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Chapter 15
Women's Work: Skin Processing in Northern Hunter – Gatherer Settlements and the Archaeological Context

Torunn Klokkernes

Abstract: The invisibility of women's knowledge in hunter -gatherer societies is caused by poor preservation of organic materials. This is the traditional approach, which is correct. There is however another reason and that is the lack of knowledge of what to look for in a settlement to allow us to see women's work more clearly. The richness of the knowledge and the variation of methods and materials used in skin processing technology, indicate that cutting and scraping tools found in archeological contexts, is only a fragment of the knowledge systems related to this meticulous craft. In order to understand what to look for in a settlement, it is important to recognize the principles of skin processing. It is furthermore important to be aware of the variety of methods employed to obtain specific material qualities used under various climatic conditions. A glimpse into the principles of skin processing technology in arctic and sub arctic cultures, the physical structures and manifestations associated with it, provides a starting point for this understanding.

Introduction

The skill of skin processing technology in the Eurasian arctic and sub arctic was learned from an early age chiefly by women, although men also need to know how to process skins, and especially how to maintain and repair skin and fur garments. Traditional knowledge systems encompass not only the practicalities of the skin processing itself – but also the beliefs and rituals surrounding the preparation practice, the gathering of materials and tanning substances and subsequently how to use, maintain and preserve the skin, as well as the clothing item itself.

Traditional knowledge is part of person's culture and is accumulated throughout a person's life. It changes gradually into new experiences without necessarily discarding former knowledge (Borgos, 1993). Even though the term 'traditional' is used, it is emphasized that all traditional knowledge is contemporary and dynamic, and continuously revised and updated (Cochran, 1997). Skin processing technology is accumulated knowledge and experience: knowledge of materials, how materials may be physically manipulated to acquire the properties that are needed for a specific purpose, and the ability to adapt materials and methods according to current conditions. Ole Henrik Magga describes traditional knowledge as follows: "Indigenous traditional knowledge and traditional cultural expressions, i.e. what we today sometimes refer to as their cultural heritage, arises as a result of a particular way of life. It is not a result of one or a group of individuals' endeavours. All members of the society contribute. Indigenous traditional knowledge and traditional cultural expressions vests in the collective, rather than with specific individuals. It is modified and enlarged over time, from one generation to the next" (Magga, 2003).

Skin processing technology in the circumpolar area is not primarily culturally determined, but seems to be more related to the availability of natural resources. The flora and fauna in a region will indicate the choice of skin materials, along with tanning substances that are most likely to be used in the skin processing technology (Klokkernes, 2007). It is, for example, shown that in regions where wild reindeer migration occurs or where reindeer herding is the basic subsistence activity, people will most likely use reindeer skin for winter clothing and reindeer leg skin for boots, whereas in regions where reindeer do not migrate, other skin materials, for example, elk, deer and wolf skin may be used in the production of winter garments (Grøn, 2005, pers. comm.).

The adaptation to natural resources is well described by Shirokogoroff (1935). He writes: "The elements of the Tungus complex of clothing and household, beginning from the wigwam, are indicative of two facts, namely that the Tungus gradually and regardless of origin have accumulated knowledge of using the materials found-at-hand in the most economical way in the given conditions and that their complex of the clothing and household with a few exceptions is well adapted to the local conditions and needs of a hunting mode of life" (Shirokogoroff, 1935). This human-environmental interaction (Müller-Wille, 2001) can also be illustrated with regards to tanning substances, for example by the use of willow bark extract and marine oils in the North Sámi culture in Finnmark, Norway and the use of brown rotted larch wood and fatty substances from land animals in the northern part of the Sakha Republic in Siberia.

Skin processing on a settlement

Skin processing is an integrated part of seasonal activities on a settlement. Depending on the main subsistence activity of the family unit, the initial stages of the processing may be

performed as the animals are slaughtered. This is observed in the Sámi culture, where the traditional subsistence activity is reindeer herding, and where the early autumn slaughtering is an opportunity to obtain good skins for the required number of garments. Cleaning and drying is initiated as soon as the animal is skinned, as well as determining what each particular skin could best be used for. In the Sámi culture five to six reindeer skins are used to produce a winter coat, and it is an advantage if the skins match in thickness, colour and quality. These skins are often taken from young calves, from the early autumn gathering. If producing festive winter coats, often made from white reindeer calf skin, years may pass until enough skins of the preferred colour and quality is obtained.

