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Sledge, Reindeer Dogs and Tractors: the Energy of Innovation and Cultural Shift

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The article discusses three significant innovations that have occurred in the culture of the nomad Evens of the Magadan region over the past 80 years: sledge (1930s), reindeer dogs (1940–50s) and tractors (1960s — 1970s). The causes and sources of these borrowings are traced, as well as the resulting systemic cumulative effect. Active innovations were associated with the adaptation of Even reindeer herders to the natural and ethnic environment, which began with their entry into the territory of the Northeast. The forced innovations were caused by the influence of the state, which set a goal to transfer part of the nomads to sedentary life, and invested significant resources and energy in the modification of reindeer husbandry as an agricultural sector. As a result of adaptation to the realities of the post-Soviet economy, a wide variety of local cultural options appeared again, complicated by borrowings and tied to the matrix of the state, but with retention of backup options in case of technical breakdowns. Innovations are regarded in the article, on the one hand, as a consequence of changing social conditions, and on the other, as a mechanism of cultural shift.

Keywords: The Evens, North-East of Russia, innovations, state input, cultural shift.

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Research area: ethnography, ethnology and anthropology.

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Introduction. The Even culture is characterised by a high level of adaptation to the natural environment in order to extract all the necessary and possible energy resources for life. Adaptation here is understood not just as an adjustment, but as a remodelling, reassembly, creation anew (Davydov, 2017). By the beginning of the 20th century, most Evens were reindeer herders in the taiga and mountain taiga (Fig. 1). "The whole life of the Evens was adapted to a nomadic way of life in the smallest detail, in which every thing, any item from household utensils was stored in one specific place, transported on a specific pack deer. In their ability to move from one place easily and quickly, without any fuss, and move to another place with extraordinary speed, set up a yurt in a matter of minutes or even a traditional nomadic camp in an hour, the Evens exceeded their paleoasian neighbours — Koryaks and Chukchi" (Popova, 1981: 94). The ergonomics of the nomadic culture had developed over centuries and provided relative autonomy.

The transition to large-herd reindeer husbandry of those Even groups that moved into the forest-tundra and tundra of the North-East, territory inhabited by Koryaks and Chukchi, began in the 19th-20th centuries. Distinctive features of the reindeer husbandry

Fig. 1. Riding on reindeer back. Srednekansk district of Magadan province.
Photo by S. Ivashchenko. 1970s

of the Chukchi-Koryak type were large herds, low-level deer taming, herding on foot, the absence of a shepherd dog and round-the-clock herding. The Evens also began to graze reindeer while riding on a deer or on foot, without smoke-shields, and adopted other features of this type of reindeer husbandry; however, they also retained their own cultural peculiarities, for example, they dispersed reindeer for the rutting season, or divided a large herd of deer into several small ones for more convenient grazing (Spevakovskii, 1980).

The transition to large-herd reindeer husbandry in the Magadan Region was significantly accelerated during the Soviet period (Khakhovskaia, 2008; Maltseva, 2014; Sirina, 2012). The state during the Soviet period became not only the largest agent, but also the largest energy resource in reindeer husbandry. Researchers criticized the excessive spending of public funds and energy resources, as by the beginning of the 1980s, the economy of state farms had become subsidized due to the use of expensive equipment, capital construction, and an increase in staffing (Batsaev, 2001; Khakhovskaia, 2008).

In 2002, the region planned to spend 1 % of its budget, or 37.1 million rubles, to support reindeer husbandry (author's field data, 2002:71), which was significantly less than in 1986 when the number of deer in the Magadan Region reached 118 thousand (excluding the Chukotka Autonomous Region), having decreased to 14 thousand by 2008 (Khakhovskaia, 2008). State costs cannot be called high, because the region has always been one of the main gold mining regions of Russia. As a result of gold mining, road construction, and collectivization, the Evens underwent repeated relocations, and reindeer husbandry disappeared in the central and western parts of the region most affected by gold mining. It was preserved mainly in the North-Even and Srednekansk districts, among the Evens and Koryaks.

