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Prehistoric Reindeer Trapping by Stone-walled Pitfalls: news and views

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Rectangular stone-walled pitfalls, in contrast to originally wood-clad, oval or circular earth-dug traps of varying size, known from large parts of interior central and northern Fennoscandia and some circumpolar areas, are restricted to the central and southern Norwegian mountains and a minor area in the Swedish Scandes. While the first constructions are exclusively intended for passive capture of wild reindeer, the latter type appear to be meant both for elk and wild reindeer. In this paper the geographical distribution, topographical setting, physical construction and practical use of stone-walled pitfalls in the Setesdal Vesthei mountains of Southwest Norway are discussed, based on recent archaeological fieldwork.

Analyses of c. 60 pitfalls, constructed in isolation or, more rarely, as pairs, with or without special stone-built exterior approach constructions, demonstrate the traps to be lying systematically in waterside-oriented landscapes, or locations that exploit other forms of 'bottle-necks' that funnel the reindeer's (extant) migration trails. The dry-walled catchment chambers are as long as a person, up to 2 m deep and normally taper towards the bottom. They are intended not to kill, but to keep the prey alive for some time.

No pitfall in Scandinavia, stone-walled or earth-dug, has been convincingly dated back to the Stone Age. Radiocarbon dates determine at least five of nine objects excavated in Setesdal Vesthei to be between c. 600 and 1800 radiocarbon years old. The 'high mountain' pitfalls are interpreted not to form a vital part of the economy, but rather as a secondary income source for the agricultural settlements established in the neighbouring valley and fjord heads.

Introduction – wild reindeer, reindeer hunting

The high-mountains of the Scandinavian peninsula gradually became deglaciated between 10,500 and 8500 uncalibrated years before present (BP). Almost immediately, new land areas revealed from the inland ice cap appear to have been inhabited on a year-round basis by populations of tundra-type reindeer (*Rangifer tarandus tarandus* L.), which were forced to leave their original traditional coastal/lowland feeding grounds as a result of abrupt forest formation and other landscape changes. In coastal southern Norway the

youngest dating of reindeer so far is around 10,200 BP (Lie 1990), about one century after the main environmental change of scene from Arctic to Boreal conditions. After a marked decline in the reindeer population from about 9700 BP, the last individuals in lowland southern Sweden and Denmark existed until *c.* 9200 BP (Björck *et al.* 1996; Aaris-Sørensen *et al.* 2007).

Unlike the remaining parts of northern and central Europe where local reindeer herds were permanently wiped out around the Late Glacial – Early Holocene transition or during the Pre-Boreal chronozone (Barton & Roberts 2004), undomesticated Eurasian reindeer have survived until the present-day in their tens of thousands, ranging over wide areas in the southern Norwegian mountains. These 'four-legged nomads', the original inhabitants of the mountain wild land, are still hunted yearly, on a seasonal basis; an economic activity which forms a tradition stretching back *both* to the last reindeer hunters of continental Northwest Europe and to the first reindeer hunters in Southwest Norway about 10,000 radiocarbon years ago.

The continuous presence of wild reindeer since the close of the Late Glacial makes the Scandes in general, and interior South Norway in particular, a key-area for studies related to the application of different hunting methods through time. An understanding of present animal behaviour in those montane environments which remain relatively unchanged throughout the ages is also vital for the interpretation of human adaptation in prehistoric landscapes.

As with most other large-game hunting, wild reindeer may be downed by two main strategies: *active hunting* by bow and arrow from a short range normally within 25–30 m, or collective drives utilising 300–4000 m long fence systems and corrals or water bodies as reception and kill areas; or *passive hunting* by use of pitfalls, snares and other fixed entrapment facilities mainly for individual animals (eg, Berg 1951; Hvarfner 1965; Blehr 1973; Selinge 1974; Barth 1983; Bang-Andersen 1988). In this paper I will present and discuss the construction and actual use of *one* visually explicative, expressive and geographically highly restricted device for the passive capture of reindeer during prehistoric times: stone-walled pitfalls.

Stone-walled pitfall traps in South Norway

Overview

Pitfalls are here understood to be traps sunk into the ground as artificially dug cavities. They occur in three ways: as isolated sites; as a series connected by a stone or wooden fence; or as an uneven scatter within a limited or larger area. The capture of reindeer involves two main types of pitfall: oval or circular pits without an inner stone-lining, but originally partly or fully supported by a solid timber frame (Barth 1981; Bergstøl 2007); and rectangular cavities with unmortared stone-built chambers (Barth 1981; Bang-Andersen 2004).