Skin processing is performed outside, close to or inside the dwelling/house or in an adjacent dwelling/house. The location for the various stages in the skin processing is dependent on the nature of the process itself, the size and weight of the skin; it is furthermore dependent upon the season and the weather, the amount of mosquitoes and upon the space required for performing certain processes. Parts of the process may be performed whilst also doing other chores, and one needs to be able to go to and fro. It may be carried out by oneself or together with family members or neighbours.

There is no visible spatial pattern for skin processing on a settlement. It is, however, possible to indicate three areas in a settlement where the different skin processing stages may take place, one area being close to water, another being some distance away from the dwelling and a third being located close to the dwelling. Certain processes may occupy more space than others, such as dehairing the skins in lakes or ponds, and the drying of skins on the ground, on racks or nailed to walls. Informant Malchakitova Ludmila Vasilievna from Chapo Ologo in Transbaikal, Siberia, describes drying in terms of the winter method and the summer method: *"The process takes place outside. You choose two trees, which are placed opposite each other at a distance a bit larger than the width of the skin. Then you take two loose trunks and fasten them horizontally on the trees at a distance of the length of the skin. Nails or string are used to fasten the trunks. Between these trunks you stretch the skin by pulling string through holes in the edges of the skin, and 'sew' the skin to the frame. You always start with the top, then bottom and then sides. In the end the string is pulled to stretch the skin evenly."* The winter method follows the same principle. The only difference is that the two vertical trunks are not rooted and the frame with the stretched skin is leaned against the wall of the dwelling.

If the smoking of skins is a regularly applied process, as in the Evenk culture, informants have specified that this should take place a safe distance from the dwelling and preferably close to water. There are several possible smoking structures, one example is a tipi shaped structure and another example is a dome shaped structure, both made from twigs and tent cloth or skin. These temporary structures are, according to the informants, are removed

Figure 1. The inside of a smoking structure. The structure is covered with skins and also cloth. Sredniy Kalar, Chita County, Russia, 2001. Photo O. Grøn.

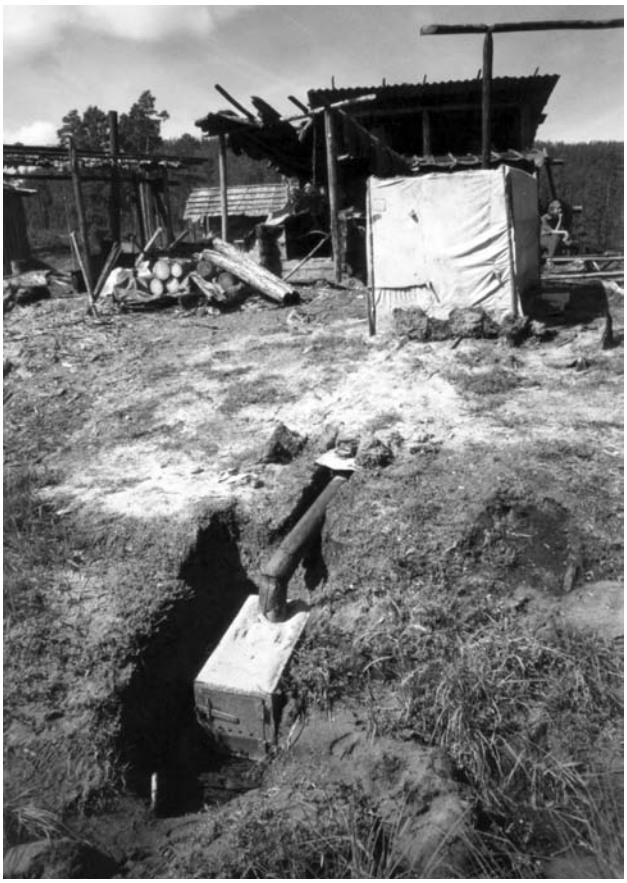

Figure 2. A more permanent smoking structure covered by metal sheets and cloth. Nichaka, Chita County, Russia, 2000.

and rebuilt when required. Smoking structures may also be larger, permanent structures covered with bark and/or cloth, with the smoke being lead through a pipe from an iron oven dug into the river bed (Fig. 1 and 2).

