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Arctic pastoralism in a subsistence continuum: A strategy for differentiating familiarity with animals

Hiroki Takakura

Center for Northeast Asian Studies, Tohoku University, Japan

ABSTRACT

This paper critically considers the hitherto theoretical assumption of the exceptionalism of Arctic pastoralism by examining the management of reindeer herds in the Arctic forest ecology. The reindeer is often called "half-domesticated" from the comparative perspective of world pastoralism. In contrast, I propose a new idea, familiarity with the animals, which is quite different from tameness, the reversible relationship between a human and an individual animal. I ask why hunting and herding are considered continuous in the subsistence pattern, regardless of the reindeer's domestication. The cases discussed in this paper are the forest reindeer herding of the Eveny in eastern Siberia and the Nenets in western Siberia. These two groups developed reindeer pastoralism independently in terms of cultural history. Nonetheless, they differentiated the role of livestock similarly according to familiarity. This strategy enables these peoples either to maintain large scale reindeer production or to engage in hunting and fishing. The combination of choices may seem random, but actually it forms a "subsistence continuum" within a specific context. The hunter-herder continuum in the Arctic region is one these. Arctic pastoralists employ diversification of roles in mono-species livestock; on the other hand, the arid pastoralists prefer the diversification of domestic animal livestock. In this respect, all pastoralists relate to the animals in the same way. Each strategy for forming various levels of familiarity works to bring about diverse ways of herding and the pastoral way of life, as well as the complexities of subsistence.

Keywords: Forest Nenets, Eveny, tameness, hunter-herder continuum, reindeer herding, pastoral continuums

INTRODUCTION

Why is reindeer herding assigned a unique position in the broader perspective of nomadic pastoralism? This has been an important question since the early days of ethnographical fieldwork among the Siberian indigenous peoples. Of course, the relationship between humans and reindeer in the Arctic is certainly different from the well-known deep and emotional relationship between humans and cattle in East Africa. On the other hand, classifying reindeer as "un-tame" is questionable. The terms "untamed" or "half-tame" do not accurately reflect the relationship between

the reindeer herders and the animals.

The co-editor of this volume, Florian Stammler, asks whether categories of hierarchy and prestige of different animals among pastoralists are applicable to Arctic settings. The question suggests the need to explore the features of Arctic settings in comparison to the arid nomadic pastoral societies, especially in respect to mono-species and multi-species animal domestication. As is well known, Arctic nomads keep only reindeer as livestock, and the subsistence pattern of hunting-gathering and pastoralism is undifferentiated. Traditional anthropological knowledge attributes this to the degree of tameness of domesticated reindeer. From an evolutionary perspective of domestication, reindeer are referred to as "half tame" or "half domesticated." Therefore, previous studies justify the reason for the lack of differentiation between hunting and herding being the relative tameness of reindeer. Reindeer are not fully domesticated animals so there is no difference between hunting and herding, which seems to be a tautological statement. Nonetheless, this unusual feature forms the basis for considering Arctic reindeer herding to be an exception in the broader perspective of pastoral nomads and their relationships to animals.

However, a recent reexamination and consideration of the research argues against the exceptionalism of Arctic reindeer herding. Reframing the question usually posed in the previous research, we ask why hunting and herding are considered continuous in the subsistence pattern, regardless of whether or not reindeer are sufficiently domesticated.

First, a review of studies of Arctic subsistence reveals some difficulties with the exceptionalist approach. Next, the so-called "symbiotic domestication" (Beach and Stammler 2006) and the continuum theory of subsistence pattern (Layton 1991) suggest new theoretical approaches.

Of particular interest are the studies of the forest reindeer herding of the Eveny in eastern Siberia and of the Nenets in west Siberia from my field data. These two groups are distributed differently in geography, belong to different linguistic groups, and have developed independently a cultural history of reindeer. Nonetheless, they handle the differentiation of the role of livestock in similar ways according to the familiarity with animals that enables them either to maintain large scale reindeer production or to engage in hunting and fishing.

Furthermore, the feral behavior of reindeer is not an attribute of the level of domestication; rather it can be better understood in the context of "large stock" herd management.

Finally, strategies among arctic and arid pastoralists are structurally the same regarding relationships between humans and animals. The former employs the diversification of roles in the mono-species livestock, and the latter prefers the diversification of domestic animal livestock[1]. The difference is not determined on the basis of culture or history, but it is shaped by the time and space constraints of the ecological and social environment settings. Therefore, what takes place in the Arctic setting may well be equally applicable to arid pastoralists.

[1] Stammler (2005: 165-166) made this argument, claiming that reindeer have the significance of both small and large stock. However, in this volume, he shows how herders diversify roles beyond the species of reindeer, where, for example, fish acquire the economic significance of small stock.

ARCTIC SUBSISTENCE THROUGH THE VIEWPOINT OF EXCEPTIONALISM

It is well known that Arctic indigenous hunter-gatherer and pastoralist economies acquire exceptional characteristics that are different from those in the temperate and tropical regions. The high ratio of animal (fish) resources and low ratio of plant (vegetable) resources in producing and consuming food among the Arctic peoples is one the best-known examples of how Arctic economies differ from those in tropical regions (cf: Koishi and Suzuki 1984: 26). Some researchers argue that sedentariness and socioeconomic inequalities of the Northern Pacific coastal hunter-gatherers are caused by the storage economy or the interfamilial occupational differentiation (Testart 1982, 1988, Watanabe 1969, 1983, 1988). Others explain the unique Arctic adaptation as an economic continuum between the nomadic and the sedentary adaptation (Krupnik 1993) and account for reindeer herding in terms of carnivorous pastoralism as compared to the milk pastoralism in arid regions (Ingold 1980).

These features precluded discussion of Arctic subsistence in a broader context beyond the different climates and ecological regions. Japanese ecological anthropologist Tanaka (1978: 3) once referred it as an adaptive specialization in high latitudes that appeared relatively late in human history. Even so, he asserts that general theoretical assumptions about foraging economies may be adopted from studies of the hunters-gatherers in the lower latitudes.

Most Japanese anthropologists who study the nomadic pastoralists and the problem of domestication share the viewpoint of exceptionalism. On the issue of how domestication changed the human-animal relationship, Tani (1997) insists the continuous sharing of the home range through many generations both by a human social organization and a herd of animals is crucial for domestication. This sharing enables the humans to control the breeding of the animals and the movements of the herd. By interfering in the relationship between the mother and offspring by separating them, herders establish an artificial relationship with the animals that allows the herders to control the movement of the herd. It is essentially identical to the human-livestock relationship among the nomadic pastoralists.

According to Tani, the reindeer is a half-domesticated animal because herders certainly practice castration as a technique of selection, but they do not involve themselves sufficiently with the mother-child relationship to organize the herd as a unit of movement or a social group for the animal. While a herder may impose on the herd a "peculiar unity which is a discernable congregation with constant membership" (Hazama 2002), such a reindeer herd is a construct of human ownership. Therefore, the relationship of herders to their reindeer is relatively weaker and thinner than the one of the arid nomadic pastoralists, which sometimes involves strong and deep ties, even emotional attachment, toward the livestock. One researcher calls the attitude toward domesticated reindeer similar to the one toward the object of a hunt (Konagaya 1995). These are the exceptionalist views of reindeer herding.

