

| Theme |



Human-animal “joint commitment” in a reindeer herding system

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This study explores the grounds and paradoxes of cooperative interaction in a reindeer herding system in Southern Siberia. While the majority of human activities are joint activities where goals or actions of participants require transparency and common knowledge, this article asks to what extent it is possible to build a cooperative interaction with minimal shared knowledge and poor means of communication. The article shows how, despite a lack of a clearly shared plans of action, herders are able to induce reindeer to come back spontaneously to the camps through nonverbal communication, even though reindeer graze freely and autonomously most of the time. Herders come to rely on reindeer's cognitive skills and desires and, more generally, on animal autonomy in order to keep their herd engaged with them. Paradoxically, humans can domesticate reindeer only if they keep them wild. Yet, in spite of a relation marked by communicational opacity and radical asymmetry, reindeer and men are able to maintain an ongoing cooperative context that allows them to carry out extremely complex joint activities, such as riding.

Keywords: reindeer herding, anthropology of cooperation, animal behavior, Tozhu-Tuva

The majority of human activities are joint activities: they involve multiple participants who carry out actions together. Participants must understand the common goal of the activity and coordinate their actions. For example, assembling a stand together requires each interactant to adapt his or her own gestures to the gestures and intentions of the other interactants. The choice of tasks and the coordination of movements are accomplished by acts of communication, essentially through spoken language, but also through gestures and embodied displays. Participants commit themselves to the activity by these acts of communication. As Herbert Clark argues (1996, 2006), to be successful, a joint action requires not only the private commitment of each participant, but also a “joint commitment” toward a common goal.

In social life, joint activities are not always as symmetrical and transparent as, for instance, shaking hands or assembling a stand together are. Cooperative activities often involve people belonging to different gender categories, age groups (parents and children), or hierarchical positions (bosses and apprentices). These categories are regularly imbued with unequal skills and knowledge, social status, and power. Expert and nonexpert interactions are typically asymmetric: parties have significant gaps in their relevant knowledge. However, on the basis of the study of a divination ritual involving a shaman and a patient, William Hanks (2006: 325) has shown, “sociality need not entail common knowledge, but still gives rise to joint commitment.” In such an interaction, the expert’s challenge is to “induce commitment” of the nonexpert and to bring him to “accept what he cannot know or even understand” (ibid.: 324).

To what extent is it possible to build a cooperative interaction with minimal shared knowledge and poor means of communication? Human societies are not composed only of humans; they also include numerous types of animals, such as pets and livestock. In herding societies in particular, people and animals are intimately bound together, they live together and influence each other; they form what could be called “hybrid human-animal communities” (Lestel, Brunois, and Gaunet: 2006). Recent studies have highlighted the ability of some domestic species, such as dogs and goats, to react to social cues presented by humans without prior learning, which seems to be evidence that they were selected for their social-communicative skills during the process of domestication (Hare et al. 2002; Kaminski et al. 2005). Even between humans and insects, one can observe the emergence of presignaletic forms of communication in learning contexts (Renesson, Grimaud, and Césard, this volume). The limits of communicational processes are currently being explored thoroughly, however in the everyday life of human-animal communities, communication is not a goal in itself, it is oriented toward the realization of tasks. In such communities, can some human-animal interactions be identified as forms of “cooperative activities”? On which common ground could a kind of interspecific cooperation be built? Real cooperation must be something both different from biological symbiosis and from communicational exchange. Cooperation implies, at least, a triadic relational scheme involving two agents looking together toward a common goal and involving themselves in its accomplishment. But what can “joint commitment” or “coengagement” of an animal and a human be?

In this paper, I will examine how a long-standing social cooperation can arise in a situation of communicational opacity and radical asymmetry. I will explore these questions using the example of a specific Siberian reindeer herding system.¹

1. After studying western Tuva (Siberia) from 2002, I conducted fieldwork in the Tozhu area (eastern Tuva), in July–August 2008 and February 2011. Tozhu reindeer husbandry has been described by explorers Ørjan Olsen ([1915] 1921) and Douglas Carruthers (1914) and by a Soviet ethnographer, Sevyán Vainshtein (1980, 1961, 2009). Recently Brian Donahoe has conducted thorough anthropological research on Tozhu and Tofa reindeer herding institutions and their relationships to the environment (Donahoe 2002, 2004).

The paradox of reindeer herding

Reindeer herding has recently given rise to much anthropological and ecological research that challenges the comprehension of human-animal relationships. Recent evidence suggests that a system cannot be correctly described from an anthropocentric point of view exclusively concerned with the actions of humans toward or upon animals as the object of such actions. Herders themselves do not interpret their activity in this way: they know that animal behavior, memory, wills, and the social organization of herds are crucial (Paine 1988, 1994). Robert Paine called the capacity of humans to decipher reindeer behavior, and the reactive ability of reindeer to memorize herders' order of things "reciprocal learning." Beach and Stammeler (2006) have highlighted what they call the "circularity of wills" between humans and animals. It has been reported in the past that Nenets herders "follow the deer," and indeed this sometimes occurs, but the actual situation is more complicated. As Hugh Beach and Florian Stammeler argue, reindeer internalize the patterns of movement dictated by herders, so that "herders follow the reindeer that follow the desires of the humans" (2006: 7). This kind of integration constitutes what they call "symbiotic domestication."

For Kirill Istomin and Mark Dwyer, drawing on Paine's concept of reciprocal learning, reindeer and humans construct not only their wills, but also their behaviors, in interaction with each other (Dwyer and Istomin 2008; Istomin and Dwyer 2010). In each herding system, humans act according to their expectations and hypotheses relating to reindeer behavior. As for reindeer, they adapt their behavior to herding techniques. Herding systems, Istomin and Dwyer argue, produce a loop of mutual adaptation of human and animal behaviors; however, this loop is also subject to perturbations under the influence of technological and sociopolitical changes.

As many authors have noted, a particularity of reindeer husbandry is that reindeer are herded in regions where they can actually survive without the intervention of man. Throughout the Arctic world, many populations of former domestic reindeer are known to have become feral (Baskin 2009). Iceland is populated by thousands of wild reindeer descending from a small group of domestic reindeer imported in the eighteenth century (Thórisson 1984). These facts give a significant advantage to the reindeer. While representatives of native peoples often claim that "without our reindeer, we will perish," reindeer can manage without humans. Siberian oral traditions recount cases of groups of herders that starved to death because their herds were driven away by huge wild reindeer herds (Gurvich 1977: 49–50). In the present day, it is clear that the survival of some indigenous peoples of Siberia is directly linked with the situation of their reindeer herding.²

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2. See King 2002: "Without deer there is no culture, nothing," the words that grace this title are from a herder in Kamchatka. In the Taimyr Peninsula, from the 1950s onwards, many domestic reindeer were driven away by an increasing population of wild reindeer. The Soviet authorities considered hunting to be more profitable than herding in this area, thus herding declined and eventually collapsed, causing both a cultural and demographic catastrophe for the indigenous peoples of the peninsula (Baskin 2009: 161).