Earth-dug *timber framed pitfall*s vary from *c.* 4–5 m in diameter (for elk) to *c.* 2–3 m (for reindeer). This variant has a northern and easterly main distribution in Fennoscandia, but is also known from the interior of South Norway and recorded from some sub polar and taiga areas in parts of Siberia. Rectangular *stone-built pitfalls* are geographically restricted to the Norwegian mountain range between Trollheimen in the North and Setesdal/Sirdal mountains in the South, with isolated examples in the inner part of Hedmark, the mountain region of Jämtland in the Swedish Scandes and a single (not finally verified) occurrence at Andøya in northern Norway. They were all intended for reindeer (Fig. 7.1). Whether constructed as individual sites or combined into smaller or larger systems, both categories of pitfalls were intended for the passive capture of individual animals as they paced, unsuspecting, on the brink of the precipice.

Until now, most archaeological research in Scandinavia has concentrated on the large rounded earth pits for elk (cf. Selinge 1974; Jacobsen & Andersen 1992). Investigation of stone-walled pitfalls of the highland type has normally been restricted to localisation, formal description and a more or less intuitive interpretation. Although they exist in their thousands, have been recognised as prehistoric monuments since the 1840s, are well known by the general public and often described in local and regional literature (and are unique to this part of the world), less than fifty stone-walled pitfall traps have been excavated, and even fewer have been dated. They may, accordingly, be classified as 'the bad conscience of Norwegian archaeology', and are ripe to be