As shown in the typology of reindeer herding in Soviet anthropology (Baskin 2000, Syrovatskii 2000, Vasilevich and Levin 1951), regional and ethnic variations mark reindeer herding in Siberia. The exceptionalist approach has been based pri-

marily on Tundra reindeer herding and a type of *closing herding* as the way of big herd management among the Chukchee and Nenets. The cultural history of reindeer herding (Sasaki 1985, Vainshtein 1970, 1971) postulates that the domestication of reindeer originated in the Altai forest region, where the reindeer is used both as a riding animal and a draft animal. It is a very familiar animal for humans. British anthropologist Tim Ingold (1980) also provides the symmetrical notion of "milch pastoralism" in the Taiga, in which humans and reindeer form an intimate relationship, and "carnivorous pastoralism" in the Tundra, in which humans and the animals are unfamiliar with each other. To find parallels only in Tundra herding is clearly not representative, however.

The previous studies presuppose that domestication must necessarily involve the process of subsistence transformation. While this idea may be true in an evolutional perspective of human history as a whole, ethnographical documentation shows the variety of human subsistence patterns. Matsui (1989) defines the term "semi-domestication" as describing the broader range of subsistence activities between foraging and husbandry, such as protective herding and cultivation with clearance (see also Harris 1996). Rather than focusing on the mode of subsistence, what is needed, in fact, is to look at the way human-nature (animal) relationships are manifested in a local environment.

SYMBIOTIC DOMESTICATION AND THE HUNTER-HERDER CONTINUUM

Additionally, current research encourages an alternative to the exceptionalist approach. The symbiosis model of domestication emphasizes the mutual benefits for both animals and humans afforded by domestication (Russell 2002: 288–9). Based on this, Beach and Stammler introduced the concept of "symbiotic domestication" or "symbiotic domesticity." That is, an animal has an equal advantage with humans; e.g., protection from insects, feeding in a protected environment. These researchers assert that symbiotic domestication is the result of learning that extends beyond one individual lifetime so that selective breeding affects the genetically-encoded consequences (Beach and Stammler 2006: 10, see also the paper of Stammler of this volume).

The term domestication may be defined as a continuous control of breeding of a particular animal population beyond one generation (Nozawa 1986: 66, Russell 2002: 286). This definition is sharply different from the definition of taming as a relationship between a particular person and a particular animal without long-term effects beyond an individual lifetime (Russell 2002: 286). Reindeer herds, even among the Tundra nomads, are protected, and the animal population is bred through selective castration. Therefore, in terms of genetics and morphology, that reindeer is most definitely a domesticated animal.

Reindeer seek out humans, but on the other hand, the animals can survive without humans. This observation is the main reason that a domesticated reindeer's behavior can be characterized as "a broad continuum from great tameness to great ferality" (Beach and Stammler 2006: 8–10).

This broad continuum of behavior is not restricted to reindeer. Some livestock

animals, like horses, also display this range of behaviors, and in some cases, the animals may become feral (Kimura 2007). The crucial difference between reindeer and the others is the circumstances of the animals' habitat. Domesticated reindeer can be found in habitats accessible to the wild population. The geographical areas of the domesticated and the wild animals often overlap, and sometimes the animals share behaviors and genetic similarities (Roed et al 2008: 1849)[2]. The wild populations of domestic livestock, such as horse and cattle, have disappeared. Other domestic animals evolve selectively from the genetic pool of the domestic population or from a kind of genetic manipulation. However, the reindeer are in the stage of evolution in which the genetic pools both of domestic and wild populations may be crossed even now.

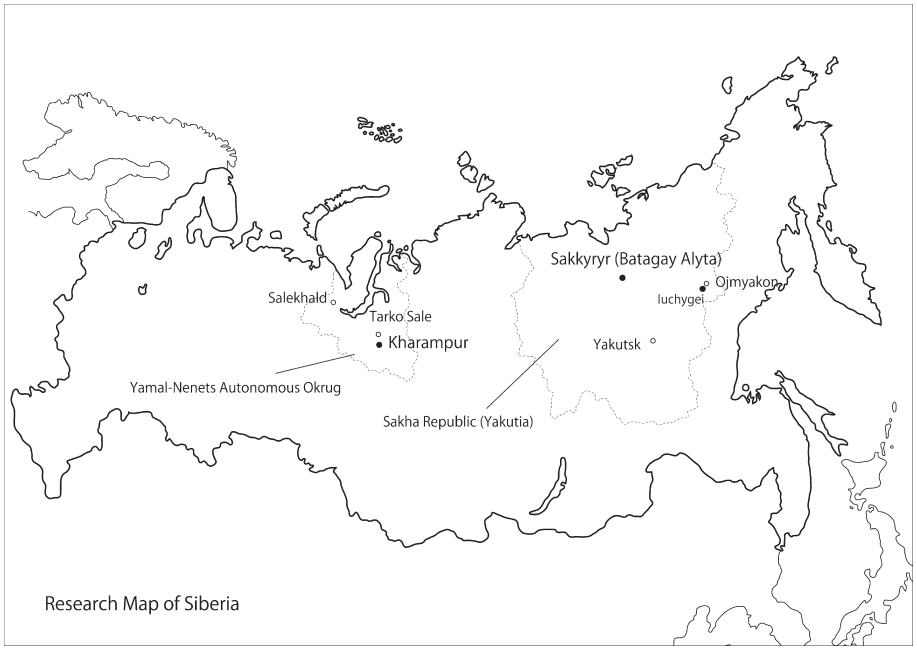
Another theory that argues against the exceptionalist view is "foraging or husbandry as alternative strategies" (Layton 1991) or the "hunter-herder continuum" (Ventsel 2006). Layton suggests that the transition from hunting to herding happened in accord with environmental change, technological innovation and socioeconomic and political change. Ventsel agrees with this theory; he proposes the hunter-herder continuum using the example of the Tundra reindeer herders in the Northwestern Yakutia. This continuum theory can perhaps be located somehow in the research history of Arctic subsistence. For example, I. Krupnik's theory of Arctic adaptation claims that the economic continuum between nomadic inland hunting and the sedentary maritime hunting-fishing represents alternative strategies. The various types of subsistence in the Arctic could have arisen according to environmental and socioeconomic factors along the spectrum of the continuum with nomadic inland hunting at one end of the pole and sedentary maritime hunting-fishing at the other end (Krupnik 1993: 210–213).

A review of the previous research confirms the following assertions: 1) The reindeer is a domesticated animal, not half-domesticated nor tamed; therefore, the notion that hunting and herding is not articulated because the reindeer is not fully domesticated is erroneous, and 2) fully domesticated reindeer allowed people to engage in either hunting or herding, whichever was more desirable given the changes in environment and socioeconomic and political conditions.

What then distinguishes the relationship between humans and reindeer from that of the other pastoralists? As Tani reminds us, herders establish an artificial inter-individual relationship of the animals in order to organize the herd as a unit of movement. Therefore, we must ask what kind of the artificial relationship the reindeer herder organizes. Another question is why the human-reindeer relationship leads to alternative strategies of hunting or herding. In previous studies of Tundra regions, historical facts of the Northwest Yakutian case confirmed this theory of a hunter-herder continuum. However, this question may also be approached by examining how the familiarities between herder and animals enable the hunting-herding continuum through a focus on the ground among cases in the Taiga regions.

The concept of familiarity between humans and animals offers a useful way to explore these questions. Familiarity, quite different from tameness, is the reversible

[2] According to the Ikeya (et al 2009), both wild and domestic fowl (chicken) in the mountainous areas of Thailand also partially overlap the home ranges of the other.



relationship between a human and an individual animal. Tameness goes beyond the levels of individual relationships or even the animal species level; it is an irreversible relationship between humans and animals. In other words, regardless of domestication, a human entertains a certain sentiment toward an individual animal. The type of sentiment reflects the extent of familiarity or extent of indifference to the animal. This sentiment may be projected from the individual animal to all the species or only toward some specific group which the human conceives of.