Thus, the paradox of reindeer herding is that, compared to other domesticated species, *humans can domesticate reindeer only if they keep them (in the) wild*. Therefore, the reindeer retain an element of choice: even in the most controlled systems, they can find opportunities to abandon humans and go live without them in the tundra or the taiga. Consequently, herders are forced to be especially aware of reindeer behavior; moreover, they often try to understand and manipulate the motivation behind this behavior, namely reindeer will and desires. Indeed, the existence of a sustainable reindeer herding system is virtually impossible without a kind of cooperation by the reindeer themselves, an engagement by the animals in the human-animal association. Reindeer are thus a good example of the participation of animals in their own domestication (Digard 1990).

The herder-reindeer relationship is a fragile and unsettling combination of domination and reciprocity, betrayal and trust, incomprehension and collaboration. Herders must both recognize animal autonomy and keep control of their interaction with them. This balance of herd control is framed by two threats, one internal and one external. If herders excessively concentrate their herd in order to control them more easily, they subject the animals to the risk of epizootics; on the other hand, if the herders' pressure becomes too loose and reindeer scatter, the risk of predators and the flight of reindeer increases (for more detail on this double threat, see Stépanoff 2012).

The key to the herders' success is their ability to get reindeer to engage in an interactional field and to have the desire to renew this engagement regularly, with as few external constraints as possible. Although reindeer do not seem to share plans and goals with humans, a kind of particular engagement by the reindeer seems to be necessary to support the human-animal relationship, and to achieve such delicate human-animal cooperative activities such as riding or moving to a new campsite through the forest. This cooperation is obviously made difficult by the fact that the participants belong to different species: knowledge is highly asymmetric, communication is poor, and the interests of the participants may sometimes be contradictory. Hence the question: What are the herders' strategies to get reindeer to engage in a sustainable cooperative interaction?

Although the reindeer-human balance is highly dependent on daily contact, there are few ethnographic descriptions of the concrete interactions between men and animals. Recent theoretical studies on reindeer herding have mostly been carried out among Nenets, Komi, and Sámi herders (i.e., on market-oriented pastoral systems of the Arctic tundra, where herders manage herds of thousands of animals). In these systems, direct interaction between humans and most of the reindeer is rather rare and basic.

My study deals with a case of reindeer herding among the Tozhu of Southern Siberia. This case of Tozhu herding is part of a hunting-oriented subsistence economy: small herds, ranging from a dozen to 150 reindeer, are herded in the taiga without a goal of meat production. Herders know all their reindeer individually, many of which have a name. I will argue that many of the herders' everyday actions aim to keep their reindeer engaged within a cooperative framework with them, and that herders attempt to ensure the integration of reindeer in the nomadic community through three central means: (1) cultivating attractiveness for reindeer, (2) using the cognitive skills of reindeer, and (3) favoring hierarchy in the herd.

Supporting an ongoing relationship with animals

The Tozhu are hunters and reindeer herders of the Sayan Mountains (Southern Siberia) where they neighbor other reindeer herders from historically related populations: the Tofa (or Tofalar), the Soiot of Buriatia, and the Dukha of Mongolia (in Mongolian, *Tsaatan*). The Tozhu, Tofa, Dukha, and Soiot dialects are very close to Tuvan, the official language of the Tuva Republic in the Russian Federation. Sayan is the southernmost area where there is reindeer herding, and it is also the oldest known, as petroglyphs attest to its existence in the Bronze Age (Kyzlasov 1952). Of course, herding techniques have undergone many changes since then, mostly under the influence of Turco-Mongolian steppe pastoralism. Tozhu herding overcame two tragic crises during the twentieth century: collectivization in 1949 and privatization during the 1990s, which was accompanied by a 90 percent fall in reindeer livestock (see Donahoe 2004).

The Tozhu system is typical of taiga reindeer herding. For Tozhu living in the taiga, domestic reindeer are used as beasts of burden, and from spring to fall seasons, does' milk is a major part of their diet. Castrated male reindeer (*chary*) are used for daily transport (for riding and as pack animals). Tozhu herders do not use sleds or snowmobiles, which would be impossible in the mountainous taiga where they live. The Tozhu avoid slaughtering their reindeer and they do it only if absolutely necessary, for example when game is scarce. If they need to kill a reindeer, they choose an ill, wounded, old, or rebellious animal.

While in tundra herding systems large reindeer herds are regularly watched over—sometimes twenty-four hours a day—Tozhu reindeer graze freely in the vicinity of the campsite, yet frequently also as much as several kilometers away. Tozhu herders sometimes go out to bring their reindeer in, but they never simply stand near to keep watch over them. In winter, reindeer come more or less regularly to the camp of their own accord—some every morning, some less frequently. Everyday, herders check which reindeer come, and if some are missing for too many consecutive days, they try to find them out in the taiga and drive them back to the camp. These searches can be difficult and dangerous and often remain unsuccessful for several days. Finding three reindeer in the dense mountainous taiga is obviously far more difficult than finding a herd of a thousand reindeer in the open landscapes of the tundra. The Tozhu herders must use their hunting skills in order to track and analyze the animals' footprints.

Unsurprisingly, herders prefer it when all the reindeer come back by themselves, but they are also aware that the reindeer might make another choice.³ Some herders report that, after the collapse of the State farm (*sovkhos*) system in the 1990s, the population of wild reindeer (*taspanan* in Tuvan) increased sharply at the expense of lost domestic reindeer from “bad” or “lazy” private herders. In neighboring areas of the Sayan chain, individual herding skills had been so deeply eradicated during the socialist period, that attempts to reintroduce private herding were disastrous. Among the Soiets of Buriatia, two attempts to reintroduce private

3. Although domestic reindeer have a different name (*iv*) from wild reindeer (*taspanan*) and are called *mal* (or “cattle”), Tozhu partly treat them as wild beasts. For instance, Tozhu say that only wild game (*ay*) liver must be eaten raw. However, when they kill a domestic reindeer, they eat its liver raw as well. They would not eat the liver of cow or a sheep in this way.

herding at the end of 1990s ended with the loss or death of most of the reindeer because herders were unaware of the pasture and mobility needs of the reindeer (Baskin 2009: 245–246). Among the Tofa, Donahoe has shown that due to herders' lack of experience and the lack of attention they paid toward reindeer behavior and needs, domestic herds almost completely disappeared within a few years (Donahoe 2004: 136–137). For example, one of the last Tofa herders kept his riding-deer tied up for several days at a time in the village (ibid.: 137–138), a practice which would never be observed among the Tozhu because, according to them, it causes hunger and stress for the animal.

In these conditions, it is clear that the Tozhu herding system's survival is, to a large extent, dependant on the capacity of herders to develop among their reindeer a tendency to come back to the camps, *a willingness to maintain contact with humans*.

Herding with delicacies

In summer, reindeer are harassed by mosquitoes (*ymyraa*) and botflies (*maas*), especially when there is no wind. These insects exhaust reindeer and cause diseases, and to avoid them, herders choose windy places for their summer camps. Sometimes herders create smoke in order to drive off insects and the reindeer gather in a compact group near the smoke and stay there all day. At night and on windy days, as soon as the mosquitoes disappear, the reindeer move away to graze freely.