Tools, implements and physical structures

The geographical and historical distribution of tools and implements used in indigenous cultures in the circumpolar area covers a wide field of inquiry. In recent centuries tools and implements have changed according to the availability of natural resources, trading possibilities, and the continuous change and improvement of the technologies which have been used in their production. The creativity in constructing tools and implements has few limitations. As long as the tool provides the effect that is required, it may be constructed in a number of ways and from a number of materials. Even so, the main shape of the various scrapers is maintained over time. The foremost tool types are referred to in Gudmund Hatt's thesis from 1914, and are described as one handed (end scrapers) and two handed scrapers made from various materials (Hatt, 1914). Regarding the distribution of tools and implements across the circumpolar area, the semi-lunar knife (the ulu) is a central tool in the Canadian arctic and in Greenland (Fig. 3). This tool is not observed in the Scandinavian and Siberian arctic and sub arctic area. The ulu is known as a women's knife and the style of the ulu changes slightly according to location (Issenman, 1997). However, the ulu appears in the coastal areas of the Bering Sea in the Chukchi and Koryak cultures (Antropova & Kuznetsova, 1964; Antropova, 1964; Bogoras, 1909), which, not surprisingly, would suggest contact across the Bering Strait.

The characteristic two handed scraper, with the s-shaped blade, which is used widely in the Sámi culture (Fig. 4 and

Figure 3. Ulu. Used as a knife and a scraper by Inuit women.

5) and is also found in the Nentsy and Nganasan's cultures (Popov, 1964; Middendorff, 1953) and in the Khanti culture (Sirelius, 1904) which suggests contact between the Nordic and Russian Sámi culture and the west Siberian indigenous cultures. As far as it can be established the s-shaped blade or the ulu is not found in the central parts of the Siberian arctic and sub arctic.

The use of a particular scraper is dependent upon the skin material which is being processed. The scraper is chosen which has the correct combination of properties for a given skin material: The angle of the tang, the length of the handle and the structure of the edges (smooth or serrated, sharp or dull). It can also be both smooth and serrated as in double edged two-handed scrapers.

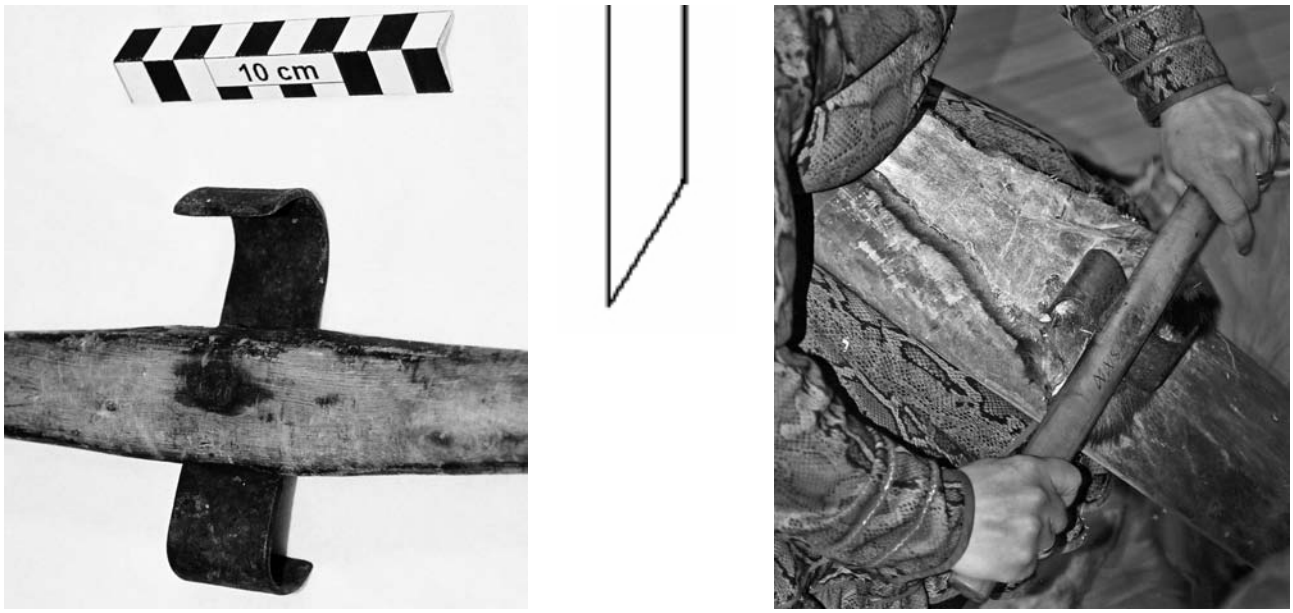

Figure 4. The characteristic Sámi culture skin scraper with the s-shaped blade, used here in the removal of the subcutaneous tissue on a reindeer leg skin. Finnmark, Norway, 2004.

