Brodtkorbneset and Steintjørna: Two Hearth-Row Sites in Pasvik, Arctic Norway

Bjørnar J. Olsen

Bjørnar J. Olsen, Department of Archaeology, History, Religious Studies and Theology, University of Tromsø – The Arctic University of Norway, P.O. box 6050 Langnes, 9037 Tromsø: bjornar.olsen@uit.no

Abstract

During the Viking Age and the early medieval period, hearth-row sites became a distinct feature of Sámi settlements over the vast interior region of Northern Fennoscandia. Consisting of large, rectangular hearths organized in a linear pattern, these sites represent a new way of organizing domestic space and also reflect new environmental preferences. In this paper, the author gives an overview of the investigations conducted at two hearth-row sites, Steintjørna and Brodtkorbneset, in Pasvik, Arctic Norway. Based on the excavated material, the author discusses changes in settlement pattern, reindeer economies, and the organization of domestic space. He also discusses the role that the hearths themselves may have played in negotiating internal social dynamics and in inter-ethnic contacts of the Late Viking Age and the early medieval period.

1 Introduction

The Viking Age and early medieval period (c. 800 – 1300 AD) brought some remarkable changes to the indigenous Sámi societies in Northern Fennoscandia, including changes in settlement pattern, organization of domestic space, ritual manifestations, exchange networks, economy, and animal relationships. The perhaps single most conspicuous example of these changes is the emergence of the so-called hearth-row sites containing large rectangular hearths organized in a distinctive linear pattern (Halinen et al. 2013; Hamari 1996; Hedman 2003; Hedman & Olsen 2009; Hedman et al. 2015). Emerging in the Late Iron Age, hearth-row sites are found over the vast interior of the current Sápmi region that includes Northern Finland, Sweden and Norway, and the Kola Peninsula in Russia. While their presence until recently was not archaeologically verified in the latter area, a hearth-row site, Liva 1, has now been found and investigated in the south-western part of the Kola Peninsula (Muraskin & Kolpakov, this volume). More intriguing, however, is the discovered hearth-row site at Aursjøen, Lesja, in Oppland County, which suggests that their distribution even included the mountain areas of interior Southern Norway, more than 1,200 km south-west of the north-easternmost known sites (Bergstøl 2008: 141-142; Reitan 2006).

This paper deals with two hearth-row sites, Brodtkorbneset and Steintjørna, situated on the Norwegian side of the River Pasvik, forming the border between Russia and Norway (Fig. 1). The sites were excavated in 2008 –2009, and 2012 –13, and the investigations conducted under the direction of Sven-Donald Hedman are more extensive, detailed, and geographically focused than any previous investigations of sites of this kind (Halinen et al. 2013; Hedman & Olsen 2009; Hedman et al. 2015; Jerand et al. 2016). The retrieved material is also remarkable in several respects, including

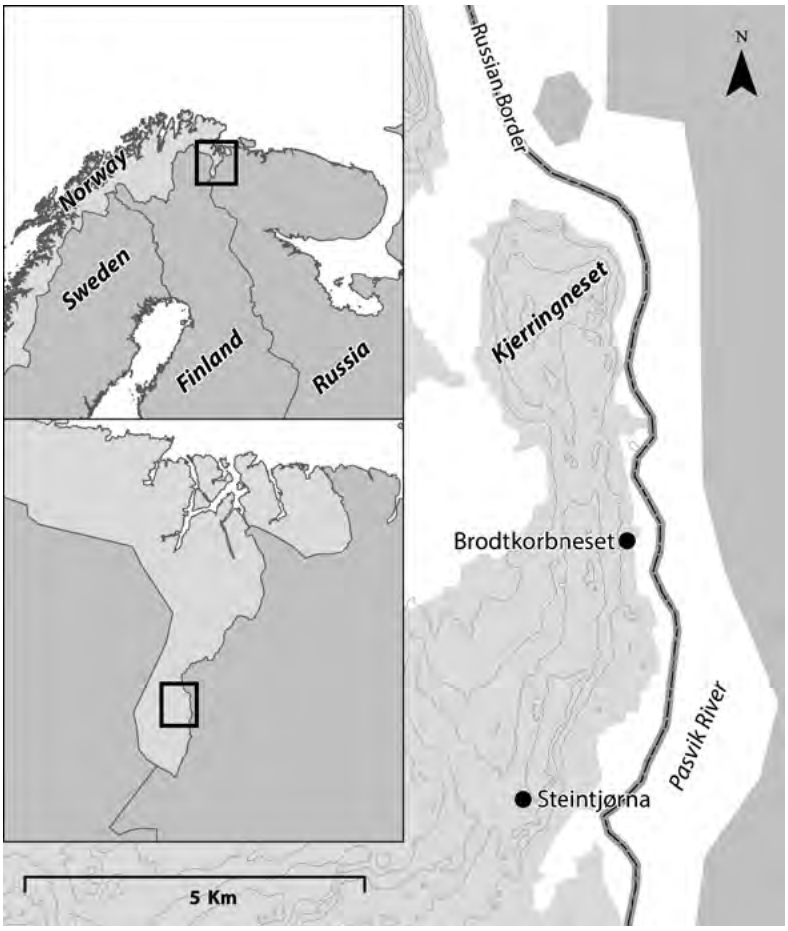

Figure 1. Location of the study area and the two investigated sites. Map: Johan Eilertsen Arntzen.

well-preserved hearths and rich artefact assemblages, and is unique within this corpus with respect to the number and preservation of faunal remains. This makes the sites important for advancing understanding of the changes that took place during the period in question, but also for more detailed studies of processes at a more site-specific level with respect to issues such as the organization of domestic space, craft specialization, economy, consumption, animal relations, and material agency.

In this paper, I present the material from the two sites and discuss some of the issues mentioned here (for more detailed discussion of some aspects of this material, see papers in this volume by Henriksen, Jerand & Linderholm, and Vretemark).

2 The sites

The Brodtkorbneset and Steintjørna sites are located approximately 70 km from the coast and on the west (Norwegian) side of the River Pasvik in the municipality of Sør-Varanger. Brodtkorbneset is the northernmost of the two sites, consisting of seven linearly organized hearths placed at intervals of 8 to 15 m (Fig. 2). Though quite close to the River Pasvik (the nearest hearth is about 100 m away), the site is located away from the river bank on a sandy turf-covered terrace with lichen, moss, heather, and pine trees. Unlike earlier and later dwelling sites (cf. Simonsen 1963), the hearth row is not oriented parallel with the river bank but east-west and thus per-

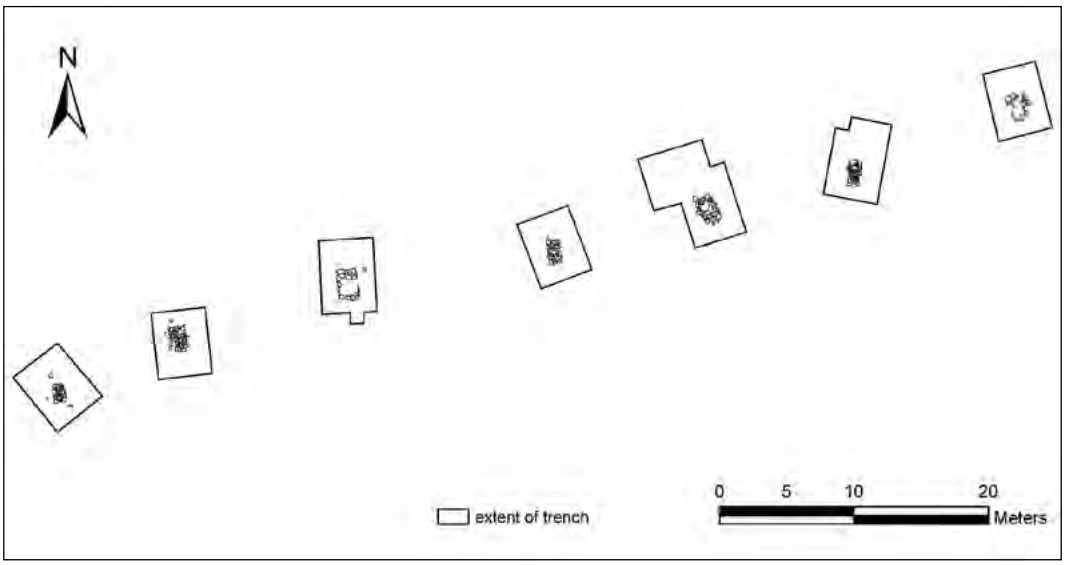

Figure 2. Outline of the hearth row site at Brodtkorbneset with excavation trenches marked.

