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Water and the Afterlife – Water-related Resources in the Burial Construction of the Nordic Bronze Age

By CHRISTIAN HORN

The waterscape, including the sea, rivers, and lakes, was highly important to communities living during the Nordic Early Bronze Age (1800/1700–1100 BC). Waterways acted as highways that facilitated journeys, trade, and warfare, enabling maritime warriors and others to distinguish themselves. This is reflected in the maritime location of rock art and important Early Bronze Age burials, which have been used to reconstruct the Nordic Bronze Age cosmology. This centres on the journey of the sun across the sky during the day, and the underworld during night. This article analyses the use of water-related resources, such as seaweed, petrified organics, beach pebbles, and molluscs, in the construction of burials, which has received little attention despite renewed interest in the maritime seascape. The data demonstrate that local communities used different resources, indicating that a common belief system was realised in local differences. These marine materials were collected from the beach, which can be conceptualised as the liminal zone between the land of the living and the sea of the dead. It is suggested that these materials, in line with other funerary practices, helped to guide the recently deceased into the afterlife in the sea.

Keywords: Nordic Bronze Age, cosmology, marine resources, burials, liminality

The Nordic Bronze Age (NordicBA) between 1800/1700 and 500 BC is a remarkable period in Europe's (pre) history. One reason is its rich, complex material culture including well over 21,000 contexts with bronze finds and equally numerous rock art images which provide researchers with ample data to study the period. The material has indeed revealed plenty of valuable information about NordicBA life, ideology, and religion over more than one and a half centuries of research. The eponymous bronze was a highly valued commodity controlled by an elite who organised the procurement and redistribution of copper and tin to maintain social structures (Larsson 1989; Earle *et al.* 2015). Mobility and the organisation of journeys across water were important to the exchange of goods and the conduct of warfare, as expressed in warrior depictions in boats (Ling & Toreld 2018) and sacrificial depositions being placed at crucial waterway passages and routes (Horn 2016).

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Thus, boats were crucial in contact at various scales and levels helping to globalise Europe and its societies (Kristiansen & Larsson 2005; Vandkilde 2016). Given the importance of boats, water, and journeys it is perhaps not surprising to find many of these aspects reflected in Bronze Age belief systems. Based on burials, pictorial art on metalwork, and rock panels, a complex cosmological narrative has been reconstructed interweaving the journey of the sun, boats, and various animals (Randsborg 1993; Kaul 1998; 2004; 2005; 2020; Bradley 2015).

Amongst this important scholarship, modern Bronze Age research often remains fixated on bronze and a few other valuables, like amber. Parallel to this, research into cosmology often only considers spectacular burials, metalwork, and pictorial evidence which are often used to reconstruct the NordicBA grand narrative. While this has led to important discoveries, it unfortunately means that local, less prestigious sources have often been overlooked or treated as ancillary. Local studies including less prestigious finds and burial constructions have added many facets that

help us to appreciate the complexity of NordicBA beliefs (see, for example, Nordenborg Myhre 2004).

The following takes inspiration from micro- and macro-studies of NordicBA cosmology to investigate the use of water-related resources in burials. It is argued that their use demonstrates local variations in how the over-arching belief system was materialised. Such data have been addressed in regional studies (Nordenborg Myhre 2004; Anfinset 2016; Appel 2017) and with different research questions (Appel & Pantmann 2013; Prescott & Melheim 2017; Kveiborg 2019). This material is difficult to study because, in addition to the historical research focus on more spectacular artefacts, some of it is organic and does not preserve well while other parts are inconspicuous and challenging to identify. As such, water-related resources in burials can be considered an under-researched part of the NordicBA material culture (Hornstrup 2017), and they may hold important information for the interpretation of localised beliefs concerning cosmology and the transition to the afterlife.

THE BRONZE AGE COSMOLOGY

Introducing Bronze Age cosmology and religion

Before we dive into the significance of water-related resources in burials within the Bronze Age cosmology, some general comments are necessary. It is widely accepted today that metalwork and rock art images detail a NordicBA cosmology which involved the journey of the sun and was split into the heavenly realm, the earthly realm, and the underworld (Kaul 2005; visualised here in Fig. 1). This separation into different spheres was not unique to the NordicBA: it can also be found in widely separated regions, such as among Native American tribes. These tribes, including the Algonquian on the Laurentian Plateau in Canada and the Dhegiha of the Western Mississippi region in the USA, incorporated the sun, water, and animals such as birds and snakes as important components of their belief systems (eg, Arsenault & Zawadzka 2014; Duncan & Diaz-Granados 2023). The importance of the sun to human life could be the basis for its significance in widely dispersed religions.

Parallel beliefs in ancient Egypt were closer in time and space, and Kaul (2004) saw them as inspiration for the NordicBA cosmology. Kristiansen (2012) linked the Nordic beliefs to Indo-European myths transmitted through Central Europe. However, Helskog (1999) traced a tripartite cosmology for northern and arctic regions among other evidence through the northern rock art tradition. In Norwegian regions like Stjørdal there is considerable spatial, temporal, and content overlap between the northern and the southern rock art traditions, which was used to suggested that southern Scandinavian Bronze Age rock art may have its origin in the north (Sognnes 2001). This is supported by the Late Neolithic boat depictions of the so-called Nag type that occurs both in the north and the south (Bengtsson 2013). These observations and factors including the location of burial monuments such as cairns has led to a criticism of interpretations that solely rooted the NordicBA cosmology in southern influences and, instead, emphasised northern roots and a long interplay between both regions (Bradley & Nimura 2013).

In this contribution, no attempt is made to interpret the geographical origin of the NordicBA cosmology. As noted elsewhere in a different context, it is highly unlikely that complex phenomena have a singular point of origin but, instead, emerge in broad networks of contact, influences, and local re-interpretation (for example, Daems 2020). A full investigation for the beliefs of NordicBA communities including both the northern and southern influences cannot be accomplished within the scope of this article. Instead, the focus is on local variation and the link between cosmology, practice, and observable natural phenomena.

The three realms and the afterlife

Here I consider a wide range of published studies detailing the NordicBA cosmology and additional research that highlights that the underworld was placed in the literal underwater, and that the beach had a role as a liminal zone where these realms met.

Based on his long-term research into NordicBA razors, Flemming Kaul reconstructs a cosmology in which the sun takes a perpetual journey helped by boats and various animals (Kaul 1998; 2004; 2005). He saw this cosmology as tripartite, which has also been discussed by Helskog (1999) for earlier northern hunter-gatherers. The sky above was the heavenly realm across which the sun journeyed during the day. This was separated from the earthly realm where the living dwell. At dusk the sun disappeared from sight, again moved by boat with the help of different animals than during day, only to re-emerge at dawn and begin