Figure 5. An Evenk culture end scraper (sharp), used here in the removal of the subcutaneous tissue on a reindeer leg skin. Kharyyalach, Sakha Republic, Russia, 2001.

The initial cleaning of the skins and the possible removal of hairs are the first stages in the processing of skins. If the preservation of the epidermis is important for the water repellent properties of the skin material, a sharp knife or ulu is used. This has been, for example, observed in central Inuit cultures, in the removal of hairs from fresh sealskin. The scraper blade is angled close to the skin's surface and the blade's edge may be bevelled on both sides. The cutting of the hairs is also highly dependent upon grip and upon skill and experience. In this process, the knife or scraper needs to be sharp to be able to cut the hairs by the root without damaging the epidermal layer, and the blade is continuously sharpened throughout the process (Fig. 6).

Today the blade of the skin scraper is primarily made from iron or steel but previously it was also made from stone, antler or bone. The blade is attached to a handle made of any available material, e.g. set in a slot, tied with a rope, sinew or leather straps, or attached with nails or screws (Antropova & Kuznetsova, 1964; Bogoras, 1909; Hatt, 1914; Mason, 1895; Middendorff, 1953; Popov, 1966).

After drying the skin, it is prepared for the tanning substances if these are to be applied. To be able to control the scraping process, the skin may be placed on a solid surface, (though it is not always) either the floor, a flat stone or on a slightly rounded wooden scraping board/ tripod. Before the tanning substances can be applied it is important to remove the subcutaneous tissue on the flesh side of the skin. This is often done with fairly sharp scrapers that have a smooth edge. Both one and two handed scrapers may be used. The process of removing the subcutaneous tissue is carefully controlled; it is important to remove the dry subcutaneous layer on the surface of the flesh side of the skin, but not to remove the underlying collagen fibres, and thereby decreasing the thickness of the skin's dermis (Fig. 4 and 5). Failure to remove the subcutaneous layer inhibits the skins ability to absorb the tanning substance, and it also decreases the skins ability to stretch and become soft. In this process, the angle of the skin scraper blade on the skin is fairly perpendicular to the skins surface, and the scrapers edge is often bevelled only on one side. When the subcutaneous tissue has been removed from the flesh side of the skin, the skin is ready to receive a tanning substance, if that is desired.

Figure 6. The removal of hair from fresh sealskin, using a sharp ulu. Churchill, Manitoba, Canada, 1993.

The use of scrapers with a dull edge has the purpose of softening the skin as well as to stretch and shape the skin. In this process, the skin fibres (the collagen fibres) are pulled apart and to a certain extent realigned. Dull edged scrapers are also used to work the tanning substances into the skins

Figure 7. Collection of tools and materials used in skin processing technology. From left to right, placed on a tanned reindeer skin are two lumps of brown rotted larch wood and above these, thin wooden sticks for drying whole skins. The typical tools; a sharp end scraper, an end scraper with a serrated edge and an extended handle, and a two-handed scraper with a smooth but not sharp blade is shown next to the scraping board. Presented by: Tomskaya Rosalia Ivanovna, Egerova Maria Ivanovna, and Stepanova Valentina Vasilievna, in Kharyyalach, Sakha Republic, Russia, 2004.

structure or in the removal of excess tanning substances from the flesh side of the skin. The blade of the scrapers used for these processes should be dull but may also be serrated (Fig. 7 and 8); the angle of the blade on the skins surface is less important and the scraping activity is more irregular, absolute control is less important than when a sharp scraper is used (Issenman, 1997; Bogoras, 1909; Hatt, 1914).