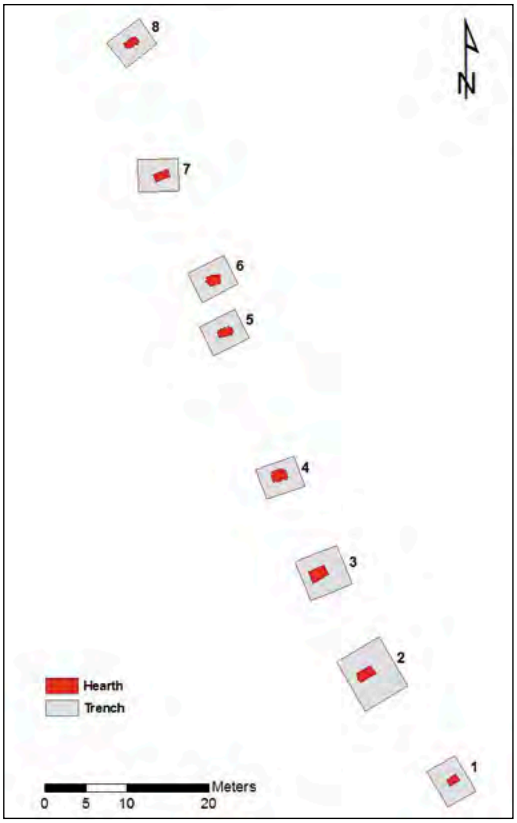

Figure 3. Outline of the hearth row site at Steintjørna with excavation trenches marked.

pendicular to the river. All the hearths are rectangular and contain packed and partly layered fire-cracked stones enclosed by larger frame stones. Oriented transverse to the linear outline of the site, they vary in length between 1.5-2.4 m, and between 1-1.2 m in width. A common feature of the larger hearths is that the northern end is built higher, creating a platform-like compartment extending up to 0.4 m above the surface (Hedman & Olsen 2009: 9). All the seven hearths were excavated, including the presumed tent-enclosed living areas around them, with trenches varying in size between 20 and 36 m². In addition to the main trenches, test pits were dug in areas intersecting the hearths.

The Steintjørna site is located 4 km SSW of Brodtkorbneset, next to a small tarn (Steintjørn) 700 m west of the River Pasvik. It contains eight hearths and is situated on moraine ground in mixed birch and pine forest. The distance between the hearths varies between 5 and 18 metres, and the general layout, size, and morphology of the hearths is close to identical to the Brodtkorbneset site (Fig. 3). One hearth, H7, however, sets itself apart by being constructed prima-

Find	H1	H2	H3	H4	H5	H6	H7	Testpit1	Testpit2	Testpit4	N=
Ironfragment		12	3	2	13	1	4				32
Nail of iron		1	1	1	1						4
Ironfragment,rivet		1			1						2
Ironring			1								1
Rivet iron					1						1
Strike a light					2						2
Fishhook, iron					1						1
Axe			1								1
Ironrod							1				1
Arrowhead		1			3						4
Scraper					1						1
Knife				1	1						1
Bronze pendant				1			1				2
Copper alloy	8	4	7	7	12	2	1			1	42
Copper alloy, trapetzoid			2	2	3	1			1		9
Copper alloy, axeshaped	1							1			2
Copper alloy, pendant		1									1
Rivet copper	1		1								2
Flint		6	9	2	29	3					49
Mica			3								3
Whetstone	1	2			2	2	1				8
Quartz	1	1	2	2							6
Quartzite		1	2								3
Pumice stone, polished		1									1
Hammerstone							1				1
Asbestosceramic	1	1	5				2				9
Comb			1								1
Melt					1						1
Total	13	32	38	18	71	9	11	1	1	1	=196

Table 1. The artefacts from Brodtkorbneset.

rily of slate slabs in contrast to the stones/rocks otherwise used. All the hearths were excavated also at this site, with trenches comparable to those at Brodtkorbneset. At both sites, the size and construction of the hearths exhibit some differences; some of the hearths are bigger and more elaborately built than others. Interestingly, these hearths also yielded more, and more varied, finds. Another noteworthy feature is their placement, in the sense that the larger and richer hearths never terminate the rows. At Brodtkorbneset in particular, these larger hearths cluster in the central part of the row.

Twenty-nine radiocarbon dates have been obtained from bone and charcoal samples from Brodtkorbneset, and twenty-three from Steintjørna (Fig. 4). Apart from one unburnt sheep bone, the bone samples consist of burnt and unburnt reindeer bones, while the charcoal samples are mostly from selected branches and outer growth rings of pine, the only tree species present in the material. With few exceptions, the dates cluster rather nicely and suggest that the sites most likely were occupied sometime between the 11th and late 13th century. Some further aspects regarding contemporaneity of the sites, and the hearths, are addressed below in this paper.

Find	H1	H2	H3	H4	H5	H6	H7	H8	n=
Iron fragment	1	4	10		5		1	1	22
Knife	2	4		1		1			8
Rivet		4	1		2				7
Arrowhead	1	2?	1?						4
Chain, part of		1	1						2
Iron blank		2							2
Iron rod			1						1
Hanger/iron		1							1
Weight			1						1
Horsehead/bronze			1					1	2
Needle/bronze		1							1
Copper alloy		25	4	3	3	3	2	1	41
Copper alloy/trapetzoid								1	1
Slag		32						1	33
Plano convex slag					1				1
Hammer scale		2			3				5
Burned clay					2				2
Bead					1				1
Flint	1	4	7	9	3	2	1		27
Rounded stone		1							1
Mica			1						1
Whetstone			1						1
Quartz					1				1
Chewing gum/hartz								1	1
Bone awl				1					1
Total	5	83	29	14	20	6	4	6	=167

Table 2. The artefacts from Steintjørna.

3 Things retrieved

The sites were rich in finds, and the most common artefacts were thin pieces of cut copper alloy and tinder flint. Of the 196 artefacts found at Brodtkorbneset (Table 1), cut pieces of copper alloy amounted to 42 specimens while 49 were tinder flint flakes. The Steintjørna excavations yielded 167 artefacts, of which 41 were copper allow and 27 tinder flint (Table 2). The flint debris is characteristic of flint struck by strike-a-lights in order to produce sparks and fire. Cut pieces of bronze or copper alloy are commonly found at both Sámi sacrificial sites and dwelling sites, and have a wide chronological distribution from the Late Iron Age to Early Modern Times (Odner 1992; Hedman 2003; see Henriksen this volume). Some of these were worked into ornaments such as trapezoid and axe-shaped pendants (Fig. 6.3), ten of which were found at Brodtkorbneset but only one at Steintjørna. At Steintjørna, most of the copper alloy pieces were found in association with H2, and in contrast to Brodtkorbneset the pieces are quite large.

Another significant difference in the assemblages from the two sites are the finds of iron slag from Steintjørna. Slag actually accounts for 20 % of the finds but was cu-

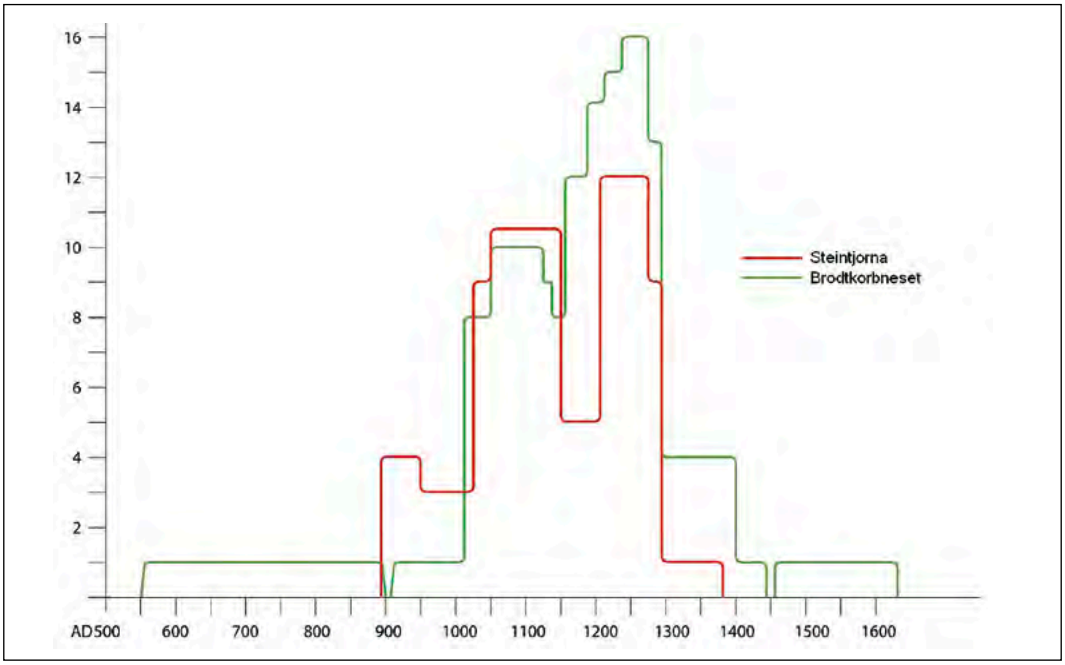

Figure 4. Diagram showing calibrated AMS radiocarbon dates from Brodtkorbneset and Steintjørna. Radiocarbon ages calibrated using OxCal 4.2 (Bronk Ramsey 2009).

