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SÁMI SETTLEMENT AND THE USE OF PINE INNER BARK IN LØNSDAL, NORDLAND, NORWAY. DATING AND HISTORICAL CONTEXT

Abstract
Inner bark of *Pinus sylvestris* (L.) used to be an important dietary resource for the Sámi. The bark was harvested in June. In the Lule Sámi language this month is called biehtsemánno meaning 'pine month'. In Lønsdalen, within Pite-Sámi area in Nordland county, northern Norway, we recorded 107 pine trees with 125 bark-peelings, of which 103 were successfully cross-dated by dendrochronology. The oldest peeling was from 1636, whereas the youngest peeleing was done in the 1880s. The same area also contains many physical cultural remains of the Sámi. We performed archaeological excavations of four hearths which were located between these bark-peeled trees. Radiocarbon datings showed that these settlements were used from the Late Iron Age or Early Medieval to the present time. Thus, the region has been important to the Sámi people for a long time. In this article we argue for a relationship between the many bark-peeled trees and the settlements.

Keywords: Sámi people, reindeer herding, bark-peeling, hearths

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INTRODUCTION

In the Lønsdal valley, Saltdal municipality, northern Norway, many bark-peeled Scots pine (*Pinus sylvestris* L.) trees have been found (Fig. 1). The trees are located in an area containing around 50 documented Sámi cultural heritage sites – in particular, many hearths have been recorded. Most of these are probably traces of Sámi reindeer herders' tents that were erected during shorter stays in the area. The area was part of reindeer herders' land use, where pine bark was one of the harvested resources.

The main question of this paper is to examine to what extent the Sámi visited the Lønsdal valley in order to harvest bark. To analyse this complex issue in broad and adequate way, it is necessary to bring in a multidisciplinary perspective. As a result, the aim of this study is threefold; 1) to record and dendrochronologically date bark-peelings of Sámi origin in an area with a long Sámi utilization history, 2) to excavate and radiocarbon date a selection of historic (Sámi) settlement sites, and 3) to interpret the relationship between the identified settlements and the bark-peelings of pine trees.

SPECIAL FEATURES OF THE AREA

Lønsdal is located in the western part of the Pite-Sámi area. Traditionally, this area included Arvidsjaur and Arjeplog north of River Piteälv in Sweden, as well as the area from Rana to Fauske on the Norwegian side (NOU 1984: 98). The valley comprises the uppermost and southernmost parts of the Saltdal valley, and extends up to the watershed in the mountains at the Rana county border. The old traffic artery known as *Ranvegen* between Rana and Saltdal passed through Lønsdal until 1860, although a permanent settlement was not established until the end of the 1930s. The Nordland railway line and the E6 highway pass through the valley nowadays. The pine forest reaches currently the altitude of 550 m asl., but

previously it extended higher, as indicated by pine root finds in the marshes of *Stødi*, located in the bare mountains (Arntzen 1987: 141). In the 1700s the pine forest along the River Lønselva was still not logged; due to waterfalls and large boulders river could not be used to float timber downstream (Schnitler 1985 [1929]: 116). Commercial forestry commenced in the 1880s.

The stallo-sites in Saltfjellet

Archaeologist Inger Storli has excavated 'stallo-sites' in Saltfjellet mountain, in the upper part of Lønsdal, 7–8 km south of the area containing the bark-peeled pine trees. The majority of datings indicate that the sites were utilized from late AD 800s/early AD 900s until the latter half of the AD 1300s, but there were also older and some younger datings (Storli 1994: 21–50). Recent research on stallo-sites suggests that they may have been used for an even shorter period than stated by Storli. Stallo-sites from Adamvalldá in northern Sweden were dated to AD 640–1178, with a peak in AD 850–1050 (Liedgren et al. 2007). The datings of these sites rests on AMS-datings, whereas earlier datings of stallo-sites were obtained by conventional radiocarbon method with larger inaccuracy. Liedgren et al. (2007) therefore concluded that previous dating of stallo-sites was too broad and that these sites were mainly used during the Viking Age (800–1050 AD).

The interpretation of stallo-sites is still a controversial issue. Nevertheless, several researchers believe that the stallo-sites must be understood as the result of transition from hunting to herding practices among the Sámi people (Storli 1994; Hedman 2005; Bergman et al. 2008).

Written sources about the use of Lønsdal area

Sámi reindeer herders lived both in Pite Lappmark in Sweden (Eastern Sámi, *østerlapper*), and in the mountainous pastures on the Norwegian side (Western Sámi, *vesterlapper*). The pastoralists migrated between different locations during the annual cycle, and the herding method can be defined as intensive (Beach 1981: 34–8; Roung 1982). The reindeer were milked in the summer and autumn.

Written sources trace reindeer husbandry back to the 1500s, while archaeological studies show that it may be far older (Olaus Magnus 1976 [1555]; Storli 1994; Andersen 2011). In contrast to the Forest Sámi, the nomads in Pite Lappmark were engaged in a more specialized reindeer herding and were dependent on long periodic migrations throughout the year. During the summer, the verdant mountain pastures west of Lønsdalen were excellent grazing land for the reindeer.

Three Sámi villages (*sijdda*) existed at the beginning of the 1600s in Pite Lappmark. These were Arvidsjaur *(Arffwes Jerff By*), Lokteby (*Lockte Bynn*) and Simisjerve (*Sijmis Jervff Bynn*) (Hutchinson 2006: 71 ff). Additionally, the village of Lais was a separate taxable entity in the latter half of the 1500s, but in 1607 it was incorporated into Ume Lappmark (Bergsland 1978). At the time, there were 105 reindeer owners in these villages with more than 2500 reindeer. Towards the end of the 1600s, two new villages appeared, namely Sørvesterbyen (Njarg) and Norvesterbyen (Mavas). In addition, there were nomadic Sámi on the Norwegian side, who had winter pastures both in Sweden and Norway.