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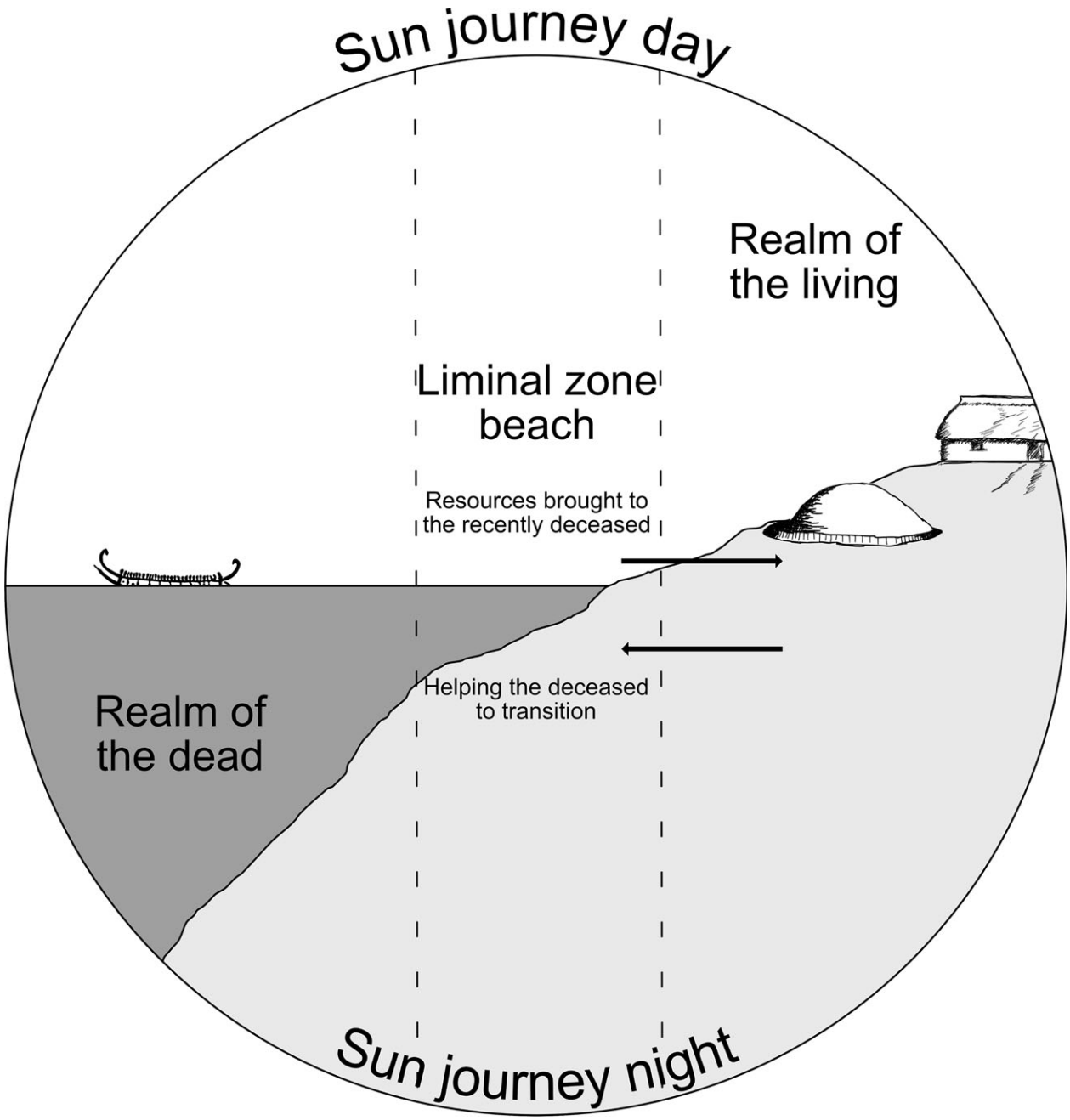

Fig. 1.
Diagram illustrating the beach position as liminal zone and the underwater as realm of the dead within the Nordic Bronze Age cosmology

the cycle again. During the night it journeys through an underworld which is linked to the dead (Fig. 1).

Variations and challenges to this model have been published. Klavs Randsborg (1993) favoured a separation into four realms by splitting the realm of nature from that of the living. Based on Katty Hauptman Wahlgren's question as to why such a powerful entity as the sun would need any help on its

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journey (Hauptman Wahlgren 2002), Joakim Wehlin proposed a subtle shift to Kaul's interpretation. To him it seems more likely that it was not the boat that helped the sun but that the sun guided the boat (Wehlin 2014). Richard Bradley (2015) took Scandinavian rock art into account and pointed out that different media could indicate local variation in such cosmological beliefs. Here it is important to point out that the sun journey becomes fully articulated first on razors from period IV (1100–950 BC), although earlier indications exist, for example in the sun wagon from Trundholm dated to period II (1500–1300 BC) which shows a sun disc drawn by a horse (Gelling & Davidson 1969).

A debated point is what happened to the deceased after they entered the underworld. It could have been seen as some sort of final destination (Randsborg 1993), perhaps the dead were reborn (Goldhahn 1999), or they remained mobile, joining the sun on its journey (Helskog 1999; Kaul 2020). Randsborg defined the underworld as the 'sea of the dead' into which the deceased entered permanently, turning into various beings like gods, ancestors, etc. Opposed to this, Kaul argued that the sea was not the final destination for the dead but that at least some were honoured to join the sun on its journey as paddlers (Kaul 2005; 2018; 2020). The link between the underworld, the deceased, and the sea seems to be generally acknowledged (Fig.1).

The beach – a liminal zone

Based on work with earlier northern hunter-gatherer rock art, the underworld was located physically in the water which would have made the shore the physical place that connected land and water (Helskog 1999). For Bronze Age rock art, Bradley (2015) made a similar point linking the night realm to the physically present sea, with the water's edge separating it from the other realms (Fig. 1). This invokes the concept of liminality (cf. Turner 1969) making the shore or beach a liminal zone (see also Westerdahl 2005; 2011). Any observer standing on the shore could see the sun go down into the water and/or emerge from it. Thus, the water's surface extending out from the beach could also be seen as the boundary between the heavenly realm and the underworld (cf. Helskog 1999; Bradley 2015). The beach merges the realm of the living and the realm of the dead in a horizontal direction and the water's edge and surface was the boundary in a vertical direction. In parallel, this could suggest that the beach or shore was a nexus between all three aspects of the Bronze Age cosmology (Fig. 1). This may have given those that transversed such liminal zones and boundaries a special status as liminal agents, for example raiding-trading boat crews travelling on top of the boundary (Horn 2016).

Walking where the dead ships dwell

In discussing the beach as a liminal zone and its physicality, we can follow Helskog's observation that cosmologies in the past were shaped by the lived experience and practices in the environment these societies inhabited (Helskog 1999). The sky itself is a good example which spanned the entirety of the area above the land humans settled, ie, the realm of the living (Randsborg 1993). The sun could be observed moving across it during the day like birds (Kaul 2005; Bradley 2015; Goldhahn 2019). While other animals are terrestrial, like horses, they are also active during the day. People experienced their use as traction animals moving things like carts and perhaps even boats during portage. All this physically observable activity may have contributed to the idea that these animals helped dragging the sun (Kaul 1998; 2005).

When we follow this argument for the realm of the dead, we need to consider the physical properties of water. While water is indispensable for human life, humans inadvertently die by drowning when they submerge in it for too long. This was probably experienced often with the sinking of boats on their frequent journeys for fishing, trading, or raiding. A sunken boat would have immediately transformed into a boat of the dead. As others have observed, there are other occasions when the deadly forces of water can be experienced, such as the destruction caused by floods and storms (Wrigglesworth 2011). Thus, the danger of the underwater was perhaps ever present.

Similar to the water itself, the creatures featured in the NordicBA cosmology may have attained their roles due to observable characteristics of their living environment and their behaviour. This process can also be seen anthropologically, for example in North America, where snakes were seen as creatures with a link to water and the underworld (Arsenault & Zawadzka 2014). Some suggestions can be made. Fish, for example, could live in the deadly underwater and, therefore, were perhaps easily associated with death and apt at helping the sun on its journey through the underworld (Kaul 1998; 2005). The association with death may also be why fish were

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engraved on spearheads and associated with elite warriors who were agents of death themselves due to the violence they conducted (Kveiborg 2019; Horn 2023). Another example are snakes which often submerge in water, because they need the humidity, but they can also be observed moving between land and water. Some snake bites can cause severe swelling, pain, and even death, ie, drag humans into death. Based on this, they may have become associated with the realm of death. Their movement between land and water may have been the reason why they could drag the sun into the underworld. Fish on the other hand can sometimes jump out of water and thus break the surface between the realms. On the beach people would be able to peer through the surface into the realm of death and see its creatures (Helskog 1999; Kaul 2005).

