

## CHAPTER FOUR

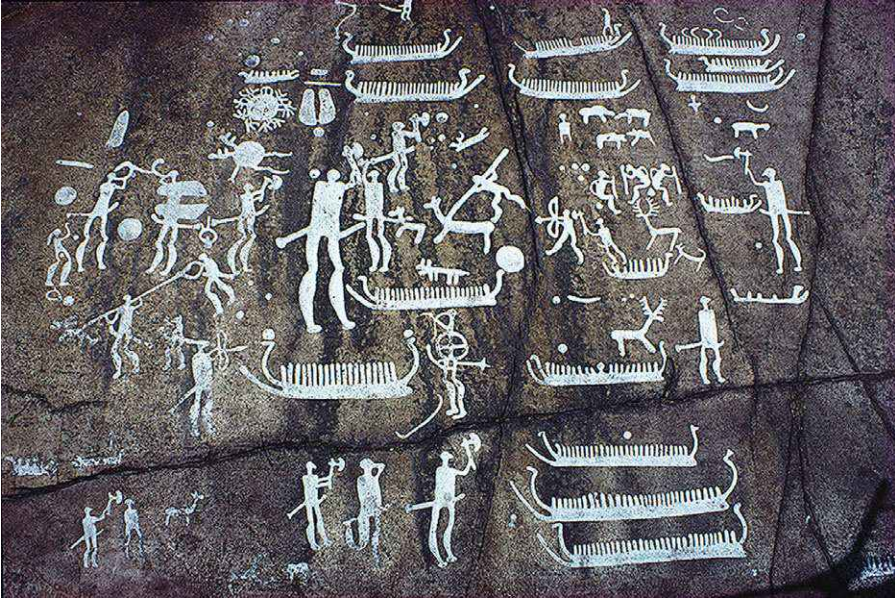
# BRONZE AGE LONG-DISTANCE EXCHANGE, SECRET SOCIETIES, ROCK ART, AND THE SUPRA REGIONAL INTERACTION HYPOTHESIS

**Johan Ling, Richard J. Chacon, and Yamilette Chacon\***

### INTRODUCTION

This chapter posits the processes that favored the rise of ranked polities in Scandinavia during the Bronze Age. We put forth the Supra Regional Interaction Hypothesis to explain how elite households were able to consolidate political power through their involvement in boat building, timber extraction, long-distance exchange, and raiding for slaves with the goal of financing trading expeditions to secure coveted metals. These elite households were organized into supra regional political sodalities that controlled political power, surplus production, debt, exchange, feasts, and warfare as well as ritual and religious means. We hypothesize that this sodality functioned as types of “secret society” as described by Hayden (2018). Thus, in order secure boats for long-distance exchange of metals and other exotica, the said political sodalities established trade confederacies, alliances, and colonies between rich agropastoral regions (more coercive) and regions rich in timber (more cooperative) – the latter ones famous for its rock art. They established transregional networks that linked and controlled interaction and exchange between regions with varied forms of environments and social organizations, spanning from more coercive to cooperative social settings (Feinman 2017). In doing so, they

\* The authors wish to thank Brian Hayden for his help, particularly for his guidance in matters dealing with secret societies.

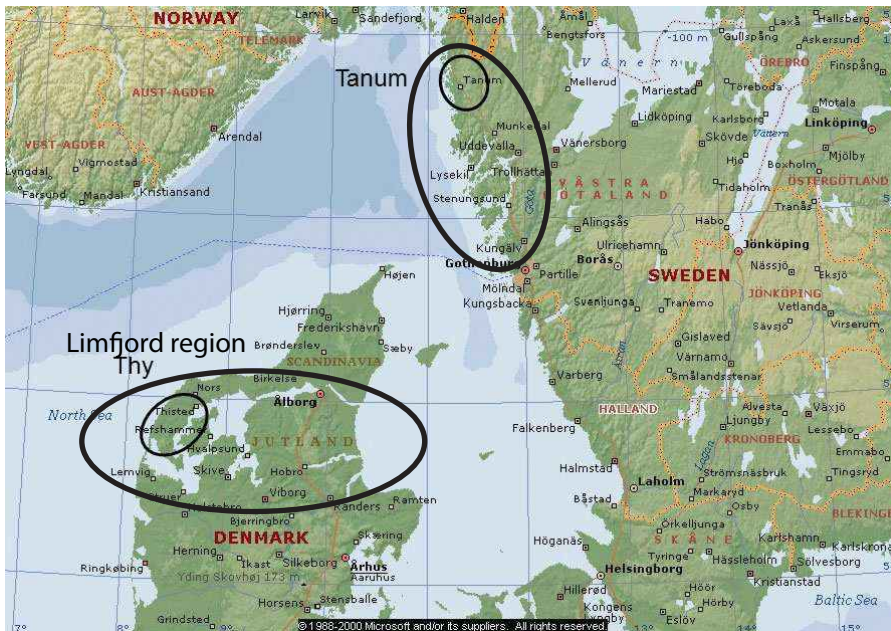


4.1. The Fossum rock art site, Tanum, West Sweden, showing warriors and ships along with a variety of social and ritual representations. In addition to numerous rock art sites, the region also shows evidence of boat building from the Bronze Age (Hällristningsmuseum Underslös. Source: SHFA)

could control labour, raw materials, skills, and surplus production over large areas. Moreover, we theorize that aggrandizing households sponsoring boat building and timber extraction also reaped many benefits stemming from the capturing of slaves. We also claim that the rock was made and controlled by members of “secret societies” and that the abundance of rock art sites in more cooperative timber-rich regions should be seen as an outcome of political/ritual interactions with elites from more coercive areas (Figure 4.1).

We will clarify this statement by way of a case study that will focus on the interaction between the more cooperative Tanum/Bohuslän region of Western Sweden and the more coercive Limfjord/Jutland region of Denmark (Figure 4.2).

To further explain and test our hypothesis, we will (1) present the empirical evidence that includes archaeological and scientific data that connects the Tanum/Bohuslän area to the Limfjord/Jutland region and we will (2) frame and further discuss our hypothesis in light of recent theoretical approaches involving Scandinavian Bronze Age society. We will focus on political economy, social organization, social complexity, and on aspects dealing with comparative advantage. Then, we will (3) present our Supra Regional Interaction Hypothesis while expanding on the topic of secret societies. We will also discuss the larger implications of our hypothesis.



4. 2. Map showing the location of the Limfjord/Jutland area in Denmark as well as the Tanum/Bohuslän region of West Sweden

Before presenting our case, we must clarify some issues connected to theory and epistemology. Our theoretical approach includes comparative perspectives and theory taken from archaeology, cultural anthropology, sociology, and history (Earle 1997, 2002; Gell 1998; Hayden 2005, 2018; Vandkilde 2006; Earle and Kristiansen 2010; Chacon and Hayward 2017). We hold that it is useful to make cross-cultural comparisons in order to discuss different archaeological models despite ongoing debates on how and why cross-cultural comparisons should be made (Reybrouck 2000; Melheim et al. 2016; Ling et al. 2018a). This debate is most relevant because it relates to various aspects of our theoretical approach about social evolution, political economy, social interaction, and social complexity in pre-state formations.

With regards to political economy and social evolution, Ling et al (2018a) argue for the existence of two key sectors in Bronze Age Scandinavia: a land-based agro-pastoral sector and a sea-based boat-voyaging sector; and in order to engage in exchange, Bronze Age Scandinavian societies depended on both of these sectors. However, due to differences in their respective environments and social settings, some regions focused on one of these economic sectors more than the other. This spurred specialized regional production, a phenomenon that can broadly be described by the rule of comparative advantage, as defined by Ricardo (1817) (cf. Rowlands and Ling (2013) along with Earle et al. (2015).