However, this technique for keeping the herd close is only effective in the summer. All year round, salt and human urine play a more central role in maintaining the fragile link between humans and animals. In winter, when some reindeer come back to the campsite in the morning, people go out of the house or the tent and distribute salt to them. While giving salt, they tie up some of the mothers and leaders. Other reindeer will stay near those tied up. This practice is not novel. At the beginning of the twentieth century, Douglas Carruthers (1914) observed among Tozhu reindeer that “for salt they have a very keen desire, keener than I have noticed in other animals; here it is a common sight at evening to see the women feeding their pet deer with salt out of little leather bags as they come to the tents for the night” (1914: 231). Similarly, Ørjan Olsen ([1915] 1921: 94) noticed that Tozhu reindeer like salt very much, and added this interesting hypothesis: “this is perhaps the reason why they stay so close to humans.”

Nowadays, some officials in the agricultural administration in the Tozhu region explain that salt is necessary for the physiology of reindeer. However, ethologists consider salt to be rather dangerous for their health if it is distributed in winter, as the Tozhu do, because the animals can get thirsty and then swallow too much snow (Baskin 2009: 17).

Herders do not claim that they distribute salt for the sake of the animals' health: they know that wild reindeer find salt by themselves in natural fields and in plants, and infer that domestic reindeer can also do this. Herders explain that they actually give salt because otherwise their reindeer would not come back to the campsite of their own accord. Indeed, the presence or absence of salt in the settlement has a strong influence on reindeer behavior. I observed that in the camp of a poor herder who had run out of salt, his reindeer did not come back for several days running, while some reindeer came back to the settlements of other herders who

gave out salt every morning. For herders, running out of salt can lead to the herd returning to the wild.

It is worth noting that the presence of salt also has important connotations in Tozhu cooking. The liver and fat of game animals are eaten raw and not salted. It is forbidden to offer salted food to the master-spirits of the landscape through the fire, probably because salt, as a characteristic feature of the human diet, is not suitable for nonhumans. In cooking, as in herding, salt seems to underline the boundary between wild and domestic domains.

The attractive power of human urine

In the Tozhu system, urine is a crucial component of the familiarization of reindeer with the human body and its odor. Although reindeer fear the smell of man, they are attracted by the presence of salt in human urine (Baskin 2009: 76, 80). Tozhu men are used to urinating near the house, often on a hollow stump, or even in a urinal specially constructed for reindeer: a tree trunk with a trough carved in it, adapted to height of reindeer mouths (figure 1). These urinals are constructed very close to the home, about ten-fifteen meters away, although among Western (steppe) Tuvans, it would be not decent to urinate so openly. In winter, urine freezes immediately and is thus conserved in these urinals, so that when they come to the campsite, reindeer can easily lick it. Reindeer also lick frozen urine and dishwater on the ground, breaking the ice with their hooves.



Figure 1. Reindeer rush up when a man comes to the urinal.

As soon as they arrive at the campsite, reindeer observe people's behavior closely—they wait for salt or urine. When a man seems to be about to urinate, some reindeer immediately gather around him, sometimes running up to him. In 1914, Olsen had already observed this behavior among the Tozhu. He points out, "When they see a man urinating, reindeer come from everywhere to be sure to find their diet. By virtue of [their] intimate relationship with men, they are so gentle that you can often catch them with your hands" ([1915] 1921: 95). Brian Donahoe (2004: 133) even noticed that herders "discriminately distribute their urine (an important source of salt for the deer) to their favorites or to those they feel need it most."⁴ Obviously, urine strongly consolidates intimate relationships and bodily attachment between reindeer and humans.

Familiarizing fawns and creating addiction

The relationship between a mother doe and her fawn is established during the first three days of the fawn's life. Initially the fawn does not specifically recognize its mother: it is attracted by any large and dark form. If this relationship is disturbed, the mother may refuse to feed her fawn (Baskin 2009).

Tozhu herders seem to have an intimate knowledge of this development process. They avoid contact with the fawns during the first days of their life. After that, the herders drive the does and their offspring to the settlement, where the fawns are tied up for several days near the tent. Their mothers are released to graze during the day, but they do not go far as their fawns stay at the campsite. This is both a means of familiarizing the fawns and of controlling the herd. In the evening, the does are brought in and tied up near their fawns to suckle them and to be milked by the herders.

While they are tied up without their mothers, young fawns receive salt, or even sugar if there is some, from the hands of the herders. Herders do not distribute sugar and salt to fawns for the sake of their health, but, as they say, because "everybody likes sugar!" They recognize that the operation of tying up fawns is quite tiring, however they also know that this critical time has a strong influence on the further development of the reindeer. Indeed, while fawns lick the herders' hands, they learn to associate pleasure with the scent of man and the contact of human skin. Herders endeavor to ingrain in reindeer from birth a physiological need for salt and to transform it into a kind of addiction, so that reindeer will look for more salt than they need and will be willing to come back to their settlements regularly in quest of pleasure.

It should be noted that people do not distribute salt just because they are preoccupied with the necessity of maintaining control on their herd. Visitors to a camp like to give salt to local reindeer too, even though they are not theirs. From the observation of herders' behavior it seemed clear to me that from the human side, there is also a kind of pleasure in distributing salt: perhaps the satisfaction of seeing a reindeer give in out of greed, slowly overcoming its fear and surrendering to humans, the pleasure of a special, fragile, and daily reinforced human-animal contact and communication (figure 2).

4. According to the ethologist Baskin (2009: 76), tundra herders sometimes attract their sledge reindeer by pretending to urinate.

