of finding something spectacular. Only a small fraction chose the financial compensation for treasure trove as a motivating factor (Figure 12).

By and large, the results of the participant's choice of predefined answers overlap with the free-

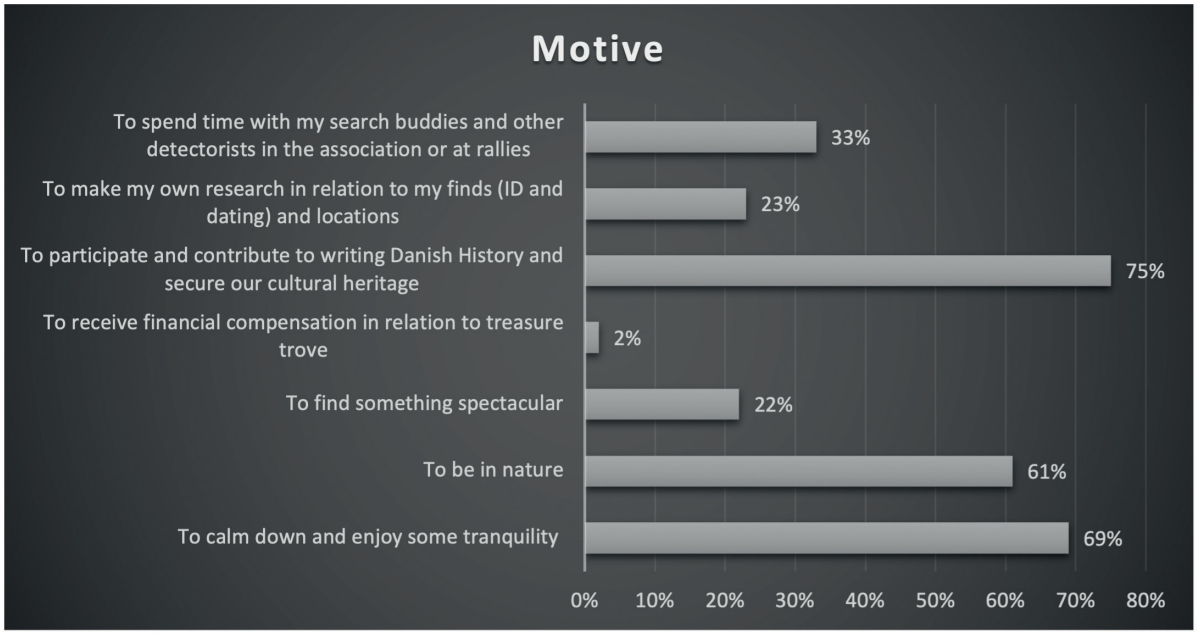

Figure 12. Distribution of what can motivate people to practice the hobby shown in percentage.

text responses. Besides the historical interest/fascination, aspects such as experiences in nature and the possibility to relax together with like-minded people was mentioned as key factors. On the other hand, the more analytical side of the hobby and the possible financial gain in the form of treasure trove (danefæ) compensation are not given high priority as motivating factors (see below for a more detailed discussion of treasure trove).

Closely linked to the motive of finding relaxation and using the hobby as a source of tranquillity, we asked a follow up question as to whether the participants suffer from mental health challenges and if metal detecting has a positive effect on these challenges. Altogether 18 % stated that they struggle with psychological challenges. This suggests that mental health problems are slightly more common among the respondents/metal detectorists than the average level in society (Sundhedsstyrelsen 2018). Near all (17 %) state that metal detecting has or has had a positive effect for them (in regard to this particular aspect of metal detecting, see Dobat and Dobat 2020).

Detecting Attitudes

In order to get a deeper understanding of the prevailing attitudes within the detector community we also asked participants about other spare time activities and interests that they might have *besides* metal detecting (once again, providing them with a long list of predefined response options). To this, the majority declared that they engage in a great variety of hobbies. Somewhat unsurprisingly, the most common activity, by far, turned out to be hunting and fishing/angling, followed by an interest in animals or other nature related activities – notably gardening. Other common activities include reading, traveling, and cars/motorcycles, etc. (Figure 13 and 14). 28 % indicated that they had *other* hobbies than those mentioned in the predefined categories. This could be hobbies such as fitness or different kind of sports, gardening, knitting, brewing, music, art, theatre, coins, veteran mops, genealogy, geocaching, computers and electronics, archaeology, local history, fossils, mountain biking, and many more (see Supplements).

