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Humans and Dogs of Mountainous Inner Asia: Sensory Collaboration and Personhood

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Abstract
I provide ethnographic, ethnohistorical, and archaeological data on human–dog relations in Inner Asia, specifically from a forested mountain environment of southern Siberia where I conducted observations with Soiot and Tofa herding and hunting communities. The work contextualizes three aspects of Soiot dog–human relations: sensory collaboration (interspecies perspectival sharing), autonomous social interaction (communal dog sharing), and cosmological relatedness (expressed through funerary rites). Emphasizing dogs as subjects, the article identifies canine-related practices of potentially deep historical and archaeological significance across Inner Asia. Discussing ethnographic dog–human relations as an aid to zooarchaeological interpretation, I seek to contribute south Siberian insights on canine domestication and co-evolution to ongoing debates on mobile and semi-mobile hunter-gatherer and pastoralist societies.

Keywords Canines · Sensory collaboration · Personhood · Soiot and Tofa herding and hunting communities · Southern Siberia · Inner Asia

Introduction

Human–dog relations have been integral to pastoralists and hunter-gatherers of Inner Asia for at least ten millennia (Devlet 1982; Vainshtein 1971). My research provides original ethnographic observations from Oka-Soiot herder-hunter-dog interactions in the Eastern Saian Mountains of southern Siberia. Situating these qualitative observations in zooarchaeological and ethnohistorical data of the wider region, a number of overarching regional and temporal patterns in dog–human practices become evident. I show how ethnographic and ethnohistorical materials can aid in the interpretation of zooarchaeological sites of Inner Asia and beyond. Ethnographic obsevations from western Buriatia (Oka) are followed by ethnohistorical accounts, and by an overview of the archaeology of dog burials in Inner Asia, before a discussion of some of their relationships.

The scope and relevance of the study include animal domestication from anthropological and multispecies ethnographic perspectives, as well as a multispecies approach to human–dog relations. Rather than viewing domestic animals as mere recipients of human intention, commodification, and ownership (cf. Clutton-Brock 1989:7), animal agency has become increasingly important in zooarchaeological and ethnographic studies of domestication (e.g., Cassidy 2007). This is mirrored by longstanding Indigenous conceptions of personhood, which are often extended to non-humans in the North circumpolar region (Brandišauskas 2016; Brightman 2002).

Effects of non-human intention on society are observable, for instance, in reindeer seeking human shelter from predators or insects (Beech and Stammler 2006:8), in herder anticipation of reindeer decision making (Stépanoff 2012:309), or in sheep-human mutual decision making (O'Connor 1997:152). Examples of non-canine animal agency are pivotal to understanding Inner Asian human–dog relations, as households contain multiple species alongside dogs. While dogs are the earliest known domesticates, the concept of 'domestication' itself takes on regionally specific interpretations (Oehler 2020b; Fijn 2011). Dukha herders of Mongolia, for instance, contrast dogs to reindeer in that the former require feeding, while the latter voluntarily graze (Küçüküstel 2021:85–86), yet both belong to a common household.

When, where, and how often dogs have undergone domestication globally remain debated (Larson *et al.* 2012;

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Germonpré *et al.* 2009). Geneticists suggest morphologically undetectable differentiation from wolves as early as 134,000 years ago (Vila *et al.* 2002), or alternatively ~25,000 to 40,000 years ago (Botigué *et al.* 2017; Skoglund *et al.* 2015), while archaeologists identify morphological changes around 15,000–10,000 years ago (Sablin and Khlopachev 2002; Tchernov and Valla 1997; Vila *et al.* 1997). Mitochondrial genome analysis of contemporary dogs places the origins of dog domestication in southern China at around 16,000 years ago (Pang *et al.* 2009), while nuclear genome-wide SNP analysis points to the Middle East and Europe for its origin (von Holdt *et al.* 2010). Regional wolf breeds from as far as Arctic Siberia also seem to have contributed to the gene pool of modern Canis (e.g., Losey *et al.* 2018; Lee *et al.* 2015). Yet, even where morphological differences have been detected, scientists remain divided on the geographic origin of dog domestication.

Some researchers suggest a polyphyly origin from more than one wolf population with subsequent backcrossing (Vila *et al.* 2002), while others propose a single origin in either southern East Asia (e.g., Ding *et al.* 2012) or West Asia (Savolainen *et al.* 2002). Conversely, the second oldest putative dog specimen, discovered in 1975 in the Razboinichya Cave in the Altai Mountains of southern Siberia (Map, point 1) dates to 33,000 calendar years ago (Druzhkova *et al.* 2013). Further research is needed to establish a statistically strong phylogeny for this specimen. If the Razboinichya specimen were to be confirmed as "an ancient dog with a shallow divergence from ancient wolves" (Druzhkova *et al.* 2013: e57754) it would challenge accepted dates and geographies for early morphological divergence, placing a potential hearth for the beginnings of human–dog relations at the roof of Inner Asia. In either case, dog–human collaboration predates the advent of agriculture, placing it with hunter-gatherers (Freedman *et al.* 2014). In present times, dogs remain essential partners in hunting and gathering along with various forms of herding practiced across Inner Asia.

I selected the study area because Oka-Soiot ways of living incorporate influences from across Inner Asia, including Mongolia, the Republic of Tyva, and Cis-Baikal. Geographically, the Eastern Saian mountains are positioned at the interface of Siberian mountainous taiga and Mongolian steppes, allowing Oka-Soiots to shift between subsistence strategies, while experimenting with diverse species historically found in neighbouring regions. Throughout Oka-Soiot occupancy, dogs have played pivotal roles, both as hunters and as guardians, in many ways consistent with the archaeological record of Inner Asia.

As a study region, Western scholars have variously cast the boundaries of Inner Asia as a region (see Atwood 2011 for a detailed discussion). In North American scholarship Inner Asia has often been seen as the interior of the Eurasian landmass, based on historically shared relationships among the civilizations of Central Asia, Mongolia, and Tibet, including Iran and Pakistan, and the republic of Kalmykia in the Russian Federation (SRI 2020; CIAS 2020). Many British scholars have drawn a tighter focus, "centred on Mongolia and extending across the region of the great steppes to the Himalayas" (MIASU 2020), including Kazakhstan, Uzbekistan, Tajikistan, Kyrgyzstan, Mongolia, Nepal, Sikkim, Bhutan, western China, south central Siberia, and North and South Korea (MIASU 2020). I adhere to the narrower approach here, while focusing its ethnography on south central Siberia.