We will expand on this point in the following section. Additionally, archaeological evidence indicates that these sectors had varied forms of social

organization, spanning from coercive to cooperative strategies (c.p. Feinman 2000; Austvoll 2018). Feinman (2000: 32) stresses that these concepts are “not meant to replace a concern with hierarchy but to expand our comparative theoretical concepts so that they may better account for more general patterns of societal variation and change.” Austvoll (2018) applies these concepts in his thesis on the sociopolitical organization along the coast of northwestern Norway during the Early Bronze Age. Based on these concepts, Austvoll holds that tension existed between these sectors. Coercive groups used the wealth generated by their large scale agro-pastoralist activities to invest in long-distance exchange (Austvoll 2018: 26ff.). Cooperative communities located in more mountainous areas or in more sea-based coastal communities which lacked the wealth-producing potential that was present in the agro-pastoralist communities were forced to resort to a more diverse economy which included some agro-pastoralism along with hunting, fishing, and timber extraction. For this latter strategy to succeed, increased cooperation would have facilitated trade which was essential for survival (Austvoll 2018: 26ff.).

In the Bronze Age, the interaction between these highly varied environments, production methods, skills, and socioeconomic and political settings, gradually fostered specialization of production. For instance, during the Bronze Age, the sea-based coastal Tanum/Bohuslän region of western Sweden was rich in timber, while contrastingly, the agro-pastoral Northern Jutland area of Denmark was deforested. Notwithstanding, the Limfjord/Jutland area had a clear comparative advantage in terms of agro-pastoral production. This “land-based” region/sector was able to amass relatively large amounts of wealth and power as is indicated by the high number of bronze artifacts recovered in this region (Randsborg 1968; Vandkilde 1996).

Both sectors were active in most regions, however, due to environmental, geographical, and social settings; some regions emphasized one of these sectors over the other. We think that the rule of interaction between regions with different economies and social settings took place between many areas in southern Scandinavia such as Jutland-Rogaland, Zeeland; coastal and inland Halland, Scania; inland Småland, Gotland; coastal and inland eastern Småland etc. The link between the Tanum/Bohuslän and Limfjord/Jutland is therefore only one example of this scenario.

#### EVIDENCE OF INTERACTION BETWEEN THE TANUM REGION AND LIMFJORD REGION

In this context, for comparative purposes, we use archaeological data and case studies put forth by Ling. et al (2018a). Importantly, it should be stressed that new insights and observations have enhanced our understanding of these particular case studies.

The following findings point to interaction between the Tanum/Bohuslän and Limfjord/Jutland regions. Eighty-one flint daggers were recovered in Tanum/Bohuslän (Ling 2008) and these items were produced and imported from the Limfjord/Jutland region (Apel 2001). Additionally, bronzes found at Tanum/Bohuslän dating from the Early to Late Bronze Age show strong typological ties to bronzes found at Limfjord/Jutland (c.p. Baudou 1960; Randsborg 1968; Vandkilde 1996; Hermer 1999). As in the case of the flint daggers, it is reasonable to assume that most of the bronzes found in Tanum/Bohuslän were transferred from the Limfjord/Jutland region during the Bronze Age. Moreover, the Limfjord/Jutland area has far more bronze finds than the Tanum/Bohuslän region. About 500 percent more in comparison (Randsborg 1968; Kristiansen 1978). Furthermore, lead isotope analyses carried out on the bronzes found at Tanum/Bohuslän compared with the ones recovered in the Limfjord/Jutland area show that they derive from the same copper sources, that is, from Atlantic Europe and from the Italian Alpine region (Ling et al. 2014, 2019; Melheim et al. 2018). Additionally, the Limfjord/Jutland area may have also served as a major transit zone for the metals arriving from central European networks via the Elbe River (Ling et al. 2019: figure 21). Thus, the relatively high number of bronzes found in the Limfjord/Jutland area as well as their shared metal signatures indicates that the Limfjord/Jutland region served as the major transit zone for the distribution of



4.3. Map showing how the Limfjord/Jutland served as a major transit zone for the for the distribution of metal in the direction of west Sweden. The arrows illustrate metal routes from Atlantic Europe and “routes” via the north German rivers.

metal in the direction of west Sweden (i.e., the Tanum/Bohuslän region) during the Bronze Age. The theory of the interaction between the said regions is further confirmed by the subsequent rise in rock art and cairns in Tanum and the rise in metals and barrows, along with the expansion of settlements in the Thy/Limfjord area during period II, III, and V (Ling 2008: 151ff.)

So far, we have presented much evidence of the flow of artifacts from Limfjord/Jutland to the Tanum/Bohuslän region; but what about the flow of artifacts in the opposite direction? In terms of the Limfjord region, there is not any direct evidence here of finds or materials indicative of exchange with the Tanum region. However, there is indirect evidence and social and historical circumstances in favour for this. The Tanum area could not simply have been a passive exchange part, if this was the case, colonization would be more critical than barter and exchange. But what could possibly have been traded in the opposite direction? We posit that during this time period, aggrandizing agro-pastoral households from the Limfjord/Jutland region established timber trade and possibly trade and with boats with the timber-rich region of Tanum/Bohuslän of western Sweden. For example, pollen analysis of western Jutland samples dating to the beginning of 1500 BC show evidence of rapid deforestation resulting from the expansion of local agro-pastoral activities (Odgård 1994; Andersen 1999; Bech et al. 2018). This situation resulted in an increased demand for timber that would have been used in the construction of boats and long houses. In fact, there is evidence indicating that groups in the Limfjord/Jutland area used driftwood for their long houses because of a shortage of timber (Holst et al. 2013; Bech et al. 2018). Furthermore, the Limfjord/Jutland region had a long tradition of building large and complex long houses during the Bronze Age and it is the region with the highest density of finds of long houses in Scandinavia during this period in prehistory (Artursson 2015).

But why should the Limfjord region trade timber with the Tanum/Bohuslän region of western Sweden? In fact, Tanum/Bohuslän could potentially have been one of the regions that provided Thy with timber and boats, when their forests were depleted by 1300 BC. Indeed, the first recorded evidence from the twelfth century AD indicates that northern Bohuslän exchanged timber and boats with Jutland against agro-pastoral products (Ling et al. 2018a). In addition, during historical times, Bohuslän was one of the most important boat-building centers in Scandinavia (Hasslöf 1970); the area was connected to timber production, and many towns in the northern region depended on timber brought down from the hinterland forests on rivers (Ling et al. 2018a). The Danish naval fleet was also traditionally reliant on timber from northern Bohuslän (Hasslöf, 1970). The Tanum area was also partly deforested from about 1600 BC and beyond, but this concerns only the lowlands, which presumably served for agro-pastoralism, while the higher grounds remained forested in its eastern parts (Svedhage 1997; Ling 2008).