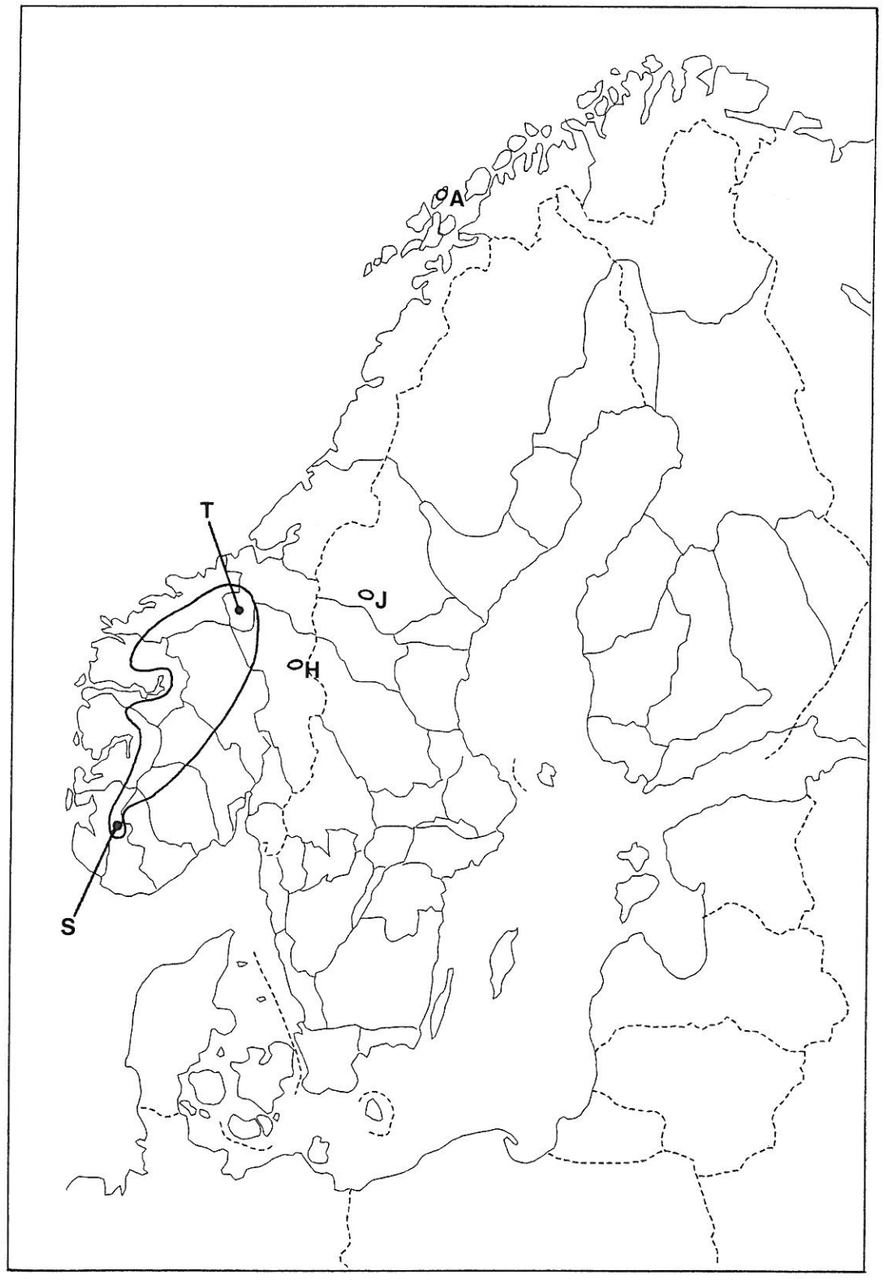

Figure 7.1: The known distribution of stone-walled reindeer pitfall traps in Fennoscandia (with country and county borders), and also on a world basis. S = Setesdal/Sirdal, T = Trollheimen, H = Hedmark, J = Jämtland, A = Andoya (not finally verified)

put on the scientific agenda for more detailed analyses.

This paper presents and interprets a group of stone-walled reindeer pitfalls which have been identified and archaeologically investigated in the Setesdal Vesthei mountains in Southwest-Norway over the last thirty years (Bang-Andersen 2004). Special attention is

drawn to the landscape-setting of this trap type, its physical construction and usage history.

The study area, covering *c.* 400 sq km, halfway between the heads of the inner Ryfylke fjords east of Stavanger and upper part of the long and narrow Setesdal valley (cf. S in Fig. 7.1) consists of bare high mountain landscapes 900–1400 m a.s.l., well above the former and present tree line. Both the northern and the southern central part of the area, deglaciated about 8800 BP, have been utilised on a seasonal basis by hunter/gatherer groups since 7200–7000 BP according to twenty five radiocarbon dates from excavated open-air settlement sites (Bang-Andersen 1989; 1999; 2008). In addition to this early settlement, easily recognisable physical remains such as rock shelters, stone hut ruins, hunting hides, meat caches, and reindeer pitfalls, explicitly stamp the area as a *cultural landscape* used for reindeer hunting into more recent periods of time. Nevertheless, natural decay and deliberate refilling with stones to avoid accidents (whether to people, grazing sheep, or the wild reindeer that still roam the area), mean that few perfectly preserved pitfalls actually exist (Fig. 7.2). As a consequence, many of the pitfalls in the mountain area are difficult to locate, measure, and even define precisely. Of a total of *c.* 100 confirmed and possible reindeer pitfall traps, only 61 are definite; all of the rectangular, stone-built 'high mountain' type (Bang-Andersen 2004).

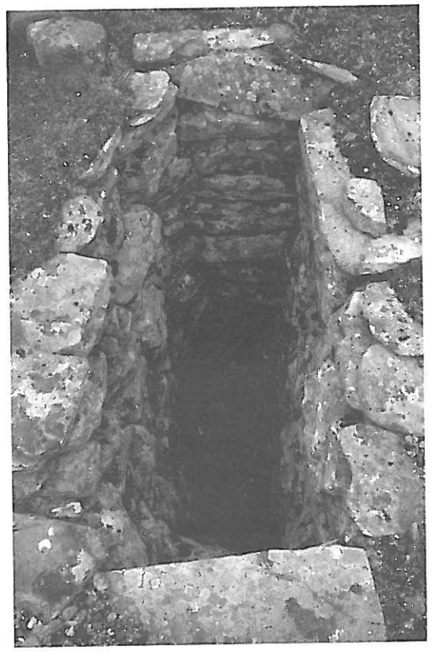

Figure 7.2: A perfectly preserved stone-walled chamber of a pitfall in Lisledalsfleene, Suldal, Rogaland county, SW Norway, clearly underlining the native designation of this group of monuments, dyregrav (animal grave), (photo: author)