Lønsdal was one of several gateways for reindeer-herding Sámi, who had winter stays in Sweden and summer stays at pastures in Saltfjellet mountain. Dypendal, a branch valley east of Lønsdal, was the most important route to the area. This movement was an annual event for a varying number of Sámi. In 1750 it was documented that 16 families from Sørvesterbyen travelled to Salten with a total of 3150 reindeer (Hutchinson 2006: 80 ff). Taxpayers could, however, represent anything from one to three families, as they were free to have smallholders. The total number of Sámi in the area was therefore probably considerably higher, perhaps up to 100 people or more in the 1750s.

The Sámi commonly stayed and rested in Lønsdal before proceeding into Saltfjellet mountain. Occasionally, some Sámi families who normally had their winter pasture in Sweden travelled to Lønsdal during wintertime, because snow crust prevented the reindeer from reaching the pasture underneath (Qvigstad & Johnsen 1912 in Arntzen 1987: 143). The written sources appear to present somewhat different information about the time the reindeer herders crossed the border to Norway (Qvigstad & Wiklund 1909a: 55, 128, 131), varying from late March to midsummer (Qvigstad & Wiklund 1909b: 44, 346).

Hans Schanche (1729–30) stated that the Western Sámi could gather at *Vorfruemesse* (25 March), at Lent, at a place called *Luns* (Qvigstad & Wiklund 1909b: 346). Luns is probably Lønsdal. Here they could reside a month before they moved to the mountains in the west. In the autumn, at the first snowfalls, they gathered at '*alle Helgens tider*' in Lønsdal. This is in the beginning of November. In Lønsdal they could stay over the winter or eventually migrate eastward into the Swedish spruce forests to find better pasture for the reindeer. Even today, the Lønsdal valley is commonly used for winter pasture (Kalstad & Brantenberg 1987: 79).

Physical cultural remains from various times

Schanche's (1729–30) account shows that Lønsdal was considered an excellent area with both fresh water and forests (Qvigstad & Wiklund 1909b: 346). There was room for many people and sometimes 40 to 50 *madnøt* would gather here for a month – a *madnøt* probably refers to a household or a family. This figure is higher than stated in 1750. The explanation for the different figures could be that the number of individuals who paid taxes often included more than one family (Hutchinson 2006: 80–1).

The people who stayed in and moved through the area left many traces in the terrain. Even though Lønsdal has not been as thoroughly investigated as some of the adjacent areas, numerous physical cultural remains testify that people moved in the area. In the part of Lønsdal that was examined for bark-peeled trees, a number of cultural remains have been recorded, among others 28 hearths of different types, one turf hut, three remains of turf hut sites, one stone mound, two reindeer fences, one resting place for reindeer, and two storage places (*luovvi*). Furthermore, a cooking pit probably from the Late Iron Age or Early Medieval is known (Arntzen 1987: 143; Hedman 2012).

In addition, the physical cultural remains recorded only a few kilometres west of Lønsdal, from Sørelva to Lake Kjemåvatnet, should be mentioned. Here many hearths, two sacrificial sites, and overhangs or rock shelters have been found (the latter are places where the Sámi stayed overnight). All these remains are related to the reindeer-herding culture (Arntzen 1987: 148). None of these cultural remains, including the finds at Lake Kjemåvatnet, have been dated, but nevertheless bear witness to a long presence of the Sámi, possibly from the days of Sámi hunting culture and up to the present time (Arntzen 1987: 148). Also the 116 stallo-sites known in Saltdal mountain should be mentioned – this is the largest known contiguous area with stallo-sites (Hedman 2012). During the 1600s, however, the Sámi occur increasingly in the written sources, illustrating the area's importance as pasture land for reindeers belonging to the growing number of Sámi (Hutchinson 2006: 74 ff).

RECORDING OF BARK-PEELED TREES

During 2006–09 we recorded all living and dead pine trees with bark-peelings of Sámi origin within a 4.5 square kilometre area on both sides of the Lønselva River (Fig. 1). The searched area included the pine tree line to the east, west, and south. We recorded tree position, size of the scar(s), height of lower scar edge, scar's compass direction, and tree's diameter at breast height (DBH). For dating purposes, we collected cores from the trees with an increment borer. Because of the long time since scarring, the scars were partially overgrown. This healing process appears mostly on the sides of the scars and to a lesser extent on upper and lower edges. Cores were therefore taken either from the upper or lower scar edge. We also collected an increment core from the opposite side of the tree to achieve as many tree-rings as possible. In some studies the increment cores have been collected from the overgrowing zone of the tree, thus trying to hit the original scar edge exactly (Swetnam 1984; Zackrisson et al. 2000; Stryd & Lawrie 2001). However, the scar edge is difficult to hit since the original width of the scar is unknown, and this increment sampling procedure may require drilling several core holes before a proper sample is achieved. Our sampling procedure was selected to minimize the number of core holes in the trees. The disadvantage of our sampling method is that some tree-rings on the scar surface may have eroded after many years of weathering, and therefore producing a scar date possibly a few years older than the correct one. However, we assume this error to be low since we searched the scar surface for locations of no or only little erosion close to the scar edges.