Hunters and anglers are clearly overrepresented among the participants and the prevalence of outdoor activities resonates well with the emphasis participants place upon nature and exercise in the description of their motivation for practicing metal detecting (see above). Comparably few participants explicitly mention history or archaeology as being one of their hobbies. However, a general historical interest/fascination is reflected in activities/interests such as historical re-enactment, antiquities, and coins. This again resonates well with such attitudes reflecting a desire to connect more

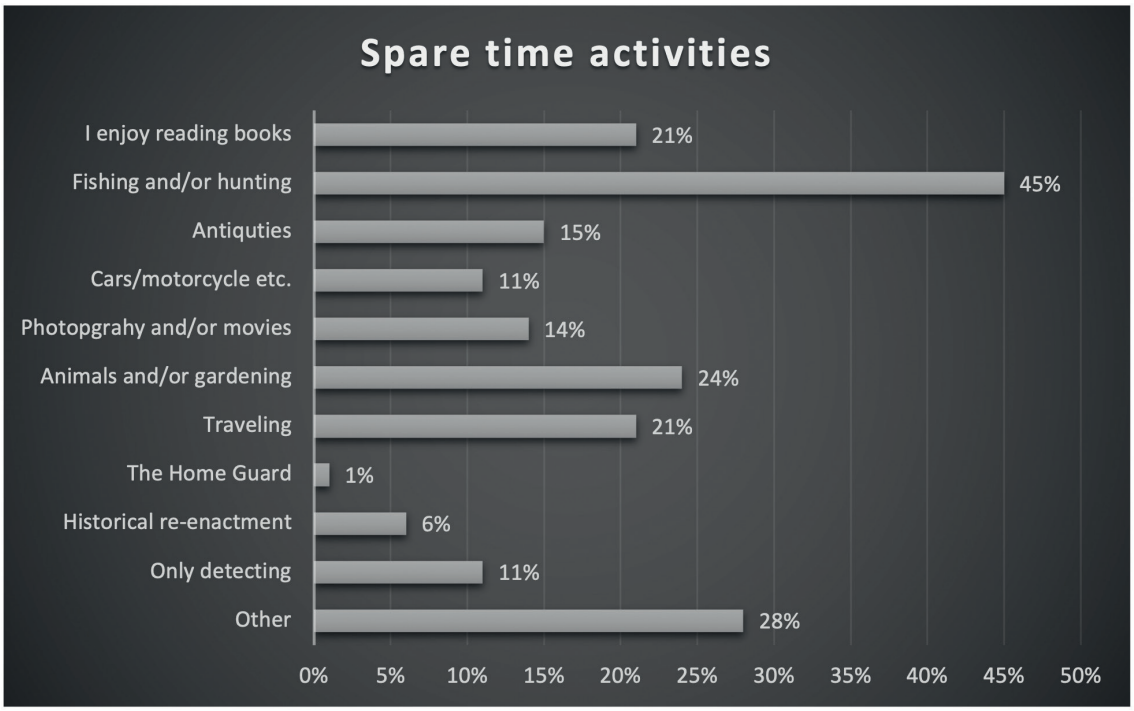

Figure 13. Spare time activities practiced among the Danish Hobbyist metal detectorists (The Detectorists could chose more than one option which is why the numbers are above a 100 %).

directly with history and to engage in a hands-on dialogue with the past.

Treasure Trove and The Financial Incitement

According to the Danish Consolidated Act on Museums (2006) finders of archaeological artefacts which are deemed treasure trove (danefæ) are obliged to hand over their finds to the Danish National Museum. In reality the first contact is with one of the approximately 30 provincial museums who then forward finds and data to the National Museum. It is then, that the National Museum determines whether a find is treasure trove and which compensation is to be paid to the finder.

While the Danish Museum Law stipulates that it is the finder of treasure trove who alone is entitled to receive financial compensation, 19 % of the respondents indicated that they share, typically 50/50, with the owners of the land where they have been given permission to detect. Through the free text responses many argue in favour of such a model based on moral considerations, i.e. fairness.

Figure 14. Most common spare time activities among the detectorists (besides metal detecting).