In the case of reindeer herding among a particular population of animals which exists as a result of genetic selection, or selective breeding, by humans, some herders exhibit a preference for a particular animal apparently for no special reason. They closely associate with that animal, and the animal also appears to understand or respond to the human's will and behavior. Unlike the presuppositions of the previous theories of the human-livestock relationship, such as symbiotic domestication, this concept focuses on the various phases of familiarity even within one species of domestic livestock; those phases result from the interaction between the herder and each animal.

THE HUMAN-REINDEER RELATIONSHIP IN DIFFERENT SETTINGS

The following three cases are drawn from ethnographical data that I gathered between 1994 and 2008: Sakkyryr Eveny, Oimyakon Eveny, and Kharampur Nenets (see Map). The first two cases are people of the same ethnicity; they belong linguistically to the Tungusic groups. The two groups live in similar ecological conditions in the mountain forest region of the eastern part of Siberia, and in both, reindeer herding is oriented to the production of meat (Takakura 2000; 2004, Vitebsky 1990, 2005). In the third case, the Nenets are a completely different ethnic group from the previ-

ous two in terms of linguistics, history, and geography (Khomich 1995, Turutina 2004, Zen'ko 2006). The Nenets, who live in western Siberia and the north European part of Russia, belong to the Samoyed language groups. They are well known as a nomadic pastoralist group with reindeer production in the Tundra.

But in this particular case, the territory of the Kharampur Nenets is the forest, and their main subsistence is river fishing, as well as the breeding of reindeer for transportation. For the past two decades, most of the territory has been exploited for oil and gas development. People catch fish both for their own food and for selling to the local fishery company. Because the historic-cultural settings and current socioeconomic situations of the Eveny and Nenets differ greatly, comparisons are difficult. Nonetheless, the three groups are useful to illustrate the familiarity between humans and reindeer.

Case 1 ***Sakkyryr Eveny***[3] This case is based on observations of a Sakkyryr Eveny reindeer herding team in northern Yakutia within the structure of a state farm system. Six to seven professional herders were engaged in the management of approximately 1500 head of reindeer in the pasture.

The field data, gathered in between 1994 and 1996, illustrates how the Sakkyryr Eveny herders demonstrate various degrees of familiarities with the herd. The most intimate familiarity exists between the herders and the dairy does (*tyhy*[4]), the reindeer they ride (*uuchakh*), and draft reindeer (*yndyy*). Next on the scale of familiarity come the individual reindeer being trained (*takkana*) and the reindeer to be used for meat (*idehe*). For sledging, the animal that leads the team is called *n'ougguhut*, and the followers are called *khos*. Those animals which have been trained are categorized as *symngaggas*, while an untrained animal is called *khangyl*. The general word for domesticated reindeer is *taba,* and a wild reindeer is *kyyl taba*, which is a complex word comprised of "wild" and "reindeer." Within a couple of years of the delivery of the animals into the care of the herders, the whole range of familiarity from close intimacy with an individual animal to the almost feral was well established. Based on the principle difference between wild and domesticated animals, herders employed an elaborate system to articulate the various levels of familiarity and usage.

Herders give individual names to the animals used for milking and riding, those with whom the herder has the most intimate relationship (see Table 1, the list of individual names). The origins of the individual names may be divided basically into four categories: (a) a physical characteristic of the animal; (b) a behavioral characteristic of the animal; (c) the history of the animal; and (d) a personal name. The way of naming implies intimate contact with and observation of each reindeer. The name of a dairy reindeer usually is hereditary, in recognition of the kinship between the mother and daughter, which the herders tend to select for milking. On the other

[3] Much of description in this case is already published in my previous paper (Takakura 2000, 2004), but revised and some new information has been added for this paper.

[4] These terms for reindeer are Sakha words, not the Eveny words. The historically close contacts between the Sakha and the Eveny in this region affected the language situation. The current mother tongue of most of the Sakkyryr Eveny is Sakha.

Table 1. List of the invididual name of reindeer ownerd (or used) by X family in Sakkyryr Eveny (1995)

#	name	meaning	type	notes
1	Altuschana	from the 6th brigade	milking doe	
2	Altuschana	from the 6th brigade	riding	
3	Auguschana	born in August	milking doe	
4	Bokshol	character like a boxer	riding	owener-state farm
5	Bokshol	character like a boxer	riding	
6	Boronkos	from the body colar (boron) = light gray	riding	
7	Chokchogo	from the body colar like a ptarmigan bird (chekchengo)	riding	
8	Elemeschan	from the body colar (elemes)	riding	
9	Hiroki	the individual whom Hiroki (the author of this paper) had trained to ride	riding	
10	Kalida	character like a brave bull	riding	owener-state farm
11	Karatiska	character like a karate wrestler	milking doe	
12	Kharchana	from the body colar like snow (khaar)	milking doe	
13	Khariyana	from the shape of antler like a spruce tree (kharyja)	milking doe	
14	Khukh lenta		milking doe	
15	Khulebshav	like to eat bread (khleb)	riding	
16	Kueregan	from the body colar like a lark bird (kueregej)	milking doe	
17	Kulumakh	from the upper half of body colar – white (kylymakh)	riding	owener-state farm
18	Kurachana	from the body size – small (kyra)	milking doe	
19	Kybahachan	from the body colar of dark gray (kubagaj)	milking doe	
20	Kylaman	from the long-lashed (kylaman)	milking doe	
21	Kylapachitar		milking doe	
22	Kyrigej	from the body colar like a lark bird (kueregej)	milking doe	
23	Maganchaan	from the body colar – white (magan)	milking doe	
24	Naskura	from the hoof colar – white	riding	
25	Naskura	from the hoof colar – white	milking doe	
26	Olishka	from the favorite girl name (Oliga)	riding	owener-state farm
27	Pavlusha	from the name of the owener (Pavel)	riding	
28	Pavlusha	from the name of the owener (Pavel)	milking doe	
29	Sattichana		milking doe	
30	Sokkol	from the body colar like a falcon (sokol)	riding	
31	Tulkchana	from the body colar like a snow bunting bird (tuluk)	milking doe	
32	Turlaina	the individual who lost the mother (tulajakh)	milking doe	
33	Turlaina	the individual who lost the mother (tulajakh)	milking doe	
34	Ulakhand'a	from the body size – big (ulakhan)	milking doe	
35	Valyuta	from the high quality of velvet antler which associate with the foregin money (valiuta)	riding	

hand, a castrated animal is a different matter, and the intimacy between a human and a riding reindeer exists for only one generation. However, familiarity does not mean the animals always behave in the prescribed manner towards humans. Notably, the intimate reindeer for the most part allow the herders to touch them directly. For example, when herders give salt to the reindeer, most of milking does and some of riding deer approach the herders and take the salt from their hands. Herders can easily catch these reindeer by hand.