In the summer of 1997, Marfa Fyodorovna, the wife of the foreman and mother of a young man working as a reindeer herder, and I walked around the town of Evensk in the Magadan Region in search of an onboard spare part (the hub drive in a track-type tractor is part of the rear axle and is designed to transmit rotation to the drive wheels that turn the tracks). The tractor that brought us from the reindeer herding brigade to the village had broken down. I recall our conversations about the future of reindeer husbandry, our walk around the town, conversations with people in places where onboard parts might have been found, like a search, figuratively speaking, for the state that in those years had left the North (cf. Humphry, 1998; Ssorin-Chaikov, 2003; Vitebsky, 2005 and many others).

In 1997, reindeer husbandry in the North-Even district was municipalized, which made it possible to eliminate wage arrears and resume support. All this became possible due to payments to the budget of the district and the region from the Russian-American-Canadian gold mining company "Kubaka", which worked in the district near the place where Marfa Fedorovna's father was buried.

The purpose of this article is to study the causes and consequences of introducing three specific innovations into local communities, in terms of the adaptive capabilities of the host culture, the energy effect of impetus given by the innovative changes and the role of the state in this process. I used field materials collected at the end of the 20th — beginning of the 21st centuries in the North Even, Srednekansk and Ol'sk districts of the Magadan region, Verkhnekolymsk and Momsk districts of the Republic of Sakha (Yakutia).

Temporalities. J. Deleuze believes that numerous autonomous time modes coexist and operate at different levels and with varying degrees of intensity, thus creating unexpected effects (Bialecki, 2018). N. V. Ssorin-Chaikov writes about "the complex and hierarchically arranged temporalities of most of the phenomena studied" (Ssorin-Chaikov, 2017). The language for describing new forms of mobility of northern cultures proposed by V. N. Davydov is based on understanding the relationship of nomads with the state as a combination of various temporal regimes (Davydov, 2018).

Evens always contacted with neighboring ethnic groups, and also have long relations with the state and merchants. During Soviet times various temporal regimes of hunters, reindeer herders and the state began to actively intersect and unite.

The reminiscences of an Even woman Maria P. Zheleznaya (Sleptsova) about the first encounters with a different culture shows the intersection of two parallel realities: the life of exiles who built roads with superhuman effort, felled timber, and mined gold and uranium, and the life of local native hunters, reindeer herders, and fishermen drawn into the orbit of industrialization, and changing together with it. These different modes of temporality, which began to come into contact, could not but affect all participants in these processes.

> We were returning home after hunting and stopped not far region from the Hot Springs in the village of Talaya (the present Khasyn district of Magadan Region — *A.S.*). There were two families — our family and my cousin's family. We had a tent. Well, then we had already had tents. This was the first tent. There was a stove and a tent. We had just finished drinking tea and settled down when we heard the dogs barking. I rushed out of the tent and saw a sleigh coming from the direction of Talaya followed by a whole *argish*

(reindeer caravan) Yeah… They drove past us, and behind it I heard people walking at a certain distance … on foot. Yeah… There were some security guards in front, and then we saw prisoners convoyed in small groups of 3–4 people. They were being marched along under guard. As I was saying. Of course, past us. Past us. Now I remember, the barking of dogs was heard at a distance of nearly three kilometers. They stopped, there were sledge drivers with reindeer teams and sledges carrying food and other things. And behind them were these prisoners.