In 2019 and 2020, an average sum of 13.013.793 Danish Kroner has been paid in treasure trove compensation to a total of 822 finders (nearly all of them being detector users). More than half (538) received less than 5000 Kroner and only 15 people received compensation adding up to more than 100.000 Kroner (personal communication with museum curator Rikke Ruhe, at the Danish National Museum). This underlines the fact that at least for the vast majority of practition-

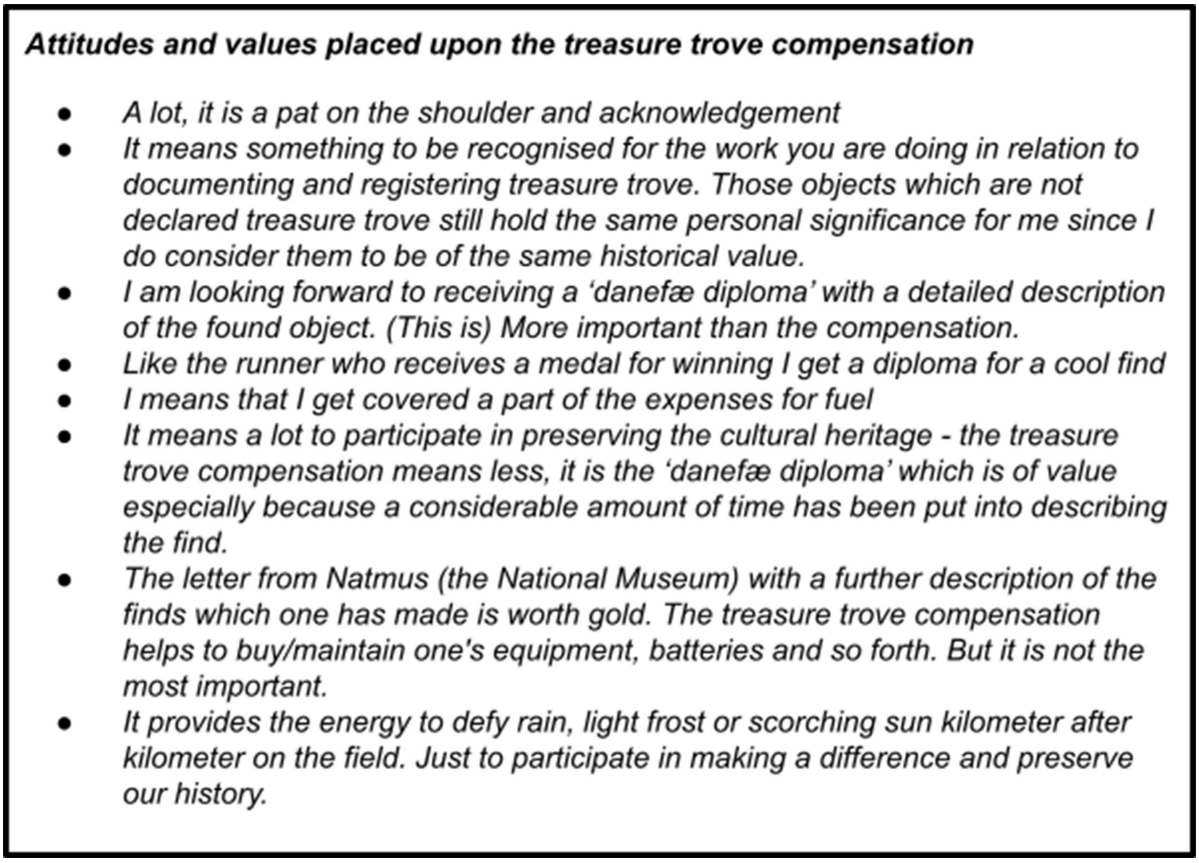

Figure 15. Selected free text responses reflecting prevalent attitudes and meanings placed on treasure trove compensation/danefæ. Responses have been translated and shortened.

ers, the financial gain connected to the detecting hobby is comparably limited and might not even cover the costs of practicing the hobby (involving gear, transportation costs, etc.).

Rather than asking whether the financial compensation is an important motivating factor, we have tried to investigate which meanings practitioners place upon it. According to the responses we received through our survey, it was observed that one needs to differentiate between pecuniary/economic capital and symbolic/cultural capital when trying to understand practitioners' attitudes towards the issue.
In the free text responses, most participants stated that they would register and hand over finds to the responsible museums disregarding whether they were offered compensation. When asked to further elaborate on their attitude(s) towards the treasure trove scheme, many emphasized that they take pride in the National Museum's approval of their find(s) (the danefæ diploma) more than the actual payment (which by some is referred to as a 'a nice supplement') (see appendix). Similar to previously discussed responses, it is striking to note the emotive language used in relation to the topic, as when participants use terms such as pride, honour, and acknowledgement (Figure 15).