However, the deforestation of the lowlands could also be a result of timber trade with the Limfjord area. In fact, the Tanum region shows both indirect and direct evidence of Bronze Age boat building, making it one of the most ideal regions for export of boats and timber, not least the Limfjord region in the Bronze Age. We now list both the indirect and the more direct evidence for boatbuilding in Tanum in the Bronze Age:

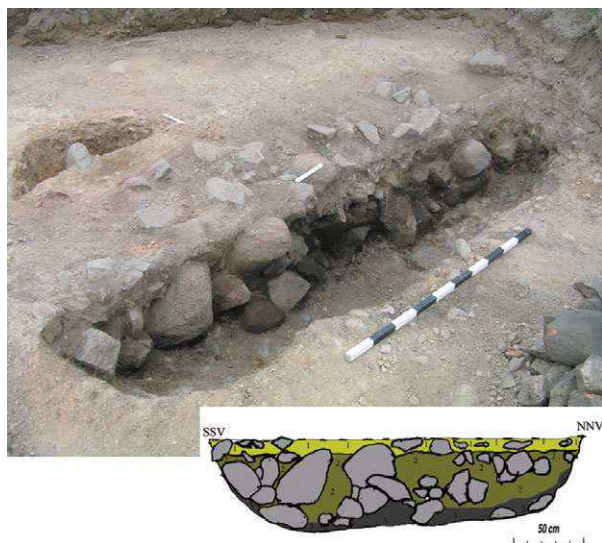
#### *Indirect Evidence*

Firstly, the Tanum/Bohuslän area has the largest concentration of depictions of Bronze Age boats in all of Europe, with a remarkably similar design to the plank-built boat found in Hjortspring, Denmark, dating from c. 375 BC (Randsborg 1995; Crumlin-Pedersen, 2003; Ling 2008). Secondly, the Tanum/Bohuslän area has the highest concentration along the west coast of Sweden of shaft hole axes of stone and bronze as well of stone hammers presumably used for timber construction and boat building (Lekberg 2002; Austvoll 2018). Thirdly, statistical analysis shows a correlation between materials indicative of boat building (see above) along with the presence of ship motifs, near ancient seaways and/or rivers in the Tanum/Bohuslän area (Ling 2008).

#### *More Direct Evidence*

Other more concrete evidence of shipbuilding includes fire-cracked stones from seaside “cooking” pits. Such features are commonly referred to as “cooking pits” and they are located along the Bronze Age shoreline. Recent excavations revealed a number of these features, all dated to the Bronze Age (Pettersson 2009) However, the designation “cooking pits” is undermined by the fact that archaeological excavations have never recovered any bone or food remains from these Bronze Age seaside pits (Pettersson 2009). Therefore, we claim, in line with Pettersson 2009, that these fire-cracked stone pits were associated with boat building activities and we provide the following evidence in support of this assertion. Analyses of the wood found in these Bronze Age shoreline pits show that the types of wood are similar to the types that were used in the construction of prehistoric boats (Pettersson 2009). Moreover, ethnographic studies document the use of fire-heated stones for the steaming of wood to be used in boat building, particularly for the keel and the side portions of traditional watercraft (Clausen 1993).<sup>1</sup>

<sup>1</sup> In order to gain a better understanding of traditional boat building techniques, the authors of this chapter conducted ethnographic investigations among the Haida of British Columbia during the summer of 2018. Haida craft specialists, who currently build boats, informed us



4.4. Large “cooking pit” from Tossene parish Bohuslän, West Sweden, dated to the Late Bronze Age. Excavated and documented by one of the authors, containing fire cracked stones, coal and burnt wood (after Ling and Ragnesten 2009)

We have now argued for the evidence of interaction between the said regions; and at this juncture, we wish to focus on the colonization component of our chapter. In effect, the evidence indicates that the western Jutland area experienced rapid deforestation beginning in 1500 BC. This loss of forest was likely the result of the expansion of local agro-pastoral activities that, in turn, would have incentivized aggrandizing Limfjord/Jutland’s households to colonize the timber rich Tanum/Bohuslän region. Additionally, c. 900 BC, there was an overall depletion of soils in Jutland (Kristiansen 1998)

and this would have provided yet another incentive to establish a colony in the less impacted Tanum/Bohuslän area.

During this period, the Limfjord/Jutland area had a considerably higher population density than the Tanum/Bohuslän region (Ling et al 2018a). At this time, Limfjord/Jutland’s household density was  $1/\text{km}^2$  with households consisting of eight to ten extended family members and perhaps three to five slaves (Holst et al. 2013; Kristiansen 2018; Ling et al 2018a). A population density of 12–15 per  $\text{km}^2$  seems likely (Kristiansen 2018; Ling et al 2018a). Contrastingly, the Tanum/Bohuslän region may have had one household per  $2/\text{km}^2$  (Ling et al 2018a). Thus, one can understand why aggrandizing households from the deforested, soil poor, and densely populated Limfjord/Jutland area would seek

that, traditionally, Haida boat builders used fire to heat stones which, in turn, would be placed in water. Then, steam emanating from the heated water would be used to bend the wood used in the construction of log boats. However, there is a major difference between the Scandinavian plank-built boats and the large log boats in the Haida nation, even if they share the same general proportion in size. The latter are cut from one piece while the formed consists of several parts. However, both boat building traditions employ the same elementary steam techniques to either expand the bottom plank and soften the planks so they can bend in the direction need (Scandinavia) or expand the entire log boat as the case among the Haida. According to Haida master craftsmen, this process was not without its hazards as super-heated rocks would sometimes crack when placed in water and individuals standing nearby during this process could be struck by rock fragments traveling at high speeds (R. Chacon’s unpublished fieldnotes, n.d.).



to establish a colony in the forested, soil rich, and sparsely populated Tanum/Bohuslän region.

Having shown the evidence for the interaction between the two regions, we now present findings that support our argument that holds that the Tanum/Bohuslän was more than just a simply colony of Limfjord/Jutland. The evidence indicates that the interactions between these two areas were multifaceted. Nevertheless, it is important to stress that ties between these regions were not on an equal footing and that the more coercive region had an advantage over the more cooperative region. We assume that the households in the aggrandizing Limfjord/Jutland area used their agro-pastoral surplus for competitive feasts that distributed gifts in the form of metals for gifts and therefore exercised influence over the more cooperative Tanum region. We will expand on this assertion in the Concluding Discussion section of the chapter.

The material and non-material exchanges that occurred between these locations were facilitated by the presence of a sodality, which, in effect, integrated the Limfjord/Jutland and Tanum/Bohuslän regions into one Supra Regional Network. Members of this sodality were granted exclusive access to specialized information on boat building, long-distance exchange, and esoteric ritual knowledge. This task-oriented sodality should be considered as a type of “secret society.” However, before we discuss the important roles that this sodality played in the creation and maintenance of the Supra Regional Network, we will provide a theoretical overview with regards to the political economy, comparative advantage, and social complexity in and between regions with varied social settings in the Bronze Age.

#### INTERACTION AND COMPARATIVE ADVANTAGE BETWEEN REGIONS WITH VARIED SOCIAL SETTINGS

The Bronze Age witnessed the rise of social stratification based on elite control over long-distance exchange (Earle 2002). In effect, the control over long-distance exchange spurred the advent of coercive ranked and/or chiefdom-level polities (Renfrew 1984; Earle and Kristiansen 2010). In effect, increased profits from exchange created a comparative advantage for coastal maritime-orientated societies possessing watercraft building capabilities and navigational abilities along with the warriors necessary for the protection of boats (Rowlands and Ling 2013). This situation would have favored “trading communities” in Scandinavia during the Bronze Age. Thus, the more coercive Scandinavian polities that appeared after 1700 BC (Vandkilde 2014, 2016) included specialized warriors and traders with leaders who invested in watercraft construction for long-distance maritime trade expeditions (Ling et al. 2018b). These polities also established coastland and inland networks to meet

the demand for particular commodities (Earle et al. 2015; Austvoll 2018). This demand also spurred the consolidation of ranked or chiefly confederacies that fostered an exchange system with regular mobilization of free and unfree people along with trade goods (Ling et al. 2018b). Other publications have argued that a specific maritime mode of production became established in the Bronze Age (Earle et al. 2015; Ling, et al. 2018a). Thus, the emerging maritime Scandinavian economy was based on agricultural output, but the region was also characterized by the presence of a maritime sphere. This maritime sphere possessed socioeconomic traits that fostered a new dynamic involving maritime warrior and trading components in the Bronze Age political system. Although inherently decentralized, ranked societies comprised elites, free farmers, warriors, commoners, and slaves.