The observable links between the underwater and death may have sparked ideas that physical death transformed humans into beings that could dwell in the deadly underwater together with their sunken boats and the creatures of this realm (Fig. 1). Like the emerging sun, boat crews may have re-emerged from the water either helping the sun on its journey or being guided by it (Wehlin 2014; Kaul 2020). Different groups may have emphasised different aspects of the potential observations concerning animals, celestial bodies, and water. These differences could be one aspect that led to the local variations in cosmological beliefs discussed in the following section.

MATERIALS AND LIMITATIONS

Within the discussed belief system, it is conspicuous that people chose to give water-related resources to their dead or used them in burial construction. The material was restricted to periods II and III of the Early NordicBA (1500–1100 BC) in today's Denmark, Schleswig-Holstein, and southern Sweden, as the publication situation provides sufficient data for a quantitative analysis (Fig. 2). Catalogues (Aner & Kersten 1973–2017; Oldeberg 1974) exist for this spatio-temporal transect and provide a large sample, although Ålborg and Hjørring are not yet published. Anfinset (2016) has summarised the evidence for some of the marine resources in Norway but has not published a catalogue and as such the data had to be left out of the analysis.

The most common water-related resources in burials were seaweed, petrified organics, shells, snails, beach sand, and beach pebbles (Fig. 3). Seaweed, which was mostly used to wrap the coffins, was recorded in 70 instances (Harris 2016), with only one case being a freshwater species. Molluscs, ie, shells and water snails, could be coincidental inclusions which entered the grave with the seaweed but seaweed and molluscs do not co-occur frequently in the network. This suggests the deliberate selection of molluscs as burial goods, as supported by findings such as in the Molkhaug (Bore, Norway) where a human cranium was placed on a circular bed of marine shells (Nordenborg Myhre 2004). As such, the material has been included in the analysis (see also Anfinset 2016).

The group of fossilised organics consists mostly of sea urchins (*Echinoidea*) but, in one barrow, two burials contained the petrified remains of sea feathers (*Pennatula phosphorea*). Beach pebbles were used to lay out stone pavements on which the burial was placed, to fill stone cists, or piled up either with or without an earthen cover to form barrows or cairns, respectively. These pebbles can be quite large with diameters over 20 cm. Beach sand was used the same way. Some other water-related resources have been mentioned in individual cases, such as bones from fish, dolphin, and seal, but they were excluded because there were so few.

NETWORK ANALYSIS

Social network analysis (SNA) is a highly developed statistical method (Scott 2013) that has many archaeological uses (Brughmans 2010; Knappett 2013; Blake 2014). Since this contribution does not seek to further the methodology of SNA, the following discussion will be brief. The burials form the *nodes* that are connected by lines (*edges*) when resources co-occur. Each shared resource adds to the strength value of the edge. The edges and nodes can then be used to calculate centrality measures to find important nodes, for example, a node with many connected edges has a high *degree centrality*.

SNA is a highly visual tool that helps to understand complex relationships. Results were displayed with the principal component analysis-based visualisation. However, only the edges that connect resource groups among burials were displayed to make the outcome more readable. The results were mapped to investigate interconnections between regions and communities and the formation of local groups.

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Fig. 2.
Work area (grey); hatched areas are missing Aner and Kersten volumes (Aner & Karsten 1973–2017)

Analysis of period II burials

While most of the network is linked during period II, the edges are all very weak, with most burials only incorporating one of the materials, and no grave having more than two. This means that only two to three sites connect different materials (Fig. 4a). The use of beach pebbles has the farthest reach which is closely mirrored by beach sand (Fig. 4b). However, it

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Fig. 3.
a) Beach in Denmark with pebbles, sand, shells, and snails; b) seaweed on a Baltic Sea coast in Schleswig-Holstein, Germany; c) fossilised sea urchin (*Echinoidea*) (all photographs under Creative Commons licence)

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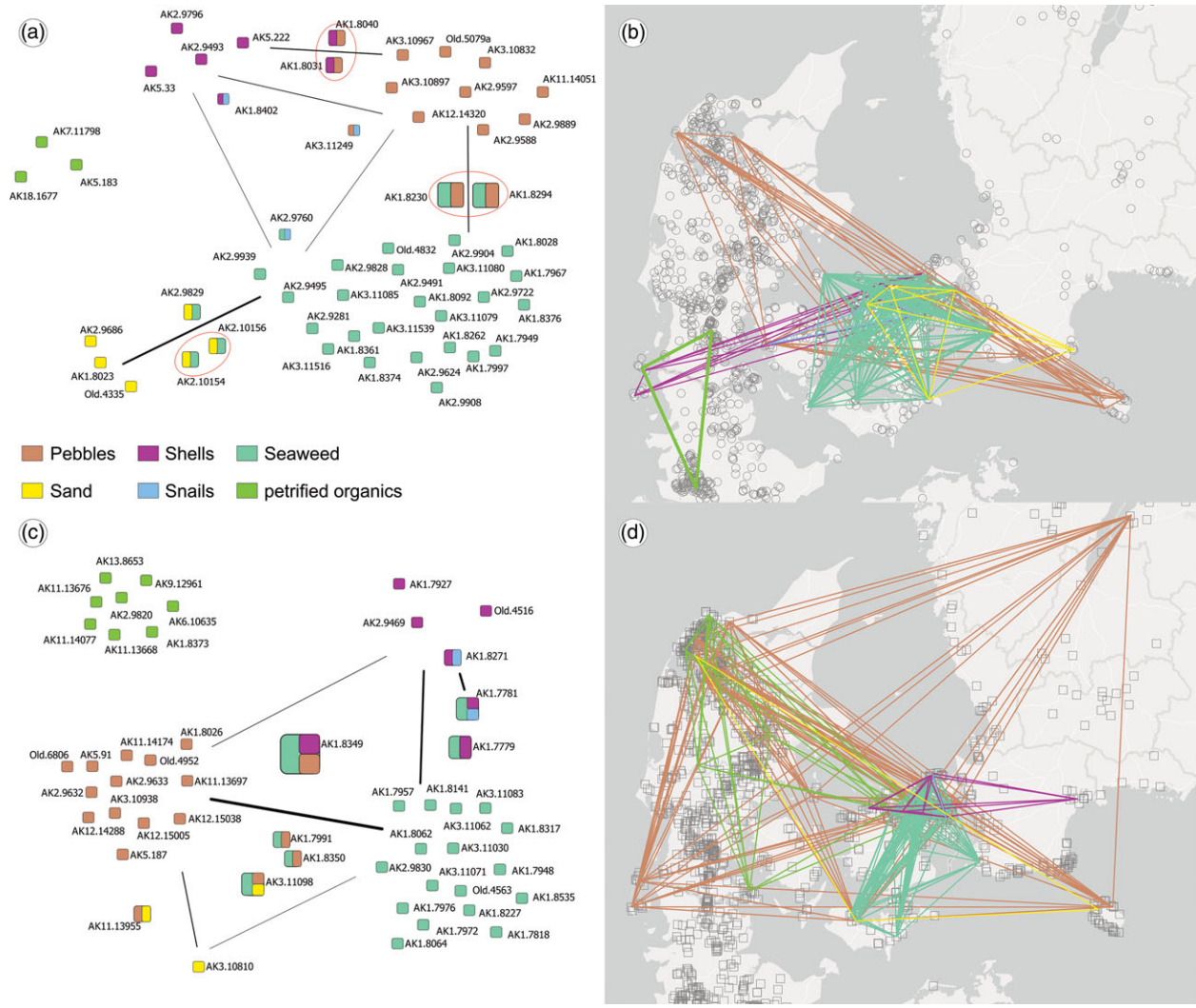

Fig. 4.
a) Social network analysis of burials with water-related resources dating to period II of the Nordic Bronze Age; b) the spatial extend of the period II network; c) social network analysis of burials with water-related resources dating to period III of the Nordic Bronze Age; d) the spatial extend of the period III network

is noteworthy that both materials are not directly linked, representing variations of ritual practices with overlapping distributions. Beach sand is only linked into the network through its co-occurrence with seaweed. Burials that incorporate seaweed are spatially more restricted, concentrating in the coastal zones of Zealand and the adjacent coasts.