Location and exterior fitting

The rugged, rocky, and water-dominated high mountain landscape of Setesdal Vesthei is naturally well suited to most kinds of reindeer hunting. The pitfalls are located in bare mountain areas between 785 and 1325 m a.s.l., with the majority between 900 and 1200 m. Of note is the systematic merging of open Stone Age sites, pitfalls, various other recent hunting remains, and present day reindeer trails at the lakes Øvre Storvatnet and Vestre Gyvatnet. The physical manifestations lie close to a topographical 'bottleneck' in the reindeer's seasonal main migration route between the South and North. In general the geographical distribution of the pitfalls is uneven: few areas have a clear concentration and several large mountain regions lack pitfalls, but this variation is not explicable either on grounds of topography or game distribution, or by a low level of research. So far the southernmost positively identified stone-walled pitfall in the study area (and in Norway, and probably in the rest of the world) is at Lake Degjevatnet in the Sirdal municipality.

46 pitfalls are well enough preserved to be analysed further as to location, dimensions and construction. 90% of the traps lie less than 100 m from a lake or riverside, and more than half are at most 10 m from the nearest water-edge (Fig. 7.3). The pitfalls efficiently exploit otherwise characteristic terrain routes at the foot of steep mountain sides, the floor of passes and gorges, or the ridge of narrow till deposits, which still serve to funnel and predict the reindeers' seasonal and daily movements. Most pitfalls are found singly, there are seldom two together, and they are never combined into the sort of larger continuous trap systems such as those known from level mountain areas with fewer lakes and other natural obstacles, for instance the eastern parts of the Hardangervidda plateau. Most of the pitfalls in Setesdal Vesthei are sited in such a way that they could catch reindeer migrating in two directions.

Where the location is not ideal, physical constructions in the form of low approach

walls of stone, diverging from one or both short-ends, a cleared approach path through uneven terrain and specially sized threshold slabs were often used in order to ease access to the traps. Most common are raised approach bridges from the chamber ends (identified outside 56% of the pitfalls), followed by approach fences (42%). Only seven traps (15%) lack any form of visible approach construction. The majority of these are located in narrow defiles between the water's edge and steep or rocky terrain where artificial barriers were not needed apart from the catchment chamber. One locality at the Langesæåi River in Vinje, however, is located in such a way that it is hard to see how the twin pitfalls of the system functioned without approach facilities, which were presumably made from timber. Postholes or posts of long wooden fences have been identified in association both with stone-walled and earth-dug pitfalls in other mountain areas in southern Norway.

Size and construction of the catchment chamber

The chambers of the 46 analysed pitfalls are without exception stone-built, on average 1.67 m long and 0.76 m wide. The relative width of each chamber varies considerably without any 'ideal ratio'. While the present depth is on average 1.1 m, depth is strongly dependent upon preservation conditions and artificial infilling, and says more about the state of the reindeer traps as cultural remains than about original depth. In order to eliminate the source of error created by degradation and infilling, a closer analysis has been carried out on 10 especially well preserved pitfalls, of which nine have been subject to archaeological excavation. The original length of the chamber opening varies widely, between 1.2 and 2 m, width between 0.5 and 0.85 m and depth between 1.3 and 1.9 m. The majority of the pitfalls have a rectangular fall opening and a chamber tapering towards the bottom both in longitudinal and cross section, of which approximately 75% is sunk into the ground.

Almost all traps have large vertical stone slabs lining the bottom of the chamber, which is otherwise constructed of dry stone walls with 5–15 courses of stone (Figs 7.2 & 7.4). There has never been any indication of vertical impalement stakes with pointed or spearhead-fitted upper ends, installed from the chamber bottom to kill or invalid the unlucky intruder (Fig. 7.4), in stone-walled pitfalls.