Operating within this mode of production, new pathways for aggrandizement were established by way of surplus production, support of voyaging, and centralized flows of wealth as key components. Even if the original “Scandinavian” mode of production was founded on a decentralized household economy, social complexity and political control came about as the result of securing control over maritime exchange and raiding (Ling et al. 2018a). However, due to environmental limitations and/or social constraints, some areas developed one economic sector over the other.

Bronze Age Scandinavia’s specialized regional economy provided a comparative advantage for coercive as well as for cooperative social interactions (Rowlands and Ling 2013; Earle et al. 2015; Ling et al. 2018a, 2018b). Thus, the comparative advantage of different regions with varied ecological and social settings offered conditions conducive to the rise of a Supra Regional Network. The goal of this network was to secure access to commodities such as timber, slaves, and prestige goods (such as bronzes). We claim that interactions linking the Limfjord/Jutland and Tanum/Bohuslän regions were organized by secret society leaders who were also, not coincidentally, leaders of aggrandizing households from these regions

#### MARITIME LONG-DISTANCE EXCHANGE, SECRET SOCIETIES AND ROCK ART

Our hypothesis favors the idea that elite households, organized into supra regional political sodalities, initiated, spurred, and stimulated the mobility between regions with varied forms of social and economic settings. We think that these sodalities shared many properties with institutions or social organizations known as “secret societies” (Hayden 2018). Secret societies are often found in association with institutions in charge of warfare or with boat guilds that execute long-distance exchange or slavery but also with institutions in

control of rituals and ritual activity such as rock art (Hayden 2018). Ling (2019) recently highlighted some of the core features of secret societies described by Hayden (2018).

(1) they were shaped and operated by a rudimentary aristocracy of aggrandizers that strived to secure advantages for themselves: they extracted surpluses from non-secret society members and their actions were self-serving rather than integrative for society; (2) they controlled local and to some extent regional politics and exercised significant influence over the activities that generated surpluses; (3) they transcended kinship by forging 'fictive' supra kinship organizations that sometimes replaced the functions of clans; (4) they monopolized ritual knowledge, ideology, and political power by proclaiming control over supernatural powers that were believed to be hazardous to non-secret society members; (5) they enforced 'private' initiation rituals at remote locations in the landscape often in caves along with the creation of rock art; from junior members and non-members alike; (6) they invested in long distance exchange of exotic items thus, fomenting the distribution of certain artistic styles over large areas; (7) they used exotic items, special ritual paraphernalia, and iconography to demonstrate their exclusivity in society and their privileged connection to the supernatural world.

(Ling 2019: 74)

We believe that the elites in Bronze Age Tanum/Bohuslän together with elites from the Limfjord/Jutland region were organized along similar lines and that the evidence of interaction between these regions reflects the presence of a trans-regional political elite network with exclusive access to advanced knowledge about boat building, long-distance exchange, and warfare. In this context, we argue that transregional boat building guilds with representatives from both Tanum and Jutland (i.e., secret societies) conducted maritime long-distance exchange, warfare, slavery, and various forms of ritual activity. Similar activities emerged during the Viking Age when boat guilds were established (Jakobsson 1992). Also, ethnographic data shows that North American indigenous boat guilds were involved in long-distance exchange (Leland 1997; Arnold 2001; Johnson 2007). Additionally, we argue that these transregional guilds also created the rock art found in the Tanum/Bohuslän area on a seasonal basis as part of the ritual process associated with the transmission of knowledge relating to navigation, boat construction, watercraft maintenance, warfare, religion, and cosmopolitan affairs. Pilgrimages and local religious shrines should also be considered in the context of rock art (Hayden 2018; see also the Concluding Discussion section). These carvings formed part of a larger ritual component designed to ensure the seaworthiness of watercraft along with the overall success of voyages (Ling 2008; c.p Malinowski 1922). Thus, we contend that the agents depicted on rock panels feature individuals

from this boat building guild who, in turn, formed an integral part of a secret society comprising warriors, traders, mariners, and craft specialists. Interesting ethnographic parallels link “maritime” secret societies with rock art, as the following quote indicates about the widely feared maritime based Northwest Coast Bella Coola of British Columbia:

Bella Coola chiefs would always call for a meeting whenever a new member was to be initiated into the kusiut secret society. “Near every village is a place where the chiefs hold such meetings. All the inhabitants know the general locality, but there is such dread of the supernatural powers possessed by members of the kusiut society that none would dare go there. If an uninitiated person should do so, he would formerly have been either killed or initiated into the society. The meeting-place of the Qomqo-ts chiefs is on a ledge or rock jutting out over a waterfall about a quarter of a mile from the village. The stream winds down a narrow cleft of the mountain side, screened by dense vegetation, and suddenly falls into a cauldron, so hemmed in by cliffs that no sunlight can enter. The ledge is immediately above the brink of the falls, one of the most awe-inspiring places imaginable. The meeting-places of other villages lack such natural settings, though all are at the bases of cliffs, or near some easily distinguished feature. Some of them are decorated with rude carvings, pecked into the stone. The meaning of the designs is not known to any of the present inhabitants. Some of them were made, long ago, by chiefs when they were composing tunes; they picked out the rock in time to the music forming in their minds. Others were mere memorials of certain events. If a chief gave an important ceremony, he, or one of his friends, carved a figure, perhaps that of a man, perhaps of some animal connected with the rite, to recall the occasion.

(McIlwraith 1948: 177–178, emphasis added)

It is fascinating to note that the making of rock art, in connection to private initiation rituals, took place at remote sites on the landscape. A similar setting is found in Scandinavia where local rock art panels are located away from habitation sites, at a distance  $\sim 1$  km (Ling 2008, 2015). It is fascinating to note that the making of rock art, in connection to private initiation rituals, took place at remote sites on the landscape. A similar setting is found in Scandinavia where local rock art panels are located away from habitation sites, at a distance  $\sim 1$  km (Ling 2008, 2015). It is generally believed that the appearance of Scandinavian rock art is associated with various social transformations including changes in the local political economy (Goldhahn and Ling 2013). Such changes fostered new political institutions and, in this context, it is reasonable to associate rock art with the presence of secret societies (Hayden 2018; Ling, et al. 2018a). Interestingly, Scandinavian rock art often depicts warriors wearing ritual garb that includes bird-like costumes, bi-horned helmets, and masks (Kaul 1998). It is important to note that such accoutrements are often

associated with secret societies (Butt-Thompson 1929; Hayden 2018).<sup>2</sup> Moreover, these anthropomorphic figures are often shown standing in or beside large boats.

Additionally, many scholars have argued that Bronze Age Scandinavian rock art formed part of important initiation rites on the landscape (Goldhahn and Ling 2013) and many factors link the propagandistic and esoteric nature of Bronze Age Scandinavian rock art to Hayden's (2018) assertion highlighting the desire on the part of secret societies to impress audiences.