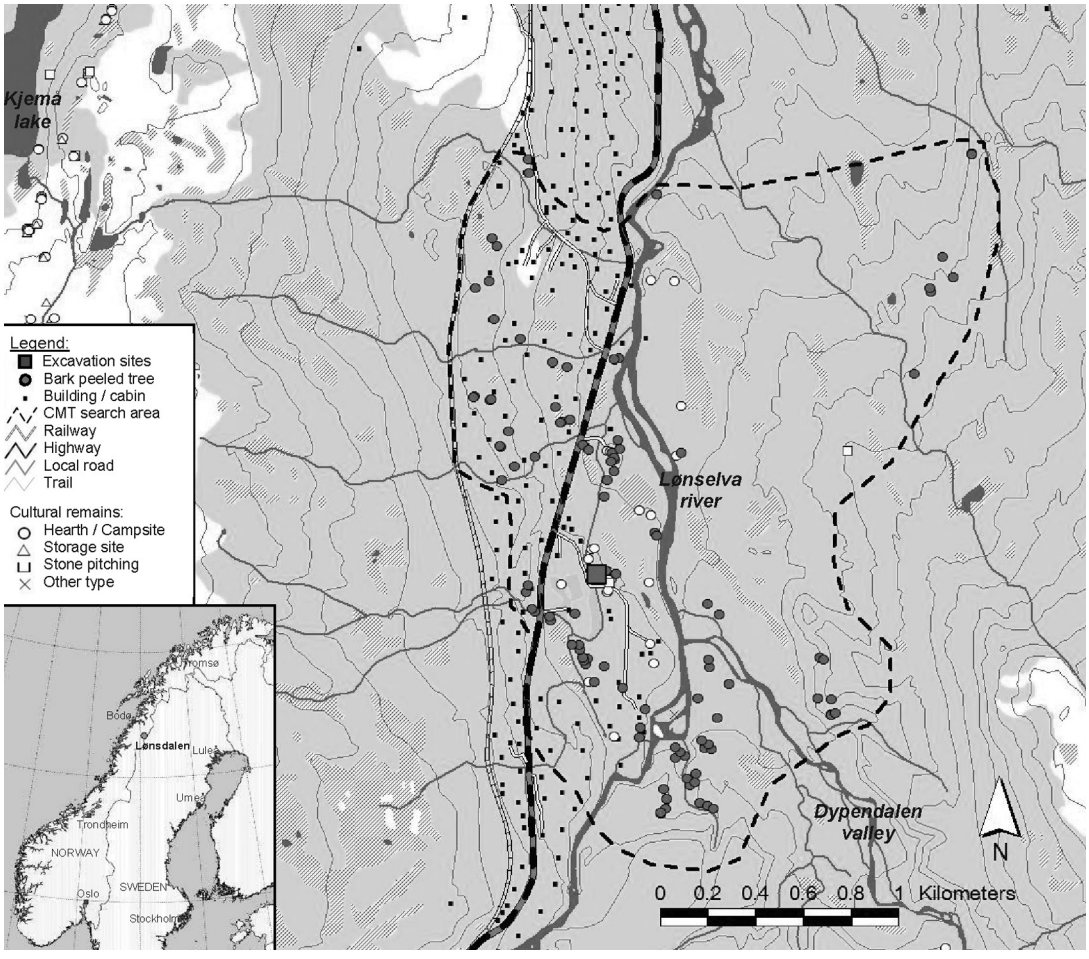

Fig. 1. Lønsdal is located in the western part of the Pite Sami area.

Fig. 2. Bark-peeled tree in Lønsdal, peeled in 1859.

Cross-dating procedure

In the laboratory, we used a scalpel to prepare the increment cores. We added zinc paste to the treated surface to make tree-ring boundaries more visible, and the tree-ring widths were measured with an Addo-micrometer (accuracy 0.01 mm). The cores from the scar surfaces were cross-dated against the tree-ring series cored from the opposite side of the same tree, and also against a tree-ring index chronology developed in the study area. The dating chronology was based on 17 old living trees, with a sample depth of ≥5 tree-ring series dating back to year 1602 (K.O. Storaunet, unpublished data). Cross-dating was performed using the program COFECHA (Holmes 1983; 1994) and controlled by a visual inspection on the conformity between the chronology and the tree-ring series.

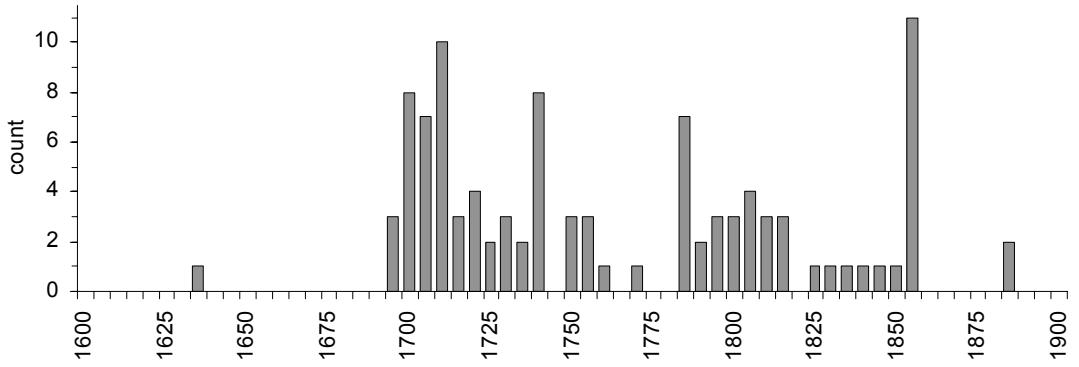

Fig. 3. The dated bark peelings in Lønsdal distributed over time in 5 year -classes (n = 103).

We estimated the total age of the scarred trees by identifying the oldest tree-ring in the increment cores. If increment cores failed to hit the pith, the length of the missing radius was estimated by matching the curvature of the inner rings to concentric circles drawn on a clear plastic sheet (Applequist 1958; Motta & Nola 2001). The mean ring width of the ten innermost tree-rings was used to estimate the number of rings in the missing radius. Finally, the estimated age at coring height was transformed to total age by adding an estimate of 1 year per 10 cm of height difference between ground level and coring height.

Bark-peeled pine trees in Lønsdalen

Within the study area we found 107 scarred pine trees with a total of 125 bark-peelings, as most trees had one bark-peeling only (Figs. 1&2). This represented an average of 24 scarred trees per square kilometre. A higher density was recorded on the western side of the river compared to the eastern side (39 and 15 per square kilometre, respectively), although the micro-region south of Dypenåga River and east of Lønselva River had even higher density compared to the western side (Fig. 1). 94 of the trees were living, and all but one of the dead trees were located on the eastern side of the river. The lack of dead, scarred trees on the western side is possibly due to the numerous mountain cabins present, as their owners have probably utilized dead trees for firewood during the last decades .