In relation to above-mentioned, the survey participants responded very differently when asked about the possible consequences if certain finds were no longer considered as a treasure trove. While the majority stated for themselves that they would continue to register and hand over (donate) such finds to the museums, only a bit over half of the respondents concluded that they think that other detectorists would continue to do so. The majority further supported the hypothetical claim that such a development would lead to an increased sale of detector finds (Figure 16). Others point out that notably a large number of newcomers, who have taken up detecting in recent years, are indeed motivated primarily by pecuniary interests (and the hope of 'cracking a Danefæ-jackpot'). Hence, even if detectorists may deny or downplay its relevance as a motivating factor, it still is an important dimension of the hobby and

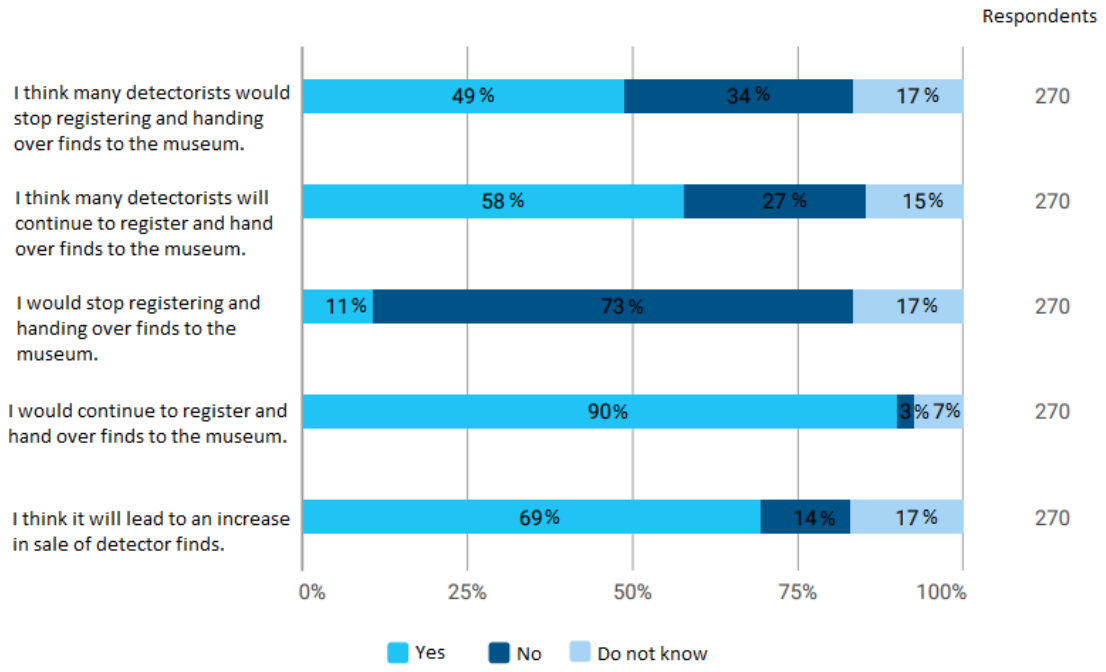

Figure 16. The detectorists view on what would happen if there would no longer be a financial compensation (treasure trove) for certain find categories.

it does mean something for a significant part of its practitioners. In relation to this, many participants also expressed dissatisfaction with the slow treasure trove turnover time at the National Museum.

Associations and Other Detectorists

It is important to take into consideration that metal detecting is also a social arena – both real (the physical meeting with peers at large scale rallies or small search parties) and virtually (the exchange in the context of social media). In the past, local and national associations (e.g., the *Bornholmske Amatørarkæologer, Harja, Tellus,* and *Thy-Mors Detektorforening*) have fulfilled an important role as an institutional link between detectorists and museums and/or other research institutions. They have also contributed positively by shaping a positive culture and responsible attitude towards metal detecting and they play an important educational role; notably by introducing novices to the field. More recently these associations have been supplemented (and to some extent taken over) by social media platforms, which also play a positive formative role. Associations and individual protagonists, however, still fulfil an important role. In fact, many recent initiatives that aim to introduce novices to the hobby while encouraging and promoting best archaeological practice in the field are in fact initiated from various stakeholders within the detector community and not by the professional sector.