And early in the morning, my grandfather and uncle left to get provisions, they harnessed the reindeer, and went off on sledges. We had already got sledges in 1938–39, before that we hadn't had them. They went for provisions to the village, Talaya, to the store. Then, in Talaya, the studies of hot springs and lakes had just begun. Then my brother Pronya and I went off on small sleds. As we were going along, we heard dogs barking. Our dogs were barking in the direction where the prisoners were being marched. We looked there and saw the reindeer team again, the driver himself, with a small load, sat on the first sledge and an officer and a prisoner were sitting on the second sledge, and the prisoner was almost undressed, I can remember his white shirt and his head was covered in something white but he was without a hat … Oh, but the officer was dressed in a white fur coat and cap with earflaps… They drove past us. It was April. In March, the hunt was over, and in April we were about to head towards the sea. So as for the prisoner, he had committed an offence, I don't know what exactly. And they took him to Talaya. I said to my grandmother, "Granny, granny, look, they're taking a prisoner in a white shirt and a white head tied up somewhere." After some time, my grandfather and my uncle came back. They brought products, such as sweets, bread, flour, a lot in general. And, of course, a bottle of alcohol. When my grandfather arrived, I began to tell him, "Grandpa, I saw a Russian officer dressed in a sheepskin, and the second man who was undressed, and his head was tied. Where were they taking him? Did you see them?" And I remember my grandfather saying,"Don't you go telling this to anyone else." And this episode has remained with me my whole life. And now I often recall this moment… They write a lot about the Gulag now, and I keep remembering, recalling… (The author's field data, 1998).

Since the 1960s, most Evens have begun living in villages, and they work at local state farms, schools, and hospitals. The Even writer, a former herd manager at one of the Magadan state farms, Konstantin Khan'kan, in the story "The Crossing", described his trip to slaughter deer in the 1980s, when as a result of a chain of unpredictable events he did not manage to return to the village for the holiday:

> "It was midnight. All my fellow villagers raised their glasses and were waiting for a chime of Kremlin bells. The village club was empty, everyone ran home before 2 am, and then they would again rush into the club to continue the fun. My wife and our son Dimka sat down to have New Year's dinner. They didn't guess that dad was celebrating New Year's Eve around a fire in the night forest. My wife thought that I was staying with the reindeer herding team to finish work" (Khan'kan, 2007: 82).

Innovative borrowings are considered in the article in the context of such temporal intersections and associations, as a consequence and at the same time the reason for further changes and cultural shift.

Borrowings. ***Sledges*** in the North of Siberia appeared at different times and were of different types — for pulling by hand, by dogs and deer. There are sledges of the Chukchi-Koryak type (arc-spur type) and Tungus-Yakut type (straight-spur type) (Vasilevich, Levin, 1961: 26) (Fig. 2). Two deer are harnessed to the sledge; a passenger sledge is called *turki*, a cargo sledge is called *inene*. The possibilities of using sledges are largely determined by the natural and geographical conditions, and especially the terrain. Sledges are not used in mountain taiga terrain, but they are well suited for forest tundra and tundra terrains. Evens of Chukotka and Kamchatka borrowed sledges from the Koryaks and Chukchi (Vasilevich, Levin, 1961). According to Gizhiginsk Evens, sledges appeared from the Koryaks, however, some groups of Evens borrowed sledges from the Yakuts "since Soviet times."

Fig. 2. Tungus-Yakut type (straight-spur type) of sledges (front), snowmobile "Buran" (behind). Moma district, Republic of Sakha (Yakutiia), 1998

"Previously, deer were afraid of sledges, it was not easy to get them accustomed to them," Petr P. Suzdalov recalled. "We learnt from Yakut hunters, we watched them harnessing horses to sledges. Then the Yakuts took reindeer and reindeer husbandry from the Evens" (author's field data, 1993). It is likely that in some Even groups this practice was adopted under the influence of contacts with merchants and the state. The Magadan Evens, united in the mid-1930s in artels and collective farms, and carried loads for the needs of Dalstroi on sledges harnessed by reindeer teams. Unlike the Nenets, Evens use sledges only in winter due to the terrain and soil composition.