103 bark-peelings were successfully dated, with the oldest scar surface dating back to 1636 and the youngest to 1888 (Fig. 3). Most of them dated to the early 1700s, followed by a period with fewer bark-peelings. Around 1800 the number increased, and many peelings were made also the 1850s. That only a few scarred trees dated earlier than 1700 may result from the fact that only a few trees living still today had an appropriate size for barking then, as well as from tree mortality, decomposition, and removal of dead trees for firewood. The lack of scars younger than 1860 is probably due to a combination of general cessation of utilizing pine inner bark by the Sámi people (Niklasson et al. 1994; Zackrisson et al. 2000; Östlund et al. 2003), and that the Sámi people experienced several years with wolves and bad winter conditions at that time, finally resulting in the termination of Sámi utilization of the area (Kalstad & Brantenberg 1987).

The size of the scars showed large variation, with a mean scar height of 63±28 cm (±1 SD) (Fig. 4). This corresponds well with the results of Niklasson et al. (1994), who analyzed bark-peeled pine trees around Lake Sädvajaure, located only 50–60 km south-east of Lønsdalen. However, the distribution of scar heights does not resemble the

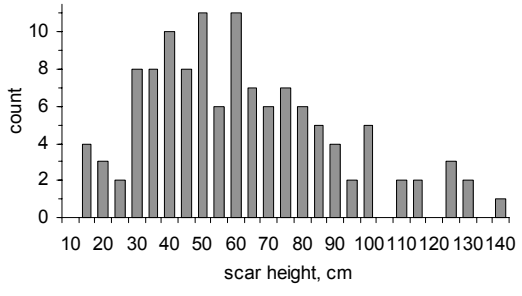

Fig. 4. Scar height of bark-peeled pine trees in Lønsdalen.

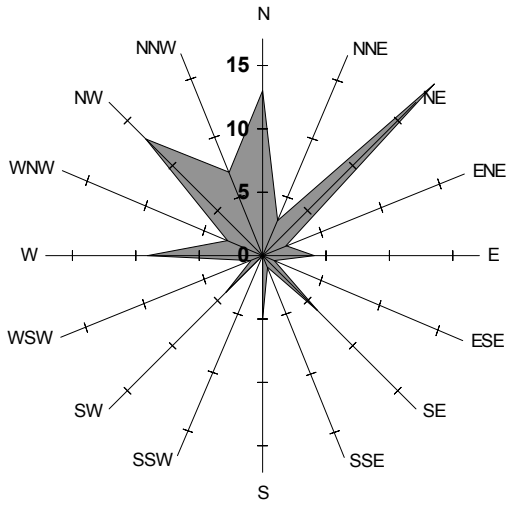

Fig. 5. The orientation of bark-peeled pine tree scars in Lønsdalen.

characteristic pattern found by Zackrisson et al. (2000). Their distribution showed three distinct peaks, interpreted to point out the original usage of inner bark by the Sámi: storing sinews in rolled-up cases, storing sinews in double-folded cases, and using inner bark for food.

The height from the ground to the lower scar edge correlated significantly to scar height ($p < 0.001$, $R^2 = 0.31$), illustrating that the bark of the trees was removed at person's general working height. The oldest scar in trees was mainly directed to the north, with 63% having the main direction between north-west and north-east (Fig. 5). This has been interpreted as a general religious tradition (Zackrisson et al. 2000), reflecting strong influence of northerly and southerly directions in various Sámi cultural and religious events (Manker 1938; 1950).

Many of the bark-peeled pine trees had high age. The youngest tree had an estimated total age of 220 years (in 2009), whereas the oldest pine was 559 years old. The mean age of living trees was 392±80 years, whereas the mean age when the first scar was made was 148±54 years. The latter figure is somewhat higher than the ages found by Zackrisson et al. (2000) and Bergman et al. (2004).

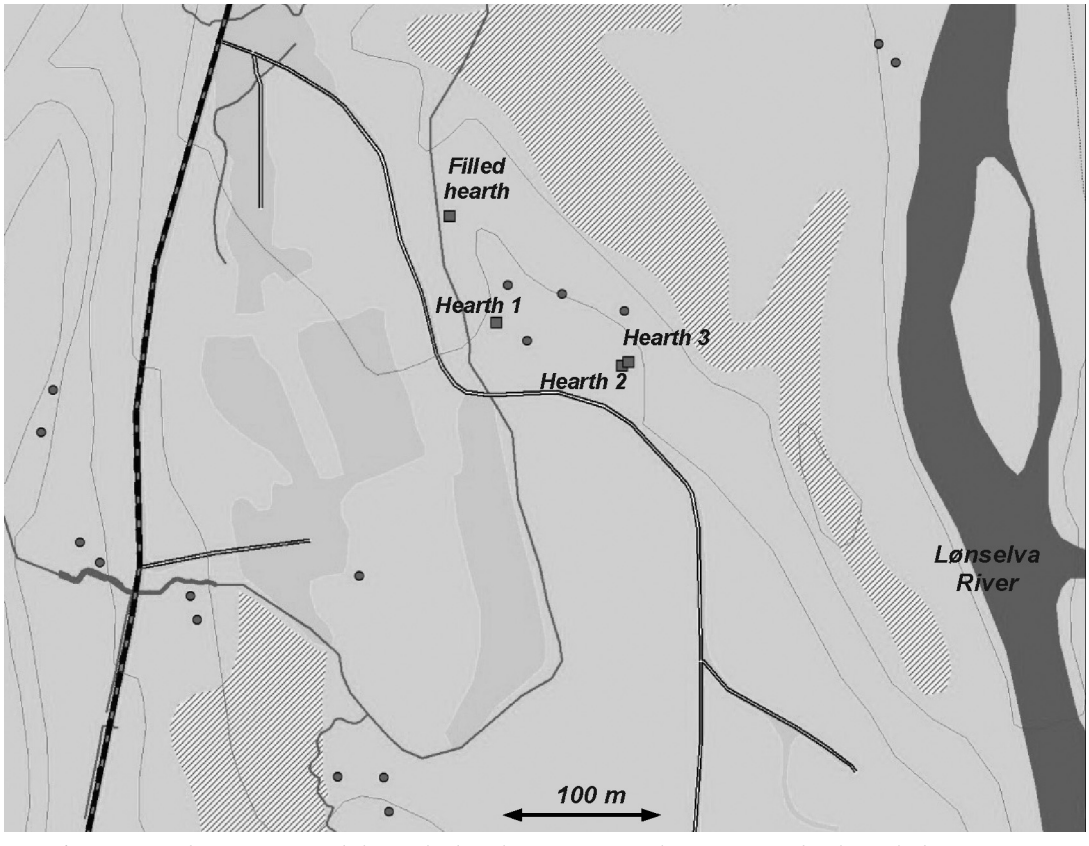

Fig. 6. Excavated sites in Lønsdal, marked with squares; circles represent bark-peeled trees.