The visual characterisation of skin materials may indicate the type of scraper used in the processing stages. This has been observed in historic indigenous culture skin materials (Klokkernes, 2007). The use of a scraper with a serrated edge may leave parallel lines in the skins surface, indicating the coarseness or fineness of the scraper (Fig 9). In the examination of the skin fragments from the Hauslabjoch find, Joachim Lange, in his article from 1992, describes long fine parallel lines in the skin, suggesting the possible use of a tool in the processing of the material (Lange, 1992). Depending on the regularity of the lines, a scraper with a serrated edge may have been used, or the marks may be from manually thinning or splitting the skin, using a sharp knife or knifelike object. However, manual splitting or thinning does not produce marks with the same regularity as a serrated scraper.

A number of implements which assist during the different stages of changing a raw pelt into material suitable for manufacturing clothing and footwear include frames or racks for drying, scraping boards, and implements to soften the skin, such as the skin press and the 'softening chair' (Fig. 10). The shape and size of the scraping boards differs slightly from area to area, but the worker's position (sitting on a stool or chair) is identical. The tripod uses the same principles, but it is customary for the user to stand during the scraping, softening, and stretching process. The 'softening chair' observed in the Evenk culture, is used mainly to soften the skin. A parallel in the Sámi culture is the scythe shaped iron (Fig. 11) which may be fastened to the wall, and where the skin also is drawn back and forth across the dull edge of the scythe (Drake, 1918; Fjellström, 1985; Nesheim, 1964; Hætta, 1993). In some areas in Siberia the skin press (talki, also called "crocodile"), is used for softening the skin. It comes in various sizes, depending on the size of the skin, and is utilized on depilated skin as well as on leg skin (Fig. 12 and 13).

Teeth are used mainly for softening thick skins or rough parts of a skin by chewing the skin, as well as holding skins or parts of skins, in place during other operations.

Figure 8. An end scraper with a serrated edge exhibited at the Olenek Historical-Ethnographical Museum of North Peoples in Olenek, Sakha Republic, Russia, 2001.

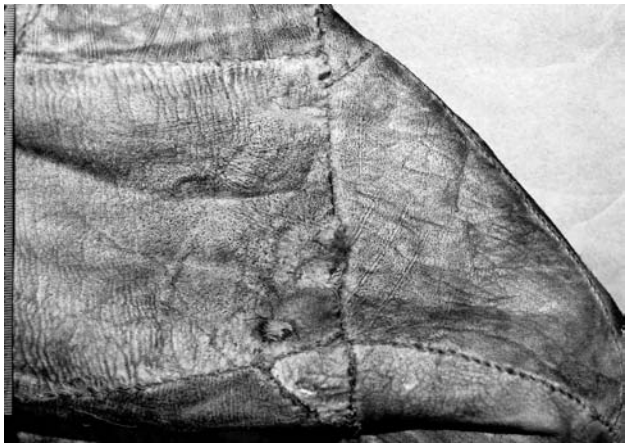

Figure 9. Tool marks on the flesh side of an Evenk culture coat, probably from the use of a scraper with serrated edge. Notice the various directions of the parallel lines.

The archaeological context

Skin materials and tanning substances leave few traces in the archaeological record, unless certain environmental conditions are present (Cronyn, 1990). Ideal conditions include very dry, desiccated conditions or desiccated and salty environmental conditions (salt mines), where mummified tissue and leather artefacts may be well preserved. An example is the mummies recovered from saline conditions in northern China, with well-preserved textile clothing items as well as skin materials, such as the deer skin boots of the so-called Cherchen man (Barber, 1999). The Hallstatt salt mines in Austria are another example where skin materials have been well preserved (Grabner, *et al.*, 2007; Goubitz, 2007; Piggott, 1965). The introduction of salt, which acts as a preservation medium, the low stable relative humidity, and the low input of oxygen, will have favourable effect on the condition and the preservation of organic material remains.

Frozen conditions also provide a good milieu for the preservation of skin and fur materials. Several archaeological sites are known for their well-preserved skin and fur artefacts and human remains. These include the man from Hauslabjoch on the Italian/Austrian border (Spindler, 1994; Egg, *et al*. 1993), the mummies of Qilakitsoq in Greenland (Hansen *et al.*, 1985), the Scythian frozen tombs in the Altai region in Russia (Van Noten & Polosmak, 1995), and the human remains and artefacts found at the traditional territory of the Champagne and Aishihik First Nations in British Columbia in Canada (Kwädāy Dän Ts'ínchi) (Beattie *et al.*, 2000). The common denominator of these sites is that the human remains, the clothing and the artefacts associated with the bodies have been kept more or less frozen since death/burial. In a frozen state the biological processes, which are responsible for the deterioration of organic materials, are inhibited or significantly delayed, thereby preserving the material. The retreat of glaciers, uncovering both human remains and artefacts, may be responsible for several archaeological finds in recent decades.