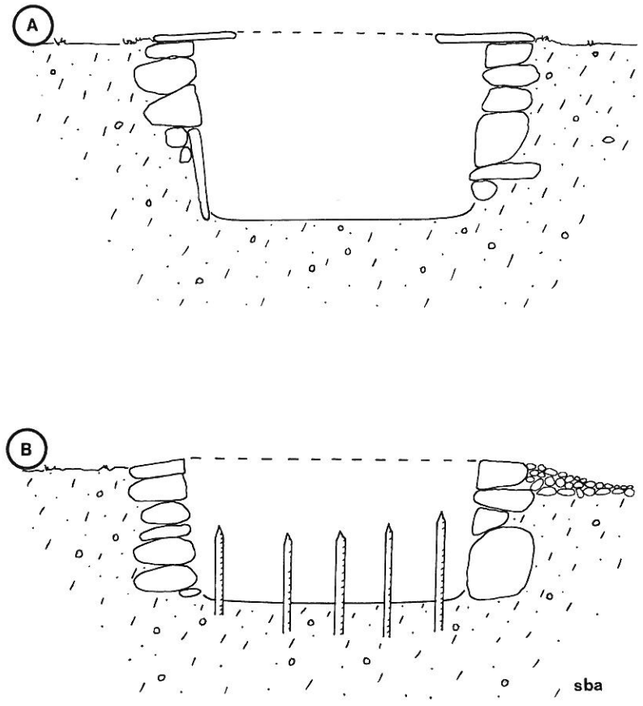

Figure 7.3: (left) A classic pitfall location at the waterfront of lake Langvatn, Bykle, A-Agder county, SW Norway, (photo: author)

Figure 7.4: (above) Imaginary longitudinal transects of stone-walled pitfalls, A: illustrating the normal situation with a 1.5–1.8 m deep unfurnished chamber, and B: a hypothetical case with a shallower chamber fitted with vertical pointed stakes. The chamber openings have been camouflaged (stippled lines), and the animals access to and descent into the chamber is facilitated by sliding threshold-slabs (A) or a specially adapted stone-piled rampart (B)

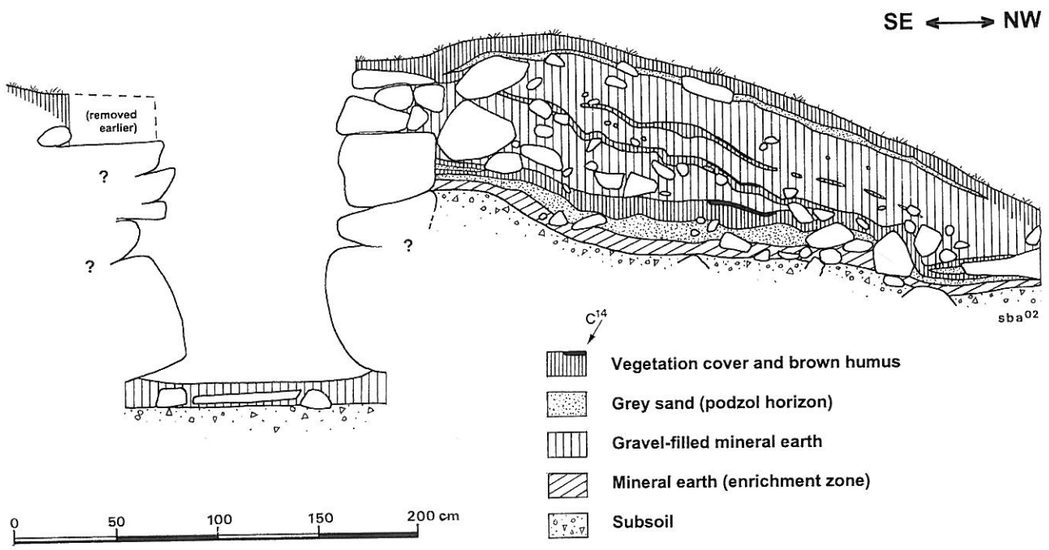

Figure 7.5: The transect of a stone-walled catchment chamber and artificially formed bank of earth bordering a pitfall at the riverside of Gyvassmidjom, Bykle, A-Agder county, SW Norway

Such stakes are, however, claimed to have been used occasionally in shallow, originally timber-walled pitfalls in the interior areas of east Norway (Barth 1981). As the reindeer meat would soon spoil after the puncturing of the stomach or chest, impaling was most probably a method used mainly in deadfalls and traps designed for wolves and other fur and predator animals.

Analysis of four pitfalls show that it was necessary to remove between 3.5 and 7.7 (on average five) cubic metres of soil and gravel before the construction of the stone-lining in the chambers could start. Consistent use of vertical slabs along the floor area has saved digging and also contributed towards making the trap more escape-proof. The amount of work needed to build a complete trap, including camouflage cover and exterior approach elements, must have varied a lot, and is calculated to have been between six and nine person-days of work. As the pitfalls were intended to keep the animal as unhurt as possible until it could be taken care of (put to death), the traps did not need continuous inspection so much as regular checking throughout the week.