Moreover, since warfare and warriors were associated with secret societies, it is interesting to see that that these features are so prevalent in Tanum rock art (see Figures 4.1, 4.5–4.7). The panels often contain images of armed warriors in or near watercraft. Most of the rock art panels that include war-related scenes were created during two separate chronological phases during the Bronze Age, period II (1500–1300 BC), and period V (900–700 BC) (Ling and Cornell 2015). Interestingly, these phases correlate with the circulation of the greatest amounts of metals in Scandinavia indicating that long-distance trade of metal and warfare rock art was executed by the same institution, that is, members of a secret society. However, there is yet another component that needs to be discussed in the context of social organization and long-distance exchange in the Bronze age, namely, the need of unfree labor

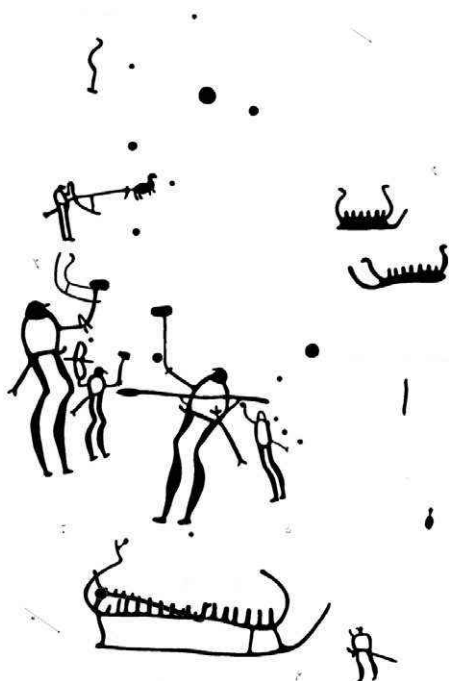


4.5. One of the most spectacular BA rock art depictions from Tanum, western Sweden, is that of an armed, phallic, bi-horned anthropomorphic being wearing a large bird-like mask (photograph by Bertil Almgren. Source SHFA)

#### WHO FILLED THE AGRICULTURAL LABOR GAP?

The need to secure particular metals was a major priority for those desiring prestige and power during the Bronze Age. Thus, long-distance exchange and raiding became imperatives in establishing and maintaining prestige/power networks. In order to conduct such activities, much labor had to be transferred from the agricultural to the voyaging sectors. This raises the following

<sup>2</sup> According to Hayden (2016: 11): "Secret societies typically used expensive paraphernalia often from distant sources; they controlled and consumed vast resources; they were regional in scope; they provided regional mobility . . . [they] engaged in feasting, the largest events being used to publicly display their supernatural and profane powers."



4.6. Images of warriors with bird-like masks brandishing axes, spears, swords, and bows depicted at the Bronze Age Scandinavian Tanum rock art site (documentation by T. Högberg. Source: SHFA)

question: With such a shift in labor, who filled the agricultural labor gap? Viking-era historical documents, as well as ethnographic accounts of maritime-ranked societies, indicate that slaves often filled this gap and constituted an important part of the economy (Ling et al 2018a, 2008b).<sup>3</sup>

We posit that this also likely took place in the Scandinavian Bronze Age. With slaves working the home farms, now unencumbered warriors/traders seeking to raise their social standing could participate in long-distance voyages to transport timber and to take captives who would be enslaved.<sup>4</sup> In short, aggrandizing Limfjord/Jutland households sponsoring boat building in Tanum/Bohuslän also reaped the many benefits stemming from the capturing of slaves. Said households had access to a network that provided slaves and imported timber for their deforested Limfjord/Jutland homeland. In turn, as previously mentioned, Limfjord/Jutland aggrandizers used profits generated from their Tanum/Bohuslän cooperative

counterpart (i.e., timber and slaves) to fund trading expeditions to secure metals from southern sources.

<sup>3</sup> This scenario also finds support in North America's ethnographic record. For example, the Tlingit, a Northwest Coast ranked maritime society, traditionally kept slaves. These slaves were often charged with performing subsistence-related tasks such as maintaining fish weirs at the mouth of the Klawock River, Little Salt Lake, and Deshuan. At these sites, the Tlingit constructed wooden-stake structures and rock wall alignments for the harvesting of salmon (Langdon 2007). During the 1750s, "[a]ccording to oral tradition, slaves were sent out to repair the wooden stake weirs in the estuaries of the nearby streams by replacing stakes broken or washed away during the previous winter so the structures would be in working order for the return of the honored salmon" (Langdon 2007: 236).

<sup>4</sup> Since the presence of warriors would serve to fend off attacks, trade expeditions that included individuals possessing fighting capabilities were more likely to succeed than expeditions lacking warriors. Thus, we argue that Scandinavian Bronze Age long-distance exchange was conducted by warrior/traders. There is ethnographic precedent for this position. Long-distance exchange was conducted by the Mojave Indians of California. This tribe successfully traded with coastal Chumash populations at Santa Barbara, California and also with Puebloan Indians of New Mexico. The success of this wide-ranging exchange was in no small part due to the fact that the Mojave were greatly feared by neighboring tribes because of their well-known fighting abilities (Smith 1966; Kroeber 1976).

EBA



LBA



4.7. Crewed ships from the Early Bronze Age (top) and Late Bronze Age (bottom) (documentation by T. Högberg and G. Milstreu at Tanum. Hällristningsmuseum Underslös. Source: SHFA)

But could slaves have been key Scandinavian export commodities? And is there evidence for the existence of slaves and in Bronze Age Scandinavia? Some scholars argue that the large and complex Bronze Age farmsteads were built and organized in order to house slaves within a certain part of the building. That is to say, these structures contained a specific section for “a family of slaves or non-free workers” (Mikkelsen 2013: 62). Mikkelsen (2013) argues that this practice goes back to the Late Neolithic. Other researchers argue that various burial findings in southern Scandinavia suggest Bronze Age era slaves. Barrows and cairns were reserved for the top segment of the society, around 20 percent of the population, whereas commoners and possibly slaves were sometimes buried in simple flat structures, pits, and gallery graves (Bergerbrant et al. 2017; Ling et al. 2018a). In terms of slave raids and violence, tentative evidence for this was found at a site in Sund, Norway, dating to 1400 BC. Excavations at the site revealed the remains of the brutal massacre of twenty-two individuals (most belonging to children) who were all buried in a mass grave (Fyllingen 2003). Moreover, a Scandinavian female was found buried in a shallow pit with a child at the Late Bronze Age site at the Island of Thanet. Strontium and oxygen isotope signatures on her bones document that she was of Scandinavian origin while other male individuals buried in high status graves showed local signatures from Kent (McKinley et al. 2013: 159). Findings of metal ingots and Baltic amber indicates that the Island served as trading location in the Bronze Age and this suggests that the aforementioned Scandinavian female was traded as a slave (like some other commodities) in the Bronze Age (McKinley et al. 2013: 159).

Furthermore, depictions of slaves may appear in several Bronze Age Scandinavian rock art panels in which lines of people are linked together in a manner suggesting that they were captives and perhaps slaves (Ling et al. 2018a). Thus, the elite households that organized slave raids and successful expeditions/raids for slaves provided aggrandizing households with slaves as an exchange commodity and as labor to expand surplus production needed for

securing metals from the south. Most likely, all crew members of the maritime slave raiding expeditions would have been members of a secret society.

#### CONCLUDING DISCUSSION: THE SUPRA REGIONAL INTERACTION NETWORK

As previously stated, Bronze Age Scandinavian polities benefited from a two-tier economy (coercive/land based and more cooperative/sea based) sectors that supported the expansion of the Bronze Age maritime economy. This process also spurred social complexity and the creation of transregional elite sodalities that controlled surplus production and comparative advantages from regions with varied forms of environments and economies. In order to control surplus extraction in various regions, trade confederacies, alliances, and colonies were established based on fictive and/or real kinship ties. For example, the timber rich and relatively low populated Tanum/Bohuslän region would have been an ideal partner for the highly populated agropastoral Limfjord/Jutland region in order to establish trade or colonial ties. This would have secured and facilitated the giving of agro-pastoral surplus, flint daggers, and metals in exchange for surplus in timber and boats taking place between these regions.