Fig. 7. The excavated area of hearth no. 1 in Lønsdal. Stones were documented in the centre of the hearth.

ARCHAEOLOGICAL EXCAVATIONS

We carried out archaeological excavations at a heather-dominated, pine-forested moraine terrace, where a number of physical cultural remains had been recorded. The terrace is located at 480 m asl., and bordered by the River Lønselva in the east and a marsh on the north-eastern side. First, two cultural remains on the western part of the terrace, near the edge leading down to a brooklet, had previously been recorded as *assebaktegrav* (Arntzen 1987). *Assebaktegrav* refers to physical cultural remains that Povl Simonsen (1982: 591; 1997) registered on the Finnmark plateau and defined as graves. Today, however, the general assumption is that these features are hearths. They are filled with fragile stones and are usually larger than hearths without stones. To distinguish such hearths from other types, we use Mulk's (1994: 147–9) term 'filled hearth' of these cultural remains. Second, seven hearths and a pit that may have functioned as a deposition pit were also documented on the terrace. Within a radius of 50 meters from these remains, four bark-peeled trees were recorded by us.

Four sites (hearths) were selected for excavation (Fig. 6), which concentrated on documenting the hearth and the immediate area around the fireplace. A total of 11 m^2 were excavated. The first of these, a filled hearth, was clearly visible as an oval-shaped hearth (Fig. 7). A number of fragile stones were located in the middle of the fireplace, and the soil beneath it was red due to strong heat. Several small fragmentary bones and glass shards were found in the excavation area. Two birch charcoal samples (*Betula pubescens* Ehrh.) from the hearth were radiocarbon-dated (Table 1). The datings matched relatively well, and the calibrated radiocarbon age indicates several possible periods when the hearth could have been used, all within the period AD 1540–1950. The hearth was partially overgrown – as this probably takes place slowly in this area, we assume that the filled hearth was not used in the 1900s.

Second excavated remain, hearth no. 1, was visible on the ground as an oval-shaped fireplace. The excavations revealed that its centre was filled with stones. No finds were made in the fireplace, except charcoal. Two pine charcoal samples were dated to the period AD 1170–1380. Additionally,

Table 1. Radiocarbon datings of four hearths from Lønsdal, Saltdal.

Locality	Code	Date	cal. BC/AD (2σ)	Species
Filled hearth/*assebaktegrav*	Beta-273975	230±40 BP	1540, 1630–1680, 1740–1810, 1930–1950 AD	Betula
Filled hearth	Beta-273976	180±40 BP	1650–1710, 1710–1880, 1910–1950 AD	Betula
Hearth no. 1	Beta-273977	790±40 BP	1170–1280 AD	Pinus
Hearth no. 1	Beta-315525	700±30 BP	1270–1300, 1370–1380 AD	Pinus
Outside hearth no. 1	Beta-273978	2790±40 BP	1020–840 BC	Pinus
Hearth no. 2	Beta-273979	1180±40 BP	720–740, 770–970 AD	Pinus
Hearth no. 2	Beta-273980	1170±40 BP	770–980 AD	Pinus
Hearth no. 2	Beta-336008	960±30 BP	1020–1160 AD	Pinus
Hearth no. 3	Beta-273981	360±40 BP	1440–1640 AD	Pinus
Hearth no. 3	Beta-315526	610±30 BP	1290–1410 AD	Pinus
Outside hearth no. 3	Beta-273982	2990±40 BP	1380–1330, 1330–1120 BC	Pinus

a charcoal sample from outside the fireplace was dated to 840–1020 BC. Third investigated feature, hearth no. 2, was rectangular in shape. Also here only charcoal was found within the excavation area. Three pine charcoal samples were dated to the period AD 720–1160. Hearth no. 3 was well marked and clearly visible, being rectangular in shape with a *boassjustein* on its south-western side (Fig. 8). A *boassjustein* is a large flat stone at the back of the fireplace (i.e. lying on the opposite side of the tent opening) and marks the transition to tent's 'kitchen department'. There were no finds in the excavation area apart from an amount of charcoal within the fireplace, as well as some outside it. Two pine charcoal samples from the fireplace gave a calibrated age AD 1290–1640, but a sample outside the fireplace was dated to the period 1120–1380 BC.

Discussion of the archaeological material

The first excavated structure, a filled hearth, had originally probably some kind of tent above it, with the fireplace located in the centre. In Sweden, this kind of cultural remains can be found all over the traditional Sámi settlement area, in all ecological zones apart from areas above the tree line. Most occurrences, however, are found in pine forests. Such areas have typically been interpreted as winter pastures, and the settlements as winter dwellings (Mulk 1994: 147–9; Hedman 2005). The investigated filled hearth is located on the north-western edge of the moraine plateau, so close to the slope that it is unlikely that the site had a tent above the fireplace – also the ground surface at the site is very uneven. These observations indicate that the location was used during wintertime and that the fireplace was probably placed in a bare location in an otherwise winter-dominated landscape. When there was snow on the ground it would have been possible to have a tent here as the ground's unevenness did not cause problems. Also, the soil beneath the fireplace seems to have been exposed to strong heat, indicating intensive fire within the fireplace. It is therefore likely that people stayed at the site during a cold time of the year. Possibly, the location has been used as a winter settlement or from March through April, as indicated by the mission's report from 1729–30 (Qvigstad & Wiklund 1909b: 346).