The potential of this study lies in suggesting new trajectories for multi-disciplinary investigations into regional relationships between dog–human practices. Despite regional specificities regarding dogs and domestication, I emphasize identifiable connections between dog–human relations across time and space. Not withstanding, hunting dogs constitute only one of at least three species (horses, reindeer, dogs) most intimately interacted with among the domesticated species of Inner Asian households. As such, canines are often seen as part of teams made up of humans, horses, and/or reindeer.

Ethnographically observable entanglements between humans and other animals, resulting in social processes of domestication, have been of increasing importance in recent animal domestication debates, including for Inner Asia (e.g., Brumm 2021; Fijn 2018; Losey 2018; Lien 2015; Ingold 1974). In these social processes, phenotypic features of animals can remain unaltered for a long time. Breeders may wish to secure in their animals a high degree of behavioural independence, combined with the physical resiliency found in a species' wild counterparts. Inner Asian social processes of domestication include reindeer and yak (e.g., Oehler 2020b), with breeders selecting for behavioural traits such as approachability while attempting to avoid loss of phenotypically wild features. Social processes of domestication can remain phenotypically undetectable (Losey 2018). In the case of dogs, as discussed below, the relative importance of social domestication seems to outweigh preferences for specific biological features.

Even where little or no phenotypic differences are detectable, animal burial practices can serve as an entry point into how personhood may have been ascribed to individual specimens. In this way, burials can help reconstruct "relational ontologies" in which "animals, like humans, were vested with sentience and agency" (Hill 2013:117). Yet not all animal burials provide evidence of ascribed sentience even if they suggest complex social relations (cf. Lindstrøm 2012 in Hill 2013). Globally, dogs are the most prevalent species found in animal burials, whether on their own or with humans, but not all dogs received special burial, suggesting "a range of roles and statuses"

held by canines in human society (Hill 2013:124).[1] The ethnographic account I present here illustrates lived circumstances that enable such "relational ontologies."

My research objective is to provide three core ethnographic markers: 1) sensory collaboration, 2) autonomous social interaction, and 3) cosmological relatedness, which help examination of archaeological scenarios for canine domestication and co-evolution in mobile and semi-mobile hunter-gatherer and pastoralist societies of Inner Asia. I refer to sensory collaboration as ways in which people and animals engage in often mutually intelligible non-linguistic communicative acts via their senses, while relying on each other's sensory advantages to form effective interspecies teams. Autonomous social interaction points to the ways in which some dogs are granted liberty to decide about hunting affiliations across households, as well as to practices of communal sharing in canine services. Cosmological relatedness stands for underlying region-wide similarities in the symbolic meanings attributed to canines.

Methodology

I draw on ethnographic materials gathered during anthropological fieldwork in Siberia between 2012 and 2016 (Oehler 2016). My aim was to gather qualitative data to enhance understanding of changing human-animal relations in mixed yak (formerly reindeer) pastoralism and hunting activities of contemporary Oka-Soiots. The project resulted in a nuanced account of the situatedness of local notions of animal domestication, including dogs (Oehler 2018a, b), yak, reindeer, wolves, and other species (Oehler 2018b, 2020b). My long term immersive fieldwork allowed for a study of interspecies collaboration in the face of changing environmental and politico-economic circumstances. I also conducted human-animal observations, human participant observation, dog observations, and a literature review.

While observations of animal behaviour outside of controlled experimentation may be insufficient for ethological research, ethnographic (and often wild) settings have their own advantages (e.g., de Waal 2006). Stemming from an anthropological perspective, my emphasis was on human perspectives on animals. I established initial research relations with Oka-Soiot communities in May 2012, followed by ten months of ethnographic fieldwork and archival research (2013–2014) in the village of Sorok and its hinterlands, as well as in archives of Irkutsk, Ulan-Ude, Kyren', and Orlik. In September 2014, I returned with palynologist and archaeologist colleagues to investigate past and present species compositions of households in Oka and Tofalaria. I again returned in spring 2018 to both field sites for clarifications and to report back to communities.

My fieldwork methods were also informed by a "zoontological" perspective (Wolfe 2003), which has been described as looking not for "what animals can do for humans" (Boyd 2017:307), but instead for "mutual becomings" (Birke *et al.* 2004). Mutual becoming does not suggest both parties must continuously be equal beneficiaries (Boyd 2017:308). Benefactor and beneficiary status may fluctuate between parties without ending their shared becoming. In dog–human relations this draws attention to canine agency. As a human observer, my reflections, observations, and writings remain human-centric, yet our daily lives and history as humans are undoubtedly situated in landscapes affected by the agency of other animals (cf. Kostyrko *et al.* 2016:76).

Contemporary Dogs of the Eastern Saians

Many Oka-Soiots practice a form of transhumant yak pastoralism including hunting and fishing activities and some market exchange. With no farming and few gardening activities in mountainous terrain (1,500–2,500 m.a.s.l.), the bulk of their nutritional needs are met by cow's milk and meat, and purchased flour, sugar, salt, and tea. The dual purpose of their dogs to hunt and guard mirrors this mixed economy of herding and hunting, in that the alarm function of dogs helps protect dairy and other domestic cattle, while their hunting capacity aids in meat, tradable musk gland, and fur procurement. Dogs are commonly present during seasonal riparian net fishing often conducted as part of hunting excursions, although they do not seem to fulfill any essential services.

Many Oka-Soiots, along with their Tozhu, Tofa, and Dukha neighbours, are historically known as reindeer-breeding hunters of the mountainous taiga (Map). These four related groups practiced the Sayan-style of reindeer breeding in which small herds of 30–80 head enable the selection of males to be trained for riding and as pack animals (Vainshtein 1960). Oka-Soiots are the only group that have since replaced their reindeer with yak, and little is known about how this may have affected historical Soiot preferences in dog breeds. Many contemporary Tozhu dogs trace their ancestry to the Buriat-Mongolian shepherd dog, which may be a Mongolian variety of the Tibetan Mastiff, possibly introduced from Tibet by yak traders (Zakharov-Gezekhus and Kashtanova 2009 in Mongush-Arakchaa 2018:147–148; Mal'ginov 1932). Whether or not the Mastiff originated from an earlier Buriat-Mongol wolfhound they have long served as aids in wayfinding and to locate prey (Mongush-Arakchaa

[1] Prehistoric dog burials are found on all continents, ranging from human-made mass cemeteries containing complete skeletons (e.g., Ashkelon, Israel), cemeteries in which skin or flesh has been used for clothing or food, to dog–human simultaneous burial.