Dating and use-history

So far no animal pitfall in Scandinavia, stone-walled or earth-dug, has been convincingly dated to the Stone Age. Six of the nine reindeer pitfall traps excavated in the Setesdal Vesthei between 1976 and 1979 have been radiocarbon dated: two using what is presumed to be the remains of the wooden camouflage cover found in the bottom of the chamber (Løken 1982), and four using sub-fossil surfaces preserved under the banks of removed gravel (Bang-Andersen 1988, 2004). According to the radiocarbon determinations, five of the pitfalls lie between 600 and 1800 radiocarbon years old, ie, they were used within a period from the Late Roman period until well into the Middle Ages, while a sixth pitfall trap may, possibly, date as far back as the Bronze Age. The pitfalls in the study area are partly contemporaneous with similar activity in Rondane in the Northeast Norwegian highlands, where most reindeer traps, albeit with varying and partly unsatisfactory documentation and precision level, have been dated to between *c.* 200 and 2000 BP (Barth 1983), and with use of pitfalls in Breheimen in the Northwest Norwegian mountains (Randers 1986).

While most dates of wood remains or artefacts such as iron arrows or spearheads found on the chamber bottom should be regarded as possible *termini ante quem* for the final use of the pitfalls, the radiocarbon ages of singular sub-fossil humus horizons in the artificial earth banks surrounding the pitfalls correspondingly represent *termini post quem* for their construction and initial use (Bang-Andersen 1988). In one extraordinary case,