Bogs and other anaerobic sites are also known for the good preservation of organic materials (van der Sanden, 1996). Depending on the type of bog or the conditions at the site, the organic materials on the site may be more or less preserved. In general one may say that protein based materials, such as skin and wool, is preserved to a greater degree under acidic (low pH) conditions than under more basic (high pH) conditions (van der Sanden, 1996; Cronyn, 1990).

Investigating the possible use of vegetable tanning agents is difficult in skin materials found in waterlogged sites, such as bogs. The skin material will most often have received a secondary tanning, through substances present in the ground (Groenman-van Waateringe *et al.*, 1999). Even though the skin may be well preserved, analysis of possible tanning agents present in the skin will be obscured by these secondary substances.

Figure 10. Nikolaeva Maria Vladimirovna using the softening-chair. The flesh side of the leg skin faces the iron blade, and the skin is pulled back and forth over the blade. Settlement north of Kharyyalach, Sakha Republic, Russia, 2001

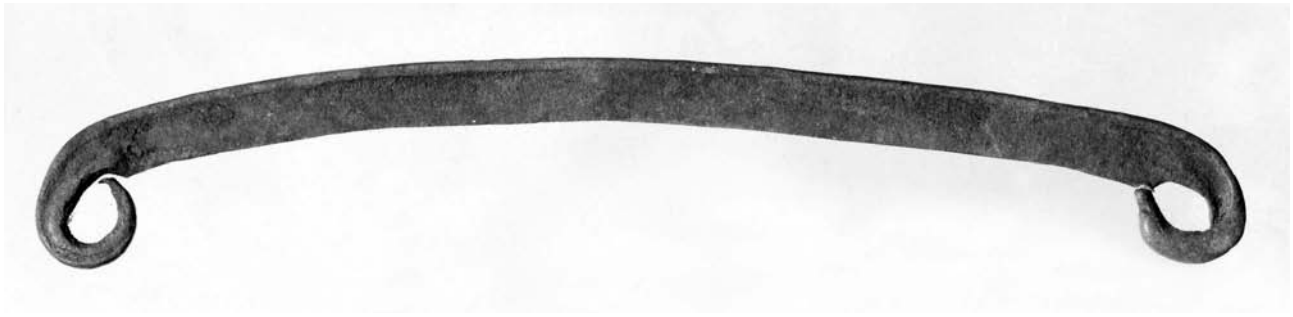

Figure 11. A scythe shaped iron from the Sámi culture, used as a softening tool. Historic photograph. © Museum of Cultural History, University of Oslo.

An example of sites where this secondary effect is lacking is very dry sites or frozen sites. In these types of sites there is a much higher probability of being able to, for example, identify vegetable tanning agents, than in ground burials.

The skin material clothing of the man from Hauslabjoch has been identified as being made of calfskin, as well as skins from red deer, goat, and bear (Groenman-van Waateringe & Goedecker-Ciolek, 1992; Lange, 1992; Groenman-van Waateringe, 1995). The preliminary analyses of the skin materials, however, do not reveal a definite tanning method, although Joachim Lange observes weak traces of vegetable tannins using thin layer chromatography (Lange, 1992).

During the analysis of skin fragments from the Hauslabjoch find, it is indicated that the skin may be have been treated with a fatty substance and smoked. This is based on Groenman-van Waateringe's (1995, 1999) experiments on how pollen fastened in the hair coat of a skin sample is affected by smoke, and by studying literature sources. Identifying smoking as a tanning method in historic skin sample material is a complicated affair, mainly because clothing and footwear as well as other items have on a

Figure 12. A newly built skin press (talki), used to soften larger skins. Nichatka, Chita County, Russia, 2000.