This relationship was thus made possible by the fact that elites from the more cooperative maritime polity in Tanum/Bohuslän were members of the same sodalities as the elites from the more coercive Limfjord/Jutland polity. These elites manifested their status/power by erecting monumental graves – cairns in the more cooperative maritime polity of Tanum – which was in contrast to the earthen barrows erected in the more coercive polity of Thy/Limfjord region. On many of the rock art scenes in Tanum, the initiation rites and rituals associated with these sodalities were depicted with the intention of emphasizing the capacity of the “secret societies” to attract audiences. In this context, one could consider how “secret society” members from the Thy/Limfjord region conducted pilgrimages to rock art locations that were established and controlled by local elites in Tanum (c.p Hayden 2018). For instance, Hayden (2018) stresses that religious shrines were often controlled by local elites in order to attract elites from other regions and that pilgrimages were performed exclusively by elites.

During certain expansive phases in the Bronze Age, the Tanum region was most likely colonized by aggrandizing households from the Thy/Limfjord region of Denmark. The first phase of expansion with new settlers coming from the Thy/Limfjord region would have taken place around 1800–1600 BC as manifested by the recovery of flint daggers and metals dating to the Early Nordic Bronze Age. However, the most expansive phases took place during Periods II, III, and V. The corresponding increase in rock art and cairns in Tanum and the increase in metals and barrows along with the expansion of settlements in the Thy/Limfjord region compared with earlier phases in



prehistory, supports this hypothesis (Ling 2008). It is important to note that the relationship between these regions was not on an equal footing and that the more coercive region had an advantage over the more cooperative region. Aggrandizing Limfjord/Jutland households directed the importation, organization, and the subsequent distribution of timber to co-residents by way of competitive feasts. Such competitive distributions not only placed all receivers of “gifts” in debt, but these events also serve to enhance a sponsor’s prestige (Chacon and Hayward 2017). Individuals who received timber would have become deeply indebted to these aggrandizing households. In turn, these socially, politically, and economically rising Limfjord/Jutland households would have been able to count on support from their indebted neighbors. These indebted co-residents would have provided support in organizing and provisioning long-distance metal-securing trading expeditions to the south.<sup>5</sup> Upon the return of a successful expedition, these same aggrandizing Limfjord/Jutland households would have overseen the distribution of metals to local supporters and to a relatively small number of loyal appointees residing at the Tanum/Bohuslän polity. These prestige-enhancing distributions would have taken the form of competitive feasts that placed all receivers of “gifts” in debt. The surpluses needed for such distributions were likely generated by way of secret societies because such sodalities provided the coordination that is necessary for collective action to be effective (Hayden 2018; Chacon 2020).

Another important aspect of interaction between the said regions, concerns the manning of boats. Ling et al. (2018a) previously argued that the larger long-distance ships needed a crew that the Tanum area could not mobilize in the Bronze Age. The quote that follows addresses this issue and that elites from the Limfjord region (Thy) compensated the groups in Tanum with feast and gifts for boats.

As depicted on the Tanum rock art, ships typically had crews of six to 13 (Ling 2008) in other maritime chiefdoms, single households typically provided one crew member (Clausen 1993; Johnson 2007). Tanum could thus have provided perhaps 30–50 maritime warriors, enough for three to four standard boats; however, the largest ships, as represented in the rock art, had crews of 60–100 . . . we argue, such ships would have been the product of transregional confederacies as between Tanum and Thy . . . . For instance, the Hassing district in Thy, with about 250 farms, could have provided 93 crew members . . . enough for a lead vessel, as seen on the rock art. If local Tanum people were involved in the building and manning of boats, then we must consider their compensation. Cross culturally, feasts are sponsored by leaders to reward work parties involved in such activities (Hayden 2016) . . . . The potential of Thy to produce

<sup>5</sup> See Chacon and Hayward (2017) for documentation of how aggrandizers operating in transegalitarian settings, employ debt to forge large and powerful coalitions.

sizable surpluses of animals and grains would have provided the means to support boat construction and crewing and could explain the wealth concentrated in Thy. Chieftains could have provided special foods (like meat) and drink for the feasts. Also, important would likely have been gifts such as cattle hides and flint from Thy. At this time, its farms intensified cattle production probably to export cattle hides and meat (Earle 2002), and specialty flint production sites were also present.

(Ling et al. 2018a: 501)

Through these actions, certain coercive/aggrandizing households from the Limfjord/Jutland region made use of both agro-pastoral and nautical sectors of the Bronze Age Scandinavian economy to their advantage. Through time, these rising households generated large profits through the importation and distribution of timber and slaves in the trans-regional exchange network. The accumulated wealth, prestige, and power of these timber-slaves-metal exporting/importing households grew over time while the indebtedness of slave, timber, and metal consuming individuals residing in the Limfjord/Jutland area also increased. This trend allowed these Limfjord/Jutland aggrandizing households to eventually consolidate political power. We believe that this was the process that spurred and transformed Bronze Age Scandinavian societies into ranked and perhaps even chiefdom levels polities.

In sum, while Bronze Age Scandinavian polities were far from being state level societies like the ancient Greek city-states, nonetheless, their boat technology and navigational expertise would have allowed them, like the ancient Greeks, to establish and maintain long-distance connections to secure desired goods. Such actions were made possible by the establishment of supra-regional political sodalities that dominated both political power, economy, commerce, warfare, and ritual activities. The theory that we have put forth is in line with Hayden's (2018) notion of "secret societies." Said political sodalities formed trade confederations, alliances, and established colonial relationships between rich agro-pastoral regions (more coercive) and maritime regions rich in timber (more co-operative) in order to secure boats for long-distance metal exchange and other exotica. Finally, to carry out long-distance maritime trade, a great deal of labor had to be transferred from the agricultural sector to the maritime sector. We argue in this sense, that slaves were necessary to fill the labor gap on the farms and that slave raids were crucial to maintaining the viability of this system.

## REFERENCES

- Andersen, S. T. (1999). Pollen Analyses from Early Bronze Age Barrows in Limfjord. *Journal of Danish Archaeology* 13, pp. 7–17.
- Apel, J. (2001). *Daggers, Knowledge & Power: The Social Aspects of Flint Dagger Technology in Scandinavia 2350–1500 cal BC*. Coast to Coast Books 3. Uppsala: Uppsala University Press.