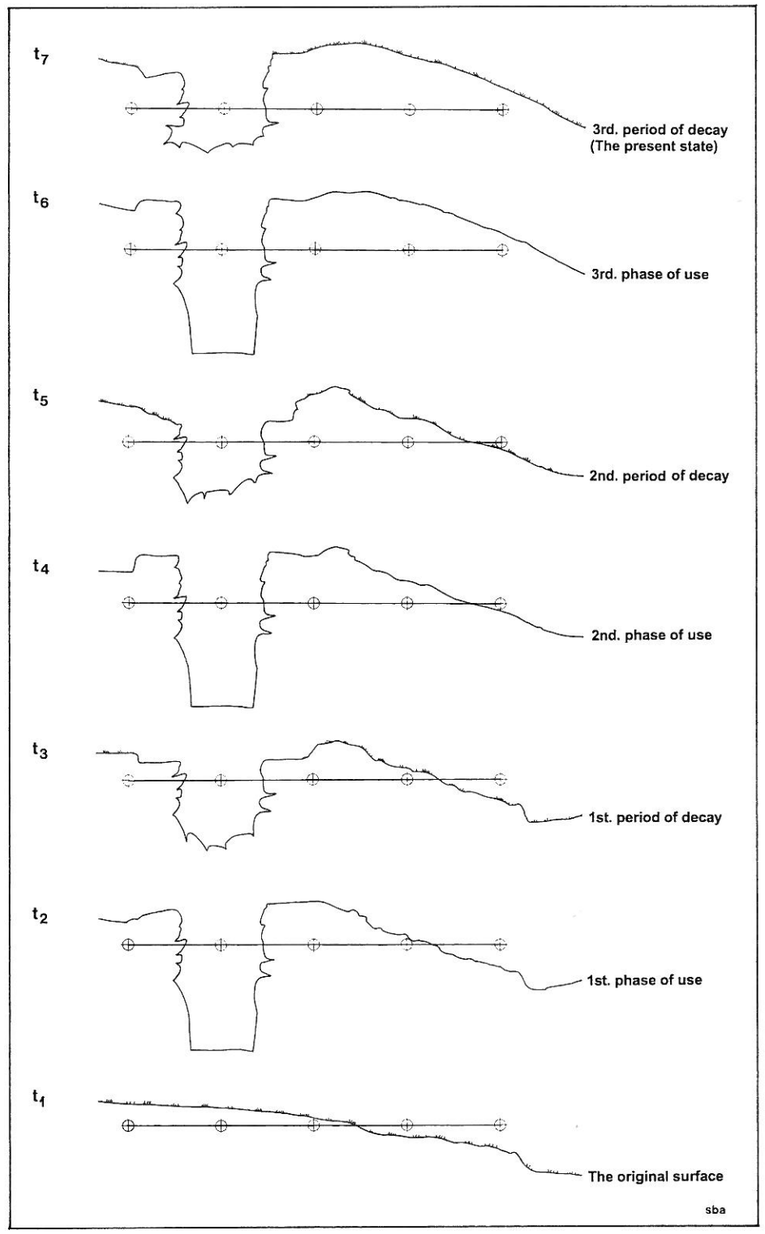

Figure 7.6: A summary of the history of construction with phases of use, decay and later re-use and re-decay of the reindeer pitfall at Gyvassmidjom depicted in Fig. 7.5. The total life of this trap probably only lasted for a few centuries, around 1,800 radiocarbon years BP

at Gyvassmillom in Bykle municipality, the layering of the earth bank proved to be more complex, with three sub-fossil humus horizons preserved in stratigraphic sequence (Fig. 7.5). According to the stratigraphy, the total use-history of this pitfall may be interpreted as six subsequent stages: three phases of use and three periods of decay, as depicted in (Fig. 7.6). Combined with environmental data, correlation with camp sites possibly

utilised during pitfall activities, and eventual contemporary utilisation of other pitfalls in this mountain area, Gyvassmillom also has potential for throwing light on questions of a wider range.

Compared with mountain regions in central South Norway, where they may occur in clusters by the hundreds, the small number of pitfalls in Setesdal Vesthei would hardly manage to provide for even a restricted group of people on an annual basis. Regarding the question of who was behind pitfall trap hunting in the Iron Age and Early Middle Ages, the possibility of specialised groups of professional hunters, living in this high-mountain area all year-round, is therefore rejected. The use of the traps should rather be seen as an additional source of income for farmers/outfield-users settled close to the maximum border of grain cultivation in neighbouring inland valleys east, south or north of the mountain area, or by the seaside at the heads of the fjords on the western side of the mountains. From its beginning, around the birth of Christ, the use of reindeer pitfalls seems to have been a common right associated with the person who first found the place and established the trap. Later, in the Viking Period or into the Early Middle Ages, written sources and tradition suggest that the pitfalls gradually became objects of private ownership that could be inherited or traded.

An analysis of the settlement development in sixteen potential 'user areas' together with evaluation of the most logical routes of transportation between these and the nearest pitfalls (Bang-Andersen 2004), has established that pitfall hunting could have originated from a number of farms on the *western* side of the mountains both in the Early and Late Iron Age. On the *eastern* side the use of pitfalls seems to have originated from the Bykle area in the Early Iron Age, and the northernmost parts of the Setesdal valley probably entered the picture during the transition Viking Period/Early Middle Ages, when large-scale iron production was established, for instance at Hovden. Further consideration of which particular farms exploited the individual trap installations in the mountains is based on the axiom that pitfalls usually belonged to the nearest geographically located area, or to the area from which they were most easily accessible. The transportation distances between the supposed farms and the pitfalls vary between 6 and 25 km as the crow flies, and the altitude difference between 185 and 1125 m. Due to generally large altitude differences, as well as limited opportunities for making use of boat transport, access to the pitfalls would have been most time-consuming and fatiguing from the western and northern side. From the eastern and southern side of the high mountain area good waterways and far less difference in elevation eased accessibility.

The role of reindeer in the farm economy in the different areas in prehistoric times is impossible to elucidate. The modest number of pitfalls indicates, however, that trap hunting of reindeer was generally far less important in Setesdal Vesthei than at, for instance the eastern part of the Hardangervidda and in the Rondane, where reindeer pitfalls existed in thousands and may have functioned within more complex systems of market distribution (eg, Blehr 1973).

The variation and visibility of reindeer hunting

Wild reindeer played a major role over wide areas of Europe as a factor in the daily well-being and yearly subsistence of hunter/gatherer societies from early prehistoric times; hunted not necessarily primarily for its tasty meat and exceptionally high nutritional value, but probably at least as much for its hide, sinew, antler and bone material quality. Hunting of this shy and agile animal always seems to have been connected with exceptional nerve, spirit and challenges. It is no wonder that reindeer held a sacred position in the minds and ceremonies of both prehistoric and recent hunting societies.