riously not present at all at Brodtkorbneset (see Henriksen, this volume). As with the cut copper alloy pieces, most of the slag was found in association with H2 (more than 1 kg), and lesser amounts were also found at H5 and H8. The slag finds include hammer scales and plano-convex slag (Fig. 5), and the concentration of slag and large pieces of copper alloy may indicate specialist skills not shared by members of other households. The fact that the archaeo-metallurgical analysis of the slag indicated unusual and complex metal processing, involving a mixture of copper and iron (Grandin & Willim 2013), may further support this interpretation. It is also interesting to note the uneven distribution of yet another frequent and mundane artefact category, tinder flint flakes. At Brodtkorbneset, while numerous in the deposits from the central hearths, they are completely lacking from the two outermost hearths (H1 and H7). In the Steintjørna assemblage they are either lacking or represented by only one specimen in the outermost hearths.

Figure 5. Plano-convex shaped bottom slag from Steintjørna. Photo: Bjørnar Olsen.

Among the other artefacts from Brodtkorbneset were four iron arrowheads, two strike-a-lights, an axe, a hide scraper, a knife and a fishhook, all made of iron. The iron knife contained a partially preserved bone shaft (Fig. 6.5), otherwise bone/antler artefacts were not preserved apart from a frag-

Figure 6. Finds from Brodtkorbneset (6.1, 6.3, 6.4 and 6.5) and Steintjørna (6.2). Photos: Bjørnar Olsen and Tromsø Museum.

mented composite comb found at this site and a bone awl from Steintjørna. Iron rivets and nails, and unidentified iron fragments, are also quite well represented. In addition to the trapezoid and axe-shaped pendants, one copper alloy brooch with four knobs and one coin-shaped pendant with open-worked oblique lattice pattern were found at Brodtkorbneset (Fig. 6.1). The first has a North European distribution, while the latter is common in Novgorodian and Central Russian assemblages from the 12th to the 14th centuries (Henriksen, this volume). The assemblage from Steintjørna included four iron arrowheads (some of which are highly fragmented) and eight knives (four of these were from H2). Intriguing items are the finds of two small horse heads of bronze, which were originally part of a horse-shaped pendant containing two opposite facing heads (Fig. 6.2). The heads, however, were not found together. One was found in the trench of H8 while the other was found 60 m to the south, in the trench of H3; thus, we do not know whether they originally were part of the same pendant. Pendants of this type

Figure 7. The distribution of bones (weight units) in the H5 area, Brodtkorbneset.

are common in Russian Karelia, with Lake Ladoga as a possible area of production (see Henriksen, this volume). Another interesting find from this site is a round flat-poled lead weight with an outer covering of copper alloy found next to H3. The weight suggests trade or exchange of small object suitable to be measured with scales, possibly silver or other desired metals. Interestingly, four nearly similar weights were found at another hearth-row site, Rerbraur 1, in the Arjeplog woodland of Northern Sweden (Hedman 2003: 161; see also Muraskin and Kolpakov, this volume) and speak to the direct involvement of the Sámi in long-distance trade. The finds from Steintjørna also included a bronze needle, a fragment of a glass bead, iron rivets and tree resin 'chewing gum'.

4 Bones, bone deposition and organization of domestic space

The faunal assemblages from Brodtkorbneset and Steintjørna contain more than 17,000 bone fragments with a total weight of nearly 16 kilograms (Hedman et al. 2015; Vretemark, this volume). Given the generally poor preservation conditions in the common acidic soil of this region, this is an unusually large assemblage. The amount of bones found in each hearth, however, differs considerably, from around 50 grams to more than 7 kilograms. The reasons for this may to some extent be explained by unequal conditions of preservation. It is nevertheless interesting to observe that the tendencies in the artefact assemblages are repeated in the bone

Figure 8. Pole photo of H3, Steintjørna (scale 2 m). Note the concentration of bones at the (upper) end of the hearth. Photo: Bjørnar Olsen.

material, with the larger hearths (often situated in the middle parts of the rows) yielding the largest samples. The fact that larger accumulations contribute to their own conditions of preservation increases this bias in the retrieved material.

There is a clear predominance of reindeer in the assemblages (Vretemark, this volume). In the merged material from all the hearths, ca. 87 % of the identified fragments are of reindeer. The amount of fish bones is also significant, equalling around 12 %. Six different fish species were identified, with common whitefish and pike as the dominant ones. The remaining 1 % of the identified fragments represent birds, artic fox, wolf and sheep/goat[1]. The faunal material is presented and discussed by Vretemark in another article in this publication, and I concentrate here on some significant aspects of the deposition and distribution of the bone material at the two sites.

When we excavated the first three hearth areas at Brodtkorbneset in 2008 we observed that bones found outside the hearths, including some large deposits, showed a clear and systematic clustering on the north (short) side of the hearths (Fig. 7). Precisely the same pattern was observed when excavating the remaining four hearth trenches in 2009, and also when later excavating the eight hearths at Steintjørna, where the bones were found to cluster next to the east end of the hearths (the hearths here are oriented E-W) (Fig. 8). Only some few fragments were found scattered at the long sides or next to

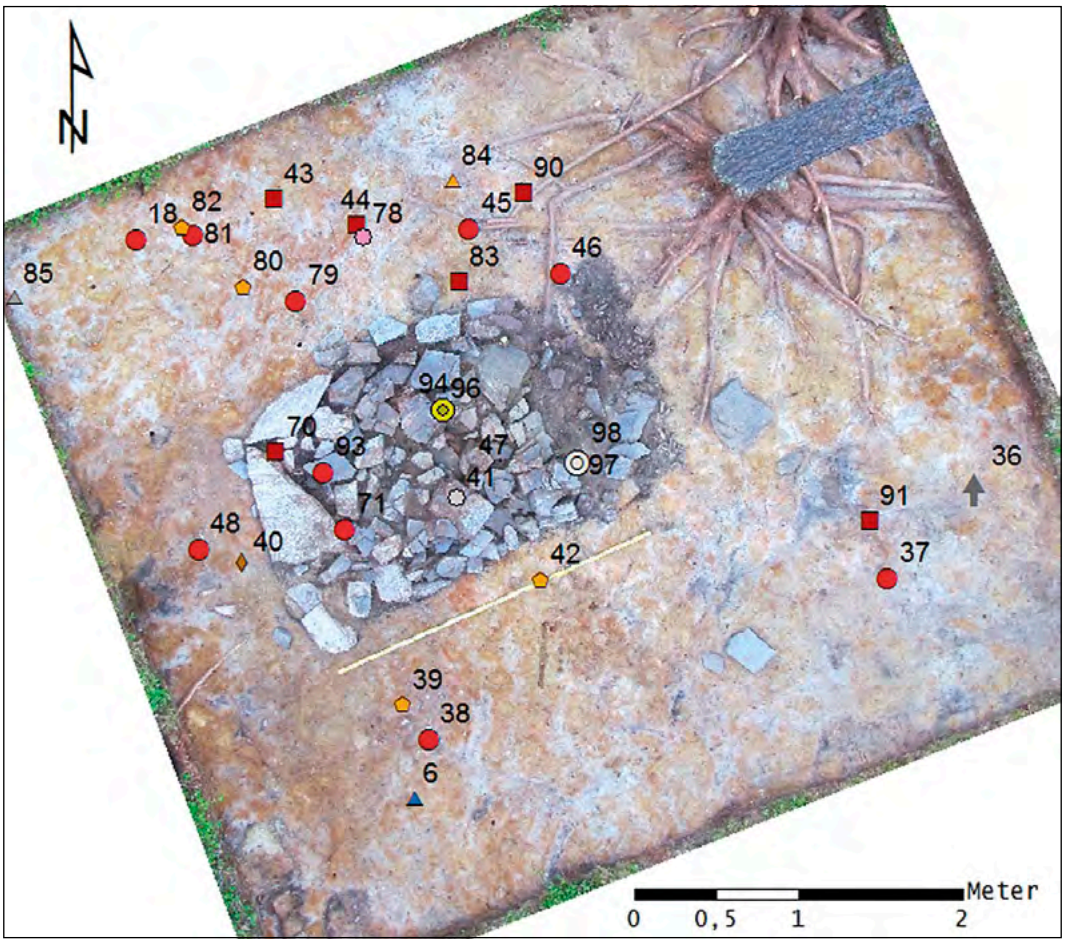

Figure 9. Distribution of artefacts in the H3 areas, Steintjørna.