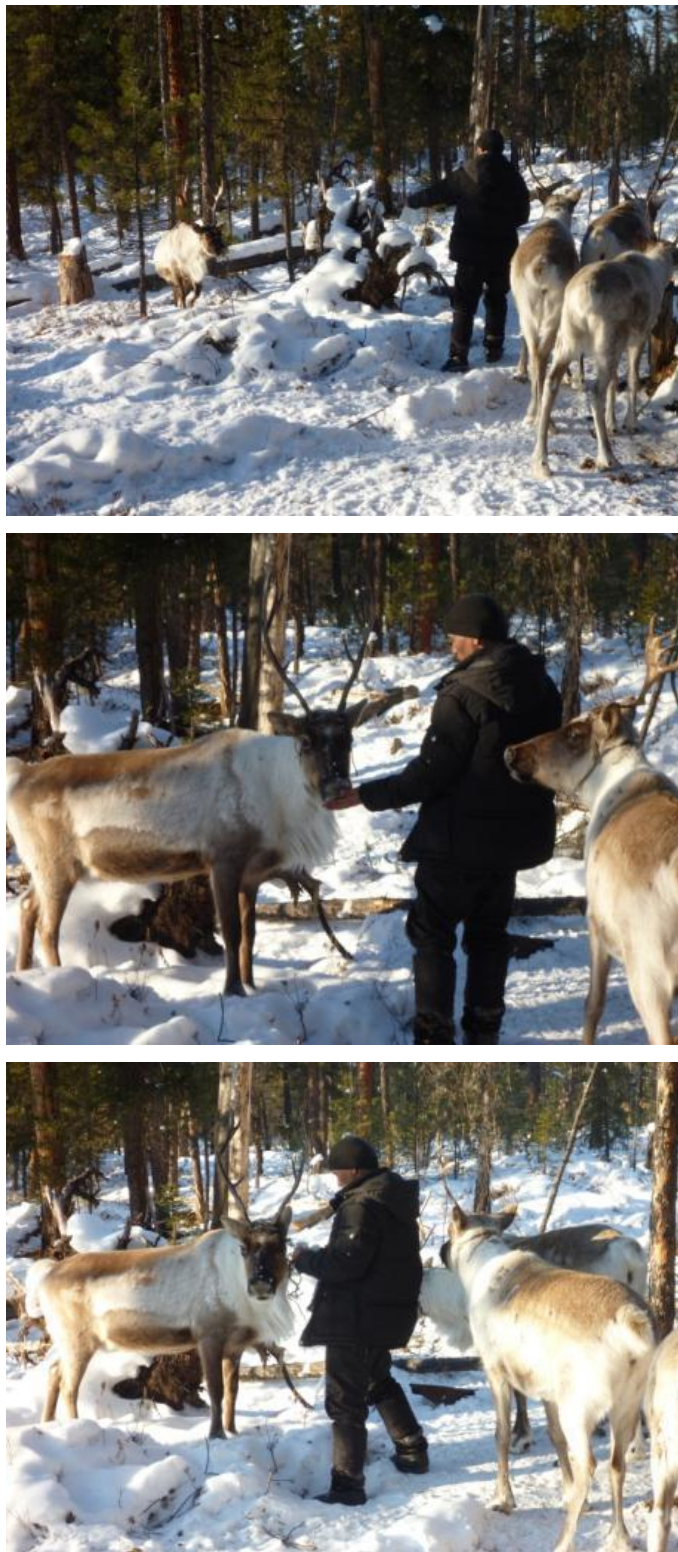


Figure 2. Attracting a deer with salt (1), offering salt (2), and tying up (3).

How do you get a reindeer to carry you?

In large-scale herding systems, many of the techniques of maneuvering reindeer herds are based on reindeer's fear of humans. Reindeer are often frightened in order to be "pushed" in the right direction (Baskin 2009: 110–121). Riding and pack animals, which are the most used to humans, are released into the herd after work. Once in the herd, they adopt the behavior of the other reindeer and they tend to flee from humans, so that it is often difficult to catch them again. According to Baskin, a minimum of two herders is needed to catch a deer: one disturbs the group where the deer is located and forces them to run, while the other herder is hidden and tries to catch it with a lasso (*ibid.*: 122–125).

Unlike some tundra herders, the Tozhu have no herding dogs; they have lassos, but they are rarely needed, apart from using them for reindeer with a particular problem, for instance if they are frightened or wounded. Usually a single herder can catch a riding reindeer out at pasture without any trouble. He follows the tracks and when the reindeer are in sight, he calls them, shouting "oh! oh!" and shows a little bag of salt that he shakes in his hand.

The cries "oh! oh!" are neither human nor reindeer language. They are an element of the different vocalizations and words the Tozhu use to address their reindeer, something similar to what Eduardo Kohn (2007) calls a "transspecies pidgin," a specific language adopted by humans in order to communicate with a domestic species (*cf.* Fijn 2011). Of course, the reindeer will have detected the herder's approach much earlier through the noise he makes and his smell, so that the aim of the cry is not to let them know that he is there, but to attract their attention and interact with them. The reindeer then stand and look at him—a field of reciprocal attention has been opened.

After some hesitation, one reindeer decides to approach, and then all the reindeer begin to gather around the herder. Then he gives salt to the animal he needs, and puts a rope around it without any problem. The field of reciprocal attention has evolved into a field of cooperative interaction.

Basically, in Tozhu herding, catching a reindeer and getting it to work initially require that the reindeer agree to engage in an interactional field with humans. Cries open a communicative field in which the reindeer is invited to engage itself. Once the deer is engaged in the interaction, the herder demands more and more engagement and coordination from it: he leads it to the camp, saddles it, and finally, standing on a small support, he deftly mounts. The support, usually a tree stump, permits the rider to mount without harming the animal's back.

In human interactions, people first negotiate to commit together to a common activity toward an overall goal, before committing to the segmental actions required for the achievement of the activity according to a means-ends analysis. For example, the joint activity of "assembling a stand together" can be broken down into actions such as "arranging the parts," "assembling the parts," and so forth. As Clark argues, commitments are hierarchical and stack vertically from a basic goal up to particular tasks (Bangerter and Clark 2003; Clark 2006). In reindeer-human interactions, joint activity is not structured in such a vertical hierarchy. On the contrary, it seems to progress horizontally from simple contact to more complex interactions. The reindeer first engages in a simple exchange of salt through a tongue-hand contact, after which it is induced into a more goal-oriented cooperative activity, such as going together with a man on its back through the taiga.

Riding on mountainous terrain covered by deep snow is a relatively difficult activity, which requires good coordination between human and animal. It is virtually impossible to achieve it with horses, which are not adapted to this region in winter. A bad coordination between the rider and the mount leads to a loss of balance, and the rider will fall off or the deer will be injured. Breaking a reindeer's back is an accident herders fear. Uneven ground, tree branches hampering the rider, unexpected slippery ice, cause ceaseless shifting of the load on the fragile spine of the animal. The deer adapts its position and effort in order to maintain its balance as well as its rider's. The rider helps it by modifying his seat and his posture, and by leaning on the stick he holds in his right hand. This stick is an important element in the technique of reindeer riding, which distinguishes it from horse riding, and reveals the rider's active participation in the maintenance of balance (figure 3). Lightly tapping the reindeer's rump with the stick and a special “ah ah” cry signal to the deer that it must move forward.



Figure 3. Riding a reindeer. The rider ensures his balance and helps the reindeer's efforts by using his stick. In his left hand, he holds the rein attached to a rope around the reindeer's neck.



Figure 4. Tying up a reindeer standing near the urinal.



Figure 5. The boy catches the deer by the neck with the right hand, with which he was just giving salt. In the left hand he holds a salt-bag.

Maintaining an attachment

When reindeer arrive at the campsite in the morning, herders who have time (and energy) tie up the leaders and some other does; they then release them in the evening. The technique of catching deer requires, first of all, distributing salt, or making the gesture of offering salt, then deer let themselves be caught by the neck and tied up (figure 4 and figure 5).⁵ The rope is then tied to a post or to the trunk of a young larch (*shet*) lying on the ground.

At first glance, tying up reindeer could seem to be a strange and risky practice. Reindeer could dislike being caught and forced to stay all day in a place where they have nothing to eat or drink (in the campsite, for example, lichen and grass are quickly crushed and covered by excrement). They could get hungry or contaminated by infectious diseases like foot rot.

So why do the Tozhu regularly tie up their reindeer? It is not in order to protect them against predators, since wolves prefer to attack at night. Some herders claim that if reindeer stay in camp all day and are released at night, they will not go graze too far away. However this is not the main reason. All herders agree that if reindeer are not tied up, they tend to become less "smooth" (*chaash*), less familiar with humans, and they might disappear into the forest: "You teach by tying up" (*baglap ööredir*). Thus it appears that keeping reindeer tied up all day at the campsite has no other goal than to support the relationship of intimacy between reindeer and their herders. It is a kind of reflexive interaction intended to allow future interactions to happen. By attaching their reindeer, herders force them to prefer the contact of salt to free pasturing, to dominate their hunger, to keep them accustomed to human smells, voice, contact, and to remain "attached," in a figurative sense, to humans.⁶ It supports a *cooperative context*, inside which reindeer can be induced to having more active participation in specific activities, such as riding and milking.