Up to now, archaeologists have rather one-sidedly connected the bagging of wild reindeer with individual bow-hunting performed from hunting blinds or other coverts in open high mountain or tundra-like landscapes. However, a range of alternative strategies and methods also existed for hunting both these and other gregarious large game species. Most widespread were probably organised collective animal drives, with or without artificially built lines, using precipices, screes, tunnel valleys, lakes or stone built pens as reception and kill areas. Other methods in certain parts of the world include permanent stone-walled or wood-clad earth pitfalls, as has been demonstrated in this paper.

Deadfalls, tread traps, snares and cavities in the snow may also have been used. The history of hunting is, therefore, as manifold, inexhaustible and adaptable as the archaeological record seems tacit and incomplete.

Bibliography

Aaris-Sørensen, K., Mühldorff, R. & Petersen, E.B. 2007. The Scandinavian reindeer (*Rangifer tarandus* L.) after the last glacial maximum: time, seasonality and human exploitation. *Journal of Archaeological Science* 34 (6), 914–923

Bang-Andersen, S. 1988. En reinsdyrgrav i Setesdal-sheiene. In S. Indrelid, S. Kaland & B. Solberg (eds), Festskrift til Anders Hagen. *Arkeologiske Skrifter 4/88*, 91–105. Bergen: Bergen Museum

Bang-Andersen, S. 1989. Mesolithic Adaptations in the Southern Norwegian Highlands. In C. Bonsall (ed.), *The Mesolithic in Europe*, 338–350. Edinburgh: John Donald

Bang-Andersen, S. 1999. The first reindeer hunters in the southern Norwegian mountains. In A. Thévenin (ed.), L'Europe des derniers chasseurs, *Actes du 5e Colloque International UISPP. Documents préhistorique 11*, 341–346. Paris

Bang-Andersen, S. 2004. Reinsdyrgraver i Setesdal Vesthei – analyse av gravenes beliggenhet, byggemåte og brukshistorie. *AmS-Varia 40*, 90

Bang-Andersen, S. 2008. De første jegerne i Dyraheio. Utnyttelsen av Setesdal Vesthei i steinalder, ca. 7000–3500 år før nåtid. *AmS-Varia 48*, 140

Barth, E.K. 1981. Konstruksjon og bruk av fangstgraver i skog. *Norske skogbruksmuseums årbok* 9, 272–298

Barth, E.K. .1983. Trapping reindeer in South Norway. *Antiquity* 57, 109–116

Barton, N. & Roberts, A. 2004. The Mesolithic Period in England: current perspectives and new research. In A. Saville (ed.), *Mesolithic Scotland and its Neighbours*, 339–358. Edinburgh: Society of Antiquaries of Scotland

Berg, G. 1951. Wooden traps. *Folk-Liv 1950–51*. Stockholm

Bergstøl, J. 2007. Aursjøprosjektet. Fangstgroper. *Rapport. Arkeologisk utgravning*. (Internal field report). Oslo, Kulturhistorisk museum

Björck, S., Ekström, J., Iregren, E., Larsson, L. & Liljegren, R. 1996. Reindeer and paleogeographic changes, climate history, vegetation development and archaeological setting 13,000–9500 14C Years BP in the Danish/Swedish Region. *Arkæologiske Rapporter* (Esbjerg Museum) 1, 195–214

Blehr, O. 1973. Traditional reindeer hunting and social change in the local communities surrounding Hardangervidda. *Norwegian Archaeological Review* 6 (2), 102–112

Hvarfner, H. 1965 Pitfalls. In H. Hvarfner (ed.), *Hunting and Fishing*, 319–332. Luleå: Norrbottens Museum

Jacobsen, H. & Andersen, R. 1992. Elgen og mennesket. Jakt og fangst på elg gjennom tidene. *Norsk Skogbruks-museums årbok* 13, 166–205

Lie, R.W. 1990. Blomvågfunnet, de eldste spor etter mennesker i Norge? *Viking* 53, 7–21

Løken, T. 1982. Jordbruksbosetningens utnyttelse av Bykleheiene som fangstområde for villrein i yngre jernalder/middelalder. In A. Lillehammer (ed.), Faggrenser brytes. *AmS-Skrifter 9*, 103–114. Stavanger

Randers, K. 1986. Breheimenundersøkelsene 1982–1984. I. Høyfjellet. *Arkeologiske Rapporter* 10, 130

Selinge, K.G. 1974. Fångstgropar – Jämtlands vanligsta fornlämningar. *Fornvårdaren* 12, 3–39