Compared to beach pebbles, shells seem to have a more southerly distribution, reaching from Sylt to eastern Zealand (Fig. 4b). Shells are linked directly to pebbles through two burials but the link to seaweed is indirect through the overlapping use of snails (Fig. 4a). Snails take a special position because they are the only group that is solely co-occurring with other materials, ie, pebbles, seaweed, and seashells. Most of the connecting burials are not only located in the same barrow but they also cluster along the coast in the northern Øresund zone – a narrow straight separating Zealand from southern Sweden (Fig. 4b).

Fossilised organics emerge as a surprise because they are isolated both geographically and within the network (Fig. 4a–b). Sea urchins used as burial goods

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are restricted to the south-eastern zone on Sylt and western Schleswig-Holstein. Within the network they do not co-occur with any other water-related resource.

Analysis of period III burials

The number of burials with water-related resources stays almost equal with the preceding period but the network for each resource expands spatially (Fig. 4c–d). While there were now burials with three resources that provide some stronger links (Fig. 4c), the overall network is still relatively weakly integrated. Opposed to the rest of the resources, seaweed retracts spatially, only being used in eastern Zealand and northern Maribo, but reaching slightly further to the east to include western Scania (Fig. 4d). Beach sand and pebbles change from being not directly connected, to now being tied together closely. Shells and seaweed are linked in the network by three burials. The role of snails diminishes with fewer burials and important connections (Fig. 4c). Øresund is apparently still a very active region but the most crucial burials are now located along the neighbouring Roskildefjord (Fig. 4d).

The use of petrified organics shifts north- and eastwards spatially, expanding and even reaching eastern Zealand (Fig. 4d). With that there is some geographical overlap with other water-related resources. However, petrified organics remain completely isolated in the network, never being placed with any other resource in a burial (Fig. 4c–d).

SOME SOURCE CRITICISM

Cairns and beach pebbles

Before the findings will be discussed in a wider context, it is prudent to make some source critical observations. Throughout the NordicBA into the Iron Age cairns (piles of stone without soil cover) were among the most frequent burial monuments, especially on the Scandinavian peninsula with about 20,000 in Sweden alone (Fig. 5a). Various identifying features have been proposed to date cairns to the Bronze Age, such as large diameters, construction on hill or ridge tops, the presence of stone cists, or the use of specific stones (Artelius 1998; Widholm 1998; Hellgren & Johansson 2022). However, only a fraction have been excavated and even fewer are well published (recently Ängeby & Ragnesten 2020).

Another issue is the stone material itself. For example, the pebbles of the famous Bredarör cairn in Kivik are very round (Goldhahn 2009; 2013) which indicates that they were subjected to water erosion for a long time (Fig. 5b). Since the cairn is only *c.* 80 m from the old shoreline there is a good chance that pebbles found at the beach were used in the construction. Cairns using beach pebbles also spread northwards along the Norwegian coast (Nordenborg Myhre 2004; Anfinset 2016) and it was suggested that all 'round stones' have been collected from the shore (Wrigglesworth 2011). However, round stones could also have been formed and transported by glacial ice masses and were, therefore, not necessarily picked up at the beach. At the same time, it has been observed that cairns in Scandinavia had a very coast-bound distribution (Skoglund 2005) suggesting that beach pebbles may just have been used out of convenience. However, dense clusters of cairns were placed away from settled areas on rocky outcrops along the coast and even on small islands out in the seascape (Bradley 1997), which speaks against pure convenience. It can be suggested that the location and the construction material were of similar significance in linking the deceased to the sea (Bradley 1997).

The role of beach pebbles is not clear for cairns located even a short distance inland. The issues with chronology and the stone material have been summarised on a regional scale from an archaeological perspective (Artelius 1998; Widholm 2006; Ängeby & Ragnesten 2020; Hellgren & Johansson 2022) but an interdisciplinary investigation including geological expertise is missing. This makes cairns a 'dark horse' with potentially thousands where beach pebbles may have been transported to the site of construction.

Seaweed and fossilised organics

Seaweed is even more fraught with issues because it is organic and does not always preserve well. This is even worse for cairns because, without earthen covers, they were always better aerated than barrows making the survival of organics very unlikely. When the survival of organics like wool, linen, bast, fur, and wood is summarised as an overall indicator of the likelihood for preservation, it becomes apparent that burials with seaweed occur in an area where there is good organic preservation (Fig. 6). However, organic materials also survive in other regions but burials with seaweed were missing. Therefore, it can be assumed that there is at least some significance in the distribution.

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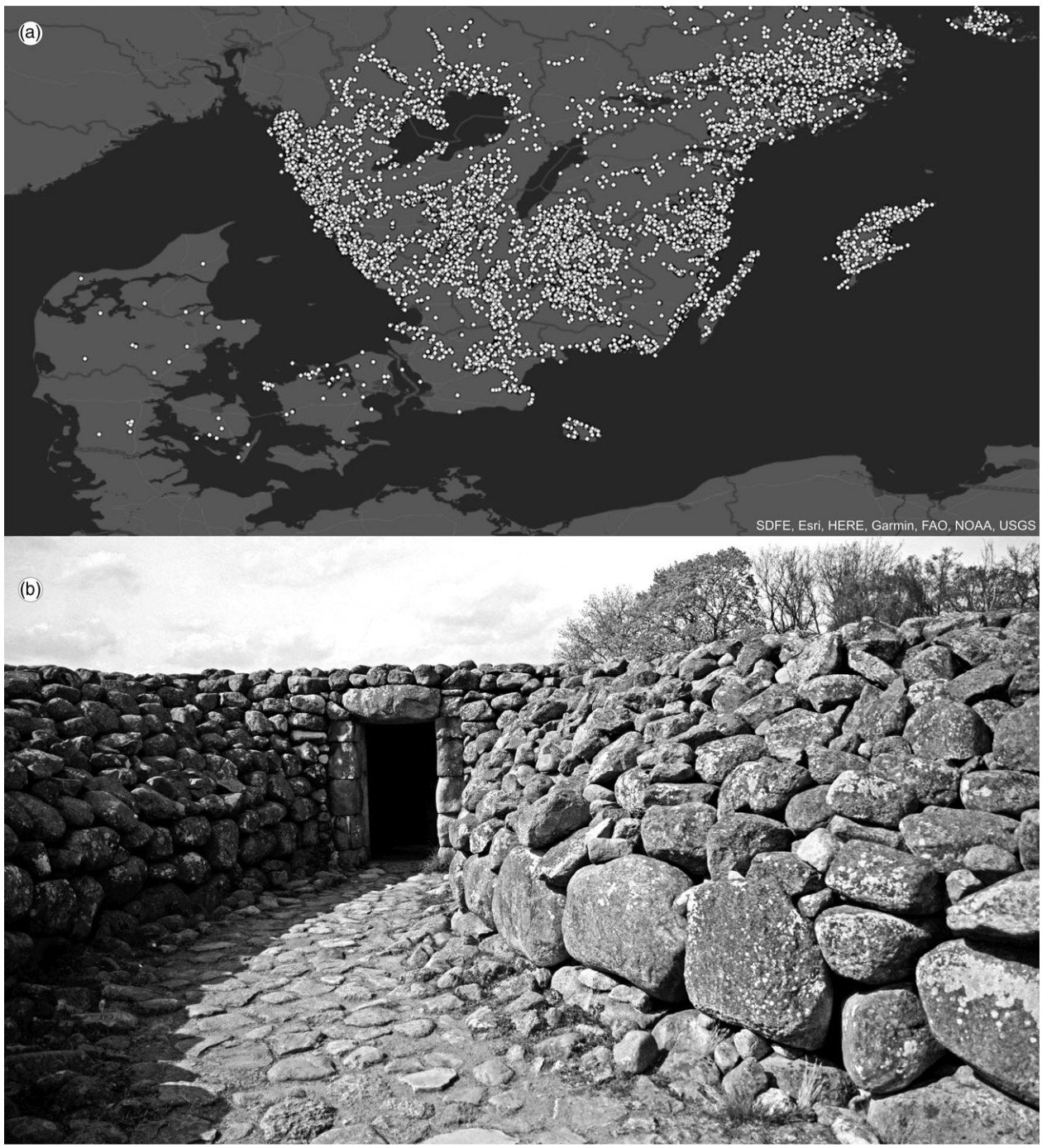