2018:133, 135). In the taiga, they often work as a team alongside one or two transport reindeer.

A less common breed historically found in some taiga households is the Tyvan "Kadarchy Yt" (Sikachinskiy 1971 and Petri 1928 in Arakchaa 2018). Its thick fur shields against mosquitoes, and its size and strength enable it to fight wolves, snow leopards, brown bears, and eagles (Darzha 2013 in Arakchaa 2018). Historically, it was kept in male–female pairs that work as a team in which the male lured the predator, then attacked its throat, while the female approached from the rear (Arakchaa 2018:148). Today the breed is rare, having disappeared with sedentarization during the Soviet years. A third breed historically used for pelt hunting in the Tyvan taiga is the Mongolian Taigan (Grumm-Grzhimaylo 1926, Turchaninov 2009 [1915] in Arakchaa 2018:155), although there is no record of the breed being used by Tozhus.

Each contemporary Oka-Soiot pastoralist household has two to three dedicated guard and hunting dogs, which spend most of their time chained to stakes near their owners' summer and winter homes. However, they are often seen roaming freely perhaps because they wiggle themselves loose, their chains break, or their owners deliberately untether them. The understanding that dogs need freedom to roam has historical roots in Tofa accounts of dogs as partially self-provisioning over the summer, scavenging for scraps, and occasionally hunting for rodents (Mel'nikova 1994:46; Petri 1928:31). Intermittent liberty enables dogs to spend time near other households, including during the fall hunting season. At such times, a dog may join dogs of another household and participate in its hunt. In this scenario, dogs make autonomous decisions about who to associate with for one or more days without their owner's formal consent. During such times a dog may be seen fending for itself near or between encampments or villages, leading the casual outsider-observer to mistake it as 'stray' or 'feral.'

Because dogs are regarded as hunters in their own right (Oehler 2018a, b) they are permitted not only to join the hunting activities of others, but are also assessed by their owners as to their disposition before any decision to embark on a canine-assisted hunt is made. Some hunters will forgo a fur hunt if their lead dog is making an unfavourable impression. One hunter noted: "If the dog is running in circles, pulling on his chain, and barking—it means that he is in a good mood (or in the right mood). If he is lying lazily by his hut, then he is in a bad mood (or in the wrong mood)" (Oehler 2018a, b:34). Such attributions of agency and subjectivity to canines do not withstand owners applying violent physical means to control their dogs from time to time, including during the hunt.

During the hunt, visiting dogs are treated as one's own, and upon return, a visiting dog's owner is paid no part of the catch for their dog's services, since the act of granting another person's hunting dog the opportunity to hone its skills is considered sufficient payment. In some instances, the owner will not know of their dog's whereabouts. In Oka, the value of a dog increases in relation to its acquired skills obtained through hunting experiences and exposure to other skilful dogs. Having one's dog join another's hunt is considered a training privilege, even if it comes at the risk of losing the animal to injury. While skilled dogs are shared, they are rarely gifted and almost never sold. There are rumours of past exchanges of horses for dogs.

The communicative intensity between humans and dogs in Oka fluctuates seasonally. As dogs are chained up near residences to alarm householders of intruders and visitors during much of the summer they experience low physical activity and reduced human attention. Exertion levels, feed quality, and inter-species communicative intensity increase in autumn and into the winter as dogs again become hunting collaborators in small fur hunting, engaging in "perspectival sharing" (Oehler 2018a, b) in which canines track the human face and eyes, while people follow their dogs' olfactory sensibilities.

While there seems to be no shared regional preference for any specific breed, owners are well- aware of the parentage of their canine collaborators.[2] Self-initiative and fearlessness are two leading qualities sought in a dog, and a young pup is given the chance to prove itself during hunting activities in the first year of its life. Hunters speak of delegating all their training of young dogs to their senior lead dogs. A dog that does not pick up skills quickly, is disinterested in a pursuit, or repeatedly falls behind, is shot. Dogs exhibiting repeated aggression toward livestock are also eliminated. Culling dogs in their first year serves as a form of selective breeding. Dogs are rarely castrated. In one instance, an owner castrated his well-mannered dogs to prevent their mingling with neighbouring dogs that were poorly socialized around cattle.

In Oka, the importance of favoured behavioural traits in dogs have shifted over time. The drop in market prices for sable has led to a decline in the training of dogs specifically for squirrel or sable (cf. Rassadin 2000:41; Petri 1928). With the importance of livestock on the rise, for many it is becoming more essential their dogs exhibit cattle-friendly qualities. Conversely, for Tofas, the annual winter hunt remains pivotal, even if its emphasis has shifted from sable to musk deer (*Moschus moschiferus*) preputial glands, which are traded to Chinese merchants.

Historically, Cervidae in the Eastern Saians were hunted using rocky outcrops in the landscape that end on one or

[2] Little information is available on the breeds Oka-Soiot hunters have historically kept. We do know that their Tofa neighbours used to have a variety of eastern Siberian huskies (e.g., Rassadin 2000:41).

more sides in a vertical cliff. The dogs track the deer and drive them to the designated cliff where hunters shoot them from below where they have been waiting with their horses or reindeer. This is known in Russian as the *ostoi* method of hunting and remains widely popular in the Eastern Saians. In the past, when musk deer were hunted for their meat, other methods not requiring dogs or cliffs were also used.

Conspecific and dog–human sensory interactions in the *ostoi* and other hunting methods play an important role in the social positioning of canines in multispecies households. Decisions about selective breeding of dogs are largely motivated by the sensory performance of an individual before it reaches reproductive maturity. Young dogs are paired with experienced tracking dogs to acquire focused driving skills. Distracted, unwilling, easily intimidated, or slow-learning dogs are culled following a hunt. Self-initiative, sustained attention to scent trails, and a strong propensity for conspecific collaboration earn a dog human esteem. Consequently, in the eyes of many hunters, credit for many a successful hunt rests near equally with dogs and humans.