The three other hearths were not built as distinctly as the filled hearth. Possibly, stones from the hearths have later been moved to new sites in the vicinity. All fireplaces are interpreted as remains of dwellings, where the fireplace has formed the centre of a tent structure (see Roung 1937: 42). The settlements appear to be temporary, as there was no clear soil layers associated with the dwelling. There were no finds from the three hearths either, and they seem to be smaller than the typical fireplaces used in the winter, like the filled hearth. Furthermore, we did not find the same red-burned soil beneath the fireplaces as we did under the filled hearth, possibly implying that these hearths were not associated with winter settlements. However, one of the hearths (no. 1) is located on uneven ground. This may indicate that the ground was snow-covered when the site was used. In the case of hearth no. 3, stones were found in the centre of the fireplace. Possibly it was necessary to conserve the heat in the tent after the fire had burned out, indicating that it was cold when the site was used. Nevertheless, the fire had

not burned so intensely that it left traces beneath the fireplace.

The amount of snow in Lønsdal from the early 1970s to the present shows that the ground is usually snow-covered until mid-May (NMI 2013). Only rarely the snow remains on the ground until late May. Therefore both hearths no. 1 and 3 may possibly have been used when snow was still covering the ground. The two settlements may therefore have been established in the early part of May, as the written sources suggest. At this time, the degree of coldness would not have required an intense fire, as might have been the case during the winter. Thus, it is likely that the hearths were used for short periods during May and/or June, and that the stays were probably of short duration.

All the radiocarbon datings were obtained through AMS-method, and together cover the period from the end of Iron Age or Early Medieval until recent times. The charcoal samples from the three hearths were pine wood. Pine is resistant to decomposition, implying that it could have been used as firewood even after being dead for some years. Thus, it may display an older age than the actual settlement's age at the site. Another factor is that the inner part of a tree is older than its outer part. Since we do not know whether our samples were from old, dead trees or whether they came from the inner or outer part of the trunk, is it possible that the sites were used in more recent times than the datings suggest. On the other hand, dating of two or three samples from the same locality approximately to the same time period increases the likelihood that the datings actually indicate the time when the locality was used.

The oldest excavated locality was hearth no. 2 with datings suggesting that the site was used in the Late Iron Age or Early Medieval (AD 720–1160). Such an interpretation is strengthened by the fact that a few kilometres upstream the valley, several stallo-sites have been dated approximately to the same period (Storli 1994) and it is therefore likely that the area was used at that time. Hearth no. 1 was dated within the period AD 1170–1380. The dating of hearth no. 3 varies to some extent. The calibrated datings cover the period AD 1290–1640, with the older date falling within AD 1290–1410, and the younger date AD 1440–1640. Samples outside two fireplaces (no. 1 and 3) were dated earlier than 1000 BC. We interpret these to be traces of earlier human activity or natural forest fires in the area.

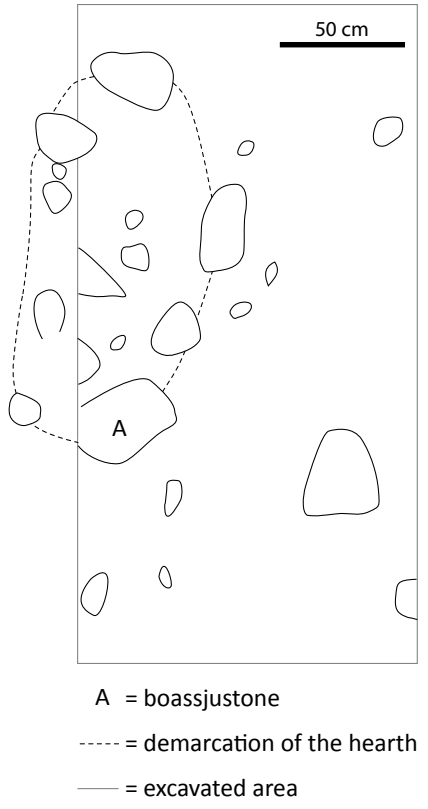

Fig. 8. Illustration of hearth no. 3 in Lønsdal.

To summarize, the datings propose that the area has been used from the end of the Iron Age or Early Medieval until more recent times. Also, we argue that three of the four hearths were used during May–June, while the filled hearth (*assebaktegrav*) was probably used during the wintertime.

THE LØNSDAL CASE STUDY

In Sámi pastoralism it has been necessary to change between different types of pasture, i.e. grass pastures during the summer and lichen pastures during the winter. For the nomads in Pite Lappmark, this alternation was generally characterized by yearly migration pattern, with winter settlements east of the high mountains between Sweden and Norway (called '*Kjølen* ') and summer settlements west of this mountain range. Western Sámi also moved to Lønsdalen and stayed there in the winter.

The reindeer herders of Pite Lappmark moved across Kjølen before or during the first part of

May, because they wanted to reach their summer settlements when the reindeer started to calve in the spring. For example, in 1743, one of Schnitler's witnesses, Jon Pedersen, stated that it was important to be on the western side of Kjølen before *Korsmesse* (3 May), since this was the time for reindeer calving (Qvigstad & Wiklund 1909a: 128). It is not known where the calving places were located, but most likely they were situated in the upper part of the pine dominated forest or just above the tree line.

The Sámi did not just herd their reindeer while staying in the area, as evidenced by numerous recorded bark-peeled trees. The dendrochronological datings show that these peelings originate from the early 1600s to the late 1800s. The bark-peeled trees are located in the same area with hearths and other physical cultural remains indicating that the area was used during the spring by the reindeer-herding Sámi.

The bark was commonly collected in June, at the time when the trees were sappy. In the Lule Sámi language June is called *biehtsemánno,* meaning 'pine month'. Since traditional knowledge of the bark has given the month its name, it is likely that bark-peeling has been an important and old tradition among the Sámi. It was, however, possible to peel bark even earlier than June. Sigrid Drake claims that the Sámi peeled bark whenever they were able to. They could start scraping the pine as early as the Easter season, and this took place in both Lule Lappmark and in Ranbyn (Drake 1979 [1918]: 154).