Individualities among the herd

A wild reindeer herd is not an undifferentiated mass. It has an internal social structure, albeit a quickly evolving one. Among wild reindeer in the tundra, the position of the leader is quite fragile and temporary. In a situation of collective hesitation the first reindeer that takes the decision to cross a river or to flee becomes the leader. In one herd, 13–37 percent of reindeer are potential leaders, each of which can become an actual leader in specific circumstances (Baskin 1976; Baskin 2009: 102–104).

How can reindeer be integrated into a human-animal community if they have their own social structure? Everywhere in Northern Eurasia, herders are aware of the internal organization of herds and use this to manage reindeer movement (Baskin 2009; Paine 1988; Takakura 2010). I will argue that Tozhu herders not only observe and use hierarchy, they also produce it.

5. Formerly, the Northern Yakut also used urine and salt to attract reindeer in winter and tie them up (Gurvich 1977).

6. In the region of the Num-To Lake, the Nenets of the Forest go to the pasture every day to give their reindeer dried fish to eat. This practice has no other goal than to maintain the human-reindeer relationship and prevent the reindeer from moving away (Marine Martin, personal communication 2012).

Bucks and leaders

The Tozhu castrate most males and keep only one buck for a maximum of thirty females. A big and strong reindeer is selected to remain entire. Herders rely on bucks' strength to defend the herd against wolves. This brings to mind an observation made by Olsen among the Tozhu in 1914: "even when wolves are numerous, little is done to help reindeer, which manage on their own" (Olsen [1915] 1921: 101).

Two-year-old castrated males, *chary*, are trained to become pack animals: they learn to accept quietly being tied up, loaded, and ridden. They are the most "tame" individuals in the herd. *Chary* have "nicknames" (*chola*), such as *kara chary* "black ox" or *ak chary* "white ox."

Among wild reindeer not all males have equal access to mating, as dominant males have priority. The position of the dominant male is the result of fighting and intimidation; it is neither irreversible (i.e., it can change every year) nor exclusive. In the middle of the mating season, dominant males may become exhausted so that mating opportunities for the low-ranking males increase (Hirotani 1994). Castration creates an irreversible and exclusive supremacy for the entire buck. It amounts to rigidifying a situation of domination that is fluid in the wild.

The "herd effect" or "gregarious behavior" is the process through which the decision of one experienced reindeer becomes the decision of a whole group of reindeer. It is crucial for herders to control which reindeer's behavior will be followed by the herd. In large-scale herding, herders endeavor to frighten the most timid reindeer, generally adult does, in order to put them in the position of leaders. Young deer do not fear humans enough and they do not flee straight from them. Herders frighten those reindeer that will have a clear and predictable movement of flight and will be followed by the rest of the herd in the direction expected by herders (Baskin 2009).

In contrast to large-scale methods and to the organization of wild reindeer herds, Tozhu herders select leaders among the less timid and most familiar animals, and they actively strengthen their position. Leaders are elderly does, whose main function is to lead their offspring and kin to human settlements regularly (figure 6). They have nicknames, such as *koigunak* "rabbit" or *ulug myndy* "great doe." In Tuvan, they are called *bashtanchy* (or "leaders"), from the verb *bashta-* ("to lead, to drive").

Oleg is a rich herder who possesses around 150 reindeer (Donahoe interviewed him in 2000, see Donahoe 2004:174). He has three leaders, each followed by a group of around fifty animals. Even when the whole herd is gathered, these groups remain separate entities. Leaders drive their groups to graze in different directions. Some lead them to the campsite every morning, some disappear for a long time—it depends on the leader's choice, namely its liking of salt. In the evening, when the reindeer are released, they are driven by herders to a distance of 50–100 meters from the campsite, after which the leader drives the herd on its own to a suitable pasture. Leaders also open up the way in the snow, making it easier for younger deer.



Figure 6. A *bashtanchy* (leader doe).

Leaders are easily recognizable by the bell hanging from their necks. Bells are the key device used by herders to stabilize their status. Each bell has its own sound, so that reindeer can easily recognize and follow their leaders. Some herders report that they accustom fawns from birth to hearing the sound of their leader's bell and to pay attention to it. And as reindeer are generally grouped around their leader, bells also help herders to find lost reindeer. Bells also contribute to the protection of reindeer, as they are supposed to frighten wolves. Thus, being around the leader is safer for other reindeer, which certainly contributes to strengthening its authority and herd cohesion.

Herders emphasize that they do not choose or train their leaders to be leaders. The leader, as they claim, “appears by itself, it is such from birth” (*tytyp keer, bodu-la törümelinden*). A herder explained: “They cannot be trained, they have it in their blood [*hanyndan*]. It is the same among humans; some are smarter than others.” In their understanding, herders do not *create* but *recognize* the leaders. Practices, however, are fairly interventionist. Although herders make use of some dispositions to leadership, they also actively modify them. First, leaders are sorted by the herders; “bad” leaders, those that have a harmful influence on other reindeer, leading them to flee from humans, are slaughtered. Second, herders strongly influence the relational structure of the herd, strengthening and stabilizing the dominant position of the leader. While the leader is a temporary position in the fluid structure of wild herds, in Tozhu herding, being a leader is a long-standing status integrated in a stable hierarchical organization—in a way quite similar to human social organization.

Consecrated individuals

It is important to emphasize that the human strategy of selecting bucks and leaders and stabilizing their hierarchical position is associated with a theory about the innate qualities of individuals. I have shown elsewhere that the innatest and essentialist mode of comprehension is also active in the strategy of identification of other “singular” (*onzagai*) beings, such as sacred reindeer and shamans (Stépanoff 2011).

Herders are very sensitive to the individual idiosyncrasies of their reindeer. They assume that “each reindeer has its own different character” (*azhy-chay*). The Tozhu have an institution that highlights their attention to individuality in the herd: the consecration of particular reindeer called *ydyk* to the master-spirits of the landscape (*oran èèz*). Most households have one *ydyk* reindeer in their herd. Such an *ydyk* is described by herders as an animal “that is never touched” (*shuut degbes*)—it is not ridden, not loaded, not milked if it is a female, not killed, and not eaten. However, it is not considered as idle. On the contrary, as a herder said, “the *ydyk* reindeer watches over [*harap-körtip turar*] and protects the household. If there is an *ydyk* animal, it is said that people and reindeer will not fall ill.” It is interesting to observe that in this herding system, where herders barely watch over their herd, they assign the task of protecting humans and reindeer to their *ydyk* reindeer. Reindeer to be consecrated are “animals that somehow distinguish themselves”—they have a particular coat, white or black, green eyes, or a “particular character” (*aazhy-chayy any*). The inferential process determining the selection can be described as such: visible atypical features are interpreted as indices of an uncommon personality, an individual essence. From this essence, this reindeer is expected to be graced with other aspects, such as occult powers and relationships with invisible agencies.