One of the most impressive displays of Oka dog–human collaboration is sable flushing. When snow covers rocky patches of taiga hill sides in the fall, sable hide in the cracks between boulders. To locate a sable, people and dogs must identify its freshest tracks. Once a tight circle of promising boulders has been identified hunters light small fires between the rocks to drive the sable out with smoke for the dogs to pursue and drive up a tree where the hunters can shoot it. In the initial process of locating the animal, dogs and humans work closely together. As much as the human relies on the olfactory capacity of the dogs, so the dogs continuously monitor the face and eye movements of the hunters. By taking cues from the human line of sight, the dogs can judge which specific scent trails to give preference to.

Russian ethnographer B.E. Petri (1928:33) describes the final conversation of a Tofa hunter with his faithful but aging dog, following a long career of collaboration. Taking the dog along, the hunter visits "a good place" atop a hill. Here he feeds the dog one last time for the "road" that lies ahead. He then speaks to the dog: "… good-bye; do not be angered; you served me well; you always helped me out on the hunt and in life; step now into your place…!" (Petri 1928:33). Following these words, the dog is shot and covered with boughs and moss. Elements of this practice persist in contemporary Oka-Soiot dog funerary rites, but they also show Mongolian elements. Soiot elder Tseren-Dorzho explains (Oehler 2018a, b:37) how a good hunting dog is hanged or shot when it gets too old, or when it is badly injured. The dog's tail is cut off and placed under its head, and a piece of fat, butter, or other food item the dog was known to like is placed on it's tongue.

Canines in Inner Asian Ethnography and Ethnohistory

In the folklore of late nineteenth and early twentieth centuries the bark of a domesticated dog, known as *adai-khus* or "dog-bird," along with the crackling sound of the hearth, were symbolic of a stable community for the Khakas of the Minusinsk Depression (present day Khakassia) (Burnakov 2012:114). Located in the plains, west of the Eastern Saians, these dogs guarded mobile pastoral encampments and maneuvered herds (ibid.). Smaller Sagan and Tozhu breeds were known for their skill at driving and holding fur bearing mammals in trees or under rocks (Yakovlev 1900:64 in Burnakov 2012:115). Combined with horses, they constituted a hunter's team. In Khakas myth, dogs are associated with cereals, for which reason feeding them was thought to ensure well-being.[3] Dogs were also attributed human qualities, including consciousness, willpower, and love, and in Khakas creation myths dogs protect the clay bodies of people sculpted by the creator (Burnakov 2012:115). This association with deities illustrates the spiritual potential ascribed to dogs in much of Inner Asia.

A Khakas dog embodied good luck, sometimes in the form of a gifted puppy transforming into a young woman to be married to the hero (Burnakov 2012:115). Similarly transformative is Khublai-Khus, the mythical Khakas hunting dog (shared with Samoyed and Iranian traditions) who hatched from a Yenisey Basin velvet scoter's egg to pursue prey on the ground, in water, and in the air, and upon death becomes the Orion constellation (2012:115). The raised tails of Khakas dogs were symbolic of a warrior's raised sable (2012:116), and as spiritual beings, dogs protected not only against physical intruders, but they were also emblematic of reproductive wealth in wedding ceremonies, a tradition shared by Buriats (Katanov 1907; Khangalov 1959 in Burnakov 2012). Protective qualities were especially attributed to dogs with two spots above their eyes. The so-called "four eyed" dog is still recognized in many places, including in eastern Tyva and northern Mongolia (e.g., Küçüküstel 2021; Arakchaa 2018; Butanaev 2003).

The spiritual and physical potencies of black and white Khakas dogs were thought transferable through physical contact.[4] Thus, before a baby was put into its cradle for the first time, a puppy was placed in it to transfer the qualities of the dog to the child. Similarly a first garment would be put on a dog, then on the infant (Burnakov 2012:117). Notions

[3] Similar associations with cereals and bread are also evident in Chuvash, Altai, and Mongol traditions.

[4] Yellow and brown dogs were thought to serve as avatars of evil spirits, although black dogs could also serve this purpose at times (Burnakov 2012:120).

of canine strength and endurance extended to health and well-being, identifying dogs as knowledgeable of naturally occurring medicines, and resulting in a series of medicinal plants containing the word *adai* (dog). Specific organs and dog derivatives were ingested or applied to cure ailments (e.g., Spassky 1818:182 in Burnakov 2012:117).

According to some scholars, wolves and dogs are interchangeable in Mongolian folklore, although the wolf is revered as totemic ancestor and sacred being, while the dog takes the position of loyal servant (Terbish 2015:142). Despite their sacred standing, Mongolian wolves are regularly killed, and a hunter will transgress the 'measure of balance' (i.e., hunting no more than what one has need for), reflecting the predator's own inclination to take without measure (Charlier 2015:99). Besides the protection of one's domestic stock, killing a wolf confers on the hunter part of the spiritual potency of its spirit master (Charlier 2015:137; Terbish 2015:142). As wolves are bearers of their spirit master's power, so dogs are thought to reflect the temperament of their human masters (Bianquis and Sedenjav 2013:304 in Terbish 2015:144). Consequently, dogs are not seen merely as representatives of their own species, but also as persons (Humphrey 2013) reflecting identifiable human-like qualities.

A dog manifests compassion when refraining from attacking smaller animals, and by barking for a reason it is thought to profess honesty. A good dog is fearless, does not steal, keeps its pursuit of the opposite sex within reason, and stays with its household, showing an equivalent to human parental loyalty (Terbish 2015:144). Canine human-like traits must also be understood in the context of Mongolian Buddhist folklore, which took root alongside Mongolian shamanism of the seventeenth century. While dogs retained their shamanic nature, they came to represented the final incarnation prior to becoming human. With only one rebirth dividing the two species, it is expected that poor human actions may result in one being reborn in the form of a dog (Terbish 2015:145). This bi-directional migration between human and canine personhood is best seen at the child-dog interface.