the opposite ends of the hearths. Phosphate analyses (mainly reflecting bone disposal) have produced soil signatures that correspond remarkably well with these patterns (Jerand et al. 2016; Jerand & Linderholm, this volume). This regularity in bone refuse disposal is so far only documented at the two hearth-row sites in question, but phosphate soil distributions from other hearth-row sites suggest a more common phenomenon (Halinen et al. 2013; Jerand et al. 2016).

The distinct and remarkably uniform pattern of bone refuse disposal at the two sites is thought-provoking. It is also interesting to note that this pattern is not matched by the artefact distributions. Artefacts are found evenly distributed around the hearths, with most of them next to the long sides (Fig. 9). Before discussing this further, it should be noted that each hearth most likely was placed inside a dwelling. This interpretation is based on the spatial patterns that emerge from the confined distribution of finds, cultural layers, and soil chemical signatures. Since no convincing evidence of sod or timbered buildings have been found, tents seem the most plausible option. One likely candidate for a tent dwelling is the winter tent (*goahti*) commonly used by the Sámi. This was constructed using a framework of paired curved poles (*baeljek*) that gave the floor a larger and more oval outline that could even

fit big hearths (Bjørklund 2013). Taking this into consideration, a possible interpretation of the bone disposal pattern is that it reflects refuse clearance and/or butchering activities related to the tent entrances. Since the hearths are always oriented transversely to the row axis, the entrances to each dwelling at the respective sites all faced in the same direction and, accordingly, produced a spatially uniform bone refuse disposal.

This interpretation is, however, complicated by ethnographic information regarding Sámi organisation of domestic space. Following the much referred to work by ethnologist Gustav Ränk (1949), the hearth mediated a basic social and cosmological dualism between front and back spaces in the *goahti*, as also reflected by its two opposite entrances. The inner part of the dwelling (the *boassu* area) is reported as a male exclusive area, leaving the middle and front part as the female and common domain. The *boassu*, and the attached (rear) entrance, were considered sacred and religious/sacred objects and hunting weapons were kept here, and as with the slaughtered wild animals they could only enter the dwelling through the 'back' doorway (cf. Yates 1989). However, the *boassu* area also served as the kitchen area of the dwelling, the place where fish and especially reindeer meat were cut and prepared for cooking. When feasible, the slaughtering of reindeer also took place outside the *boassu* entrance. Thus, if we are to trust the ethnographic record, it may well be that the distinct bone disposal patterns observed at Brodtkorbneset and Steintjørna rather reflects a social and cosmological division of domestic space, and where the *rear* side of the dwelling actually may be the one which leaves most bone refuse and the clearest soil chemical signatures.

There are, however, features that seem less in compliance with the ethnographic understanding. For example, the distributions of artefacts, with possible gendered affinities, do not match the bone refuse patterning and show a far more even dispersal around the hearths. One possible explanation might be that the deposition of bones was more subject to the prevailing social and cosmological schemes, including rules for how and where to handle meat and food, but even here the archaeological material contains some cautionary tales. According to Ränk's account (1949), domestic products such as milk, and also domesticated animals (e.g. goats and sheep), should be kept separate from game and 'wild' products and should enter the house through the front entrance (see also Yates 1989). However, in our assemblages the sheep bones are found in the same deposits as bones of reindeer, other wild animals, birds and fishes, and thus inappropriately mixed and placed according to the ethnographic canon. Speaking to this is also the observation that there are no discernible differences between the bones found inside and outside of the hearths (Hedman et al. 2015: 15-16).

Though the ethnographic understanding calls for reflection, there is much to suggest that the distinct and uniform bone distributions mostly are a product of refuse removal and cleaning through a single and equally oriented entrance. This, however, does not rule out that also social and cosmological conceptions may have impacted the formation of the assemblages retrieved, and there are features that may be better understood through this way of thinking. Such features are, for example, the large bone deposits associated with H3 at Brodtkorbneset, which apart from bones of reindeer and wild species, also included most of the sheep bones in this material, and, in addition, a rare iron axe and two trapezoid pendants. Might such deposits also involve ritual significance and could sheep, moreover, as perhaps also suggested by their rather surprising presence in this context, have had significance beyond subsistence and practical utility, for example, in relation to the negotiation of external relations and trade?

5 Seasonality and settlement pattern

A great deal of data suggest that the two sites were inhabited during winter. For example,

the size and solidity of the hearths, the traces of intense firing, and the stone packing inside them, all point to dwellings where heat radiation and heat storage were crucial. The location and orientation of the Brodtkorbneset site, which is situated quite close to the bank of the River Pasvik, may further support this. Despite the relative proximity, the placing and layout of the site seems to 'ignore' the river's presence and spatial guidance and seems more in compliance with dwelling in a winter landscape where the shore-river boundary anyway is blurred and snow conditions, moreover, may be more favourable on the chosen, elevated terrace. The location of the Steintjørna site, next to a small tarn 500 m away from the river, is also noteworthy compared with other inland prehistoric dwelling sites but fits well with the pattern historically described for location of the winter villages of the local Skolt Sámi community. Located in the interior of the Pasvik River Valley, these were always placed at a distance from the main river (Keilhau 1831: 43; Tanner 1929: 105-139).

The faunal material also indicates winter habitation. It is important to bear in mind, however, that since food may have been preserved for winter storage, the season of catching does not necessarily match the time of consumption and thus of habitation. In this respect, the absence of species may be more telling than their presence. Birds are sparsely represented in the faunal remains, but especially the material from Steintjørna shows that sedentary forest birds such as different grouse and capercaillie were hunted (see Vretemark, this volume). More significant for the question of seasonality, however, is the absence of migrating spring and summer birds. Especially the absence of ducks (apart from a wing bone at Brodtkorbneset), geese and swans are significant, since these species were traditionally important among the Sámi (Fellman 1906: 72; Lillienskiold 1698: 188-90). It is also interesting to note that despite the large amount of reindeer bones, no remains of very young calves were found. Though hardly hunted or slaughtered, some bones of suckling calves would be expected if the sites were in use during the calving season (May-June) (Hedman et al. 2015). These absences in the faunal material make it unlikely that the sites were in use during spring, summer and early autumn.

When discussing the seasonality and habitation of these two sites, it is hard not to make comparisons with the historically documented settlement pattern of the local Skolt Báhceveaj/Pasvik siida, which until the early 20th century used this very area as part of their territory (cf. Halinen et al. 2013; Hedman & Olsen 2009). The winter village (*Talv-sijd*), used from December to April, was the aggregate site for the entire siida community. During other seasons the group dispersed into family-based units, which had their spring and summer sites on the coast. In the winter village, the community lived to a large extent on stored food reserves and access to reindeer pasture and firewood were the main factors determining the location of the site. Due to decimation of the surrounding pasture and forest, the winter village was moved at intervals of 5–30 years (cf. Nickul 1948: 54-56; Tanner 1929: 104-106). Actually, this pattern of short-interval 'moving' winter villages may be a plausible model for interpreting the Brodtkorbneset and Steintjørna sites, which, despite some differences, are very similar and chronologically hardly distinguishable. The quantity and variety of finds seem also well in accordance with a communal site occupied during a substantial (winter) period, and the number of hearths, moreover, fits well with the first records from 16th and 17th centuries of the number households in Pasvik and neighbouring siidas (Qvigstad 1926: 7; Tanner 1929: 305-310; Tegengren 1952: 33-34). The general spatial organization of the sites also speaks in favour of aggregate sites for the local community rather than smaller, family-based localities. In addition, bones of ocean fish such as cod and salmon[2] in the faunal material, as well as finds of pumice stones, may indicate movement to the coast

during summer and thus a settlement pattern similar to the one documented historically for the Pasvik siida (Olsen 1984: 142-157; Tanner 1929).