Having started the use of sledges and, later, mechanized transport, Gizhiginsk Evens had lost their pack and riding reindeer herding by the 1980s, although they preserve the memory of migrations (the author's field data, 1997). The loss of pack-reindeer herding in the 1960s-1980s also occurred among various Evenki groups throughout the North and Siberia (Klokov, 2003; Sirina, 2012; Vorob'ev, 2007).

With the change of one type of movement to another, not only the form of mobility changes (Vorob'ev, 2017), but also other elements of culture (Shirokogoroff, 2017). One change entails another, which can be inconspicuous at first. The sledges were borrowed from the northeast paleoasian people or Yakuts, depending on the place of residence of the Evens; and together with the sledge they borrowed elements of the Koryak-Chukchi 'closed' clothes (without slits/openings), adapted to the Arctic zone. Thus, borrowing sledges caused a cumulative effect, which provoked a further cultural shift. In particular, the Even's winter clothing completely changed. Marfa F. Korkopskaya (Gizhiginsk Evens) noted,

> "Now we've adapted to what is easier, what is faster, we do only that. We do not put on suede stockings, called *khevri*. There was an 80-year-old woman among us, only she put on *khevri*, and no one else did except her. It feels uncomfortable … it's better to sew a single item … Moreover, *khevri* has slits on all the sides, you feel chilled through. They used to ride on deer, while here you sit on a sleigh, it's just uncomfortable" (the author's field data, 1998).

Informants from the group of Rassokha Evens also said that

> "In winter, we put on Koryak clothes while riding on a sledge. The clothes are not draughty, they're closed. We sewed them ourselves, getting this experience from the Koryaks. They came to us to buy deer. We had a state breeding farm, they came there. And our hat style was purely Koryak, we took it from them, and we can sew them ourselves" (the author's field data, 1998).

The traditional unbuttoned suit, which is very beautiful in the perception of the Evens themselves, in which they rode astride deer, became unnecessary. It is ideal for riding deer and hunting, as it consists of individual components: a coat open at the front, with ties, under which an apron is put on, an *avun* cap, which fits tightly to the head and is decorated with beads, and fur shoes. But it became uncomfortable to wear it when riding on a sledge.

Thus, access to new territories, contacts with neighboring peoples, an increase in the number of deer led to the use of a new means of transport, which, in turn, was one of the reasons for changing the cut of traditional Even clothing, the idea of which was borrowed from neighbors. This was an illustration of economy in a culture. However, it is important to note that the mobile Evens keep the traditional clothing for funerals and festivities; this latter is inherited (Sirina, 2004: 48). Today, sledge reindeer herding has been abandoned by some of the mobile Evens of the Magadan Region, but people can return to it in the case of a long-term equipment failure.

Innovations. ***Reindeer herding dogs***. The Evens traditionally had a hunting husky that helped to search for wild and fur animals, but was not suitable for grazing deer. Shepherd dogs were introduced to Even, Chukchi, Koryak collective farms in northeastern Russia in the 1950s — 1960s from the north of Western Siberia, from the Nenets, on the initiative and at the expense of the state. Social engineering affected not only society, but also nature: in those years experiments to resettle new species of wild and domestic animals to Siberia were carried out (e. g. the American muskrat). The introduction of the reindeer herding huskies was justified by the state's plans to eliminate private reindeer husbandry and create large united herds in the North as part of collective and state farms. Since the 1960s, the Ministry of Agriculture of the RSFSR "regularly sent Nenets herders with reindeer herding huskies to the Far North-East." After training, the dogs were left on the farms (Gurvich, Sokolova, 1991: 56–57). The informants remember that the reindeer herding dogs came from the "*syroedy*" ("raw food eaters", Nenets). Many Chukotka reindeer herding dogs came from a breeding farm organized in the village of Markovo, where during the 1960–70s breeders from the regions of this breed's origin were imported, but in 1990 the farm was closed. Today, the environment that reproduces the breed is reindeer husbandry, in which breeding is carried out at the level of traditional cultural mechanisms: exchange and gift. This innovation has become one of the most successful borrowings, as it did not cause the "snowball" effect, and also had practically no environmentally harmful effects. This soft version of innovations, initiated by the state and at its expense, has