In Mongolian dog burials, the tail is often placed under the dog's head, and fat or butter is put in its mouth indicating its impending rank as a human, as such foods are reserved for humans and deities. More specifically, a dog may return to its household by being born as one of its children, and vice-versa, a deceased human relative can return to their family as a dog (Terbish 2015:145, 150). Dogs and children are both caught in a liminal stage; the ones as not-yet-human, the others as not-yet-fully-human (Bianquis and Sedenjav 2013:306 in Terbish 2015:148). The likeness of their predicaments has resulted in reports of a living dog's soul converging with the soul of a living child, in which case the separation of their bodies can result in the death of one of their bodies (Terbish 2015:146–147).

Inner Asian Dog Burials

As Inner Asia experienced its own transition from the Ice Age to the Holocene some 10,000 to 13,000 years ago, North Asian steppes gave way to tundra, species of the cervidae family replaced mega fauna, and light mobile housing structures replaced Paleolithic Mal'ta and Buret' stationary architecture (Okladnikov 1990:60–62). It is in this Neolithic landscape of taiga and forested and non-forested steppe that the bow and arrow and light pottery are thought to have appeared, while dress, mobile architecture, boats, and weapons of Neolithic Baikal hunter-fishers are likely to have flowed directly into ethnographic Tungus material culture of the seventeenth-twentieth centuries (Okladnikov 1990:63, 69–70). Contemporaneously, sedentary Neolithic tribes were practicing agriculture in Mongolia and Inner Mongolia long before mobile pastoralism came to dominate the region (Liu *et al.* 2014; Okladnikov 1990:70).

The earliest Copper Age finds come from Eurasian Afanasevo peoples of the Minusinsk Depression, accompanied by cattle breeding, including sheep, horses, cows, and possibly agriculture (Okladnikov 1990:79–80). The Okunev culture followed, known for its artistic stelae (ibid.:81), and around 1500 BC the sedentary pastoralist Andronovo culture becomes centred in the Minusinsk Depression, extending from the Altai Mountains to the Yenisei and from Kazakhstan to the southern Urals (1990:83–84). By 1200 BC, pastoralist horse-riding Karasuk take over southern Siberia and Kazakhstan, reaching into northern China (ibid.:85). Between the late seventh and fourth centuries BC, related nomadic Iranian-speaking Iron Age tribes (Scythians) populated the Central-Eurasian steppes from the Altai Mountains to the Carpatian Basin (Melyukova 1990:97), with some of their oldest burial mounds located in the Altai Region.

For at least 10,000 years, these diverse populations with their varying and often mixed subsistence strategies have been accompanied by hunting and guard dogs (Devlet 1982; Vainshtein 1971). It is difficult to distinguish wolves from domesticated canids in fragmentary skeletal remains. Some archaeologists have interpreted petroglyphs depicting straight tails (pointed at the ground) as belonging to wolves and curled tails as indicative of domestication (Devlet 1982:30). Robert Losey *et al.* (2011) describe Middle Holocene hunter-gatherer cemeteries of Cis-Baikal containing canids (see map, points 2–12). One of the oldest known examples is Lokomotiv cemetery (7000–8000 BP, uncalibrated), where a human male cranium and mandible were found between the legs and rib cage of an individually buried canid (Losey *et al.* 2011:179).

Canid remains were also found with men and women at Shamanka II cemetery (c. 7,000–6,100 BP, uncalibrated)

(Losey *et al.* 2011:176–178). Drilled wolf or dog teeth, likely part of a necklace, were located alongside a probable female in her early 20s, and beneath a neighbouring grave containing five humans a middle aged 60 cm tall male husky or Samoyed-like dog was found in a tightly arched position. It had lived on a diet similar to that of the humans, suggesting long term collaboration in hunting and gathering. Similar burials are found at Khotoruk cemetery (c. 6550–7020 BP, uncalibrated), and at Khuzhir (>5720–6550 BP, uncalibrated) where the remains of a human were found wrapped in a sewn birch bark sheet covered by poles with two Siberian husky-like canids lying on top, one to each side (Konopatskii 1982:44 in Losey *et al.* 2011:180–181).

At Uliarba cemetery (c. 4290 BP, uncalibrated) two adult women were buried, each with a fully articulated dog (Goriunova *et al.* 2004 in Losey *et al.* 2011:181). Similar finds were made in Kurma XI (c. 3900–4050 BP, uncalibrated) and Obkhoi cemeteries (c. 3760 BP, uncalibrated) (Ovodov *et al.* 2009; Weber 1995 in Losey *et al.* 2011:181). Though poorly dated, Early Bronze Age burials at Pad' Lenkovka cemetery contained a vertically lined and covered stone slab pit with a canid skeleton curled up inside (Okladnikov 1974 in Losey *et al.* 2011:181). Other Holocene to Bronze Age canid burials, such as the mid to late Holocene Baikalskoe III site, the Neolithic Ust'-Khaita (c. 8275 and 8350) habitation, and Berloga site (c. 6500 BP, uncalibrated), exhibit separate and/or unintentional canid burials — the latter possibly representing the earliest dogs in the region (Emel'ianova *et al.* 2009, Klement'ev *et al.* 2005; Nomokonova *et al.* 2009 in Losey *et al.* 2011).

Dogs are widespread among forager groups of the Baikal region in the Early Neolithic, with dog consumption becoming popular by the Iron Age (Losey *et al.* 2018:62). This practice was likely adopted from neighbouring Han in China (Losey *et al.* 2018:64). Ancient Cis-Baikal dog burials are most common in the Early Neolithic (7000–8000 BP), a time when human burials are also common (Losey *et al.* 2013). Yet they are limited to foraging groups and occur especially during periods of shared aquatic diets, while pastoralists appear to have sacrificed their dogs without formal burial. There exists ethnographic evidence of Buriat, Evenk, and Russian use of dogs to locate seal breathing holes in the ice cover of Lake Baikal, suggesting a regional subsistence mode with potentially deep prehistoric roots (Georgi 1777; Levin 1897; Pallas 1788; and Zhambalova 1984 in Nomokonova *et al.* 2010:172).