There are, however, some deviating features that need further consideration. The substantial amount of fish bones in the hearths indicates the importance of fishing. Common whitefish are most numerous, with pike as the second most important species. While lake and river fishing in later periods was most commonly carried out during spring and especially during the autumn spawning period (Nickul 1948: 21-53; Tanner 1929: 125, 134-137), whitefish and pike were also caught in winter with nets under the ice. A more intriguing feature of the pike remains, however, is that they are mostly bones from the extremities (cranial elements and tail end vertebrae), while vertebrae from the flesh-rich body parts are missing (Vretemark, this volume). This strongly suggests that pike was processed at the sites but meant for consumption elsewhere. Drying was the most common way to preserve fish, which also facilitated easy transportation due to the significant weight reduction. That pike was actually dried is further indicated by characteristic cut marks found on the front portion of the jaws, which are identical to ethnographically observed butchering marks on fishes that are split in order to facilitate faster drying (Hedman et al. 2015: 10-11, Vretemark, this volume). Drying may likely have taken place during autumn, and thus suggest that the sites also may have been used outside the actual winter season, either as part of a continuous stay or visited temporarily. However, it cannot be ruled out that pike was (freeze)dried during winter in a way similar to drying ocean fish along the coast.

The convincing data of pike being processed/dried and not consumed at the sites may suggest that it was processed specifically as a trade or tax item, a use that is well documented from later periods in the area (e.g. Tegengren 1952: 21). The eastern ornaments found at the sites, as well as the weight from Steintjørna, clearly indicate involvement in exchange networks, and the dried pike may well have figured among the goods given in return. It may also be noted that the historically documented trade with the Sámi usually took place during winter, at the so called 'winter markets', when snow facilitated expedient transport on reindeer-pulled sledges and skis, and which may be read as further support for the site's suggested seasonal affiliation.

6 Hunting and/or herding: Archaeology, genetics, and osteology

As mentioned, reindeer is by far the most dominant species in the faunal material from Steintjørna and Brodtkorbneset, accounting for ca. 87 % of the identified bones in the merged assemblages. The bone remains represent different parts of the carcass, and bones from both meaty body parts such as thighbones and shinbones and bones from less meat-rich parts are well represented (Hedman et al. 2015: 11; Vretemark, this volume). This suggests that the killing or slaughtering of reindeer, and the dismembering of the carcasses, were carried out quite close to the sites (or even perhaps at them). This further accentuates the question whether the abundant reindeer remains are from hunted or herded animals? Returning to the Skolt Sámi ethnographic analogy, it seems likely that if the inhabitants had stocks of domesticated reindeer and kept them close to the sites, as was the case at the Skolt Sámi winter villages (Tanner 1929), any slaughtering of these reindeer would probably produce the pattern of evenly distributed body parts observed in the zooarchaeological material. Nonetheless, the presence of arrowheads in the excavated material shows that hunting still took place and, whether contemporary or not, recorded pitfall systems for trapping wild reindeer clearly suggest good nearby hunting grounds. In fact, collective hunting of wild reindeer in this region is recorded as late as the early 19th century (Rathke 1907: 159).

In order to discuss in more detail the question of whether the excavated reindeer material represents hunted or herded animals, I shall include some other data from DNA analyses of reindeer bone samples from Brodtkorbneset and Steintjørna. They were included in a comprehensive DNA study of 193 reindeer samples from 12 archaeological sites in Finnmark County dated between AD 1000–1700 (Røed et al. 2018), which were compared with similar data from more recent archaeological sites, and also from extant pastoral herds. An earlier study that included samples of reindeer bones from Stone and Iron Age sites in Finnmark revealed the absence of mtDNA haplotype clusters that were typical of modern pastoral herds in the region, thus indicating that the contemporary domestic population did not descend from the ancient wild reindeer (Bjørnstad et al. 2012). The new study confirmed this and showed that the mitochondrial genome in Finnmark reindeer has undergone massive genetic replacement since medieval times. The shift is characterized by a significant loss of native mtDNA haplotypes, together with a significant emergence of new ones, most likely indicating the introduction of non-native animals. The new data strongly suggest that the shift took place during the 16th and 17th centuries, which complies well with earlier interpretations of when the transition from hunting to reindeer herding took place among the Finnmark Sámi (Hansen & Olsen 2014; Olsen 1987; Vorren 1973). The samples from Brodtkorbneset and Steintjørna fell within the native mtDNA haplotype clusters typical of the ancient wild reindeer stock (Røed et al. 2018).

It is important to emphasize that the results do not rule out that domestication or active management of local reindeer may have taken place before the Early Modern Period. What the study strongly indicates, however, is that any such possible earlier attempts did not play any significant role for the formation of the extant pastoral herds. Thus, it still remains to be investigated to what extent the material from Brodtkorbneset, Steintjørna and other hearth-row sites indicate a new relationship with animals; relationships that may indicate domestication and small-scale herding beyond the reindeer traditionally kept by the Sámi for transport and hunting purposes. In this respect, the environmental setting of the hearth-row sites is intriguing by differing significantly from that of earlier prehistoric inland settlements (Halinen et al. 2013; Hedman 2003; Hedman & Olsen 2009). While earlier sites are mostly found along the shores of lakes and larger rivers, the hearth-row sites normally appear in what seem to be more marginal forest areas away from the major bodies of water, and thus indicate a very wide-ranging change in location preferences. The sites are typically situated on dry moraine outcrops in marshy areas, on forested terraces or next to small creeks and tarns often surrounded by heathland rich in reindeer lichen (Hedman 2003:50). The new environmental preference, as also witnessed by the Pasvik sites, may indicate that access to reindeer pastures, and thus the importance of domesticated reindeer, had become imperative to site location (see also Jerand & Linderholm, this volume).

Another clue is provided by the age distribution of the reindeer represented in the bone material from Brodtkorbneset and Steintjørna (Hedman et al. 2015: 11-14; Vretemark, this volume). This distribution is strikingly similar at both sites, and further speak to their relatedness in terms of human occupancy. Based on observations of attributes of the long bones there is a clear predominance of mature reindeer. The majority (over 60 %) were five years old or more when killed, and reindeer more than four years old amount to 70–80 % of the material. Only a few per cent were less than one and a half years old and there is a total lack of bones of very young calves. This is an age distribution that often is associated with hunting (e.g. Hambleton and Rowley-Conwy 1997: 68), based on the assumption that hunters would go for adult animals, and preferable males, with the highest yield of meat. Such selective target-