According to our survey, almost three quarters of the participating detector users are members of one or several associations/clubs. Yet, this result probably is somewhat skewed, given that the majority of the respondents are 'serious' detectorists/super users who also are more likely to be members of an association.

In connection with the social aspect of the hobby, the majority indicated that they enjoy the company of peers when detecting. Yet, to another similar question, almost half of the respondents declared that they prefer being alone (Figure 17). Thus, the hobby's social setting seems to be depending on specific situations.

Relation to Museums

It is considered one of the preconditions for the relative success of the liberal Danish model that from the beginning, the museum sector took on a pos-

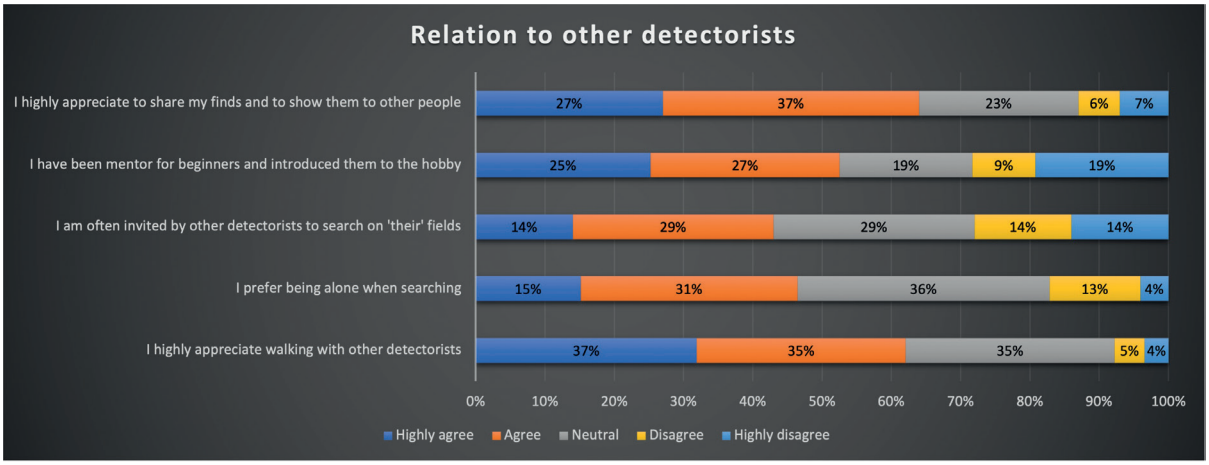

Figure 17. Different relations to other detectorists and the attitudes towards these among the detectorists.

itive attitude towards metal detecting and actively sought cooperation with detectorists, and vice versa. Today, representatives of the Danish heritage sector regularly emphasize the constructive alliance between museums and hobby detectorists (Andersen 2015; Dobat et Jensen 2016). At the same time, museums and museum professionals are responding very differently to the growing popularity of the detector hobby and the continuously growing number of people who wish to engage in it. Some institutions invest considerable resources providing guidance for good practice in the field or arrange regular schooling events for both experienced users and novices (e.g., Hansen and Henriksen 2012; Ulriksen 2014). Others engage more reluctantly with the community and focus first and foremost on the incoming finds (in accordance with the Museum Law). But how do the Danish detectorists perceive their relationship with the Danish museums? What kind of cooperation exists between these two entities? And what are the detectorists' suggestions for improving this cooperation?

According to the survey data, more than half of the detectorists (61 %) have participated in a search with a museum, while a bit less than half of the detectorists (48 %) has searched on areas being appointed by a museum. Somewhat surprising is the fact that only less than a quarter of the respondents have at some point participated in a course offered by the local museum on detecting and find recording (Question 28). The remainders either note that their museum have never offered such courses or that they have not participated.

Even though Danish detectorists generally look very positively on the constructive cooperation between detectorists and the museums, their evaluation of this cooperation, however, shows that opinions are clearly divided. We can assume that while especially the more experienced protagonists might feel firmly integrated in museum practice, a significant number of less experienced members of the community feel somewhat excluded and not sufficiently acknowledged for their efforts. Such sentiments probably also relate to the growing pressure on available permissions. Cooperation with the museums, hence, can be seen as a potential way of gaining access to fields.