Moving beyond the Baikal region, archaeological evidence of dog–human relations becomes sparser (see map, points 13–17). Turkic Samoyed horse graves of the Altai Mountains generally contain no dogs with one exception of a burial dated between the sixth to eleventh century in which a dog is found at the feet of two women (Fribus *et al.* 2019:861). More common are petroglyphs of the early medieval period depicting hunting scenes, many of them on the Russian side of the Altai (Konstantinov *et al.* 2016:12). At Ust-Kan, hunters are seen practicing falconry, either on foot or on horseback (2016:12). In several scenes hunters use dogs to drive their prey, including wolves, toward archers. Dogs are also found in several graves of the same period (Kormushin 2008:140 in Konstantinov *et al.* 2016:13). Earlier evidence of human–dog relations comes from Kazakhstan, immediately west of the Altai.

The record shows significant regional variation in household species combinations of Neolithic to Bronze Age Kazakhstan, with cattle in the forested steppe, goats in the steppe, and horses in all areas (Outram *et al.* 2012). The Copper Age sites of sedentary Botai horse pastoralists of northern Kazakhstan contain evidence of "the use of dogs for both horse herding and in the hunt alongside the horse" (Olsen *et al.* 2006:92). Commonly whole dogs or dog skulls were deposited in pits on the west side of houses, likely to protect the home against spirits (ibid.:107–108). This idea has been associated with Indo-Iranian Avesta religious texts of the first millennium BC, which speak of dogs as guardians at the gate to the afterlife in the west to which the Sun God would travel from the east. Other Saka Period kurgans contain similar dog burials, evidently in accord with this cosmology (Beisenov *et al.* 2017:100).

Deliberate dog burials are also evident at Begash (1950—1690 BC to historical times), eastern Kazakhstan, which was a winter encampment of mobile pastoralists (Franchetti and Benecke 2009:1028, 1031–1034). Medium to large dogs represent the smallest percentage of domesticates, but they are consistently present from prehistoric to historical times. Showing no cut marks, and found alongside wild red deer bones, these remains suggest dogs were not eaten but used for guarding, herding, and hunting in a mixed herding and hunting economy. At the Bronze Age site of Tasbas, transhumant pastoralists left canid bone fragments (of wolf or dog) in their high alpine encampments (Doumani 2015:21). Similarly, agro-pastoralist Iron Age sites along the Tien Shan Mountains of southeastern Kazakhstan contain sheep, goats, cattle, and horses, with small quantities of camel and dog bone (Chang 2017:177), including some game (Chang 2012:20). Dogs were likely part of households practicing "sedentary village-based animal husbandry," while engaging in some hunting (Chang *et al.* 2003:306). Based on rock art, canines remain active in mixed pastoral-hunting contexts of Kazakhstan into medieval times (Rogozhinsky 2011).

Evidence for early dog–human relations in Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan comes from petroglyphs (Map, points 18–24). Bronze to Middle Age rock art from Fergana Valley in Kyrgyzstan shows archers with dogs, camel riders, and goats being chased by predators (Amanbaeva *et al.* 2011:54–55). At Aravan Rock dogs are

seen with antlered deer, and in Early Iron Age petroglyphs at Issyk Kul (northern Tian Shan) dogs are depicted along with game, camels, and archers (Amanbaeva *et al.* 2011:50). At Vybistdara (Tajikistan), murals contain archers and horse riders hunting wild yak, some with camels, dogs, and chariots (Bobomulloev 2011:79). The Hissar Alai murals (middle of the first millennium BC) show a dog chasing a mountain goat towards an archer (Bobomulloev 2011:86). Early Bronze Age rock art at Sarmishsay (Uzbekistan) contains various game, predators, and dogs (Khujanazarov 2011:104), and at Arkhar dogs join goats, horses, oxen, leopards, camels, wolves, and foxes (2011:101). The Kichi Bezegli-Dere petroglyphs (Turkmenistan) contain herding and hunting scenes with dogs, possibly dating to the sixth to thirteenth centuries, with others as recent as the sixteenth to the nineteenth centuries (Muradova 2011:97).

It is known that dogs were present in Mongolia and Inner Mongolia (e.g., Wu 2004) by the Bronze Age, if not earlier, but little has been written on their role in prehistoric society (Broderick and Houle 2013:8) (Map, point 25). Better evidence of human–dog relations in Inner Mongolia dates to more recent times. The exterior wall of a painted Liao Dynasty (916–1125) tomb at Ulijimurensumu (IMFT 2005:141) depicts a yellow and a gray-brown hunting dog, each sitting with a falcon, guarding the tomb. In a painting of elite women of the Jin Dynasty (1115–1234), a Jurchen male rider carries a hawk accompanied by an emaciated dog (Johnson 2011:58) that may have been part of a multi-species hunting team.

Prior to the introduction of sky burials, tombs were used on the Central and Eastern Tibetan plateau from the Late Neolithic to the ninth century CE (Aldenderfer 2013:293). Many of these burials contain domestic animals, including dogs, which were likely part of pre-Buddhist ritual sacrifices (Aldenderfer 2013:310). The only domesticated species found in a Neolithic hunter-gatherer site of northeast Tibet is a canid (probably a hunting dog) (Ren *et al.* 2020:8). Stone tablet petroglyphs (first millennium BC) from Manda in the Zanskar Valley (bordering Tibet, Map, point 26) show a horseman and a lean dog with pointed ears near two fighting yaks (Polosmak *et al.* 2018:61). This is a typical scene in Tibetan petroglyphs predating Tibetan Mastiff yak herding dogs (Bruneau 2014:83). Iron Age nomadic pastoralist graves at Haigouliang (Xinjiang, Map, point 27) contain dogs and other domesticated species, along with farming implements and pottery (Wang *et al.* 2016:694).

Discussion

Nearly all the archaeological and ethnographic sites described above indicate dogs were used for both hunting and guarding, whether by hunters (e.g., Losey *et al.* 2011), pastoralists (e.g., Olsen *et al.* 2006), or in mixed economies (e.g., Franchetti and Benecke 2009). Two aspects come to the fore when combining prehistoric data with ethnohistorical and ethnographic accounts. Firstly, the manner in which dogs and humans engage each other stands in relation to household or hunting team species composition. Secondly, specific regional patterns of human–dog interaction emerge depending on household geography and subsistence strategy. The ethnographic observations I have presented fit well within this framework of fluctuating subsistence patterns, even if no direct continuity can be traced to a broader regional archaeological record. What I can note here is how sensory collaboration, autonomous social interaction, and cosmological relatedness — core findings from Oka dog–human ethnography — contribute to future zooarchaeological interpretative work in multi-species sites within and beyond Inner Asia.