Fig. 5.
a) Distribution of cairns dating to the Bronze and Early Iron Ages in Southern Sweden and Denmark; b) Modern entrance to the Bredarör cairn in Kivik with a good view of the pebbles

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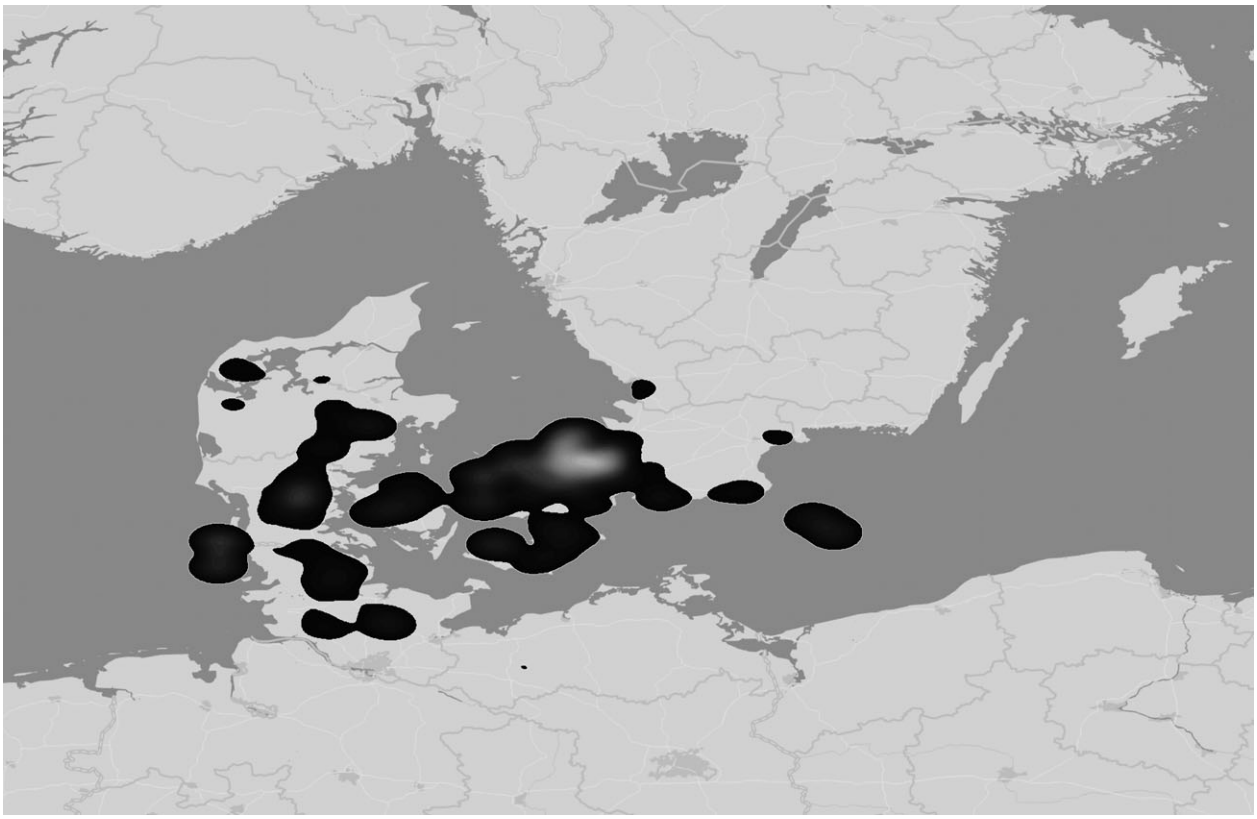

Fig. 6.
Kernel density estimate of burials with metalwork and organic remains (lighter = higher)

Fossilised organics no longer have organic parts so they could have been preserved everywhere but instead they show a distinctly localised pattern which is a good indicator for localised burial traditions. However, it should be mentioned that it is possible that they may have been overlooked among other stone material, especially in inexpertly excavated barrows or less than ideal preservation circumstances (Hydén 2009).

THE COSMOLOGICAL SIGNIFICANCE OF FOSSILISED SEA URCHINS & SEAWEED

Fossilised sea urchins as bearers of celestial symbols

Fossilisation turned organics such as sea urchins into a flint-like stone that can be found in flint-rich regions. While they can be dug up inland, where they are often encased in the chalk, collectors are most successful at the chalky cliffs, for example, on the German Island of Sylt, Thy in Denmark, or the moraines surrounding the coastal town of Esbjerg where they can be found lying on the beach and are easier to spot (Søvsø 2017; an alternative location are stone quarries in which they were laid open through excavation; see for example: https://www.danhostel.dk/en/fossil-hunt-in-denmark (last accessed 12/11/2023)). During the Early NordicBA these fossils were used in burials in some, but not all, regions where they would have been easy to find suggesting that only some prehistoric communities considered these fossils as being important in their funerary rites.

Fossilised organisms including sea urchins were socially significant before and after the NordicBA. They were used, for example, in ritual bog depositions such as in Hindby (Sweden) throughout the Scandinavian Mesolithic and Neolithic (Berggren 2007; 2010; Ljunggren 2019). After the Bronze Age, they were often linked to various folk beliefs as 'thunderstones' (Oakley 1965; Søvsø 2017). They were also used in burials of other regions (Brück &

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Jones 2018). However, during the NordicBA, there was perhaps a special link to contemporaneous symbology.

Most fossilised sea urchins display a five-ray star shape (Fig. 3c) that has a remarkable parallel in NordicBA material culture dating to periods II and III. The pattern on the sea urchins consists of lightly coloured dotted lines that are sometimes framed by a darker colour, with the remaining body being lighter. A similar pattern can be observed on objects including NordicBA double buttons, buckles, and metal vessels, (Fig. 7a–d). Larger symbols include more details, for example, dotted lines. Sometimes contrasting colour patterns resembling those on sea urchins were created on metalwork either by inlaying areas with pitch and resin, using artificial patination with ammonia to darken areas, or creating golden strips for more subtle colour variations (Berger 2014; Berger *et al.* 2016). The same star symbol was also discovered on wooden vessels from the Guldhøj and Store Kongehøj, Ribe (Aner & Kersten 1986; nos 3820, 3832). In these cases tin rivets provided white or silvery dotted lines. These were contrasted using pitch to create a dark frame. The lighter body of the vessel provided another colour change corresponding with the body of many sea urchins (Fig. 7e–f).