When asked how they would grade the cooperation/relationship with the local museum on a scale from 1 to 10, the score of 7.6 can be taken as indicative of a general satisfaction. The purpose of the grading (which seen in isolation is of limited value) was to motivate respondents to also provide qualitative data and to elaborate further on their grading in the provided free text field. Of the 263 respondents 136 provided more detailed comments. The majority of these touch upon one – or several – of the following three aspects:

- Museums should to a larger degree ***include and cooperate with*** detectorists – notably in the context of excavations and other types of field work.
- Museums should offer courses on detector archaeology and handling of finds (especially for newcomers).
- Museums (many here explicitly included

the National Museum) should prioritize and speed up the ***administrative processing of finds*** ('fundbehandlingstid').

Besides the above-mentioned aspects, which are by far the most dominant issues, a significant number of participants expressed the wish that museums should:

- establish a national standard for recording and registration of finds
- use the DIME portal (dime.au.dk) as a standard tool for processing finds
- be more present and proactive towards the detectorist community.

Some respondents also gave air to very personal sentiments, which were in many cases based on feelings of their discoveries and contribution not being sufficiently acknowledged by the museum(s). At the same time, many answers displayed a high level of critical awareness of the varying attitudes and levels of engagement across the museums in Denmark and they also showed understanding for the various challenges (not least in terms of resources) faced by many museums.

Challenges within Danish Detector Archaeology

As one of the last, and maybe most relevant questions we asked detectorists was what they considered to be the biggest challenges within Danish metal hobbyist detecting. Some note that they found that the Danish system functioned well – especially compared to other countries. Thus, expressing an awareness of the hobby's contentious nature in other contexts. However, with over 200 statements, respondents also voiced more critical observations and opinions. While some of these relate to challenges inherent to the detectorist community, others relate to the public view of the hobby as well as the museum sector. Most answers focused on the following themes:

- Other detectorists accumulating 'permissions' (exclusive excess rights) and hence limiting the potential search areas for other detectorists.
- Nighthawks (people detecting on other detectorist's permissions or without the permission of the landowner)
- The media's focus on the hobby and spectacular finds attracting too many newcomers.
- The growing number of newcomers with no or limited knowledge of responsible practice, rules, and regulations (and the self-imposed ethical codes within the community)
- The growing number of treasure hunters with a primary motivation to find treasure/treasure trove (as opposed to contributing to history)
- Misinformed landowners who do not know or who misinterpret the rules and their rights (the fear of archaeological discoveries leading to excavation on the landowner's cost)
- The long turnaround time in the administrative find processing at museums, notably the National Museum ('fundbehandlingstid').
- The lack of resources at the museums

Through the open-ended questions the participants were also encouraged to formulate ideas and (if relevant) suggestions related to the improvement of the current situation. Nearly all the responses focused on the role of the Danish museums and partly duplicated earlier responses in relation to the cooperation between detectorists and museums. Among the most common suggestions were:

- Museums should use detectorists as a resource and increase the level of inclusion and cooperation, notably in the context of excavations and other types of field work
- Museums should inform and guide the many newcomers through courses, information material, presence in social media, etc.
- Museums should implement the DIME portal (dime.au.dk) as a standard tool for registration and processing of finds
- There should be more control of the hobby and its practitioners (specific suggestions were mandatory courses, a license model, mentorships, etc.)
- Museums should prioritize and speed up the administrative find processing ('fundbe-

handlingstid')
- Funding for museums should be increased

Discussion

Metal detecting attracts people of all genders, age-groups from various backgrounds and places in life. However, demographically, a clear majority of the practitioners are men in the age 40-59 years. With respect to educational and professional background, detectorists at large mirror Danish society with the majority being either craftsmen, academics or retired/in early retirement. Linking our demographical data with participants' motivations and attitudes towards the hobby, we can conclude that the typical Danish detectorist is a middle-aged man who likes to be outside with an active purpose. There are a number of obvious resemblances when comparing our data with the results of similar surveys, notably Finland and the UK. Also here, detectorists usually are men in the age group between 30-50 years (Thomas 2012a, 51; Immonen and Kinnunen 2016, 170). Interestingly, a higher educational background is common among detectorists in Finland, resembling the Danish situation, while detectorists in the UK are often represented by the working class (Immonen and Kinnunen 2016, 179).

Those detectorists who responded to our survey are generally highly experienced and practice the hobby on a very regular level. The majority can look back on a long 'career' and have produced a considerable number of treasure trove finds. Our data strongly support the general impression of the Danish detecting community as a very competent and knowledgeable group with a high standard for responsible field practice and recording of finds. Furthermore, there seems to be a strong desire to cooperate with the museum sector and to be included and acknowledged by the professionals.