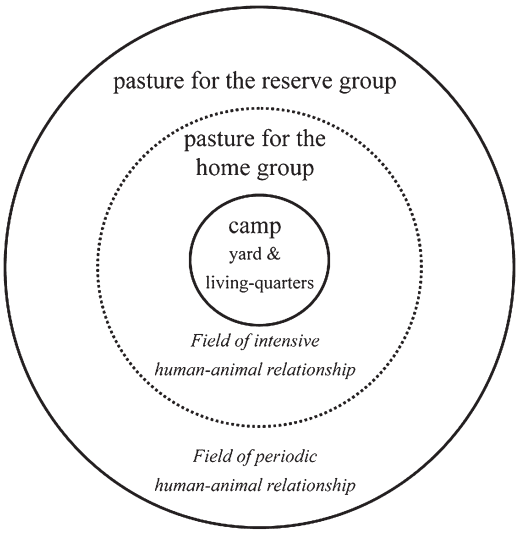


Fig. 1. Spatial model of pasture and camp

Nonetheless, if the most intimate animals remain with the other reindeer, their behavior often changes. Herders need to catch them with a lasso. Conversely, even some meat reindeer may approach a human camp in order to escape mosquitoes in summer and to imbibe human urine in winter for the salt the animals need.

A herder further divides the herd into a home group (*d'ie tabalara*) and a reserve group (*suuma*) (Takakura 2004: 55, Takakura 2000: 141)[5]. The two categories are likely based on behavioral features of domesticated reindeer. The members of the two groups are not fixed, but rather, the groups are normative and performative categories for herders. The dairy females and the riding and draft animals make up the home group; the meat deer comprise the reserve group. In fact, although herders make strong efforts to divide the herd in this fashion, the behavior of the reindeer does not always permit neat categorization. Therefore, the home group usually consists mostly of intimate reindeer and a few that are not so intimate. The reserve group, while including many of the non-intimate meat reindeer, also contains some of the intimate ones. That kind of group is usually not well integrated but rather is scattered into several populations.

The key to controlling herd movement is the dual structure of these groups. The home group is placed near the camp, and the reserve groups surround the outer areas of the camp. Every day the herders drive the home group to the camp where they catch the riding deer. The mounted herders then patrol the surrounding reserve groups in order to prevent the reindeer from going further afield or dispersing more widely (See Figure 1).

When the herders move the herd seasonally to bring the reindeer to new pastures, this dual structure is temporarily abandoned and the herd is unified under the herd-

[5] Other anthropologists also recognize this kind of functional grouping inside the reindeer herd (Stammler 2005: 65, Yoshida 2003: 43). Among them, the concept closest to mine is the set of "byk" herd and "kor" (Dwyer and Istomin 2008: 525-526).

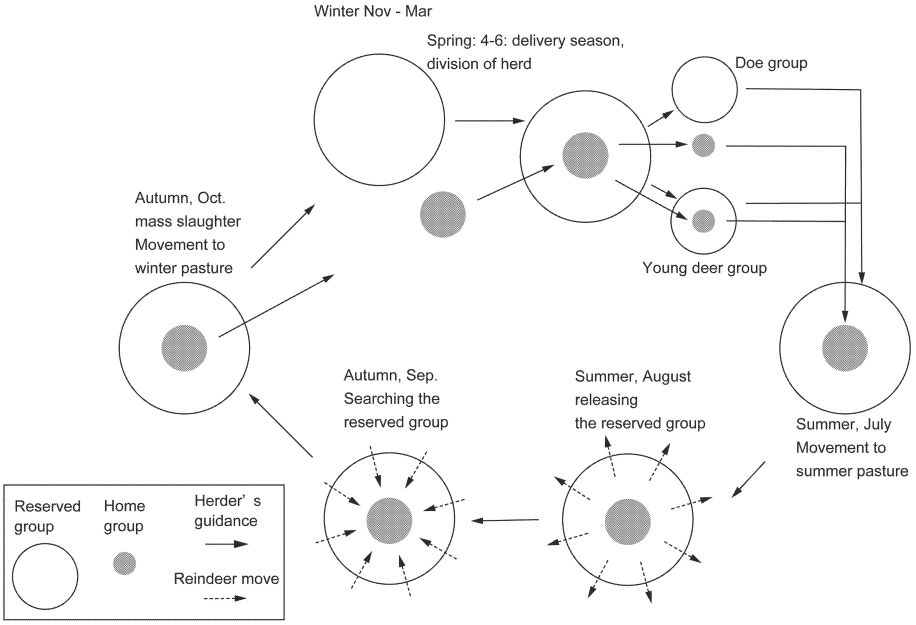


Fig. 2. Seasonal migration and structure of reindeer herd

er's control. When they reach their destination with the herd, herders release the animals and start to focus once again on only the home group for daily herding. Figure 2 shows the seasonal pattern of the herd structure. During the spring and autumn, herders try to keep the home group and reserve group unified; however, in summer and in winter, they completely divide the two groups. While a herder repeatedly gathers together the home group once a day during these seasons, the reserve groups are allowed to range freely. During the off season, herders spend much of their time hunting and fishing or repairing fences and enclosures.

The most crucial daily activity of Sakkyryr reindeer herding is maintaining the integrity of the home group. On principle, reindeer do not stay overnight in the herders' camp. Instead, the first thing herders do each morning is to search for the home group and drive it to the camp. Herders catch some of riding and draft animals for that day's work, but in the evening they release those animals and let them leave the campsite. The day-to-day herding activities involve several interactions between the humans and the animals. The herders gather, catch, place, and release the animals. Animal behaviors corresponding to these human activities are moving on, grazing, resting, and departing. As a result of the herders' repeated cycle of gathering in the morning and releasing in the evening, the home group tends to range relatively close to the campsite.

This pattern of gathering and release is applicable not only to the Sakkyryr but also to the Oimyakon Eveny and the Kharampur Nenets.

Case 2 ***Oimyakon Eveny*** This case is based on observations of a reindeer herding team working in a state farm in Iuchygei village of the Oimyakon district,

Table 2. Timetable of herding activities

Oimyakon Eveny's herding activities on 31 March 2007:

gathering	12:05	Herders started the searching for the herd of reindeer.
	12:30	Herders found the herd in pasture.
	12:45	The herd was lead into the corral inside the campsite.
catching	14:07	Herders started to catch some reindeer.
	15:50	Twenty one heads of reindeer were caught by herders.
releasing	18:25	Herder left the campsite to lead those reindeers used on this day.
	18:40	Herder found the releasing point of place for those reindeer and then releases them.
	18:50	Herder confirms that those released animals were approaching to the herd.

Kharampur Nenets' herding activities on 10–11 March 2008

gathering	unknown	Herders started the searching for home group of reindeer.
	9:30	Herders drove the herd into the campsite by snowmobile.
catching	9:30	Herders started to catch some reindeer.
	13:10	Eight reindeer were caught by herders.
releasing	17:35	Herder left the campsite to lead caught reindeers for next day.
	17:55	Herder found the releasing point of place for the reindeer and then let them freely with the long rope.

which I visited in March 2007.

Six herders are usually assigned to this team, but because it was still winter at the time of my visit, only three herders, a father and his two sons, were engaged in the management of the herd. Together with the father's wife, a daughter, and a younger brother, they all stayed at a lodge house with a small corral in the winter pasture.

The team's reindeer numbered 1400. During the winter season from the end of November to early April, they divided the herd into a home group and a reserve group, with daily herding required only for the home group (see also Figure 2). The home group was made up of approximately 80 animals, including mostly trained reindeer, such as riding and draft animals, and milking does.

The daily herding activities of the Oimyakon were the same as with the Sakkyryr: gathering, catching, placing, and releasing. On March 31, 2007, the activities in the camp are documented as follows. To understand these activities in a very real sense and for purposes of comparison, the time of each activity is noted (See Table 2).