Written sources show that the Sámi of Pite Lappmark moved into Lønsdal in the late spring. The reindeer herders' calving land was in the upper tree line or just above it, whereas the main settlements were located just below the tree line, in the forest. It is uncertain whether the location of filled hearth can be linked to this migration pattern since it probably was used during the winter. However, as previously mentioned, there are a number of documented hearths in the area, many of which probably date from the period after the 1600s and many of these can probably be attributed to the Sámi reindeer herders' spring migration. Sámi reindeer herders stayed in the area from early spring until midsummer, when they moved to the high mountains. In this period they also harvested inner bark from the pine trees.

Inner bark can be eaten right after it has been harvested from the trees, or be mixed with reindeer milk. Collecting pine bark was inextricably linked to the old herding tradition, where milking was important, since the bark was often mixed into the milk and eaten fresh (Drake 1979 [1918]: 154; Zackrisson et al. 2000: 103). Families with large herds and relatively tame reindeer produced larger quantities of milk, and consequently the need for inner bark increased (Zackrisson et al. 2000: 103). In the mid-1700s the number of Sámi families and reindeer coming from Pite-Sámi area to Salten was high. We can assume that many of them migrated to Lønsdalen because this area was located in one of the most used gateways to Saltfjellet mountain. It is likely that the reindeer herder faimilies, who milked their reindeer intensively, put emphasis on harvesting bark. This explains the occurrences of bark-peelings in the area.

Three of the excavated sites were dated to the period from the end of the Iron Age or Early Medieval until 1600. They were located in the area where many bark-peeled trees have been identified. Thus, the question arises whether the pre-1600 sites can be interpreted in a similar manner as those from the period after 1600.

Bark was a resource that has been important to the Sámi households, and we must assume that the bark was important also before the 1600s. The absence of bark-peelings from this early period is due to several factors. The trees may have been logged or harvested for firewood. There are many cabins in the area today, and standing and fallen dead trees may have been used as firewood. Moreover, natural mortality and decomposition are a probable reason for the absence of bark-peelings earlier than 1600. The discovery of sub-fossil pine logs with bark-peelings in regulated lakes close to indigenous archaeological sites in Arjeplog, Sweden, shows that the bark-peeling tradition in Pite Lappmark has been practiced for a very long time. Radiocarbon datings indicate that bark-peeling occurred as long as 2800 years ago (Östlund et al. 2004). Other studies support the Swedish bark harvesting in the Pite-Sámi area (Niklasson et al. 1994; Östlund et al. 2003). Further, equipment to remove bark from trees has been found in an excavated settlement in Juikenttä, northern Finland, dated to AD 1200–1600 (Carpelan 1975: 63). Therefore, there is no reason to propose that the use of bark started in Lønsdal only in the 1600s, but that it was common to use bark also before this time, even though the traces of this activity have vanished.

Several of the excavated hearths were probably used in the early spring, i.e. in May. No finds were made from the excavated sites that could be directly related to the bark-peelings, and the link between settlements and bark-peeled trees is based on their close location with each other. In addition, the datings of the sites overlap with the datings of the bark-peelings. The sites were therefore probably established to harvest bark from the pine trees, already from the end of the Iron Age or Early Medieval on. Thus, our results confirm a long historical and cultural tradition.

CONCLUSIONS

Traditional sources emphasize that pine inner bark was an important resource for the Sámi, which was harvested in the spring. Traces of this harvest may be found today as bark-peelings on pine trees. The bark was either eaten immediately after it was harvested from the trees, or mixed with other products, preferably reindeer milk.

In Lønsdal many bark-peeled trees have been recorded. Dendrochronological datings show that the bark was removed from the trees from the early 1600s until the late 1800s. In the same area, a number of hearths have been excavated and interpreted as Sámi settlement sites. Written sources show that this area has been important for the reindeer-herding Sámi for centuries, who moved into the area during springtime. One of the reasons was that the reindeer calved here, but at the same time the Sámi harvested bark from the pine trees. Based on the archaeological investigations, we assume that the tradition of bark-peeling in this area goes back to the end of the Late Iron Age or Early Medieval.

REFERENCES

Unpublished sources

Hedman, S.-D. 2012. Rapport över dokumentation av samiska kulturminnen i Beiarn, Rana och Saltdalen kommuner, Nordland 2011–2012. Unpublished research report.

Internet sources

Norwegian Meteorological Institute 2013. Free access to weather- and climate data from Norwegian Meteorological Institute from historical data to real time observations. http://eklima.met.no. Accessed 27 March 2013.

Literature

Andersen, O. 2011. Reindeer-herding Cultures in Northern Nordland, Norway: Methods for documenting traces of reindeer herders in the landscape and for dating reindeer-herding activities. *Quaternary International* 238: 63–75.

Applequist, M.B. 1958. A simple pith locator for use with off-center increment cores. *Journal of Forestry* 56: 141.

Arntzen, A.H. 1987. *Registrering av samiske kulturminner på Saltfjellet-Svartisen 1986.* Universitetet i Tromsø, Tromsø.

Beach, H. 1981. *Reindeer-herd management in transition: The case of Tuorpon sameby in Northern Sweden*. Acta Universitatis Upsaliensis/Uppsala Studies in cultural Anthropology 3. Almqvist & Wiksell International, Stockholm.

Bergman, I., Östlund, L., & Zackrisson, O. 2004. The use of plants as regular food in ancient subarctic economies: A case study based on Sami use of Scots pine innerbark. *Arctic Anthropology* 41(1): 1–13.

Bergman, I., Liedgren, L., Östlund, L. & Zackrisson, O. 2008. Kinship and settlements: Sami residence patterns in the Fennoscandian alpine areas around A.D. 1000. *Arctic Anthropology* 46(1): 97–110.

Bergsland, Knut 1978. 'Lais Lappebyen', In *Kultur på karrig jord: festskrift til Asbjørn Nesheim*: 77–100. Norsk folkemuseum, Oslo.