Figure 18. Even though the majority of danish detectorists are men, the number of women joining the hobby is growing (Photo: Allan Faurskov).

The most central research question for our survey was asked with the aim of gaining a better understanding of the detectorists' motivation(s) for practicing their hobby. Therefore, the respondents were asked to answer this question by using their own words (which happened to lever some of the most surprising results of the survey). Some of the most central keywords used by the participants were terms and concepts such as: nature, relaxation, being active, being part of a community, and the excitement of discovery. While somewhat in contrast to prevailing expectations among museum professionals, these results resonate well with studies on metal detector use and users in other countries which have shown that practitioners are motivated by many different factors, with terms and concepts such as relaxation, nature, excitement, the social dimension of the hobby etc. being at least as important as contributing to archaeological knowledge and preservation (e.g. Immonen and Kinnunen 2016; Thomas 2012b; Winkley 2016). The hobby's quality as a space for relaxation gains additional significance in light of the 21 % of the respondents suffering from mental health challenges and where 94.4 % consider metal detecting to have a positive effect for them. The result resembles recent studies on the use of metal detecting as a form of self-therapy in Britain and Denmark (Dobat et al. 2020; Dobat and Dobat 2020) and emphasizes the multitude of (partly unexpected) reasons for people to engage with metal detecting. What becomes rather clear is that the archaeological finds and their historical background is only one among many different and completely unrelated values and meanings which participants project onto the metal detecting hobby. Furthermore, only a minority of the participants referred to the more abstract or analytical dimensions of the met-

Figure 19. Our survey underlines that detectorists are motivated by many different factors, with relaxation, nature, excitement, it's social dimension and others being at least as important as contributing to archaeological knowledge and preservation (Photo: Allan Faurskov).

al detecting hobby, e.g., the registration and identification of finds or archaeological research. In contrast, many of the responses, in one way or the other, highlight the personal connection with the past. Being able to hold and touch archaeological artefacts instead of 'merely' seeing them behind glass is explicitly emphasized by some. Others use emotive language suggesting that detecting for them is also about connecting with the past on an emotional level. The desire to enter a hands-on dialogue and to personally/emotionally connect with the past seems to be one of the most important motivating factors for most of the survey participants.

Through our question concerning 'other hobbies besides metal detecting' we attempted to gain insight into the prevailing attitudes among danish detector users. Detectorists obviously engage in many different spare time activities. The prevalence of outdoor activities resonates well with the emphasis participants place upon nature and exercise when describing their motivation to practice metal detecting. However, hunting/fishing overshadows all others, which begs the question of the possible relationship between the metal detecting hobby and hunting/fishing. Comparing the two practices there are in fact a number of obvious parallels. Both activities involve being outdoors and require the practitioner to master a mechanical device and to 'read' and study the landscape in order to be successful. Both hunting/fishing and detecting have an ultimate price in the form of either a piece of nature (meat and trophy/trophy–picture) or a piece of history (artefact). Like metal detecting especially hunting has a strong social component. For example, the practice of reciprocal hunting invitations has a very direct counterpart in the common habit among detectorists to mutually invite trusted peers to their permissions. On a deeper psychological level, both hobbies require a sense of patience and persistence and have a strong element of anticipation and excitement with long periods of waiting time between actual successes (in the form of a kill/catch/find). Finally, similar to what the detectorists emphasized as being their primary motivation, the true essence of hunting and fishing for many is also first and foremost about finding peace and relaxation.

As might have been expected, only a small fraction of the participants chose the financial compensa-

Figure 20. Detectorists volunteering in an investigation of the spoil-heaps of Moesgård Museum's excavation around Vore Frue church in the medieval center of Aarhus (Photo: Allan Faurskov).

tion for treasure trove as a motivating factor. On the one hand, this can be assumed to reflect the prevailing attitude among large parts of the community. On the other, it could also mirror what detectorists believe is considered the most acceptable answer among peers and museum professionals. In comparison, the pecuniary dimension within social media fora tend to take up more space in both posts and debates and often sparks heated and emotional discussions. It is a part of the picture that many survey participants explicitly note that especially many newcomers indeed are motivated by the chance of finding treasure and 'making money'. Using the survey data to at least try to understand which *meanings* practitioners place upon treasure trove compensation is a matter of interpretation. However, according to the responses, one needs to differentiate pecuniary/economic capital and symbolic/cultural capital. Participants use highly emotive language when asked to describe what treasure trove personally means to them and typical key words are terms such as pride, honour, and acknowledgement. There certainly are few dedicated and productive '*super users*' for whom treasure trove compensation has proven to generate a real source of income either because of high quantities of finds or due to the one special discovery. This, however, does not mean that they are motivated by pecuniary interest. For most dedicated detector users, the data imply that they are indeed primarily motivated by the recognition of their effort – a recognition which in the Danish system happens to be epitomized with a treasure trove diploma and financial compensation.