A herder and his younger sister started the gathering activity, leaving the campsite on foot to search for the home group at 12: 05. After the herder found the two riding reindeer by the sound of their bells, he scattered mixed fodder at 12:30. Among the approaching reindeer, he caught one riding deer named *Tuzaty* by hand. The sister rode the deer and started to drive the group into the campsite. The herders and the home group reached the campsite at 12:45 and the herders put the group of animals into the corral. After a break, from 14:07 until 15:50 all the people at the campsite were catching the deer. In this time, they caught 21 reindeer—one four-year-old animal that had been castrated for training and 20 draft animals. Other than

Fig. 3. The release activity of the reindeers used on that day (March 31, 2007, Oimyakon, Sakha Republic, photography by Hiroki Takakura)

these reindeer, the rest were released from the corral and then sent away from the campsite.

Of the 21 animals that were captured, one was to be trained as a draft animal; six were to be used for work that day; and 14 were scheduled for work the next day from the early morning. The next day's work was the preparation of food supplies for the moving of the herd in the spring and early summer. They bring such staples as grain, pasta, sugar, and cigarettes from the winter campsite and secure them in special storage stations along the route to the summer pasture. Because they would be transporting many supplies, they would need 14 deer. Meanwhile, the young sister and a herder used six animals for transportation by sledge until the evening.

In the evening at 18:25, a herder left the campsite on foot to lead those reindeer away from the camp. At 18:40, he stopped at the foot of the hills and found the rest of home group on the slope and released the six reindeer to rejoin the group (see Figure 3). Then the herder checked to confirm that the released animals were approaching the rest of group, and at 18:50 he left for the campsite. The reindeer for the next morning's work were brought a bit away from the campsite and individually tethered to trees with ropes five to six meters long.

In summary, daily work activities on this particular day included 40 minutes spent gathering (from 12:05 to 12:45); 103 minutes spent catching (from 14:07 to 15:50); and 15 minutes spent releasing the animals (from 18:25 to 18:40). The herders did not place the animals because no grass or lichen was present in the vicinity of the winter campsite. This pattern of the day-to-day activities of herding is also same among the Sakkyryr Eveny.

Case 3 ***Kharampur Nenets*** During the 18th century, Nenets in both the Tundra and the Taiga engaged in hunting and fishing, while simultaneously tending

small herds of reindeer. With the disappearance of wild reindeer from the Tundra, the Nenets adapted by becoming large reindeer herd nomadic pastoralists. However, the Nenets in the southern forest zone continue to live unchanged; their main subsistence depends on river fishing and on small herds of reindeer (Khomich 1995: 51–61, Prokof'eva 1964: 551).

The last case includes observations of the camp of Kharampur Nenets in the forest-Tundra ecological region, in the Yamalo-Nenets region, in March 2008. This group practices the forest type of reindeer subsistence. One of the well known classifications in Siberian anthropology, the forest type features a complex economy of hunting, along with the herding of a small number of reindeer to be used as draft animals. The Tundra type is predominant in large scale pastoralism, mainly for food.

Three households resided in this campsite, and all members were somehow kin to the others. In terms of their social organization and residential patterns, there were almost no similarities to the state farm system of the Socialist regime.

The group mainly engaged in river fishing for subsistence and kept small numbers of reindeer, as well. A fishing factory had been opened during the Soviet era, and more recently, gas and oil fields were being established. These created a big demand for fish for workers. Throughout the Soviet period until the present, the group practiced a typical Taiga pattern of reindeer subsistence—the herding of a small number of reindeer, as well as fishing and hunting.

Because of the recent introduction of the snowmobile, the people do not often use reindeer as a mode of transportation. Nonetheless, herders recognize the individual animals in their herds. Table 3 is a list of the individual reindeer which a herder recited one day. It includes information about the animal's sex and age, along with

Table 3. List of Individual name of reindeer in Y camp of Kharampur Nenets (2008)

#	name	sex	age	owner	family number
1	Netmeia	doe	4	Kolia	1
2	Aiu	doe	22	Miyu	3
3	Varabi	doe	2	Kolia	1
4	Pepsikora	doe	4	Viktor	2
5	Tun"stan	doe	15	Miyu	3
6	Nina	doe	31	Viktor	2
7	Orok	doe	6 or 7	Viktor	2
8	Antiropa	doe	4	Oksana	1
9	Kulbai	castrated male	6	Sergei	1
10	Liupkin	castrated male	10	Andrei	1
11	Pushkin	castrated male	6	Yura	3
12	Verepka	doe	11	Viktor	2
13	Posono	castrated male	26	Kolia	1
14	Diana	castrated male	4	Sergei	1
15	Varabi	doe	4	Viktor	2
16	Singacheta	doe	2	Tat'iana	1
17	Parkanti	doe	9	Yura	3

the name of the owner. He identifies each animal by face and by body type; he also recognizes the individual behavior of each animal. Some of the mother-child relationships are also known. As shown the column labeled "Family" in Table 3, the number signifies who lives together in this campsite. The closest intimacy between a person and a reindeer is embedded in individual recognition. A herder recognizes all the individual reindeer belonging to members of the camp and the reindeer's owners[6].

Although herders are easily able to recognize individual animals, the spatial relationship between human and reindeer depends on the individual animal. Some animals voluntarily approach the campsite in the morning, and humans can easily catch them by hand, especially if the human starts to feed them. On the other hand, other animals must be driven to the campsite by herders on snowmobiles, and it can be difficult to catch the animals even with a lasso.

The catching activity on March 11 is described as follows (see Table 2). Because a sledge race was be held as part of a local festival in the middle of March, the herders needed to prepare the strong draft reindeer. They drove approximately 50 heads of reindeer to the campsite at 09:30, and then eight persons started to catch them by lasso. This work could be considered gathering and catching, as it is the same with the Sakkyryr and Oimyakon Evenys. This activity continued with some breaks until 13:10. A total of 8 animals were caught. Compared to the catching activity of the Oimyakon Eveny, this group was not very efficient. However, efficiency in catching may not be so important because the corral was increasingly being used as a tool for labor efficiency[7]. Moreover, these herders never thought of their reindeer as wild, even those animals that were hard to catch. Nenets generally dislike interbreeding of domestic and wild reindeer (Khomich 1995: 62).

It seems quite important to note that the forest Nenets also engage in releasing activity. On March 10, they caught the four deer already mentioned, and then they tethered those animals to snowmobiles and left the campsite at 17:35. They slowly drove the snowmobiles with the animals in tow and at 17: 55 reached the place where the herders separated from one another. One end of a long rope was looped over the neck of each reindeer and the other end, over a log. Then, herders buried the rope inside the snow. This activity illustrates again that herders always try to create some distance between the campsite and the reindeer.

CLOSE FAMILIARITY AND ADJACENT SPACE

These three case studies share some interesting characteristics: (1) Herders achieve intimacy with particular animals which serve a useful role in the lives of the humans; and (2) these more useful animals tend to be placed near the human residential space but not on the site itself. The dual structure of the herd is based on this human-animal relationship (Sakkyryr Eveny and Oimyakon Eveny). The intimate reindeer mainly are selected for the home group, and the meat reindeer are selected for the

[6] A herder cuts the ear of reindeer to indicate ownership. This is related to property relations in between families.

[7] There was no interim-corral made of sledges nor did herders use pipelines, for example, as "natural barriers" for catching as the Yamal-Nenets do (personal communication with F. Stammler).

reserve group. The forest Nenets, on the other hand, maintain a herd of only the home group, although the introduction of the snowmobile has decreased the practical value of their draft animals as a means of transportation. In place of a reserve group of reindeer, these people rely on river fishing as source of food and cash income.