The number of matching details between sea urchins and material culture is so striking that it is unlikely they occur coincidentally. Thus, we can assume that some communities recognised this important symbol on the fossilised sea urchins which served as a reason to collect them. When we consider the meaning of this symbol, it needs to be pointed out that essentially any round symbol used during the NordicBA becomes equated with the sun (Kristiansen 2012; critique in Coles 2000). However, we should expect that other celestial bodies, like stars, also played a role in religion, as indicated by the Nebra disc which includes stars and the moon (Schlosser 2006; see also Wehlin 2014). Perhaps different numbers of rays could have indicated a range of different celestial bodies (Figs 3c & 7).

The idea that the star-shaped pattern held significance in burial practices is supported by the central burial (A) in a barrow in Hjordkjær, Denmark (No. 3017), from which five stone rows extend towards a stone circle (Fig. 8a). This is a parallel to the five rays on the sea urchins with the stones perhaps mimicking the dotted appearance of the rays. This burial construction has been interpreted as a wheel (Aner & Kersten 1981). However, many wheels in rock art and those on the sun-wagon are four-spoked, forming crosses. The constructions with radial divisions, and also wheels themselves, have been interpreted as being a reference to solar or other celestial symbols (Bradley *et al.* 2010). Thus, it seems likely that the resemblance of the rows of stones to the dotted rays on fossilised sea urchins (Fig. 3) is not co-incidental and they represented similar celestial symbols.

It is difficult to say whether the fossilised sea urchins were picked *because* they had that pattern or whether they *inspired* the use of this pattern. However, the latter seems less likely because the number of rays employed is inconsistent. It is less difficult to see that they represent an important Bronze Age symbol which was linked directly to the beach and the water. Since a meaningful symbol was present without human agency, it is possible that the sea urchins were associated with another realm in which other entities, like spirits, ancestors, or gods dwelled that may have created the symbol. This will be discussed in more detail below but it is worth pointing out that marine molluscs found on beaches may represent a similar phenomenon with their naturally present spirals and the pervasive spiral patterns seen during period II.

Seaweed and iron pans

Given the difficult preservation conditions, the number of surviving burials with seaweed is surprising. In the cases where observations were possible, it seems that the seaweed was used to wrap the dead as part of the burial rites. Susanne Harris (2016) argues that Bronze Age barrows in Scandinavia are the outcome of multiple wrapping events seeking to pile on multiple layers to transform the deceased and the grief into something new. Since different materials were used to form these layers, it can be assumed that they were not chosen arbitrarily and were, instead, laden with meanings. This could perhaps be interpreted generally as within the realm of fertility and renewal. There is evidence for the exploitation of charred seaweed from the wider North Atlantic sphere from the Bronze Age at least for a wide range of uses from fodder to fertiliser or flux material (Mooney 2021). It is interesting to note that it was burnt to a glass-like substance called 'cramp' in Late Bronze Age cremations on Orkney. While it may seem like an ordinary waste material of the fuel that was used to burn the deceased, it was potentially more meaningful

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Fig. 7.
a) Petrified sea urchin and two double buttons with matching star-shape from barrow Sb. 23 in Jyllinge, DK dated to period III (after Aner & Kersten 1973); b) bouble button discovered in barrow LA4 in Bornhöved, Germany, magnification ×60; c) tutulus discovered in barrow LA14, burial B in Bornhöved; d) hanging bowl discovered in barrow Sb. 1 in burial A in Oppe-Sundby, Denmark, which was also wrapped in seaweed (after Aner & Kersten 1973); e) wooden bowl with tin studs from the barrow 'Guldhøj', burial A, in Vester Vamdrup, Denmark; f) digital reconstruction of the pattern and colours on the underside of the wooden bowl from the 'Guldhøj' (Fig. 6e by the National Museum of Denmark, Copenhagen, CC-BY-SA; all other drawings and photos by the author)

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because it was deliberately collected and wrapped around the burials (Photos-Jones *et al.* 2007). Based on the cosmology of the NordicBA, the presence of seaweed in Scandinavia could have had a meaning more directly related to beliefs about death and the afterlife.

Seaweed grows in water which means wrapping the deceased or the oak coffin in it was perhaps a visual performance which parallels submerging them in water. There is precedence for another burial custom that semantically linked the deceased and water. In midland and southern Jutland (Denmark) as well as in Schleswig (Germany) clusters of burials with oak coffins surrounded by a layer of iron pan were discovered that mostly date to period II. These pans are a cemented layer formed by intruding water that immersed the burial and created a water-saturated core. Interestingly, in view of the topic under discussion, the iron pans have a distribution that is distinct from that of sea urchins, seaweed, beach sand, molluscs, and even beach pebbles (Fig. 4b). As such, they could represent yet another local variation on linking the deceased to water, which should be explored further.

There are several theories about the iron pans, but studies by Breuning-Madsen indicated that this effect was deliberately brought about by supplying water to the core during burial construction (Holst *et al.* 2001; Breuning-Madsen *et al.* 2003; Holst & Rasmussen 2015). It may be argued that this was done to preserve the deceased. However, together with Holst, Freudenberg points out that it is unlikely that this was the aim because some burials with iron pans contain cremated remains (Freudenberg & Holst 2005) indicating practices that were partially focused on creating a symbol or conducting a symbolic act during the burial rites. Thus, it is possible that the act of adding water during grave construction carried some meaning. Many of these burials are located inland on important transportation and communication networks including important nearby rivers such as the Kongeå (Holst *et al.* 2015). These waterways flowed out to the North Sea or the Baltic and, thus, boat journeys may have played an important role in transportation (Holst& Rasmussen 2015). Therefore, they may have been as entangled into the NordicBA cosmology as other water bodies (Nimura *et al.* 2020) which could be a reason why, here, the dead were doused with water, symbolically linking them to the realm of the dead (see also Rasmussen & Holst 2004).

Boats in burials

Ship settings constituted water-related symbolism whose construction began during the Bronze Age (Wehlin 2013). While the Late Bronze Age ship settings were visible in the landscape, some stone settings were discovered within burials dating to period II and III that resemble canoes or boats (Fig. 8b–c; see also Nordenborg Myhre 1998; Ballard *et al.* 2004; Kastholm 2008). In the barrow from Bösdorf, Germany (Fig. 8c), the stone setting was constructed with raised ends (Aner *et al.* 2017, no. 10044) and an inner construction consisting of 4–5 small compartments. Ship settings and Scandinavian rock art provide parallels to this, although the ends were not as high or curved as the boats represented in rock art. The Bronze Age logboat from Shardlow in Derbyshire, England, has a comparable outline (Martin 2005). Two radiocarbon dates for the boat (SUERC-4063, 3225 ± 35 BP; 1544–1418 cal BC and SUERC-4064, 3215 ± 35 BP; 1536–1416 cal BC; 2σ, OxCal ver. 168) and the burial goods at Bösdorf indicate that both could have been constructed during period II of the NordicBA. A wooden coffin was perhaps placed on top of the Bösdorf construction (Aner *et al.* 2017) which would mean that, in this case, the coffin may have been placed into a logboat rather than a canoe. Other examples exist – in burial A (barrow LA2) in Bebensee, Germany (Aner *et al.* 2011) and Resen, Denmark, dated to period III; in the latter case large stones also indicate stems (Nielsen 1977).

An actual boat was discovered in 1909 in a barrow (no. 15) in Tødsø, Denmark (Aner & Kersten 2001; no. 5327) where wooden pieces of a vessel frame were placed on top of an oak coffin. While this was interpreted as a logboat, the frame could also have supported a plank-built vessel. The preserved length is 2.60 m, but the eastern part was destroyed meaning that the total length could have been 3.00 m or more. The contextual relationship to burial A, which was unfortunately without further finds, suggests that the boat was placed here deliberately when the barrow was originally constructed. Burial B is a secondary burial dated to period II which may present a *terminus ante quem* for the construction of the boat. However, the boat itself is not dated and could be a much later addition (Kastholm 2012).