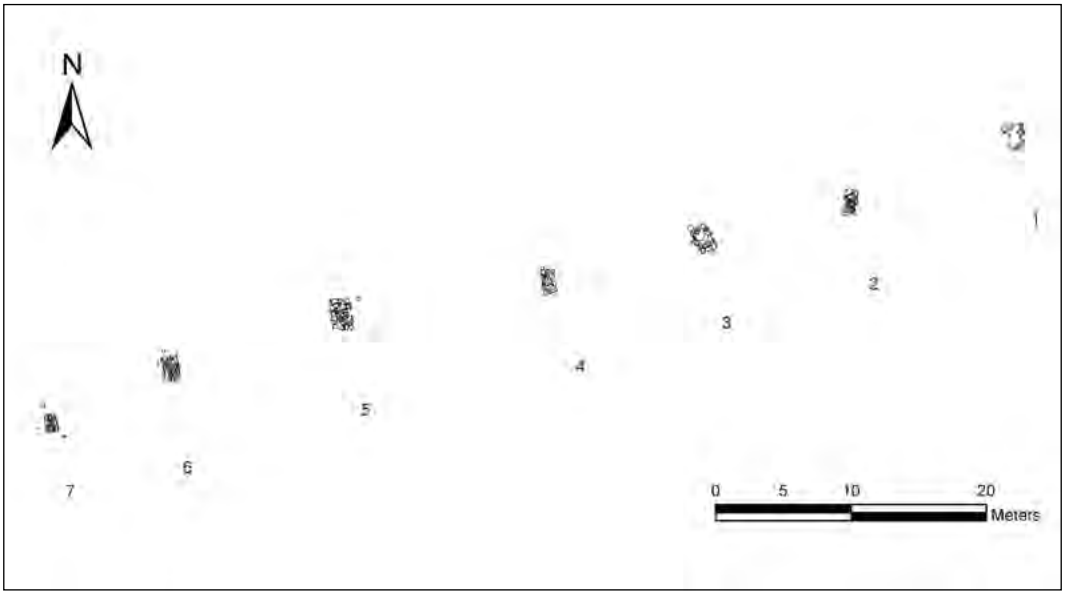

Figure 10. The heart row at Brodtkorbneset

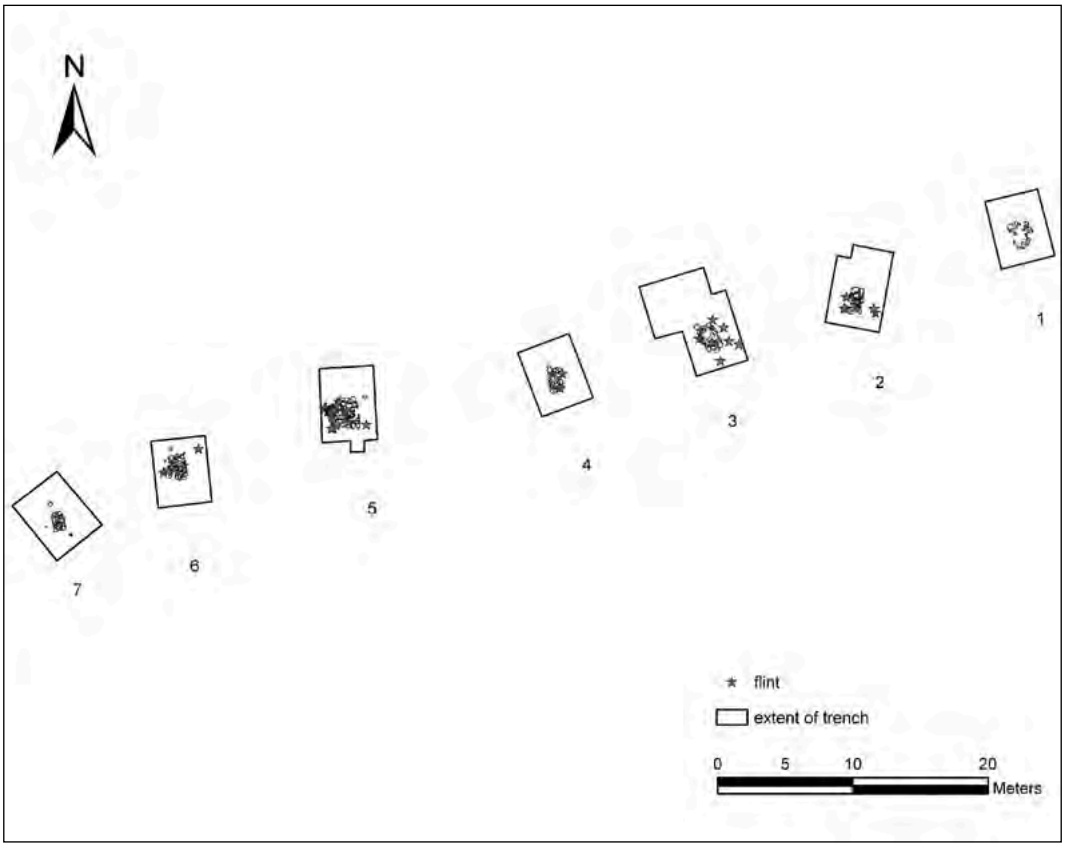

Figure 11. The distribution of tinder flint at Brodtkorbneset

ing, however, is dependent on individualized hunting strategies. The use of pitfall systems and even stalking, as practiced on crust snow during late winter (Fellman 1906: 60; Tegengren 1952:105), are quite indiscriminate and would result in a far more differentiated yield. Moreover, the implied reverse assumption grounding this interpretation, that herding economies would predominantly slaughter young and sub-adult reindeer, is more typical of a modern meat and market-oriented reindeer economy than of pastoral preferences at large. For example, traditional reindeer herding among Sami groups in Northern Sweden in the 18th and 19th centuries involved a culling strategy with essentially the same selection as observed in the Pasvik zooarchaeological material (Drake 1918: 55-56; Vretemark, this volume).

The predominance of adult reindeer in the faunal material might therefore as well reflect small-scale reindeer herding. Moreover, the presence of bones from sheep in the material shows that the people of the hearth-row sites were not unfamiliar with animal husbandry. A total of 20 such bone fragments were found in the hearths, most of them (17) from the deposits associated with H3 at Brodtkorbneset (Hedman et al. 2015: 14-15, Vretemark, this volume). One of the sheep bones from this trench has been radiocarbon dated to AD 990–1155 (Niemi et al. 2013), which makes this the yet earliest undisputable domesticate from any Sámi settlement site. Though admittedly few, the anatomical distribution of the sheep bones indicates that the animals were slaughtered at the dwelling sites (Hedman et al. 2015: 15, Vretemark, this volume). These suggestions of husbandry notwithstanding, such small-scale reindeer (and sheep) herding would not be sufficient to meet the demands for meat, marrow and entrails, or for skins, bones and antlers, neither locally nor as products of exchange. As indicated by e.g. the finds of iron arrowheads, reindeer hunting was still clearly important. Thus, rather than continuing to think of these animal relationships as mutually exclusive, we should perhaps envisage a situation where herding was developing alongside hunting. As suggested, the new importance of herding may well be reflected in the new environmental preferences manifested by the location of the hearth-row sites. A cautionary tale from the genetic studies, however, is that we should stop seeing such possibly early herding attempts as the roots of modern pastoral economies.

7 The agency of hearths

The most conspicuous feature of the hearth-row sites is precisely what their very naming implies; the formalized linear organisation of the hearths (Fig. 10). Indeed, the two sites discussed here typify this organization in an eloquent manner. A common archaeological question posed to such aggregates is whether they are contemporaneous or the accumulated outcome of separate events? Based on the radiocarbon dates, we cannot say for sure whether all the hearths and thus their dwellings were in use at the same time, although the very spatial organisation itself speaks to a site established and conceived of as an entity. What we nevertheless can say for sure is that all hearths from a certain moment onwards were contemporaneous, in the same way as they still are. This is more than a trivial truism, as it suggests a more liberal and inclusive conception of contemporaneity than the one normally guiding archaeological chronologies (cf. Olsen 2010: 126-128; Olsen 2013). Moreover, in the case that some of the hearths were added later, they must have been constructed and organized in compliance with a spatial order already established by those previously built. Likewise, if one or more hearths were abandoned earlier than the others, these abandoned hearths were likely still conceived to be part of the hearth row, especially since there are no signs of destruction or reusing stones for building new hearths. This may also be indicative of what might be termed the "agency" of these hearths, which impact may have exceeded their actual human phase of use. Even when no one returned to the site any more to re-

Figure 12. Excavating H5 at Brodtkorb-neset. Photo: Bjørnar Olsen.

Figure 13. Pole photo of H1, Steintjørna (scale 2 m). Photo: Bjørnar Olsen.

Figure 14. Pole photo of H2, Steintjørna (scale 2 m). Photo: Bjørnar Olsen.

erect their tents, the hearths continued to affect and draw attention to themselves from hunters, herders, traders, and archaeologists passing by.

What did this new and linear way of organizing domestic space imply? And how did it come about? Linearity is feature that seems easy to associate with symmetry and equality (e.g. Levi-Strauss 1979: 133-139, 291-292). Arranging each hearth next to the other emphasises the commonality and bonds among households occupying a site. In small and fragile societies such means of cohesion are crucial, as commonly reflected in norms of reciprocity and sharing. This, however, does not rule out differentiation between households. In fact, as we have seen, some of the hearths have substantially richer assemblages than others, both in terms artefacts and faunal material (and thus likely representing differences in food processing and consumption). The numbers of metal processing finds associated with H2 at Steintjørna is a clear indication of differentiated skills, and the fact that most of the sheep bones are associated with H3, Brodtkorbneset, may likewise suggest unequal access to certain goods. As suggested earlier (Halinen et al. 2013: 179), such internal inequalities may even have been related to the control of fire. At Brodtkorbneset, the two strike-a-lights were both found next to the rich H5, and as mentioned above, while tinder flint at this site are abundant at the central hearths it is completely lacking at the two outermost ones (H1 and H7) (Fig. 11). In the Steintjørna assemblage, there are no strike-a-lights but the distribution of flint shows a similar pattern as at Brodtkorbneset with only one specimen each in H1 and H7, and none in H8. The ability to light and keep the fire in the hearths was, of course, vital for survival in Arctic winters and to be dependent on others a possible source of inequality and subordination.