Figure 13. Malchakitova Ludmila Vasilievna softening a leg skin in a small skin-press (talki). Chapo Ologo, Chita County, Russia, 1999.

regular basis been exposed to smoke in the dwelling. This is especially true if they have been regularly dried in the dwelling close to the hearth. A modern parallel is the observation of reindeer leg skin boots in the Sámi culture, where the smoking of skins is not used as part of the skin processing method. Informants have, however, indicated that they have noticed a strengthening of the skin as it ages, and perhaps so because the boots are kept and dried in a smoke filled environment (Eira, 2005, pers. comm.).

Conclusion

Characterising and identifying skin processing methods in the course of archaeological excavations is a challenge, and identifying tanning substances, if skin materials are among the finds, is equally challenging. Using ethnographic parallels in the study of prehistoric skin processing technology including the use of various tools and implements may, however, give indications as to what to look for in an excavation and in the artefact material itself. Visual characterisation and a range of analytical techniques which are under continuous development is available for the study of prehistoric skin materials, and yields information both on the animal skin type, on features in the processing stages, on tanning substances, and on the condition of the artefact. However, the alterations of the material, under certain burial environments such as bogs and other waterlogged, anaerobic conditions, may interfere with and obscure the analytical results. It is therefore important to treasure the relatively few finds which have not been exposed to, for example, a secondary tanning, and to refrain from any post-excavating treatment which would alter the composition of the material.

References

Antropova, V. V., 1964. The Koryaks, in M. G. Levin & L. P. Potapov (eds.) *The peoples of Siberia*: 851-876. Chicago and London: The University of Chicago Press.

Antropova, V. V. & Kuznetsova, V. G., 1964. The Chukchi. in M. G. Levin & L. P. Potapov (eds.) *The peoples of Siberia:* 799-836. Chicago and London: The University of Chicago Press.

Barber, E. W., 1999. *The Mummies of Ürümchi*. New York : W. Norton & Company.

Beattie, O., Apland, B., Blake, E. W., Cosgrove, J. A., Gaunt, S., Greer, S., Mackie, A. P., Mackie, K. E., Thorp, V. & Troffe, P. M., 2000. The Kwädāy Dän Ts'ínchi discovery from a glacier in British Columbia. *Journal Canadin d'Archéologie*. 24:129-147.

Bogoras, W., 1909. *The Chukchee. The Jesup North Pacific Expedition.* Memoir of the American Museum of Natural History. Vol. 7. Ed. F. Boaz. G. E. Stechert & Co. New York.

Borgos, J, 1993. Tradisjonall Samisk kunnskap og forskning, in: L. Lasko (ed.). *Traditionell samisk kunskap och forskning.* Dieðut 5:7-21.

Cochran, P., 1997. Traditional knowledge systems in the Arctic. Bering Sea ecosystem, workshop report, Anchorage, Alaska: 93-98.Online: http://www.nativescience.org/html/traditional_knowledge.html "*What is traditional knowledge? When an elder dies, a library burns*". Reading date: 27.5.2005.

Cronyn, J.M., 1999. *The Elements of Archaeological Conservation*. London:Routledge.

Drake, S., 1918. Västerbottenslapparna under förra hälften av 1800-talet. *Etnografiska Studier. Lapparne och deras land. Skildringar och studier.* 7. Stockholm. Wahlström & Widstrand.

Egg, M., Goedecker-Ciolek, R, Groenman-van Waateringe, W. & Spindler, K., 1993. Die Gletschermumie vom ende der steinzeit aus den Ötztaler Alpen. Mainz: *Jahrbuch des Römisch-Germanischen Zentralmuseum*, 39.

Eira, T. M., 2005. Personal communication

Fjellström, P., 1985. *Samernas samhälle i tradisjon och nutid.* P.A. Norstedt & Söners Förlag. Stockholm.

Goubitz, O., 2007. *Stepping through time. Archaeological footwear from prehistoric times until 1800*. Zwolle, Stichting Promotie Archeologie.

Grabner, M., Klein, A., Geihofer, D., Reschreiter, H., Barth, F.E., Sormaz, T. & Wimmer, R., 2007. Bronze age dating of timber from the salt-mine at Hallstatt, Austria." *Dendrochronologia*, 24:61-68.

Groenman-van Waateringe, W. & Goedecker-Ciolek, R., 1992. The Equipment made of hide and leather, in: F.Höpfel, W. Platzer & K. Spindler (eds.). *Der Mann im Eis, vol. 1. Bericht über das Internationale Symposium* 1992 , Innsbruck. Eigenverlag der Universität Innsbruck.