These studies indicate that the following assertions are probably valid: (1) Herders sometimes focus on particular animals among the domesticated population and increase the degree of familiarity with those animals; and (2) for the purpose of controlling herd movement, herders adjust from adjacent to remote the spaces accessible to their various animals with the human residence at the center. The wider the diversity of familiarity among a herd or a domesticated population, the more distant the space the human needs to cover. The Sakkyryr and Oimyakon Eveny cases are examples of groups with the most differentiation of familiarities among the reindeer herd, yet even they utilized the dual structure to organize the herd and used extensive space for herd management. On the other hand, the Kharanpur Nenets displayed the relatively homogenous familiarity of their reindeer and they used adjacent space[8].

Herders achieve close familiarity with particular livestock and place them in space adjacent to their residence, which is the core of forest reindeer herding. If the herder preserves this human-animal relationship, the choice of a main activity to produce food depends on the environmental, socioeconomic, political circumstances, and personal preferences. During the Soviet Socialist period, the government attempted to introduce to the Siberian indigenous peoples a model for an animal industry to produce meat. Most of the herders could accept the system and the corresponding technological innovations. Other herders, however, chose fishing and hunting as the main sources for subsistence, without relinquishing their domesticated reindeer. Thus, the level of familiarity and the use of adjacent space are keys to enable the hunter-herder continuum in the Arctic forest region.

RECONSIDERATION OF LARGE ANIMAL DOMESTICATION AND SAKHA HORSE-CATTLE PASTORALISM

Domesticated reindeer, which generally do not care to be touched by humans, are usually restricted to space outside human space. This practice does not occur only in reindeer herding. As Baskin (1974: 540) once said, "The free pasturing of domestic ungulates without human control has a number of practical implications for the keeping of reindeer, yaks, camels, and horses." Therefore, the issue of the control of the herd's movement needs to be reconsidered in terms of the size of the livestock.

Previous research, in particular research that focused on the herding of horses in Mongolia and Central Asia, indicates that the control of the herd's movement is similar for reindeer. A herd of horses consists of many horse bands or units including a single male with a harem of females. These bands are allowed to roam freely, far from the campsite; many herders regard their behavior as "wild" (Konagaya 1989,

[8] This is not true among all Nenets. Stammler (2005, Chapter 3) also describe the Tundra (Yamal) Nenets as the same as the Sakkyryr and Oimyakon Evenys.

Shnirelman 1996, Vainstein 1980). The situation is the same in Sakha or among the horse and cattle pastoralists in Siberia (Takakura 2002). The term "distant herding" was coined to differentiate an intentional technique for controlling the herd from simple free range management. This concept may be paired with "proximate herding," which is applicable to controlling the movement of herds of small-sized livestock[9]. In this case, herders and livestock share the living quarters as a rest space. In the morning, herders drive their animals from the camp to pasture and water sites, and in the evening, they return the animals to the camp, the typical day-trip herding.

Again, as Tani suggests, herders appear to construct an artificial inter-individual relationship with animals to organize the herd as a unit of movement. Another way to say this is that in the unified structure of the herd, its purpose as a unit of economic management for humans and its purpose as a unit of livelihood should overlap. This principle is applicable to horse herding. Sakha horse herders carefully intervene in the selection of animals for the harem, even at times directly paying a matchmaker to organize the harem (Takakura 2002). However, herders do not practice day-trip herding, and the behavior of the horses does not reflect the intimacy of the riding horses.

The theory of symbiotic domestication permits the horse some rewards for its interaction with humans. For example, the horse might receive nutritional support during the spring or the birthing season, and the pasture is safer because humans try to exterminate predators, rewards which are almost the same for reindeer. Cattle pastoralism, on the other hand, occupies a unique position in this respect. Unlike horses, Sakha cattle reside in sheds next to the human settlement. When the human opens the door of the shed each morning, the cattle disperse to seek grass and water with or without the herdsman. Needless to say, the human intervention in the breeding of cattle is the same as the horse. These examples illustrate well the irregular behavior of livestock towards humans, even after continuous human intervention in breeding over several generations.

Clearly, the size of an animal is important neither for domestication nor for management of the herd. The effect of domestication on animal behavior appears at the species level in a local environment which is the locus of a particular human population and a particular animal population. In terms of symbiotic domesticity, not only biological features of the animal but also animal-personhood that influences things on the individual level. For the further understanding of that effect, we need to correlate species, herd, and individual to other factors. Species corresponds to domestication, the herd corresponds to control, and the individual animal corresponds to familiarity. The range of familiarity with that animal is determined at the species level in a particular local environment. The quality of familiarity is determined at the individual level through daily interactions and the perception of the animal's personhood. The herd is crystallized as a combination of the range and quality of familiarity.

[9] For a discussion of the similarity and difference between my set of concepts the previous corresponding one, (closing/loose herding), please refer to Takakura 2004: 58-59.

DISCUSSION

The reconsideration of the domestication of reindeer in Arctic and sub-Arctic leads to a questioning of the exceptionalism of Arctic pastoralism. The exceptionalist approach is based on only Tundra reindeer herding and on a comparison with the other domestic livestock, an approach which enhances our understanding of the evolutionary approach to human history as a whole. However, it fails to explain the reason that diversified human-reindeer relationships are developed in different times and loci. Therefore, I began to consider whether hunting and herding could be continuous in the subsistence pattern, regardless of the level of domestication.

For humans, the most important benefit of reindeer domestication is acquiring a means of transportation. Although some ethnic groups milk the does, the amount is limited, and not all reindeer people practice dairying. Reindeer may provide a stable supply of meat, but reindeer to be used for meat do not necessarily have to be domesticated. The shortage of milk and the large size of the animals if they are to be used for transportation are biological conditions for the domestication of reindeer.

The benefits that accrue to humans from domestication are different for each animal. In Mongolia, the domestication of the horse is not enough to make the animal a secure source of food because the animal's reproductive power is relatively low and the animal matures rather slowly. Therefore, it is also important to have a flock of sheep, whose biological traits and conditions are quite different from the horse's (Imanishi 1995: 65). As the climate and ecological conditions allow some groups to keep only reindeer as a domesticated species, they need to devise alternative strategies to attain certain benefits, such as hunting and fishing or husbandry of meat reindeer based on the transportation relationship with that animal.

The need to devise alternative strategies may be confirmed from an historical analysis and analysis of the current situation of the northwestern Yakutia of Eastern Siberia from the 17th to the 19th centuries. The Turkic Sakha, whose traditional subsistence is husbandry of horses and cattle and hunting in the sub-Arctic middle basin of the Lena River, migrated into the Arctic region of the lower Olenek River towards the end of the 17th century and changed their subsistence pattern to reindeer husbandry and hunting. When they migrated, the Tungusic Evenki and some Russian hunters (*promyshlenii*) were already living in the region. The Sakha abandoned horse and cattle husbandry and instead took up reindeer herding which was introduced to them through cultural contacts with the Evenki. The ratio of reindeer herding to hunting was dependent on the size of the wild population of reindeer (Gurvich 1977, chap.1, see also Ventsel 2006). In the 18th century, Sakha in this region generally depended mostly on wild reindeer hunting. From the end of the 19th century, the number of their domesticated reindeer increased and the animals became an important source of food (Gurvich 1960: 69, Khazanov 1983: 113). In addition, the current situation of these people also confirms the transformation from husbandry to hunting of reindeer in this region. The local population in the Olenek district turned from reindeer husbandry to hunting wild reindeer and fishing as their main ways to procure food after the collapse of the Soviet Union (Takakura 2008).