Although variation in archaeological assemblages may be caused by a number of factors, including post-depositional processes, there are still ample reasons to suggest that it in this case also signifies actual differences between households. This should come as any major surprise. As a number of studies of Sámi burials, sacrificial sites and settlements elsewhere in Sápmi have convincingly shown, there were clearly an emerging social differentiation within Sámi societies during the Late Iron Age and the medieval period (Halinen 2009; Hansen & Olsen 2014; Odner 1992; Schanche 2000; Storli 1994; Zachrisson 1997). Such differences may, for example, be related to the status and prestige ascribed to successful hunters or herders, and/or to successful involvement in trade networks (Bergman & Edlund 2016; Olsen 1987; Wallerström 2000). What is less explored, however, is how such differences are played out and negotiated in actual sociomaterial contexts. With respect to the sites dealt with here it is therefore important to consider how the hearths themselves may have "acted" these differences, and thus played a significant role in both articulating and negotiating them (Figures 12-14).

Although the large stone-built hearths display commonality by sharing overall design, orientation and appearance, they also exhibit clear distinctions in term of actual size, constructional details and, in one case, even stone materials (H7, Steintjørna). Moreover, as noted above, these commonalities and distinctions are played out and accentuated in the relational context of the row. Thus, while a hearth row may act to articulate equality and bonding, it may also, through the hearth's relative placement within the row, act as a means for differentiation. It is hardly accidental that the smallest and 'poorest' hearths are at the ends of the rows at both Brodtkorbneset and Steintjørna (Fig. 13). One key to understanding the material dynamics and communication involved is thus to take seriously the ambiguous and subtle role of the hearths and the hearth rows in articulating both equality and difference. They were not just expressions of household and communities but formed integral parts of these collective and composite entities. In considering their possible "agency" and subtle affordances one should also take notice

of their enclosement during the season of dwelling. Apart from the subsequent period of abandonment, the heart row itself was only visible prior to and after the seasonal assembling/disassembling of the tents in late fall and early spring. Thus, during the season of habitation, the individual hearths required access to households in order to be seen.

Being attentive to the material characteristics of the hearths, and the hearth rows, may also provide a clue to understand why they became so remarkably widespread and common among the Sámi in the Viking Age and early medieval period. This period was clearly a time of change, affecting both interethnic relations and the Sámi societies themselves. State formations and Christianization transformed Nordic societies, and together with an emerging market economy, clearly created very new conditions. While earlier interaction to a considerable extent was mediated by local redistributive economies and partly shared religious values (Hansen & Olsen 2014; Odner 1983), the new regimes created a less culturally embedded and predictable sphere of interethnic contact. The intensification of fur trade and taxation as effectuated by the emerging states of Sweden and Norway, as well as the medieval Novgorodian trade empire, put the Sámi economy under pressure and also caused a more direct interface between the local society and the emerging European 'world system' (Hansen & Olsen 2014). While these new conditions likely may have initiated or accentuated processes of social differentiation within Sámi societies, we should not forget their internal causes. For example, how trade, new commodities, and possibly changes in reindeer economies may have accentuated already existing tensions in relation to property rights versus common access to resources. Crucial in this respect is the delicate balance in small-scale societies between individual realization and collective interest. One way to negotiate this balance is seen in the principle of sharing, where an egalitarian principle of common access to resources is maintained through the opposite principle of individual prestige ascribed the hunter for sharing his catch (cf. Olsen 1987).

The external and internal changes, dependencies, and 'frictions' that emerged and developed in the Viking Age and early medieval period provides an overall social and economic context for the hearth-row sites. Taking this into consideration, I think one rational of the hearths and the hearth rows was that they provided a subtle means for simultaneously articulating commonality *and* difference that proved socially effective. Being a mundane manifestation of domestic space, they quite literally made the small and fragile societies appear more solid and bonded, while at the same time constituted a means for displaying and negotiating social difference (Figs. 12-14). How this initially came about is difficult to discern, although it is unlikely that it emerged as any planned or intentional undertaking for the outcome suggested here. What is important is that their articulations 'worked' under the prevailing circumstances; and it is this success that may well explain their attractiveness and dispersal over such an amazingly large geographic area.

No one could foresee this distribution or have known the full extent of the hearth rows. Little did they know, those who settled 800–900 years ago at Brodtkorbneset and Steintjørna that an almost identical site had been established and abandoned more than 1200 km to the south. As with many other phenomena this can only be seen in retrospect; it is, if you like, an archaeological affordance. Moreover, through the spread of the hearth-row sites new and unforeseen effects was created. They may over time unintentionally have contributed to processes of ethnic consolidation and unification, and by being constructed over increasingly larger areas, their presence may have reminded travellers and traders of to whom this land belonged. Against the backdrop of state economies and trade networks competing over Sámi resources, the hearth rows may have increasingly become regarded as a mutually comprehensible if tacit statement of Sámi rights to hunting grounds and pastures.

Figure 15. Exposed hearths, Steintjørna. Photo: Bjørnar Olsen.

8 Postscript: the hearth man

The forest floor in the Pasvik woodland hides its treasures well. Scattered with tussocks and uprooted trees, and overgrown by moss, heather, birch, and pine, it poses a tough challenge to a surveying archaeologist. Arriving here in August 2007, it was Sven-Donald's first visit ever to Pasvik. He had recently joined the research project that initiated these investigations, chosen because of his excellent research in Sámi archaeology but also because of the skills he held from decades of surveying and excavating Sámi sites in the woodland of northern Sweden. Despite being foreign to this particular area he felt immediately at home with the conditions here. A few weeks later, he led the first survey and among the many discovered sites were the hearth-row sites at Brodtkorbneset and Steintjørna. And the rest, as they say, is archaeology. Sámi archaeology.

During the coming years of surveys and excavation, Sven-Donald proved his skills as an outstanding – and in this particular habitat, I would claim, unrivalled – field archaeologist. When we visited the sites for the last time together in the autumn of 2014, half a year before his untimely death, we talked much about the work we had done, discussed future research, and how to investigate the third hearth-row site situated a little to the north. Those plans should not be realized. Still, as the director of the investigations at Brodtkorbneset and Steintjørna, Sven-Donald played a more than crucial role in making this unique archaeological legacy available through fieldwork, analyses, research, publications, as well as numerous presentations in Norway, Sweden, and abroad.

Included in this record is also the wealth of memories of all those summer days and nights in the Pasvik forests; memories that speak to his kindness and wit, to his knowledge of the forest and its animals and birds. And to all cups of coffee brewed over the fire, all the sausages fried, and to all pieces of dried reindeer heart, chocolate, apples, and oranges shared with fellow diggers during the afternoon breaks. The hearths left exposed at Brodkorbneset and Steintjørna are a most appropriate commemoration of the legacy of this extraordinary man (Fig. 15).

References

Unpublished sources

Bergstøl, J. 2008. *Samer i Østerdalen? En studie av etnisitet i jernalderen i det nordøstre Hedmark*. Doctoral thesis. Oslo: University of Oslo.

Grandin, L. & Willim, A. 2013. *Ett komplext metallhantverk på en samisk boplats. Analys av metaller och slagger från Norge, Finnmark, Sør-Varanger: Steintjørna R 148462*. UV GAL Rapport 2013:12. Riksantikvarieämbetet.

Olsen, B. 1984. *Stabilitet og endring. Produksjon og samfunn i Varanger 800 f.kr-1700 e.kr.*. Mag.art. thesis in archeology. Tromsø: University of Tromsø.

Reitan, G. 2006. Aursjøprosjektet Boplassfunn: samiske ildsteder fra vikingtid/middelalder og boplasser fra bronsealder, Dalsida statsalm., gbnr 156/1, Lesja kommune, Oppland. Report Museum of Cultural History, University of Oslo. https://www.duo.uio.no/handle/10852/53145

Literature

Bergman, I. & Edlund L.-E. 2016. Birkarlar and Sámi – inter-cultural contacts beyond state control: reconsidering the standing of external tradesmen (birkarlar) in medieval Sámi societies. *Acta Borealia* 33: 52–80.