The ritual of consecration is performed in a singular human-animal relational configuration. The ritual is carried out by a shaman or an elder of the household. The reindeer is fumigated with juniper and colored ribbons are tied around its neck. Milk is poured over the animal. Then it is led three times around a fire. Next, the person performing the ritual catches hold of its head and forces it to bow three times before the sun and to “pray.” During this the ritual performer pronounces: “May the herd grow, may there be a lot of milk, may alien things (*öske chüveler*) not attack.” These words are attributed to the reindeer; it prays for the happiness of its herd and against wolf attacks (designated by the euphemism “alien things”), just like a shaman does for his or her patients. In this ritual, the reindeer is given the position of an actor and is responsible for the relationships between the herd and the entities of the environment (sun, wolves, etc.).

The practice of consecrating reindeer is important for the problem of cooperation between man and reindeer. From a psychological point of view, this institution actively contributes to spreading and reinforcing the following: (1) the idea that the herd is structured by deep essential differences that exist between individuals and that these differences should be noticed and enhanced by humans (In other words, humans’ psychological essentialism contributes to reinforcing a social organization that is much more volatile among wild herds.); (2) a model of a human-animal relationship which attributes autonomy and responsibility to reindeer.

A cooperation through nomadic space

Reindeer mostly pasture freely over vast territories around human encampments that are moved seasonally. During the year, there are many possibilities for humans and reindeer to lose each other. It is important that humans and reindeer have common perceptions of the landscape and common routes to meet up again and maintain their association.

According to herders, reindeer remember landscapes and roads very well, even better than humans do. If a reindeer taken to a village in summer is then let free, it will be able to find its own way back to the campsite, even if it is many kilometers away. However, in winter, reindeer do not suffer from the heat in villages as they do in summer, so they may decide to stay. If a rider gets lost, or if he is drunk, he can simply let his reindeer go free and it will lead him back to his campsite.

Nomadic routes belong to common geographical knowledge shared by reindeer and humans. The nomadic route is neither a product of human or animal volition, it is the result of long-standing relationships among humans, animals, and their common environment. A nomadic route is the spatial projection of the reindeer-human coengagement in the landscape (see figure 7).

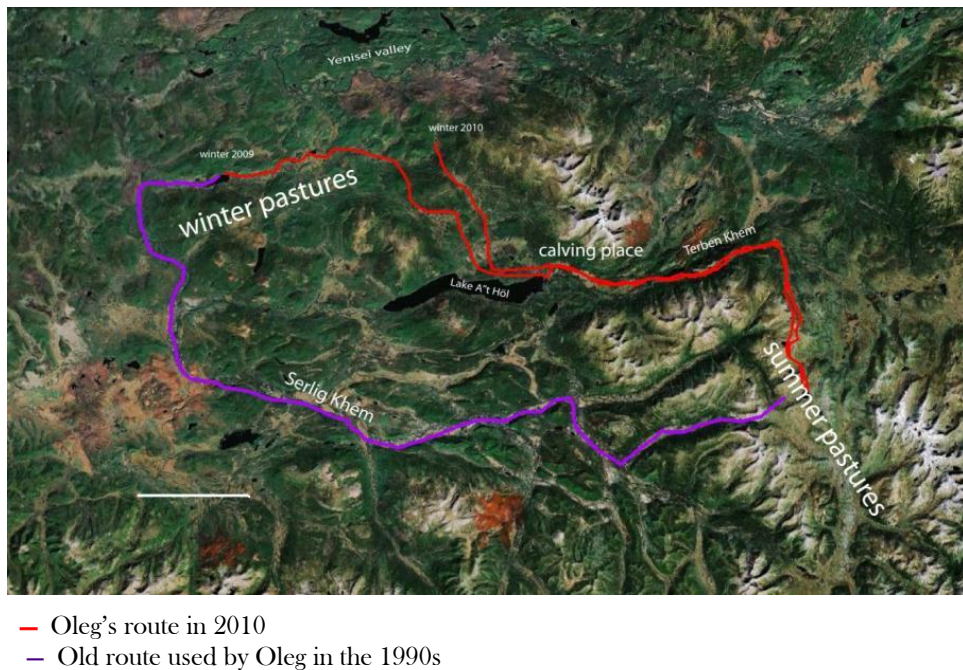


Figure 7. Routes in the Sayan Mountains.
Satellite view: © Google 2012, Terrametrics 2012.

The spatial pattern of routes

It is possible to distinguish ecological factors (animal behavior, biotopes, climatic conditions) and nonecological factors (political environment, cultural traditions) that influence the movement pattern (Dwyer and Istomin 2008), however many of these factors are closely interconnected. Anatoly Khazanov (1994: 38) stressed that, within one migration route, it is important to distinguish the interseasonal

movements, which are determined by natural seasonal cycles and the intraseasonal movements that depend on the herd's size, and a series of other nonecological factors. Spatial patterns of routes are a combined response to different parameters such as:

- Traditional land use rights.
- Reindeer health and reproduction needs.
- Herd control needs.
- Other occupations, such as hunting, fishing, or going to the village of Adyr-Kezhig.

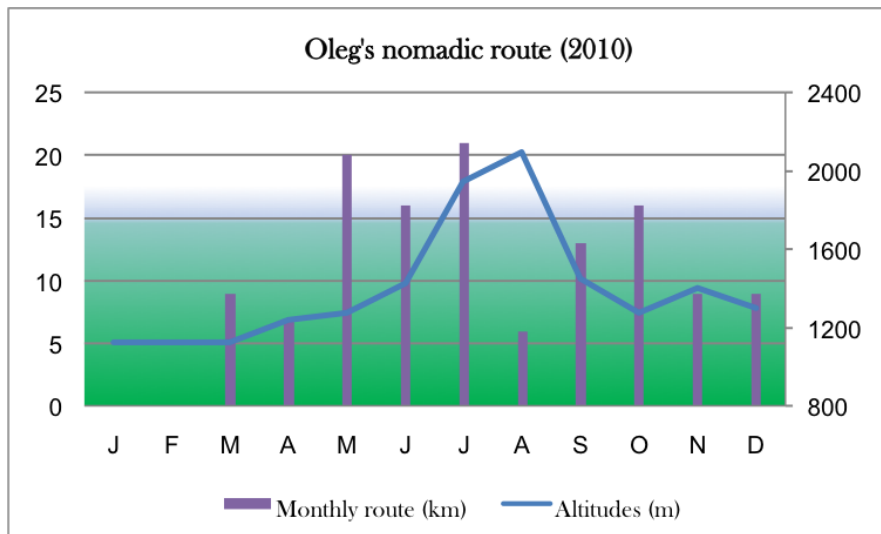
Land rights. In the Tozhu area, the overall geographic setup of the annual route of a herder family is primarily determined by the land use rights and by reindeer needs. Of course, these factors are themselves connected, as hereditary territories are adapted to reindeer behavior. Although present-day herders may have been employed in different places during the Soviet era, after the fall of the *sovkhos*, they came back to places where their families had roamed before. Oleg says that he lives on his “ancestors’ territory” (*ögbeler churtu*). This territory is structured by “roads” (*oruk*) that connect different river valleys.