The hunter-herder continuum in Siberia is not an exceptional adaptation; rather it

is the result of human choice in response to environmental change and socioeconomic conditions. The biological conditions necessary for the domestication of reindeer and the ecology of their habitat are among those factors. As Layton (1991) suggests, the transition between hunting and gathering and specialized husbandry should not be regarded as a one-way process. It is rather "constructed as adaptive under certain natural or social conditions…loss of husbanded resources may favor hunting and gathering, while degradation of the environment and population growth tend to render intensive husbandry irreversible" (Layton 1991: 261–262). It is noteworthy that ever since domestication led to development of a new way for humans and animals to relate, the range of subsistence choices has continuously increased up to now.

When the first domestication of animals in human history occurred in western Asia, the range of subsistence was first formed as two opposite poles: hunting-gathering and specialized husbandry. But once the latter was established, other forms of subsistence such as commerce, long-distance trade, and market exchanges developed. When any social organization faces certain ecological constraints and socio-economic-political settings, it adaptively manages to invent a particular combination of subsistence choices. The combination of choices may seem random at first sight, but actually it forms a "subsistence continuum" within a specific context. This new term is defined by the particular set of the range of possible subsistence patterns, such as hunter-gatherer, pastoralist, farmer, trader, and any other livelihood. Needless to say, the word "subsistence" is meant to be understood in a broad sense: a source or means of obtaining the necessities of life rather the conventional anthropological term which opposes the market economy. The hunter-herder continuum is such a "subsistence continuum." The hunter-herder continuum theory (Ventsel) and the subsistence continuum theory introduced herein clearly explain the reason why hunting and herding are continuous among the northern pastoralists rather than exceptionalist among Arctic reindeer herders.

Spencer's concept of the pastoral continuum in East African cases is persuasive. He identifies two different pastoral continuums that were formed according to the environmental and historic-political factors. The Islamic pastoral continuum, which ranged from the Middle East to the Sahara and northward in Africa, is characterized by the dynamic interrelations between nomads and farmers. Its history relates to commerce, long distance trade, and urbanization in the region. On the other hand, a non-Islamic pastoral continuum is focused on areas that are "culturally islands onto themselves" despite trade relationships with local farmers (Spencer 1998: 257–258). In the latter case, the population "face[s] a spread of choices from free-ranging nomadism to a more sedentary commitment to farming" according the various settings (Spencer 1998: 20). It may be called a herder-farmer continuum in my lexicon.

As well as Spencer, some studies also regard the pastoralism as a continuum from nomadic pastoralism to sedentary agriculture. A given pattern of subsistence economy among East African pastoralists is formed according to the amount of the rainfall (Smith 1992: 10) or to the environmental instability and socio-economic factors (Gray et al 2002: 125). The ranges of "subsistence continuum" in this paper further could extend beyond the one from pastoralism to agriculture under the condition of

not only the subsistence economy but also the market economy. An ethnographical report shows that the case possibly classified to the non-Islamic pastoral continuum includes a hunting. Recently, Banna or Ethiopian pastoralists have begun to rely for their subsistence on hunting wild game, according to the intrusion of the state authority and market economy (Masuda 2005). Any particular subsistence pattern embodied in a given space and time matrix is a projection corresponding to the multi-polarized continuums, which is the essential idea of the 'subsistence continuum.'

CONCLUSION

We should regard hunter-gatherers, or pastoralists who now appear to be such, as a result of adaptation in a particular space and time matrix against each particularly formed subsistence continuum. What characterizes the core of the pastoral population is their own strategies for differentiating familiarities with animals through the control of breeding and movement and the various subsistence patterns. The climate, ecological conditions, and socioeconomic-political institutes limit the choice of strategies.

Familiarity is established by the herder, who interacts with the environment and the social setting. The range of familiarity is shaped not only for human purposes but also by the character of the animal which has been conditioned both by the local ecology and genetics. The differences among levels of familiarity with a particular animal determine the structure of the herd of livestock. My argument supports the claim that both arctic and arid—i.e., all pastoralists—relate to their animals in the same way. Each strategy for forming various levels of familiarity works to bring about the diverse ways of herding and the pastoral way of life, as well as the complexities of subsistence.

As a result, many pastoralists in the arid region adopt the multi-species livestock strategy. However, they could just as easily devise different subsistence patterns, emphasizing either farming or trading. The subsistence continuum must be formed in different settings according to the environment and prevailing social conditions. The hunter-herder continuum in the Arctic region is one of these; it does not form simply because of the Arctic location.

REFERENCE

Baskin, L. M.

1974 Management of Ungulate Herds in Relation to Domestication. In *The Behaviour of Ungulates and its Relation to Managemen*t, ed. V. Geist and F. Walther, 530–541. Morges, Switzerland: International Union of Conservation of Natural Resources.

2000 Reindeer Husbandry/Hunting in Russia in the Past, Present and Future. In *Polar Research* 19–1, 23–29.

Beach, H. and Stammler, F.

2006 Human-animal relations in pastoralism. In *Nomadic Peoples* 10–2, 6–30.

Dwyer. M. and Istomin, K.

2008 Theories of nomadic movement: A new theoretical approach for understanding the movement decisions of Nenets and Komi reindeer herders. In *Human Ecology* 36, 521–533.

Gray, S., Leslie, P. and Akol, H.

2002 Uncertain disaster: environmental instability, colonial policy, and resilience of East African

pastoral system. In *Human Biology of Pastoral Populations*, ed. Leonard, W. & M. Crawford, 99–130. Cambridge: Cambrdige UP.

Gurvich, I. (Гурвич, И.)
1960 Эвены камчатской область [Evenys in Kamchatka]. In *Trudy instituta etnografii* 25, 42–55.
1977 *Культура северых якутов-оленеводов* [The Culture of Northern Yakuts Reindeer herders]. Moscow: Nauka.

Harris, D.
1996 Domesticatory Relationships of People, Plants and Animals. In *Redefining Nature: Ecology, Culture and Domestication*, ed. R. Ellen and K. Fukui, 437–463. Oxford and Washington, D.C.: BERG.

Hazama, I.（波佐間逸博）
2002 家畜ヤギが形成する「輪郭のある群れ」と放牧管理［"Peculiar unity which is a discernable congregation" formed by domestic goat and its herd management］. In *Dobutsu kokogaku* 19, 73–91.

Ikeya, K. et. al.（池谷和信）
2009 「野鶏」の飼い慣らしは可能か？ タイ北部の山地農民の事例［Is it possible to tame wild chicken?: The case of hill farmer in Northern Thai］. In *Domestication: sono minzoku seibutsugaku teki kenkyu*, 225–246. Osaka: National Museum of Ethnology.

Imanishi, K.（今西錦司）
1995［*1945–46*］ 遊牧論その他［Nomadic pastoralism and so forth］. Tokyo: Heibonsha.

Ingold, T.
1980 *Hunters, rastoralists and ranchers: Reindeer economies and their transformations*. Cambridge: Cambridge University Press.

Khazanov, A. M.
1983 *Nomads and the outside world*, trans. J. Crookenden. Cambridge: Cambridge University Press.

Khomich, L. (Хомич, Л.В.)
1995 (1966) *Ненцы: Очерки традиционной культуры* [Nenets: outline of traditional culture]. St-Petersburg: Russkii dvor.

Kimura, R.（木村李花子）
2007 野生馬を追う―ウマのフィールド・サイエンス［Following the feral horse: field science of horse］. Tokyo: Tokyo University Press.

Koishi, H. and Suzuki, T.（小石秀夫・鈴木継美）
1984 栄養生態学［Nutrition ecology］. Tokyo: Kowa shuppan.