Bjørklund, I. 2013. The mobile Sami dwelling – from a pastoral necessity to an ethnopolitical master paradigm, in D. G. Anderson, R. Wishart & V. Vate (eds.) *About the Hearth. Perspectives on the Home, Hearth and Household in the Circumpolar North:* 69-70. New York, NY: Berghahn Books.

Bjørnstad, G., Flagstad, O., Hufthammer, A. & Roed, K. H. 2012. Ancient DNA reveals a major genetic change during the transition from hunting economy to reindeer husbandry in Northern Scandinavia. *Journal of Archaeological Science* 39: 102–108.

Bronk Ramsey, C. 2009. Bayesian analysis of radiocarbon dates. *Radiocarbon 55* (1): 337-360.

Drake, S. 1918. *Västerbottenslapparna under förra hälften av 1800-talet*. Uppsala: Almqvist & Wiksell.

Fellman, J. 1906. *Fellman, J. 1906. Anteckningar under min vistelse i Lappmarken*, vol. 1. Helsinki: Finska litteratursällskapet.

Halinen, P. 2009. Change and continuity of Saami dwellings and dwelling sites from the Late Iron Age to the 18th century. In T. Äikäs (ed.) *Máttut – máddagat: the roots of Saami ethnicities, societies and spaces / Places*: 100-115. Publications of the Giellagas Institute; Vol. 12. Oulu: Oulu University.

Halinen, P., Hedman, S.-D. & Olsen, B. 2013. Hunters in transition: Sámi hearth row sites, reindeer economies and the organization of domestic space AD 800–1300. In D. G. Anderson, R. P. Wishart, V. Vaté (eds.) *About the Hearth: Perspectives on the Home, Hearth and Household in the Circumpolar North*: 152-182. New York and Oxford: Berghahn Books.

Hamari, Pirjo, 1996. Taking a look at a Sámi way of life – rectangular hearths in Finnish Lapland or: a periphery reconsidered. *Kontakstencil* 39: 127-135. Umeå.

Hambleton, E. & Rowley-Conwy, P. 1997. The medieval reindeer economy at Gæccevaj'njar'ga 244 B in the Varanger fjord, north Norway. *Norwegian Archaeological Review* 30 (1): 55-70.

Hansen, L. I. & Olsen, B. 2014. *Hunters in transition: an outline of early Sami history*. Leiden: Brill.

Hedman, S.-D. 2003. *Boplatser och offerplatser. Ekonomisk strategi och boplatsmönster bland skogssamer 700-1600 AD*. Studia Archaeologica Universitatis Umensis 17. Umeå: Umeå University.

Hedman, S.-D. & Olsen, B. 2009. Transition and Order: a Study of Sámi Rectangular Hearths in Parvik, Arctic Norway. *Fennoscandia archaeologica* XXVI: 3-22. Helsinki: The Archaeological Society of Finland.

Hedman S.-D., Olsen, B. & Vretemark, M. 2015. Hunters, herders and hearths: interpreting new results from hearth row sites in Pasvik, Arctic Norway. *Rangifer*, 35, (1), 2015: 1-24.

Jerand, P., Linderholm, J., Hedman, S.-D. & Olsen, B. 2016. Spatial Perspectives on Hearth Row Organisation Through the Analysis of Phosphate Content. *Journal of Archaeological Science: Reports* 5: 361-373.

Keilhau, B. M. 1831. *Reise i Øst- och Vest-Finnmarken : samt til Beeren-Eiland og Spitsbergen : i Aarene 1827 og 1828*. Christiania: Cappelen.

Levi-Strauss, C. 1979. *Structural Anthropology*. Penguin Books, Harmondsworth.

Lillienskiold, H. 1698 (1942). *Speculum Boreale*. In O. Solberg (ed.) Finnmark omkring 1700. *Nordnorske Samlinger* IV (1942). Oslo: A.W. Brøggers Boktrykkeri.

Nickul, K. 1948. *The Skolt Lapp community Suenjelsijd during the year 1938*. Acta Lapponica vol. 5. Stockholm.

Niemi, M., Bläuer, A., Iso-Touru, T., Nyström, V., Harjula, J., Taavitsainen, J.-P., Storå, J., Lidén, K. J, & Kantanen, J. 2013. Mitochondrial DNA and Y-chromosomal diversity in ancient populations of domestic sheep (Ovies aries) in Finland: comparison with contemporary sheep breeds. *Genetics Selection Evolution* 45:2

Odner, K. 1983. Finner og terfinner. *Oslo Occasional Papers in Social Anthropology* 9. Oslo: University of Oslo.

Odner, K. 1992. *The Varanger Saami. Habitation and Economy A.D. 1200-1900*. Serie B, Skrifter LXXXVI. Oslo: The Institute of Comparative Research in Human Culture.

Olsen, B. 1987. Stability and change in Saami band structure in the Varanger area of Arctic Norway, AD 1300–1700. *Norwegian Archaeological Review* 20 (2): 65-80.

Olsen, B. 2010. *In Defense of Things. Archaeology and the Ontology of Objects*. Lanham, MD: AltaMira Press.

Olsen, B. 2013. Memory. In P. Graves-Brown, R. Harrison and A. Piccini (eds.) *The Oxford Handbook of Contemporary Archaeology*: 204-218. Oxford: Oxford University Press.

Qvigstad, J. 1926. *Bosætningen i Sør-Varanger før 1870*. Tromsø Museums årshefter 48 (3).

Ränk, G. 1949. Grundprinciper för disponeringen av utrymmet i de lapska kåtorna och gammerna. *Folkliv. Acta ethnologica et folkloristica Europaea*. TOM XII-XIII. 1948-1949: 87-111. Stockholm.

Rathke, J. 1907. *Afhandling om de norske fiskerier og beretninger om reiseri aarene 1795-1802 for at studere fiskeriforhold m*. v. Bergen: Selskabet for de norske fiskeriers fremme.

Røed, K., Bjørklund, I. and Olsen B. 2018. From wild to domesticated reindeer: Genetic evidence of a non-native origin of reindeer pastoralism in northern Fennoscandia. *Journal of Archaeological Science: Reports* 19: 279-86.

Schanche, A. 2000. *Graver i ur och berg. Samisk gravskikk og religion fra forhistorisk til nyere tid*. Karasjok: Davvi Girji.

Simonsen, P. 1963. *Varangerfunnene III. Fund og udgravninger i Pasvikdalen og på den østlige fjordstrand*. Tromsø Museum Skrifter VII:3. Tromsø: Tromsø museum.

Storli, I. 1994. *"Stallo"-boplassene. Spor etter de første fjellsamer?* Oslo: Novus.

Tanner, V. 1929. Antropogeografiska studier inom Petsamo-området. I. Skolt-lapparna. *Fennia* vol. 49 N:o 4. Helsinki – Helsingfors: Societas Geographica Fenniae.

Tegengren, H. 1952. *En utdöd lappkultur i Kemi lappmark: studier i Nord Finlands kolonisationshistoria*. Acta academiae aboensis. Humaniora XIX (4). Åbo.

Vorren, Ø. 1973. Some trends of the transition from hunting to nomadic economy in Finnmark. In G. Berg (ed.) *Circumpolar Problems: Habitat, Economy and Social Relations in the Arctic*: 185-194. Oxford: Pergamon Press.

Wallerström, T. 2000. The Saami between east and west in the Middle Ages: an archaeological contribution to the history of reindeer breeding. *Acta Borealia* 17: 3–39.

Yates, T. 1989. Habitus and social space: some suggestions about meaning in the Saami (Lapp) tent ca. 1700-1900. In I. Hodder (ed.) *The meaning of things. Material culture and symbolic expression*: 249-262. One World Archaeology 6. London: Unwin Hyman Ltd.

Zachrisson. I. (ed.) 1997. *Möten i gränsland, samer och germaner i Mellanskandinavien*. Statens historiska museum Monographs 4. Stockholm

Notes

1 It is hard to distinguish between sheep and goat due to the similarities of skeleton morphology. In those cases where clear species identification was possible, including one DNA analysis, however, it turned out to be sheep.

2 Salmon cannot pass Skoltefossen, the waterfall close to the mouth of the Pasvik River, 60 km to the north. Salmon is also evidence of summer fishing.