Sensory Collaboration

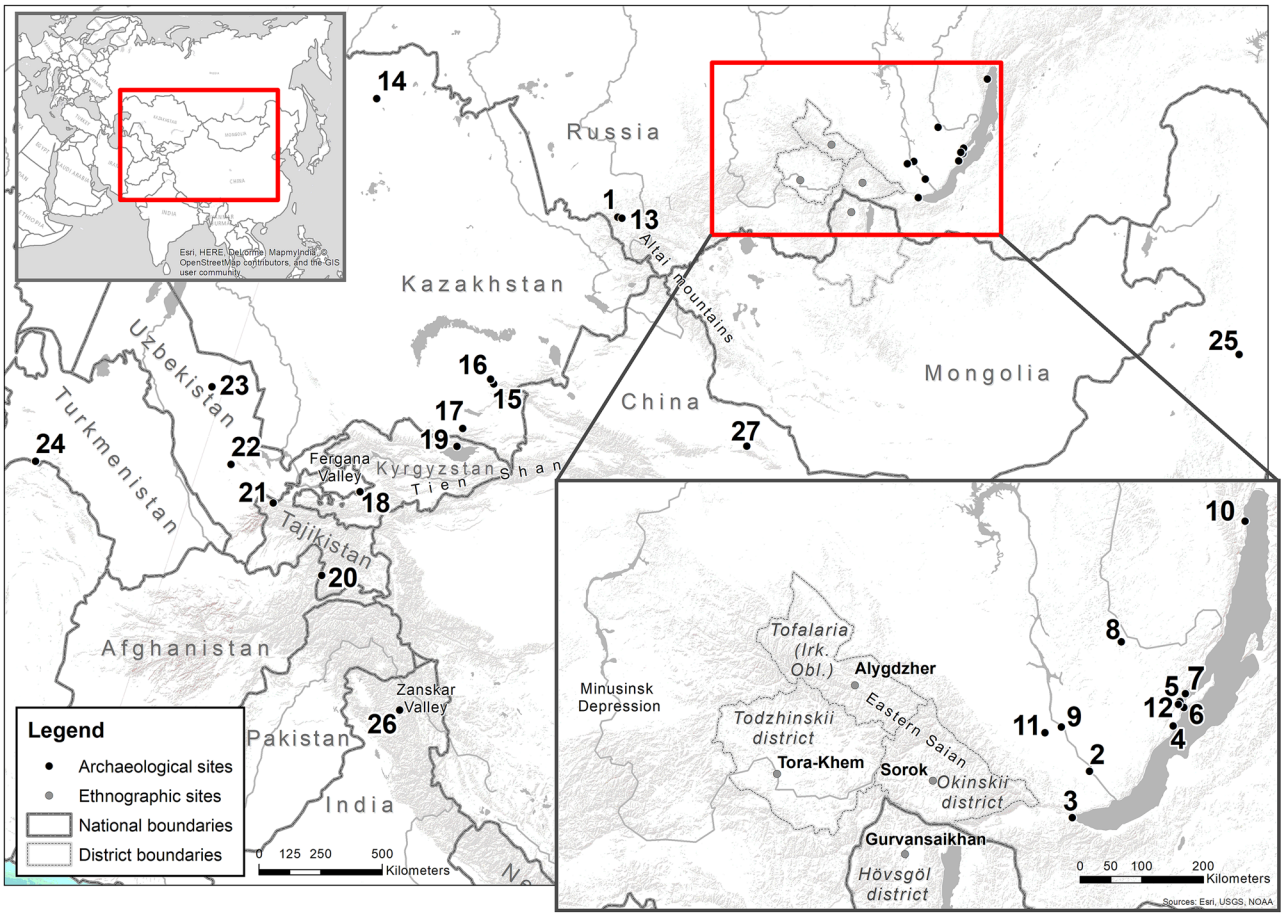
Given the close resemblance between hunting scenes of Bronze Age to Medieval Inner Asian petroglyphs and the *ostoi* hunting method described above, it is likely that select sensory interactions between dogs and people remain unchanged. Many of the sensory qualities, such as sustained scent tracking, visual tracking of other's movements, careful handling of prey, and an embodied knowledge of land and its features, which are sought after in canines of the ethnographic period, would likely have been essential also prehistorically. In fact the logic of contemporary selective breeding in dogs relies largely on sensory performance during the first year of life. It would be interesting to see whether such breeding practices can be accounted for in the bone records of Inner Asian dog burials beyond the Eastern Saians.

Other aspects of the social standing of dogs in the ethnographic record touch on the development of interspecies perspectival sharing (Krupenye and Call 2019; Luhrmann 2011). Mind reading, or the act of adopting another's point of view to one's own or another's advantage, is not uncontested in non-humans (e.g., Quesque and Rossetti 2020), and it is even more difficult to identify in archaeological remains. However, ethnographic observations of dog–human interactions, such as in the sable hunt described above, are indicative of the esteem dogs receive for their ability to adapt their skills and sensory advantages to those of their human (and other) collaborators. The ability to combine their own skills with those of humans makes dogs intimate members of multi-sensory multi-species hunting teams. Ethnographic observations of sensory collaboration can thus aid our understanding of ethnohistorical, and possibly prehistoric, canine funerary rites.

Autonomous Social Interaction

Ethnographic examples of autonomous social interaction from the Eastern Saians can provide alternative explanations for canine burial sites extending beyond Inner Asia. The presence of supposedly 'straying' or 'feral' dogs found in modern Near Eastern sites, serves as one example. Based on the Ashkelon site (late first millennium B.C.E.) in modern Israel, interdisciplinary historian Helen Dixon (2018:34) argues that the two commonly opposed conceptions of dogs — either as pets or working dogs or as dogs fending for themselves — are not mutually exclusive. She notes how, "providing mortuary rites for feral dogs living within human settlements … is probably a new regional demonstration of a longstanding dog–human relationship, in which some kind of unique social role is afforded to dogs that are not pets or working animals." Dixon's observations are from outside Inner Asia, but they suggest an archaeological parallel to patterns of dog autonomy and seasonal inter-species interaction encountered in Soiot dog–human relations.