- Arnold, J. (2001). The Chumash in World and Regional Perspectives. In J. E. Arnold, ed., *The Origins of a Pacific Coast Chiefdom: The Chumash of the Channel Islands*. Salt Lake City: University of Utah Press, pp. 1–19.
- Austvoll, K. I. (2018) *Seaways to Complexity: A Study of Sociopolitical Organisation along the Coast of Northwestern Scandinavia in the Late Neolithic and Early Bronze Age*. Dissertation for the Degree of Philosophy Doctor (PhD). Department of Archaeology, Conservation, and Ancient History. University of Oslo, Norway.
- Artursson, M. (2015). The Long-House as a Transforming Agent: Emergent Complexity in Late Neolithic and Early Bronze Age Southern Scandinavia 2300–1300 BC. In M. P. Prieto Martínez and L. Salanova Havertown, eds., *The Bell Beaker Transition in Europe: Mobility and Local Evolution during the 3rd Millennium BC*: Oxford; Oakville: Oxbow Books, pp 69–76.
- Baudou, E. (1960). *Die regionale und chronologische Einteilung der jüngeren Bronzezeit im Nordischen Kreis*. Studies in North European Archaeology, vol. 1. Stockholm: Acta Universitatis Stockholmiensis.
- Bech, J.-H., Eriksen B. V., and Kristiansen, K., eds. (2018). *Bronze Age Settlement and Land Use in Thy, Northwest Denmark*. Højbjerg: Jutland Archaeological Society, Aarhus University Press.
- Bergerbrant, S., Kristiansen, K., Allentoft, M. E., Frei, K., Price, T. D., Sjögren, K.-G., and Tornberg, A. (2017). *Identifying Commoners in the Bronze Age: Burials outside Barrows*. Oxford: Archaeopress, pp. 37–64.
- Butt-Thompson, F. W. (1929). *West African Secret Societies*. London: H. F. & G. Witherby.
- Chacon, R. (2020). “Ancient Associations.” Review of “The Power of Ritual in Prehistory: Secret Societies and Origins of Social Complexity” by Brian Hayden Cambridge: Cambridge University Press (2018). *Inference* 5:2. <https://inference-review.com/article/ancient-associations>.
- Chacon, R., and Hayward, D. (2017). Tibenuk and Chuji: Status Attainment and Collective Action in Egalitarian Settings. In R. Chacon and R. Mendoza, eds., *Feasts, Famines, or Fighting? Multiple Pathways to Social Complexity*. New York: Springer, pp. 223–248.
- Clausen, B. L. (1993). *Tomoko: En krigskaano fra Salomonøerne*. Roskilde: Viking Ship Museum.
- Crumlin-Pedersen, O. (2003). The Hjortspring Boat in a Ship-Archaeological Context. In O. Crumlin-Pedersen and A. Trakadas, eds., *Hjortspring: A Pre-Roman Iron-Age Warship in Context*. Ships and Boats of the North 5. Roskilde: Viking Ship Museum, pp. 209–232.
- Earle, T. K. (1997). *How Chiefs Come to Power: The Political Economy in Prehistory*. Stanford: Stanford University Press.
- (2002). *Bronze Age Economics: The Beginnings of Political Economies*. Boulder: Westview Press.
- Earle, T. K., Ling, J., Uhner, C. O. J., Stos-Gale, Z., and Melheim, L. (2015). The Political Economy and Metal Trade in Bronze Age Europe: Understanding Regional Variability in Terms of Comparative Advantages and Articulations. *European Journal of Archaeology* 18:4, pp. 633–657.
- Earle, T. K., and Kristiansen, K. (2010). Organizing Bronze Age Societies: Concluding Thoughts. In T. Earle and K. Kristiansen, eds., *Organizing Bronze Age Societies*. Cambridge: Cambridge University Press, pp. 218–256.
- Feniman, G. M. (2000). Corporate/Network: New Perspectives on Models of Political Action and the Puebloan Southwest. In M. B. Schiffer, ed., *Social Theory in Archaeology*. Salt Lake City: University of Utah Press, pp. 31–63.
- (2017). Multiple Pathways to Large-Scale Human Cooperative Networks: A Reframing. In R. Chacon and R. Mendoza, eds., *Feast, Famine or Fighting? Multiple Pathways to Social Complexity*. New York: Springer, pp. 459–478.

- Fyllingen, H. (2003). Society and Violence in the Early Bronze Age: Analysis of Human Skeletons from Nord-Trøndelag, Norway. *Norwegian Archaeological Review* 36:1, pp. 27–43.
- Gell, A. (1998). *Art and Agency: An Anthropological Theory*. Oxford: Clarendon.
- (2015). Proving Communal Warfare among Hunter-Gatherers: The Quasi-Rousseauan Error. *Evolutionary Anthropology* 24, pp. 111–126.
- Goldhahn, J., and Ling, J. (2013). Scandinavian Bronze Age Rock Art: Contexts and Interpretation. In A. Harding, and H. Fokkens, eds., *The Oxford Handbook of the Bronze Age Europe*. Oxford: Oxford University Press, pp. 266–286.
- Haslöf, O. (1970). *Sømand, fisker, skib og værft. Introduktion til maritim etnologi*. København: Rosenkilde og Bagger.
- Hayden, B. (1995). Pathways to Power. In T. D. Price and G. M. Feinman, eds., *Principles for Creating Socioeconomic Inequalities: Foundations of Social Inequality*. New York: Plenum, pp. 15–86.
- (2016). Political Economies in Prehistory: Comments on Trade before Civilization Papers. Paper presented at the Trade before Civilization Conference at the University of Gothenburg, Gothenburg, Sweden. May 2016.
- (2018). *The Power of Ritual in Prehistory: Secret Societies and Origins of Social Complexity*. Cambridge: Cambridge University Press.
- Herner, E. (1999). Föremålskatalog. In H. Kindgren, ed., *Bronser. Bronsfynd i Göteborgs och Bohus län*. Kulturhistoriska Dokumentationer 8. Uddevalla: Bohusläns Museum, pp. 9–69.
- Holst, M. K., Rasmussen, M., Kristiansen, K., and Bech, J.-H. (2013). Bronze Age ‘Herostrats’: Ritual, Political, and Domestic Economies in Early Bronze Age Denmark. *Proceedings of the Prehistoric Society* 79, pp. 265–296.
- Jakobsson, M. (1992). *Krigarideologi och vikingatida svärdstypologi*. Stockholm studies in Archaeology 11. Stockholm: Stockholm University Press.
- Jantzen, D., Brinker, U., Orschiedt, J., Heinemeier, J., Piek, J., Hauenstein, K., Krüger, J., Lidke, G., Lübke, H., Lampe, R., Lorenz, S., Schult, M., and Terberger, T. (2011). A Bronze Age Battlefield? Weapons and Trauma in Tollense Valley, North-Eastern Germany. *Antiquity* 85, pp. 417–433.
- Johnson, J. (2007). Ethnohistoric Descriptions of Chumash Warfare. In R. Chacon and R. Mendoza, eds., *North American Indigenous Warfare and Ritual Violence*. Tucson: University of Arizona Press, pp. 74–113.
- Kaul, F. (1998). *Ships on Bronzes: A Study in Bronze Age Religion and Iconography*. Copenhagen: National Museum.
- Kristiansen, K. (1978). The Consumption of Wealth in Bronze Age Denmark: A Study of the Dynamics of Economic Process in Tribal Societies. In K. Kristiansen and C. Paludan-Müller, eds., *New Directions in Scandinavian Archaeology*. Studies in Scandinavian Prehistory and Early History 1. Copenhagen: National Museum, of Denmark, pp. 158–190.
- (1984). Krieger and Häuptlinge in der Bronzezeit. *Jahrbuch des Römisch- Germanisches Zentralmuseums Mainz* 31, pp. 187–208.
- (1998). *Europe before History*. Cambridge: Cambridge University Press.
- (2016). Bronze Age Vikings? A Comparative Analysis of Deep Historical Structures and Their Dynamics. In L. Melheim, Z. T. Glørstad and H. Glørstad, eds., *Comparative Perspectives on Past Colonisation, Maritime Interaction and Cultural Integration: New Directions in Anthropological Archaeology*. Sheffield: Equinox Publishing, pp. 177–186.
- (2018). The Rise and Fall of Bronze Age Societies in Thy, Northwest Jutland. In J.-H. Bech, B. V. Eriksen and K. Kristiansen, eds., *Bronze Age Settlement and Land Use in Thy*,