In a barrow in Ejstrup, Denmark, a logboat was perhaps used to lay the deceased to rest. Only half of the log had been used, contrary to typical oak coffins.

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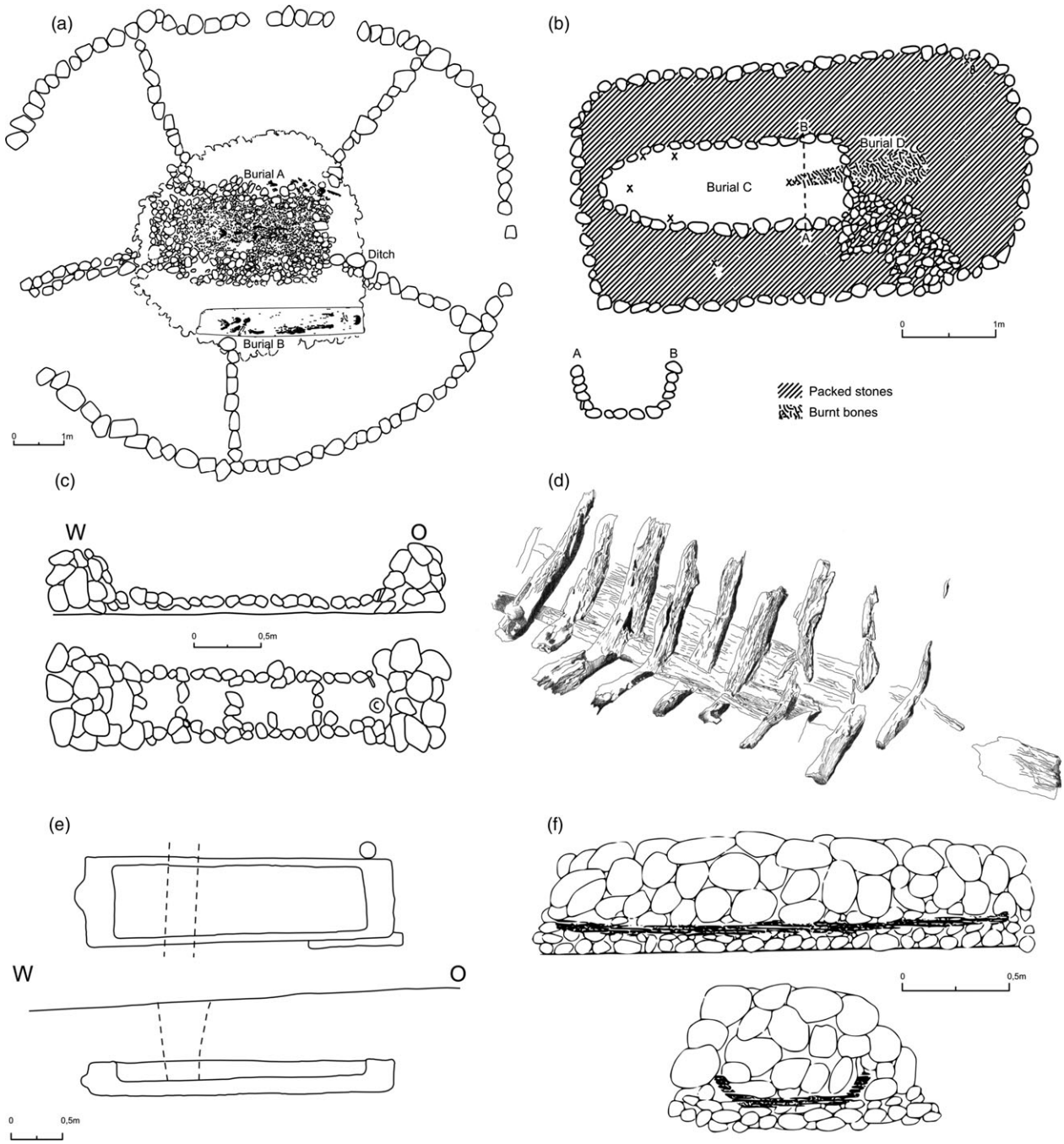

Fig. 8.
a) Inner construction in the barrow Sb. 51 in Hjordkjær, Denmark, perhaps dated to the Late Neolithic (after Aner & Kersten 1981, no. 3017); b) Burial C with a boat-like stone setting in barrow Sb. 84 in Fuglesang, Denmark, dated to period II (after Aner *et al.* 2014, no. 6756); c) boat-like stone setting in barrow LA 7 in Bösdorf, Germany (after Aner *et al.* 2017, no. 10044); d) boat discovered on top of the oak-log coffin in Burial A in the barrow Sb. 15 in Tødsø, Denmmark (after Aner & Kersten 2001, no. 5327); e) either an oak-log coffin with only the lower half used or a logboat used as coffin in barrow Sb. 23 in Ejstrup, Denmark (after Aner & Kersten 1990, no. 3017); f) Potential boat-like coffin or logboat used as coffin in a barrow in Bösdorf, Germany (after Aner *et al.* 2017, no. 10043) (all images redrawn by the author)

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In addition, the cross-section was less rounded and flat-bottomed which is closer to logboats rather than oak coffins in appearance (Aner & Kersten 1990; no. 4277). Judging by the flat, u-shaped cross-section and the thinness of the wooden remains in another burial in Bösdorf (no. 10043), this could also have been a logboat or dugout canoe. Comparing oak and other wooden coffins (Aner & Kersten 1973–2017; Randsborg & Christensen 2006) to dug-out canoes or logboats (Kastholm 2008; 2015), it could be suggested that there is a link between their production techniques and that this link might also establish a semantic connection (Rasmussen & Holst 2004). For Britain, such a link has been suggested in which the logs represent 'death ships' (Parker Pearson *et al.* 2013).

Overall, the observations presented, combined with the previous results, seem to suggest that a lot of emphasis in the funeral rites and construction of burial monuments was laid on placing the deceased on or in the sea. To investigate this further, Bronze Age cosmology will be discussed next.

DISCUSSION: BEACH RESOURCES, BOATS, CAIRNS, & THE DEAD

If we consider the vertical and horizontal separation of the different realms of the NordicBA cosmology, connected by the liminal zone of the beach which was transversed physically for example by boat crews (summarised in Fig. 1), then we can draw some interpretations about the presence of fossilised sea urchins, seaweed, beach pebbles, and other water-related aspects in funeral rites. The resources would have been collected at the beach, ie, the zone where the realms of the living and the dead merge into each other (Westerdahl 2011). Nordenborg Myhre (2004) argues that the inclusion of beach pebbles in burials expresses a liminality parallel to the position of the cairns in the landscape on islands, along the coast, and major water bodies (see also Bradley 1997; Wrigglesworth 2011) which linked these places of the dead to the beach.

In terms of liminality and transition, the pattern on the sea urchins is intriguing because it is paralleled by contemporaneous metalwork in funerals and burial construction so that we can assume that this pattern was significant to people in the past. Whichever celestial body it may have represented, it would have been an important symbol that mysteriously appeared where the different realms merged. The urchins were perhaps tokens of the night/underworld that, like the sun, either emerged from the realm of the dead, entering the realm of the living at dusk or breaking the water's surface to travel into the underworld at dawn. Maybe they were seen as a piece of the sun that emerged from the water or, alternatively, that they were placed there by the deceased ancestors or otherworldly entities. This would have made them powerful, perhaps animated, artefacts that could help transform the recently deceased (Helskog 1999; Brück & Jones 2018) and guided them in their transition into the underworld, as the sun guides the sun-ship. Based on the later ship settings and Kaul's (2004) reconstruction of the cosmology, Wehlin (2013) argued that it was precisely during the crucial and dangerous phase of the transition from one realm to the other that the deceased needed the help of liminal agents.