The herd's needs. The needs of the herd are generally fairly similar to those of wild reindeer, thus their respective routes are often quite close. In winter one can observe wild reindeer tracks just a few kilometers away from those left by domestic reindeer (herders are able to distinguish wild and domestic reindeer tracks). In winter, reindeer need places with rich lichen cover, and not too much snow or wind. In the Tozhu region, such places are found in low valleys with taiga vegetation. Summer pastures must be places with cool temperatures and a strong wind in order to avoid insects and diseases. In Tozhu, high open pasture with *mengi* “everlasting snow,” without trees, where the wind blows day and night, is ideal. Consequently, Tozhu migration patterns come under “vertical nomadism,” going from low taiga pastures in winter to the summits in summer (figure 8).

Control needs. These depend on the herd's size. A large herd has several leaders which go off to graze in different directions. Therefore controlling its movement is more difficult than with a small herd. In a valley, when herders release reindeer in the evening, they drive them in the direction of an uphill slope, or toward rocks, or up to high snow, so that it will be less tiring—and therefore more tempting—for them to come back to the campsite the following morning than to move away from it.⁷

Other occupations. Hunting and fishing do not have an equal influence on all the households and their nomadic patterns. Comparisons show that poor herders with small herds are freer to change their itinerary in order to go hunting or fishing.

7. The use of the relief as a natural barrier was observed among the Tofa in the 1920s (Petri 1927).



In green: forest zone

In white: high altitude tundra

Figure 8. Distances and altitudes of a migration route.
Hot months are spent in the high altitude tundra.

Routes and reindeer memory

Herders with small herds often take two different routes to climb up to summer pastures and to come back down in autumn. For example, one poor herder sometimes changes his summer pasture and goes to another valley in order to find more game of different species. He says that he finds it interesting to explore new hunting and fishing territories. But, such freedom in the choice of his itinerary is not possible for a rich herder like Oleg, who owns around 150 reindeer. It is important for him that his reindeer remember a single route; this is why he takes the same route in the same valley every year to reach summer and winter pastures.

Oleg is one of the most experienced and respected herders of the high Yenisei Valley. Donahoe published data on his route in the year 2000 (Donahoe 2004: 174), which enables us to assess the evolution of his movement pattern over ten years. Formerly living only in a tent, in March 2000 Oleg was building a log cabin on his winter pasture near a lake in the Serlig-Khem region (*ibid.*). In February 2011, when I visited him, he already had five such cabins; each winter he stays two to three months in one of them depending on the weather conditions that year. The rest of the year, Oleg lives in a tent. Interestingly, in his case, the construction of log cabins does not imply a reduction of mobility.

The cabins are situated at various altitudes between about 1100 meters and 1400 meters, within a ten kilometer radius. Knowing exactly the different average snow coverage at each one, Oleg chooses the most convenient one each year. In addition to this climatic factor, he does not go back to the same cabin two years running, in order to enable the lichen to regenerate.

Oleg selects a winter pasture that insures an ideal thickness of snow, around 40–60 centimeters. Snow should not be neither too thick, so that reindeer can dig for lichen with their hooves, nor too thin, which would enable them to move too easily and for wolves to approach and attack reindeer. In 2010, the total route

length was 125 kilometers, with a difference in height of about 1000 meters between the winter and summer campsites.

Oleg avoids wide rivers such as the Yenisei, where reindeer can move easily on flat ice with thin snow cover and that is frequented by wolves. At the end of the 1990s, Oleg had only about twenty reindeer, which he had received from the former *sovkhos* after privatization. At that time, he used to follow different seasonal routes: he went up to summer pastures through the Terben Valley and back down in fall following the Cholos and the Serlig-Hem. However, when his herd grew, he decided to use the same corridor both in spring and in fall, the Terben Valley. He explains:

Having only one route is better for the reindeer: they remember it. . . . That is my habit, and my reindeers' habit: they know the route even better than I do. In March, I send them to the summer pasture and they will go there anyway, I don't need to look for them. When we move, if a couple of reindeer stay behind it doesn't matter, they will get to the campsite later. If I wandered away from this route, my reindeer would get lost. . . . A reindeer is clever like a person. That is my secret.

Oleg's strategy is to adopt a single route, so that reindeer can easily internalize it. The reindeer will go in the right direction without requiring much effort from the herder to get them to do it. This kind of movement management relies on animal memory and on the internal organization of the herd, because the route is memorized by experienced leaders who drive the herd to the right place. As Oleg and his family do not have the necessary strength, technologies, or the desire to control their large herd actively, they have to rely on reindeer capacities and their willingness to collaborate in the human-animal nomadic movement. The consequence is that the new route must be adapted not only to the reindeers' physiological needs, as it were, but also to their cognitive skills. On the other hand, by using this single route, Oleg can no longer allow himself to go off in search of new hunting and fishing places. The growth of his herd has lead him to reduce the scale of nonherding elements connected to the migration, thus decreasing the share of hunting and fishing in the household income. The household becomes more dependent on its herd; in order to get cash or meat, it will be easier for them to sell or to kill reindeer. However Oleg continues to hunt whenever he can. (It is easier in winter when the herd's requirements are low.)

In purely pastoral contexts, it is well known that large herds require more pasture and more mobility than small ones. This is not only caused by the dietary needs of the livestock, but also by the behavior of the animals (e.g., cows walk faster in large herds than in small ones). However, this is not true in the case of the Tozhu because, besides reindeer herding, other factors such as hunting and fishing induce herders to move. Small herds of ten reindeer can walk very far if their herder wants to hunt. The size of the herd does not influence the length of the route, but its form—the larger the herd, the more stable and simple the migration route should be in order to maintain herd control.⁸

8. Detailed data collected by Rastsvetaev in 1927 among Even reindeer herders of the Tompo basin, who had a way of life similar to the Tozhu, seem to confirm the link between the size of the herd and the simplicity of the route (Rastsvetaev 1933). While households with small herds (around fifteen heads) accomplish circular routes between different fishing and hunting places, richer households (from 30–100 reindeer) tend to

This case is particularly interesting as it gives a clear example of a smooth transition from a mixed system where hunting is dominant to a herding-oriented system. In this transition, a key factor is played by the requirements of reindeer cognition. It is possible that in other places throughout Eurasia, the growth of herds has increased the importance of animal "memory requirement" in herd management and in movement patterns, which has rendered impracticable an erratic mobility dedicated to hunting.

The timing of the itinerary

We have seen the importance of different factors influencing the choice of the spatial aspect of the itinerary, but a nomadic route is not only spatial. It also has a calendar, a series of decisions of moving, which varies from year to year. It has been observed among Nenets herds, for example, that reindeer tend to migrate when they feel the need. As Dwyer and Istomin (2008: 529) put it: "The herders move when reindeer no longer want to stay on the pasture." It means that in the decision process of moving to a new camp, pasture and climate conditions are not directly evaluated by the herders but by the reindeer themselves (*ibid.*).

This analysis is clearly relevant to Tozhu herding. The Tozhu are proud to be more mobile than Western Tuvan pastoralists, who move camp only two or four times a year. The Tozhu explain that they actually cannot stop being mobile, because "the reindeer move themselves; if you stay, your reindeer will go away." Tozhu herders observe that, at the end of April, as soon as it becomes "hot," reindeer cannot stay in the same place, they begin to head off toward the calving area and the herders must follow them. At the beginning of summer, reindeer tend to go higher up in the mountains. In fall, they have a very strong tendency to leave the high mountain pastures and to descend into the valleys (in fall many mushrooms appear in the forest and reindeer, who love them, go "mushroom picking"). Another reason is the snowfall. Reindeer go down to the forests, where the snow is thinner than on high pastures and will not prevent them from finding food.