- Northwest Denmark*. Højbjerg: Jutland Archaeological Society, Aarhus University Press, pp. 15–37.
- Kristiansen, K., and Earle, T. (2014). Neolithic versus Bronze Age Social Formations: A Political Economy Approach. In K. Kristiansen, L. Šmejda and J. Turek, eds., *Paradigm Found: Archaeological Theory – Present, Past and Future. Essays in Honour of Evžen Neustupný*. Oxford: Oxbow Books, pp. 236–249.
- Kristiansen, K., and Larsson, T. B. (2005). *The Rise of Bronze Age Society: Travels, Transmissions and Transformations*. Cambridge: Cambridge University Press.
- Kroeber, A. (1976). *Handbook of the Indians of California*. New York: Dover Press.
- Langdon, S. (2007). Sustaining a Relationship: Inquiry into the Emergence of a Logic of Engagement with Salmon among the Southern Tlingits. In M. Harkin and D. Lewis, eds., *Native Americans and the Environment: Perspectives on the Ecological Indian*. Lincoln: University of Nebraska Press. pp. 231–273.
- Lapshina, Z. (2016). The Phenomena of the Skull Mask of the Lower Amur Petroglyphs. *Journal of The Siberian Federal University* 9, pp. 1320–1332.
- Lekberg, P. M. (2002). *Yxors liv – människors landskap. En studie av kulturlandskap och samhälle i Mellansveriges senneolitikum*. Coast to Coast Book 5. Uppsala: Uppsala University Press.
- Leland, D. (1997). *Aboriginal Slavery on the Northwest Coast of North America*. Berkeley: University of California Press.
- Ling, J. (2008). *Elevated Rock Art: Towards a Maritime Understanding of Bronze Age Rock Art in Northern Bohuslän, Sweden*. Gotarc Serie B, Gothenburg Archaeological Thesis 49.
- (2019). Brian Hayden. The Power of Ritual in Prehistory: Secret Societies and Origins of Social Complexity *European Journal of Archaeology, Cambridge University Press*, 22:4, pp. 599–603.
- Ling, J., Chacon, R., and Chacon, Y. (2018b). Rock Art, Secret Societies, Long Distance Exchange, and Warfare in Bronze Age Scandinavia. In A. Dolfini, R. Crellin, C. Horn and M. Uckelmann, eds., *Prehistoric Warfare and Violence: Quantitative and Qualitative Approaches*. New York: Springer. pp. 149–174.
- Ling, J., and Cornell, P. (2010). Rock Art as Secondary Agent? Society and Agency in Bronze Age Bohuslän. *Norwegian Archaeological Review* 43:1, pp. 26–43.
- (2015). Krieger und Felskunst im bronzezeitlichen Skandinavien. In H. Meller and M. Schefzik, eds., *Krieg Eine Archäologische Spurensuche. Landesamt für Denkmalpflege und Archäologie Sachsen*. Anhalt: Landesmuseum für Vorgeschichte, pp. 265–268.
- Ling, J., Earle, T., and Kristiansen, K. (2018a). Maritime Mode of Production: Raiding and Trading in Seafaring Chiefdoms. *Current Anthropology*. 59:5, pp. 488–524.
- Ling, J., Hjärthner-Holdar, E., Grandin, L., Stos-Gale, Z., Kristiansen, K., Melheim, A. L., Artioli, G., Angelini, I., Krause, R., and Canovaro, C. (2019). Moving Metals IV. Swords, Metal Sources and Trade Networks in Bronze Age Europe. *Journal of Archaeological Science: Reports* 26, pp. 1–34. DOI:10.1016/j.jasrep.2019.05.002.
- Ling, J., and Ragnesten, U. (2009). *Tanumprojektet Arkeologiska undersökningar vid hållristningar i Tossene socken*. GOTARC Serie D Arkeologiska rapporter no. 72. Göteborg: GOTARC Serie D Arkeologiska.
- Ling, J., Stos-Gale, Z., Grandin, L., Billström, K., Hjärthner-Holdar, E., and Persson, P.-O. (2014). Moving Metals II: Provenancing Scandinavian Bronze Age Artefacts by Lead Isotope and Elemental Analyses. *Journal of Archaeological Science* 41, pp. 106–132.
- Malinowski, B. (1922). *Argonauts of the Western Pacific*. London: Routledge & Kegan Paul.
- McIlwraith, T. (1948). *The Bella Coola Indians*. Vol I. Toronto: University of Toronto Press.
- McKinley, J. I., Schuster, J., and Millard, A. (2013). Dead-Sea Connections: A Bronze Age and Iron Age Ritual Site on the Isle of Thanet. In J. Koch and B. Cunliffe, eds., *Celtic*

- from the West 2: Rethinking the Bronze Age and the Arrival of Indo-European in Atlantic Europe. Oxford: Oxbow Books, pp. 157–184.
- Melheim, L., Glørstad, H., and Glørstad, Z. T., eds. (2016). *Comparative Perspectives on Past Colonisation, Maritime Interaction and Cultural Integration*. Sheffield: Equinox.
- Melheim, L., Grandin, L., Persson, P.-O., Billström, K., Stos-Gale, Z., Ling, J., and Kristiansen, K. (2018). Moving Metals III. Possible Origins for Copper in Bronze Age Denmark Based on Lead Isotopes and Geochemistry. *Journal of Archaeological Science* 96, pp. 85–105.
- Mikkelsen, M. (2013). The Topographical Placing of the Late Neolithic and Bronze Age Settlements and an Introduction to a New Interpretation of the Layout of the Individual Farm. In K.-H. Willroth, ed., *Siedlungen der älteren Bronzezeit: 33–66. Beiträge zur Siedlungsarchäologie und Paläoökologie des zweiten vorchristlichen Jahrtausends in Südkandinavien, Norddeutschland und den Niederlanden*. Neumünster: Wachholtz Verlag, pp. 33–76.
- Odgård, B.V. (1994). *The Holocene Vegetation History of Northern West Jutland, Denmark*. Opera Botanica, Number 123. Copenhagen: Aarhus University Press.
- Petersson, H. (2009). *Kokgropar vid Kind. Tanum 1835, Säm 5:8, Tanums socken och kommun*. Bohusläns museum rapport nr 2009:50. Uddevalla: Bohusläns Museum.
- Randsborg, K. (1968). *Von Periode II zu III: Chronologische Studien über die ältere Bronzezeit Südkandiaviens und Norddeutschlands*. Copenhagen: Munksgaard.
- (1995). *Hjortspring: Warfare and Sacrifice in Early Europe*. Aarhus: Aarhus University Press.
- Renfrew, C. (1984). *Approaches to Social Archaeology*. Edinburgh: Edinburgh University Press.
- Reybrouck, D. V. (2000). *From Primitives to Primates: A History of Ethnographic and Primatological Analogies in the Study of Prehistory*. Leiden: University of Leiden Press.
- Ricardo, D. (1817). *On the Principles of Political Economy and Taxation*. London: J. Murray.
- Roscoe, P., Chacon, R., Hayward, D., and Chacon, Y. (2019). Social Signalling and the Warrior-Big-Man among the Western Dani: A Man Called Tibenuk. *Human Nature* 30:2, pp. 176–191.
- Rowlands, M., and Ling, J. (2013). Boundaries, Flows and Connectivities: Mobility and Stasis in the Bronze Age. In S. Bergerbrant and S. Sabatini, eds., *Counterpoint: Essays in Archaeology and Heritage Studies in Honour of Professor Kristian Kristiansen*. Oxford: Archaeopress, pp. 517–529.
- Smith, G. (1966). *The Mojaves*. San Bernardino: San Bernardino County Museum.
- Svedhage, K. (1997). *Tanumsslätten med omgivning*. Rapport 1997:13. Uddevalla: Bohusläns Museum.
- Vandkilde, H. (1996). *From Stone to Bronze: The Metalwork of the Late Neolithic and Earliest Bronze Age*. Publications XXXII. Aarhus: Jutland Archaeological Society.
- (2006). Archaeology and War: Presentations of Warriors and Peasants in Archaeological Interpretations. In T. Otto, H. Thrane and H. Vandkilde, eds., *Warfare and Society: Archaeological and Social Anthropological Perspectives*. Aarhus: University Press Aarhus, pp. 57–73.
- (2014). Breakthrough of the Nordic Bronze Age: Transcultural Warriorhood and a Carpathian Crossroad in the Sixteenth Century BC. *European Journal of Archaeology* 17:4, pp. 602–633.
- (2016). Bronzization: The Bronze Age as Pre-Modern Globalization. *Prähistorische Zeitschrift* 91, pp. 103–123.