turned into a tradition. Although dogs constantly accompany reindeer herders, they are only used when the herd gets broken up in bad weather, in fog, so as not to frighten the deer (the author's field data, 1997). Reindeer herding dogs facilitated the work of reindeer herders, helping them to maintain physical energy and have a companion for herding deer. They have become that living "tool" that allows regulating and adjusting the movement of the herd at the herdsman's wish. The use of reindeer herding dogs made Chukchi-Koryak and Even reindeer herding more similar (Fig. 3).

In the places of mixed settlement with Koryaks, Kamchadals and Itelmens, where the natural and geographical conditions made it possible to get dog food, namely fish, in abundance, Evens needed a universal means of transportation and sledge dogs appeared. At the same time, sledge reindeer were kept for harnessing to sledges.

As a result of entering new natural conditions with a foreign ethnic environment, the development of new economic activities, two breeds of dogs, namely reindeer herding dogs and sledge dogs, entered the Even culture. However, dog adaptation methods varied. The reindeer herding dog — the Nenets shepherd's husky — appeared thanks to the deliberate efforts of the state, while the sledding husky appeared as a result of ethnocultural contacts with paleoasian people.

Tractors. The rapid penetration of a wide variety of technologies into the environment of the nomadic peoples of the North has recently attracted attention as

Fig. 3. A herder with shepherd dog grazing reindeer. North-Even district, Magadan Region, 1997

a transforming factor that at the same time stimulates their mobility (Golovnev, 2015: 9–10). Nowadays, much is written about the "snowmobile revolution" in the North (Pelto, 1973), which influenced the methods of grazing reindeer herds in flat tundra and forest-tundra terrains of European Russia and Western Siberia among the Komi and Nenets people in the late 1990s — 2000s. (Abramov, 2015, Istomin, 2015a, etc.). However, much earlier, in the 1970s, "the tractor and all-terrain vehicles revolution" took place among the Evens, Chukchi, and Koryaks in the North-East of Russia, which until now has not attracted the attention of researchers.

In 1957, the Leningrad ethnographer, who studied Chukchi culture, I. S. Vdovon in a note addressed to the governing authorities, wrote, "Tractors, all kinds of motors and engines in collective farms are not directly related to reindeer husbandry and the work of reindeer herders" (Vdovin, 2004: 106). In subsequent years, Chukchi-Koryak reindeer husbandry kept to an on-foot way of herding, however, "tractors and all-terrain vehicles were more widely used" by migrating teams (Gurvich, Sokolova, 1991: 57) (Fig. 4).

Fig. 4. Reindeer herders team is ready for migration. North-Even district, Magadan Region, 1997

Some reindeer herders remembered the 1960s as the time when their life had begun to improve (the author's field data, 1997). In the 1970s, 25 reindeer herding teams, grazing 17 thousand deer, worked at the "Heyday of the North" state farm in the North Even district of Magadan Region. U. G. Popova noted, "One of the main levers of production efficiency at the state farm was the maximum quantity of facilities in the reindeer husbandry sector: the state farm machinery and tractor fleet has about 40 DT-75B, T-100 tractors, off-road trucks, and all-terrain vehicles" (Popova, 1981), which was based in Gizhiga and at three fishing bases. DT-75B tractor (modified for swamps) was attached to each shepherd's brigade, while an all-terrain vehicle was attached to an intermediate base.

Transformed reindeer husbandry practices are changing the environment and everyday life of people themselves, and these changes have not yet been adequately studied, including in terms of adaptation and change in temporalities and energy sources. Compared to snowmobiles, tractors support the community-based nature of movement, since a tractor with a sleigh-trailer attached to it for transporting belongings, cargo and people allows the entire outfit to move around, and in this sense is one of the symbols of its modern mobility.