Groenman-van Waateringe, W., 1995. Pollenanalyse als indikator fü das gerbeverfahren bei der tierfelle des mannes vom Tisenjoch, in: K. Spindler, E. Rastbichler-Zissernig, H. Wilfing (eds.). *Der Mann im Eis, vol. 2:* 67-71. Vienna, Springer-Verlag,

Groenman-van Waateringe, W., Kilian, M. & van Londen, H., 1999. The curing of hides and skins in European prehistory. *Antiquity*, 73: 884-890.

Grøn, O., 2005. Personal communication

Hansen, J. P. H., Meldgaard, J. & Nordqvist, J., 1985. Qilakitsoq. *De Grønlandske mumier fra 1400-tallet.* København. Det grønlandske landsmuseum, Chr. Ejlers forlag, København.

Hatt, G., 1914. *Arktiske skinddragter i Eurasien og Amerika. København* , J. H. Schultz Forlagsboghandel..

Hætta, I. H., 1993. Sisti. Unpublished Masters thesis. Statens Lærerhøgskole i forming, Oslo.

Issenman, B. K., 1997. *Sinews of survival. The living legacy of Inuit clothing.* Vancouver. UBC Press and Études/ Inuit/Studies.

Klokkernes, T., 2007. *Skin Processing Technology in Eurasian Reindeer Cultures. A Comparative Study in Material Science of Sámi and Evenk Methods — Perspectives on Deterioration and Preservation of Museum Artefacts*. Ph.D. thesis, The Royal Danish Academy of Fine Arts, School of Conservation. LMR Press, Rudkøbing. URL: http://www.langelandsmuseum.dk/LMR%20Press.htm

Lange, J., 1992. Vorläufige befunde der untersuchungen an pelzlederprobe, in F.Höpfel, W. Platzer & K. Spindler (eds.) *Der Mann im Eis, vol. 1:* 419-435. Bericht über das

Internationale Symposium 1002. Innsbruck. Eigenverlag der Universität.

Magga, O. H., 2003. *Tangible and Intangible Cultural Heritage. An indigenous perspective. The World Heritage Convention: Future challenges and possible lines of actions*. European Conference, Røros, Norway, 3-5. September 2003. Online: http://www.unesco.no/. Reading date: 20.5.2005.

Mason, O. T., 1895. *Woman's share in primitive culture*. London and New York. Macmillian & Co.

Müller-Wille, L., 2001. Cultural identity among Sámi and Inuit: Issues of ethnic groups and boundaries. *Études/ inuit/studies*. Vol, 25: 285-294.

Middendorff, A. Th. von, 1953. *Auf Schlitten, Boot und Renntierrücken.* . Leipzig. Veb F. A. Brockhaus Verlag.

Nesheim, A., 1964. *The Lapp fur and skin terminology.* Reprint from Studia ethnographica Upsaliensia, 21:199-218.

Piggott, S., 1965. *Ancient Europe from the beginning of agriculture to classical Antiquity.* Edinburgh, Edinburgh University Press.

Popov, A. A., 1964. The Nganasans, in M. G. Levin & L. P. Potapov (eds.) *The peoples of Siberia*: 571-582. Chicago and London. The University of Chicago Press.

Popov, A. A., 1966. *The Nganasans. The material culture of the Tavgi Samoyeds*. Vol. 56. Uralic and Altaic Series. Bloomington. Indiana University.

Shirokogoroff, S. M., 1935. *Psychomental complex of the Tungus*. London. Kegan Paul, Trench, Trubner & Co.

Sirelius, U. T., 1904. Die Handarbeiten der Ostjaken und Wogulen. *Journal de la Société Finno-Ougrienne.* 22. Helsinki.

Spindler, K., 1994. *The man in the ice.* London. Weidenfeld and Nicolson,

van der Sanden, , W., 1996. *Udødeliggjorte i mosen. Historien om de nordvesteuropæiske moselig*. Amsterdam. Batavian Lion International,

Van Noten F., Polosmak N., 1995. *The frozen tombs of the Scythians*. Endeavour. Vol. 19: 76-82.

Vasilievna, M. L., 1999. Personal communication

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