Conclusions and practice recommendations

It is important to emphasize that the Danish metal detecting community is highly heterogeneous and that the results of our survey are shaped by a number of biasing factors. For most aspects discussed above, our data can only provide a simplistic and schematic picture of a far more multifaceted reality. Concerning other aspects one can question, as it is normal for questionnaires, whether the responses reflect real sentiments or rather what is believed to be the acceptable answers. While many detectorists certainly will recognize their own and others' motivations, some will maybe not see their own personal attitudes and character reflected in this study. However, we do believe that our data reflect some general tendencies and characteristics and that they provide insight into what we have called the sociological dimension of the metal detecting hobby.

One of the focal points of this study was the motivation(s) of Danish detectorists to practice metal detecting and the values and attitudes they pro-

ject upon the archaeological heritage that they engage with through the hobby. One could argue that finders' motivations and attitudes are irrelevant for museum professionals as long as finds are being recorded and handed over whether this be out of a desire to contribute to heritage preservation and archaeological research or pedicular interests. However, the results of this perspective, we want to argue, contain an important lesson for professionals who wish to develop a best practice model for cooperating with detectorists.

For both professionals and hobby detectorists the archaeological material and the stories related to it is obviously important. However, metal detecting is for the practitioners a hobby – alongside other and often closely related vocational activities. Resonating the characteristics of 'serious leisure', as defined by Stebbins (1992), detectorists may act highly professionally and be very conscious (and self-policing) about their irreversible impact on the archaeological heritage. But it is still a vocational activity motivated by a variety of factors. The desire to contribute to archaeological knowledge and preservation is only one of these factors – and not necessarily the primary one.

In their view on the cultural historical dimension of detector finds, professionals typically put emphasis on analytical aspects and the artefacts' wider historical context. Many amateurs take a fundamentally different approach. For them, their finds provide a means of entering into a personal and hands on dialogue with the past and their relationship with the past is not necessarily of an analytical but rather of an emotional nature. We wish to argue that realizing and acknowledging this difference in approach is not only a central prerequisite for cooperation but being empathetic towards these alternative values is also an ethical matter.

The liberal model of Danish metal detector archaeology is widely regarded as a unique and well-functioning example of participatory approaches in heritage management and archaeological research. In combination, the cooperation between detectorists, museums, and the digital infrastructure of the recording portal, DIME, constitutes one of the biggest and most successful (both in terms of participants and number of finds) citizen science and co-creation projects in archaeology worldwide.

This optimistic view of the current Danish model is shared by the clear majority of the survey participants who generally take on a very positive stance on the constructive cooperation between museums and detectorists. However, the survey participants also raised critical issues and pointed at a number of challenges inherent to the detectorist community or relating to the public view of the hobby as well as the museum sector. Many of these issues and challenges are attributed to the increasing popularity of the hobby and the rapidly growing numbers of people who wish to engage in it for various reasons. Many explicitly express frustrations over and blame the excessive exposure of the hobby and spectacular finds in public media. Metal detecting for archaeological artefacts means consuming a non-renewable resource and our survey gives the clear impression that the hobby's recent growth has started to create peer-pressure and competition for productive permissions. When being asked to point out possible solutions, most answered were turned towards the local Danish museums, who, in the eyes of many of the participants, should 'step up' and take greater responsibility for the development of the hobby – be it through inclusion, information, control or other measures.

It would boost the frame of this article to discuss specific possibilities or systemic obstacles faced by Danish museums in this field. However, like the detectorists themselves, many professionals are also growing increasingly worried about the future of the phenomenon and its long-term sustainability in its current form. This survey and notably the inside views expressed in more than 1175 individual free text responses might serve as a source of inspiration towards the necessary development and possibly renegotiation of practices and strategies which acknowledge both the professionals and the detectorists' ambitions.

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