Following this, the resources discussed may have served as material liminal agents. Collecting seaweed, pebbles, or sand, and wrapping, encasing, or bedding the coffin, meant placing the dead directly at the beach or in the water where they would be able to transition into the underworld, perhaps to begin their journey through the water, eventually re-emerging with the sun (Bradley 1997; Kaul 2020). This may have complemented other burial aspects observed by other authors. Water may have played a direct role in some burials, eventually leading to the formation of iron pans (Breuning-Madsen *et al.* 2003; Rasmussen & Holst 2004). If some coffins mimicked or actually were boats, then these deceased would perhaps be imagined to move in their submerged vessels from their resting places along the coast, rivers, or from small islands into the underworld (Bradley 1997).

Overall, there is a lot of variation in the way local communities helped their deceased in transitioning to the underworld. For some it may have been the sun or another celestial body that itself emerged on the beach in the form of sea urchins, while others collected seaweed, pebbles, or sand to place the deceased symbolically at the beach. Yet others placed the deceased in boats, the water, or directly by the seashore – a practice that perhaps continued with ship settings and later boat burials well into the Scandinavian Iron Age. Thus, the different and, in some cases, strictly separated material agents may reflect localised beliefs around the common theme of the sun's journey that emerged during the NordicBA (Fig. 1).

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CONCLUSION

Reviewing the literature showed that the physical underwater was the realm of the dead and some of the deceased potentially joined boat crews during the afterlife, accompanying the sun on its perpetual journey. It is possible that the cosmological realms of NordicBA were not abstract, intangible, or purely placed in the imagination. They were experienceable with the senses and transitioned into each other at physical locations, ie, the beach or shore. The properties of this liminal zone and the water's surface could be experienced and were utilised for sea journeys to procure food, trade with others, and for warfare. It is possible that local groups experienced and valued different aspects of water or the beach, leading to variation when they were translated into local symbology and rituals. Some communities placed their deceased by the sea into a liminal landscape to allow the dead entry into the afterlife. Others built structures resembling boats which may have taken the deceased on their journey.

In this contribution, several water-related resources have been discussed that could have served a similar purpose as liminal material agents guiding the dead into the afterlife. Ultimately, the results show that there is plenty of variation in the beliefs of local communities, while still conforming to the general pattern of Bronze Age religion (Kaul 2004). There are many more potential variations and future analysis, for example of cairns, will perhaps contribute more to our understanding of the diversity of NordicBA communities.

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RÉSUMÉ

Eau et au-delà – ressources associées à l'eau dans la construction des tombes de l'Age du Bronze Nordique, par Christian Horn

Les communautés vivant durant l'âge du Bronze Nordique ancien (1800/1700–1100 BC) accordaient une haute importance au paysage aquatique comprenant la mer, les rivières et les lacs. Les voies navigables servaient alors d'autoroutes facilitant les voyages, le commerce et la guerre, permettant aux guerriers de la mer et autres de se distinguer. Ceci est illustré par l'emplacement maritime de l'art rupestre et d'importantes tombes de l'âge du Bronze ancien, qui ont servi à reconstruire la cosmologie de l'âge du Bronze Nordique. Celle-ci est centrée sur le voyage du soleil à travers le ciel durant le jour, et le monde souterrain durant la nuit. Cet article analyse l'utilisation de ressources liées à l'eau, tels que les algues, les organismes pétrifiés, les galets de plage, et les mollusques, dans la construction des tombes, qui ont reçu une attention moindre malgré l'intérêt renouvelé pour les paysages maritimes. Les données montrent que les communautés locales utilisaient chacune différentes ressources, ce qui indique qu'un système de croyance commun étaient mis en place par le biais de différences locales. Ces matériaux marins étaient collectés sur la plage, laquelle pouvant être conceptualisée comme une zone liminaire entre la terre des vivants et la mer des morts. Nous suggérons que ces matériaux, au même titre que d'autre pratiques funéraires, servaient à guider les personnes récemment trépassées vers l'au-delà au sein de la mer.

ZUSAMMENFASSUNG

Das Wasser und das Leben nach dem Tod. Wasserbezogene Ressourcen in der Bestattungskonstruktion der Nordischen Bronzezeit, von Christian Horn

Die Wasserlandschaft, einschließlich Meer, Flüssen und Seen, war sehr wichtig für die Gemeinschaften der Nordischen Frühbronzezeit (1800/1700–1100 v. Chr.). Wasserstraßen dienten als Verkehrswege, die Reisen, Handel und Kriegsführung erleichterten und es maritimen Kriegern und anderen ermöglichten, sich auszuzeichnen. Dies spiegelt sich in der maritimen Verortung von Felszeichnungen und wichtigen frühbronzezeitlichen Gräbern wider, die zur Rekonstruktion der Kosmologie der Nordischen Bronzezeit herangezogen wurden. Diese konzentriert sich auf die Reise der Sonne über den Himmel während des Tages und in die Unterwelt während der Nacht. In diesem Artikel wird die Verwendung von wasserbezogenen Ressourcen,

wie z. B. Algen, versteinerten organischen Stoffen, Strandkieseln und Mollusken, bei der Errichtung von Bestattungen untersucht, die trotz des neuerlichen Interesses an der maritimen Meereslandschaft wenig Beachtung gefunden hat. Die Daten zeigen, dass die lokalen Gemeinschaften unterschiedliche Ressourcen nutzten, was darauf hindeutet, dass ein gemeinsames Glaubenssystem mit lokalen Unterschieden verwirklicht wurde. Diese marinen Materialien wurden am Strand gesammelt, der als liminale Zone zwischen dem Land der Lebenden und dem Meer der Toten konzeptualisiert werden kann. Es wird angenommen, dass diese Materialien, in Übereinstimmung mit anderen Bestattungspraktiken, dazu beitrugen, die kürzlich Verstorbenen ins Jenseits im Meer zu geleiten.

RESUMEN

Agua y más allá – los recursos relacionados con el agua en la construcción de enterramientos de la Edad del Bronce nórdica, por Christian Horn

El paisaje del agua, incluye el mar, ríos y lagos, que fueron especialmente importantes para las comunidades nórdicas durante la Edad del Bronce inicial (1800/1700–1100 BC). Estos canales actúan como caminos que facilitan los viajes, intercambios, y enfrentamientos, permitiendo a los guerreros marítimos y a otros distinguirse a sí mismos. Esto se refleja en la localización marítima del arte rupestre y los enterramientos importantes durante la Edad del Bronce inicial, que han sido utilizados para reconstruir la cosmología de la Edad del Bronce nórdica. Esto se centra en el viaje del sol a través del cielo durante el día y del inframundo durante la noche. Este artículo analiza el uso de los recursos relacionados con el agua, como las algas marinas, materiales orgánicos petrificados, guijarros de playa y moluscos, en la construcción de los enterramientos, lo cual ha recibido poca atención a pesar del renovado interés en el paisaje marítimo. Los datos demuestran que las comunidades locales usaron diferentes recursos, lo que indica que se forjó un sistema de creencias común a pesar de las diferencias locales. Estos materiales marinos se recolectaron de la playa, lo que puede ser conceptualizado como la zona límite entre la tierra de los vivos y el mar de los muertos. Se sugiere que estos materiales, en consonancia con otras prácticas funerarias, ayudaron a guiar a los recién fallecidos hacia la vida después de la muerte en el mar.

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