Carpelan, C. 1975. Sompio: Kemijoki 8000-laxälv i norr. In A. Erä-Esko (ed.), *Forntiden i Kemiälvområdet under åtta årtusenden i arkeologisk belysning*: 63–9. Helsinfors Universitet, Helsingfors.

Drake, S. 1979 [1918]. *Västerbottens lapparna under förra hälften av 1800-talet: etnografiska stuier*. Lapparna och deras land: Skildringar och studier utgivna av Hjalmar Lundholm VII. Almqvist & Wiksell, Umeå.

Hedman, S.-D. 2005. Renskötselns uppkomst i Övre Norrlands skogsområden. In: O. Andersen (ed.), *Fra villreinjakt til reindrift*: 13–32. Tjálarájddo/Skriftserie nr.1. Báhko. Árran Lulesamisk senter, Ájluokta.

Holmes, R.L. 1983. Computer-assisted quality control in tree-ring dating and measurement. *Tree-Ring Bulletin* 43: 69–78.

Holmes, R.L. 1994. Dendrochronology program library – Users manual. University of Arizona, Tucson.

Hutchinson, A. 2006. *Saltdal: gård og slekt. Bind* 4. Saltdal kommune, Rognan.

Kalstad, J.A. & Brantenberg, O.T. 1987. *Reindrift, samiske samfunn og kultur på Saltfjellet: Vassdragsutbygging i Saltfjellet-Svartisenområdet*. Universitetet i Tromsø, Tromsø.

Liedgren, L.G., Bergman, I.M., Hörnberg, G., Zackrisson, O., Hellberg, E., Östlund, L. & Deluca, T.H 2007. Radiocarbon dating of prehistoric hearths in alpine northern Sweden: problems and possibilities. *Journal of Archaeological Science* 34(8): 1276–88.

Manker, E. 1938. *Die Lappische Zaubertrommel* I [The Lappish magic drum I]. Acta Lapponica 1. Nordiska Museet, Stockholm.

Manker, E. 1950. *Die Lappische Zaubertrommel* II [The Lappish magic drum II]. Acta Lapponica 6.Nordiska Museet, Stockholm.

Motta, R. & Nola, P. 2001. Growth trends and dynamics in sub-alpine forest stands in the Varaita Valley

(Piedmont, Italy) and their relationships with human activities and global change. *Journal of Vegetation Science* 12: 219–30.

Mulk, I. 1994. *Sirkas – ett samiskt fångstsamhälle i förändring Kr.f. – 1600 e.Kr.* Studia Archaeologica Universitatis Umensis 6. Arkeologiska institutionen, Umeå.

Niklasson, M., Zackrisson, O. & Östlund, L. 1994. A dendroecological reconstruction of use by Saami of Scots Pine (*Pinus sylvestris* L.) inner bark over the last 350 years at Sädvajaure, N. Sweden. *Vegetation History and Archaeobotany* 3(3): 183–90.

Norges offentlige utredninger (NOU). 1984. *Om samenes rettsstilling*. NOU 1984:18. Universitetsforlaget, Oslo.

Olaus Magnus Gothus 1976 [1555]. *Historia om de nordiska folken*. Gidlunds forlag, Örebro.

Östlund, L., Ericsson, T.S., Zackrisson, O. & Andersson, R. 2003. Traces of past Sami forest use: An ecological study of culturally modified trees and earlier land use within a boreal forest reserve. *Scandinavian Journal of Forest Research* 18(1): 78–89.

Östlund, L., Bergman, I. & Zackrisson, O. 2004. Trees for food – a 3000 year record of subarctic plant use. *Antiquity* 78(300): 278–86.

Qvigstad, J. & Johnsen, O. 1912. *Svenske nomadlappers flytninger til Nordlands og Tromsø amter i ældre tid.* Grøndahl & Søns, Kristiania.

Qvigstad, J. & Wiklund. K.B. 1909a. *Renbeitekommissionen af 1907: Dokumenter angaaende flytlapperne m.m. samlede efter renbeitekommissiones opdrag af rektor J. Qvigstad og professor K. B. Wiklund. Vol.* I. Grøndahl & Søns, Kristiania.

Qvigstad, J. & Wiklund, K.B., 1909b. *Renbeitekommissionen af 1907: Dokumenter angaaende flytlapperne m.m. samlede efter renbeitekommissiones opdrag af rektor J. Qvigstad og professor K. B. Wiklund. Vol.* II., Grøndahl & Søns, Kristiania.

Ruong, I. 1937. *Fjällapparna i Jukkasjärvvi socken*. Geographica, Skrifter från Uppsala universitetets geografiska institution 3. Appelbergs, Uppsala.

Ruong, I. 1982. *Samerna i historien och nutiden*. Aldus akademi, Stockholm.

Schnitler, P. 1985 [1929]. *Major Peter Schnitlers grenseeksaminasjonsprotokoller 1742–1745. Bind* II. Norsk historisk kjeldeskrift-institutt, Oslo.

Simonsen, P. 1982. *Veidemenn på Nordkalotten 4: Jernalder og middelalder*. Stensilserie B. Historie 21. Universitetet i Tromsø, Tromsø.

Simonsen, P. 1997. Assebakte tombs and rowhearth: Did the Sami once practice cremation? *Acta Borealia* 14(2): 59–65.

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

Stryd, A.H. & Lawrie, S. (eds.) 2001. *Culturally modified trees of British Columbia – A handbook for the identification and recording of culturally modified trees*. British Columbia Ministry of Forests, Nanaimo.

Swetnam, T.W. 1984. Peeled Ponderosa pine trees: A record of inner bark utilization by Native Americans. *Journal of Ethnobiology* 4: 177–90.

Zackrisson, O., Östlund, L., Korhonen, O. & Bergman, I. 2000. The ancient use of Pinus sylvestris L. (Scots pine) inner bark by Sami people in northern Sweden, related to cultural ecological factors. *Vegetation History and Archaeobotany* 9(2): 99–109.