Konagaya, Y.（小長谷友紀）
1995 狩猟と遊牧をつなぐ動物資源観［A view toward animal bridging hunting and nomadic pastoralism］. In *Koza chikyu ni ikiru (3) Shigen he no bunka tekio*, ed. R. Ohtsuka, 69–92. Tokyo: Yuzankaku.

Krupnik, I.
1993 *Arctic Adaptations: Native Whalers and Reindeer Herders of Northern Eurasia*. Hanover and London: University Press of New England.

Layton, R. et al
1991 The transition between hunting and gathering and the specialized husbandry resources. In *Current anthropology* 32–3, 255–274.

Matsui, K.（松井 健）
1989 セミ・ドメスティケーション：農耕と遊牧の起源再考［Semi-domestication: reconsider the origin of cultivation and nomadic pastoralism］. Kyoto: Kaimeisha.

Masuda, K.（増田研）
2005 「野生の宝庫」の行方［Current setting of "wild treasure"］. In *Shakaika sareru seitai shigen: Etiopia taema naki saisei*, ed. F. Katsuyoshi, 151–178. Kyoto: Kyoto University Press.

Nozawa, K.（野澤 謙）

1987 「家畜化の生物学的意義」[Biological significance of domestication]. In *Bokuchiku bunka no genzo*, ed. K. Fukui and Y. Tani, 63–108. Tokyo: Nippon hoso shuppansha.

Prokof'yeva, E. D.

1964 The Nentsy. In *The peoples of Siberia*, ed. M. Levin and L.Popov, 547–570. Chicago and London: The University of Chicago Press.

Road, K. et al

2008 Genetic analyses reveal independent domestication origins of Eurasian reindeer. In *Proceedings of the Royal Society B*. 275, 1849–1855.

Russell, N.

2002 The wild side of animal domestication. In *Society and Animals* 10: 3, 285–302.

Sasaki, S.（佐々木史郎）

1985 トナカイ飼育の歴史 [History of reindeer husbandry]. In *Minpaku tsushin* 30, 85–95.

Shnirelman, V. et al

1996 Hooves across the steppes: The Kazak life-style. In *Horses Through Time*, ed. S. Olsen, 131–152. Boulder: Roberts Rinehart Publishers for Carnegie Museum of Natural History.

Smith, A.

1992 *Pastoralism in Africa: origins and development ecology*. London: Hurst & Company.

Spencer, P.

1998 *The pastoral continuum: the marginalization of tradition in East Africa*. Oxford: Oxford University Press.

Stammler, F.

2005 *Reindeer Nomads Meet the Market: Culture, Property and Globalisation at the End of the Land*. Vol. 6. Halle Studies in the Anthropology of Eurasia. Münster: Lit publishers.

Syrovatskij, D. (Сыровацкии, *Д.*)

2000 *Организация и экономика оленеводческого производства* [Organization and economy of reindeer production]. Yakutsk: Sakhapoligrafizdat.

Takakura, H.

2000 社会主義の民族誌—シベリア・トナカイ飼育の風景 [Ethnography of socialism: Landscape of reindeer herders]. Tokyo: Tokyo toritsu daigaku shuppankai.

2002 An Institutionalized Human-Animal Relationship and the Aftermath: The Reproductive Process of Horse-Bands and Husbandry in Northern Yakutia, Siberia. In *Human Ecology* 30–1, 1–19.

2004 Gathering and Releasing Animals: Reindeer herd control activities of the indigenous peoples of the Verkhoyansky Region, Siberia. In *Bulletin of National Museum of Ethnology* 29(1), 43–70.

2008 エヴェンキ、トナカイ飼育の崩壊と狩猟への転換 [Evenkis, the collapse of reindeer herding and change into hunting]. In *Kikan minzokugaku* 124, 8–13.

Tanaka, J.（田中二郎）

1978 採集狩猟民の比較生態学的考察 —— とくにブッシュマンとピグミーの狩猟を中心として [Comparative ecological consideration of hunter-gatherers: Bushman and Pigmi]. In J*inrui no shizenshi*, ed. J. Itani and R. Harako, 3–27. Tokyo: Yuzankaku.

Tani, Y.（谷　　泰）

1986 Two Types of Human Interventions into the Sheep Flock. In *Domesticated Plants and Animals of the Southwest Eurasian Agro-Pastoral Culture Complex, II*, ed. Y. Tani, 1–42. Kyoto: RIHS, Kyoto University.

1989 The Geographical Distribution and Function of Sheep Flock Leaders. In *The Walking Larder*, ed. J. Clutton-Brock, 185–199. London: Unwin Hyman.

1997 神・人・家畜 牧畜文化と聖書世界 [God, human and livestock: Pastoralism and Bible]. Tokyo: Heibonsha.

Testart, A.

1995 (1982) *Les chasseurs cueilleurs, ou, L'origine des inégalité*, Japanese trans. H. Yamanouchi. To-

kyo: Hosei University Press.
1988 Reply. In *Current anthropology* 29–3, 490–491.
Turutina, P. G. (Турутина, П. Г.)
2004 *Лесное ненцы. Сказания земли пуровской* [Forest Nenets, Story from Purov land]. Novosibirsk: Izd-vo SO RAN.
Vainshtein, S. I. (Вайнштеин, С. И.)
1970 Проблема происхождения оленеводства в Евразии. 1 [Problem of origin of reindeer husbandry in Eurasia (1)]. In *Sovetskaia etnografiia* 1970–6, 3–14.
1971 Проблема происхождения оленеводства в Евразии. 2 [Problem of origin of reindeer husbandry in Eurasia (2)]. In *Sovetskaia etnografiia* 1970–5, 37–52.
1980 *Nomads of South Siberia*. Cambridge: Cambridge University Press.
Vasilevich, G. M. and Levin, M. G.
1951 Типы оленеводства и их происхождение [Types of reindeer husbandry and its origin]. In *Sovetskaia etnografiia* 1951–1, 63–87.
Ventsel, A.
2006 Hunter-Herder Continuum in Anabarski district, NW Sakha, Siberia, Russian Federation. In *Nomadic Peoples* 10–2, 68–86.
Vitebsky, P.
2005 *Reindeer people. Living with animals and sprits in Siberia*. London: Harper Collins.
1990 Centralized Decentralization: The ethnography of remote reindeer herders under Perestroika. In *Cashiers du Monde russe et sovietique*, XXXI (2–3), 345–356.
Watanabe, H.
1973 *The Ainu Ecosystem: Environment and Group Structure*. Seattle: University of Washington Press.
1978 Classification of Food for Hunter-gatherers. In *Minzokugaku kenkyu*, 43–2, 111–137.
1983 Occupational differentiation and social stratification: the case of northern pacific maritime food-gatherers. In *Current anthropology* 24–2, 217–219.
1988 On the social anthropology of Hunter-Gatherers. In *Current anthropology* 29–3, 489–490.
Yoshida, A.（吉田　睦）
2003 トナカイ牧畜民の食の文化社会誌 : 西シベリア・ツンドラ・ネネツの生業と食の比較文化 [Ethnography of Food of Reindeer Herder: Comparative culture of subsistence and food of Tundra Nenets in Western Siberia]. Tokyo: Sairyusha.
Zenk'ko, M. (Зенько, М.)
2006 *Сибирские лесные ненцы, историко-этнографические очерки* [Siberian forest Nenets: Historical-ethnographical outline]. Moscow: Basko.

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Arctic Centre, University of Lapland, Finland &
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Hiroki Takakura
Center for Northeast Asian Studies,
Tohoku University, Japan

Center for Northeast Asian Studies
Tohoku University, Sendai
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