Therefore, reindeer have a tendency to follow the route expected by humans, although the timing of their migration cannot be controlled by humans, as it depends on complex ecological factors. As in Dwyer and Istomin's study (2008), herders do not make their decision to move after an evaluation of different ecological factors. They observe the behavior of their reindeer and they move when they notice that "cattle cannot stay in place" (*mal turbas*), and when it becomes too difficult to control the herd.

In short, (1) the choice of migration routes and fixed campsites is made by herders, who evaluate the quality of pastures and the presence of snow; (2) the timing of movements depends mostly on reindeer behavior. Herders consider that the decision to leave a camp is actually taken by the reindeer.

While humans master the spatial aspects, reindeer master the timing. This does not mean that reindeer have no idea regarding the question of the direction of the migration, or that humans have no idea about the timing of the migration. However, humans tend to impose their view about the direction, and to listen to

be bound to a single route, in one main valley. These data will be analyzed in more detail in another publication.

reindeer about the time to go. This is understandable as it is much easier to orient the movement of a herd than to prevent it leaving when it has already decided to migrate.

Discussion: Animal autonomy, distributed cognition, and joint commitment

This study confirms Istomin and Dwyer's (2010) hypothesis that reindeer behavior should not be considered as a natural given, as it largely depends on local herding technologies, and as such has cultural foundations. Tozhu reindeer behavior is as far from tundra reindeer behavior as their herders' techniques are from those of tundra herders.

The human-reindeer relationship is characterized by fundamental opacity and asymmetry. Humans ride and kill reindeer; the opposite is not true. Humans can claim that they have a much better knowledge of reindeer intentions than vice versa, and they are certainly right. Herders make sure that reindeer understand their intentions when they ride them or drive them in the taiga. However, a reindeer does not know that the herders want to slaughter it, until the split second when it feels the knife in its neck. While among western Tuvans slaughtering a sheep is a public and festive event carried out near the home, among the Tozhu, men usually kill the deer in isolation, out of the sight of the other reindeer, but also of women and children. As a result, while in large-scale herds reindeer develop panic behavior related to the experience of slaughtering places, Tozhu reindeer do not show fear connected with the danger of being killed by their herders.

On the other hand, it does not seem possible for a reindeer to hide its intention to kick a human or to flee from him. Thus humans can relatively easily make inferences about reindeer intentions. Herders attribute intentions and desires to their animals, they try to anticipate and modify them, and take them into account when taking decisions. Humans are able to select which of their intentions they communicate to reindeer, which means that they have representations of the representations reindeer have of their intentions. There is no evidence of the opposite being true for reindeer.

Although asymmetric and opaque, this relationship is not without reciprocity. Discussing Tim Ingold's (2000) concepts, Donahoe (2004) rightly observes that "respect of autonomy" and "trust" are crucial in the Tozhu attitude toward domestic reindeer. This is true at different levels of herd control: protection, direction, cohesion, in which herders try to lead reindeer to engage themselves. Most of the time, the Tozhu do not watch over their herd, but rely on the reindeers' capacity to gather around their leader and to go in the right direction, and on their desire to keep contact with humans in order to have access to salt and for protection. This kind of joint management, which is central to the Tozhu herding system, is founded on *animal autonomy*. The principle of animal autonomy implies that humans expect and encourage in animals the presence of skills that enable them to play an active role in their relationship with humans and with the environment.

Humans must deeply engage in their association with reindeer. They must completely adapt their way of life to reindeer needs. In order to be able to use reindeers' strength, milk, and, sometimes, flesh, humans give them their urine. Reindeer can lead herders into potentially critical situations if they leave the herders, and opportunities of this happening arise every day. This gives strategic

importance to the animals’ will and desires within this herding system; herders cannot ignore this. Furthermore, herders’ bodily engagement (giving reindeer salt and urine, milking them, tying them up repeatedly) is necessary in order to build up an intimate relationship with their reindeer. Only in such a relationship will reindeer then engage themselves.

In the Tozhu system, herders share some important cognitive tasks with reindeer such as the evaluation of complex ecological factors, the memorization of the route, and decision-making about migration. So, is it possible to qualify this herding system as a “joint activity” with shared intentionalities and goals?

In this relationship, human and animal knowledge is highly asymmetrical, although complementary. The herder-reindeer relationship is close to what Hanks (2006: 302) calls “induced commitment,” by which the nonexpert, although he or she does not understand what the expert is doing, “is drawn into the process as an active co-participant.”

Certainly, although they do cooperate, there is no evidence that reindeer share common plans with humans and that they feel a motivation to help humans to reach them. For example, a reindeer and its rider can both have the intention: “We come back to the campsite,” and the reindeer will actively and deliberately contribute to achieve it, even if the rider is drunk and unable to drive it. If the drunken rider happens to fall, the reindeer will stand by and wait for him so that he can easily mount. This seems to indicate that the reindeer’s intention does include the rider and that it is aware of its participation in a joint action. However, in this case we may have two *coordinated* but *separate* intentions, rather than a joint plan of action in which two intentionalities merge. Only humans seem to be able to form representations on others’ representations. According to Michael Tomasello (2006), only humans engage in acts of shared intentionality, where participants integrate others’ intentions and representations and coordinate their actions to pursue a shared goal.

So in what kind of opaque and shaky cooperation are reindeer and herders engaged? Our data show that, in the Tozhu system, humans cannot accomplish their goals if their reindeer do not support them and regularly reinforce the relational field constituting the frame of these goals. Reindeer “induced commitment” is subtly aroused and controlled by herders; it is based on animal memory, desires, and motivation to migrate, which are modified to include humans. What is shared in such a human-animal community is not so much a strict and explicit plan of actions, but rather a common intention to maintain a *cooperative context*—a desire to carry on living and carrying out undefined actions together.

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Un “engagement conjoint” homme-animal dans un système d'élevage de rennes

Résumé : La présente étude explore les fondements et les paradoxes de l'interaction coopérative dans un système d'élevage de rennes en Sibérie méridionale. Bien que la majorité des activités humaines soient des activités conjointes où les objectifs comme les actions des participants exigent transparence et connaissance commune, cet article se demande dans quelle mesure il est possible de construire engagement conjoint transspécifique avec un partage minimal des connaissances et de faibles moyens de communication. L'article montre comment les éleveurs parviennent à inciter les rennes, qui pâturent librement la plupart du temps, à revenir spontanément aux campements, ce grâce à une communication non verbale et en l'absence d'un plan d'action clairement partagé. Pour maintenir un engagement du troupeau envers eux, les éleveurs s'appuient sur les compétences cognitives et les désirs de leurs rennes, et plus généralement sur une autonomie animale. Paradoxalement, les humains ne peuvent domestiquer les rennes que s'ils les maintiennent à l'état sauvage. En dépit d'un rapport marqué par l'opacité communicationnelle et l'asymétrie radicale, rennes et hommes entretiennent un contexte coopératif renouvelé qui leur permet de mener des activités conjointes complexes telles que la monte.

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