As we have seen in the case of Oka, temporal free roaming does not preclude a Soiot dog from receiving proper funerary rites. In fact, in the Soiot example of dog sharing, freely roaming dogs may align themselves to multi-species hunting parties that do not originate in the households to which the dogs belong. Over the course of a year, a Soiot dog can spend extended periods of time



1	Razboinichya	8	Obkhoi	15	Begash	22	Sarmishsay
2	Lokomotiv	9	Pad' Lenkovka	16	Tasbas	23	Arkhar
3	Shamanka II	10	Baikalskoe III	17	Talgar	24	Kichi Bezegli-Dere
4	Khotoruk	11	Ust'-Khaita	18	Aravan Rock	25	Ulijimurensumu
5	Khuzhir	12	Berloga	19	Issyk Kul	26	Manda
6	Uliarba	13	Ust-Kan	20	Vybistdara	27	Haigonliang (Xinjiang)
7	Kurma XI	14	Botai	21	Hissar Alai		

A map of Inner Asia, depicting the location of the ethnographic study area (Tofalaria, Okinskii district), alongside published zooarchaeological sites (points 1–27) mentioned in this article

Photograph of Strel'ka, a trained Oka-Soiot female hunting dog that took part in the sable hunt described in this article

chained to a pole as a watch dog, then run freely adjoining itself to another household's pursuits, before being enlisted in its owner's hunting endeavours. Without making any generalizing assumptions, the autonomous social interaction observed in Oka presents a comparative case that can offer a third interpretative angle to a complex zooarchaeological site such as Ashkelon.

While dogs fall prey to wolves in Oka on a regular basis, their autonomous movements are not paired with reports of interbreeding with wolves. Oka-Soiot households select for behavioural traits in dogs, but they do not usually maintain a breeding program aimed at maintaining specific pedigrees or to affect phenotypic resemblance with wolves. Instead, various dog breeds have been used for hunting purposes over the course of living memory. As long as a dog's bodily parameters meet the needs of hunters and herders, any breed is acceptable. This proliferation of breeds stands in contrast to the predominance of canids with Samoyed or Siberian husky features in ancient burials of the larger region. Emphasis on behavioural traits in contemporary Oka dog breeding suggests social processes of domestication take precedence over phenotypic features.

Cosmological Relatedness

While similar environmental and economic markers can result in regionally shared patterns of sensory collaboration — including parallels in how autonomy is extended to canines — there also exist common underpinnings regarding the cosmological standing of dogs across Inner Asia. Ideas about dog personhood differ by region, but many share common features rooted in Indo-Iranian, shamanic, and/or Buddhist cosmology. Indo-Iranian ideas of the (deceased) dog as protector against harmful intangible entities may, for instance, have informed the canine funerary practices of Copper Age Botai steppe pastoralists in northern Kazakhstan (Olsen et al. 2006). The concept also resonates with contemporary Tozhu, Tofa, and Dukha (Küçüküstel 2019:175) dogs that will warn people about malign entities in the taiga. As shown above, these and other more-than-human propensities are transferred to people in Khakas accounts of tactile contact with dogs (Burnakov 2012). Conversely, Mongolian steppe pastoralists gain from the powers of master entities by hunting the bodies of their wolf emissaries (Charlier 2015), further cementing the cosmological significance of canines.

Mongolian Buddhist conceptions of reincarnation resonate also with Soiot and Tofa hunters who provide their deceased canine collaborators a final meal, normally intended only for humans or deities. The extent to which such regional practices are rooted in a shared belief in the human rebirth of dogs varies. Since its broader adoption in the late nineteenth century, the importance of Mongolian Buddhism in Oka has fluctuated, having been in competition and syncretic dialog with Oka-Soiot and Buriat shamanism and with a regional variant of the Central Asian mountain cult introduced by Buriat settlers in the late eighteenth century. In light of the numerous religious and philosophical influences in the region, it is probable that new layers of meaning have been applied to old practices,

allowing elements of once-shamanic rites to persist under Buddhist or other disguise.

Conclusion

I have presented ethnographic examples of sensory collaboration, autonomous social interaction, and cosmological relatedness as key observable aspects of contemporary Soiot dog–human relations. By pairing this information with regional ethnohistorical data, I sought to contribute to our growing understanding of canine social domestication and co-evolution in mobile and semi-mobile hunter-gatherer and pastoralist societies. I also reviewed Inner Asian dog burials in the context of south Siberian multispecies ethnography, pointing to a long-standing dual purpose of dogs for hunting and guarding across Inner Asia while highlighting connections between dog–human relations and household species composition, as well as region-specific geography and subsistence strategies.

The zooarchaeological record for Inner Asian dog burials is quite extensive and diverse. Yet broad gaps between available material evidence from the Holocene, petroglyphs of the Bronze to Middle Age, and ethnohistorical accounts of the nineteenth and early twentieth centuries make it difficult to draw any cohesive regional development for dog–human relations that would lead seamlessly into the ethnography of the Eastern Saians. All that can be done at this point is to identify existing parallels between types of canine-human collaboration, which are linked to specific subsistence strategies prevalent at different times and across diverse landscapes. The project's ethnographic insights do, however, contribute to the advancement of zooarchaeological interpretation beyond southern Siberia.

To date, little archaeological evidence exists in Oka to determine the presence or breeds of dogs in early Oka-Soiot or Oka-Samoyed settlement. Future research will do well to determine what prehistoric breeds were in use and their genetic kinship across wider Inner Asia. From ethnographic and sensory standpoints, future work should examine the effects of transitions in household occupation on dog–human relations, specifically in new and emerging scenarios, such as are currently afoot among the Dukhas of northern Mongolia who find themselves deprived of their hunter-gatherer existence by new legal regulations that may result in heavier reliance on transhumant steppe pastoralism.

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Declarations

Ethical Approval This research was ethically approved by the Research Ethics Board (REB) of the University of Aberdeen. Participants in this research gave their informed consent as per REB requirement. No animals were harmed for this research.

Conflict of Interest I declare no conflicts of interest.

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