A former herd manager, an Even man, Konstantin Khan'kan ethnographically accurately describes state farm reindeer husbandry in the forest-tundra zone of the North Even district in the late 1980s, mentioning many innovations that became the facts of everyday life and which can also be considered as a combination of several temporal regimes:

> The director of the state farm instructed me to go to the nearest reindeer herding brigade, which required two days to get to, promptly slaughter 300 well-fed deer and bring the carcasses to the central estate of the farm. It should be noted that the whole slaughter company, as well as the haul to the spots of deer slaughter, to the places of formation of feeding flocks, was organized by us, herd managers.
>
> It took me a day to prepare for the trip. By dinner, I had gathered workers who were to leave the following day with a brigade to slaughter the reindeer. I clarified the situation and let everyone go to prepare for the trip. I received food products from the warehouse, equipment, several tents with a set of tin stoves. All of this was loaded onto two all-terrain vehicles to set off at dawn…
>
> In the morning I ran to the office, warned the herders on the radio to get ready. The garage foreman came up and said that all-terrain vehicles had left at six o'clock in the morning, perhaps by night they would have reached the brigade. Tractor sleds with

> high wooden racks, planked with boards, fitted with lightweight dense canvas so as not to make people feel chilly are ready to leave. And we covered the boardwalk with dry skins…

Below I will return to this story to trace what other mechanisms of maintaining vital energy work in the North.

For the Izhemsk reindeer herders the snowmobile revolution ran along with market restoration, and these processes complemented each other (Istomin, 2015a). However, the tractor revolution went along with socialist industrialization. Only in this way tractors could appear in reindeer husbandry, since the Evens and Chukchi had neither the intention, nor the means to buy, keep and maintain this equipment. The acquisition and operation of motorized vehicles is associated with involvement in the money economy, or in the economy of state subsidies. State subsidies are depersonalized, and therefore this form of interaction is less understood by indigenous peoples compared to traditional exchange and gift. The introduction of mechanized means of transport in reindeer husbandry made the state a visible agent of economic relations. The transfer of technology to reindeer herders could be perceived by them as a gift, but the function of the gift as a form of non-economic exchange is to create relations. The material-specific tractors and all-terrain vehicles that were available in each brigade, and the delivery of fuel were the visible forms of interaction between the district authorities and state farm managers with the peoples of the North. Agents directly involved in this delivery potentially became members of an expanded social network. In the summer of 2002, I observed the off-road delivery of ten two-hundred-liter fuel barrels and foodstuffs in an old truck to an Even's reindeer herder camp in the upper Omolon at a distance of 250 km from the regional center. This became a real feast for reindeer herders, not only because of the delivery of urgently needed goods, but also because of the real participation of the state in the life of reindeer herders, which is considered as a source of necessary material and energy resources and a guarantee of stability. This connection was important for several guests from the village, including me, because we were returning back in the same truck. At the same time, when representatives of the district administration and the municipal enterprise had come previously to this brigade to conduct control, audit and veterinary measures, the owners did not seem to react favorably to this.

The tractor has become a material symbol of the presence of the state and state ownership in reindeer husbandry. The positions of tractor driver, car driver, all-terrain vehicle driver appeared in the staffing table of state farms, and then municipal unitary

enterprises; accordingly, state costs increased. In the draft law "On reindeer husbandry in the Magadan Region" (2002), the costs of state financing of reindeer husbandry were to amount to 37.1 million rubles, of which 8.3 million rubles were planned to be allocated for labor costs, and 7.4 million rubles were planned to be allocated for material costs, including feed, petroleum products, electricity, spare parts (the author's field data, 2002: 70). The state incurred these material costs, bearing in mind several goals: the need for commercial production of venison for the needs of the mining industry, the facilitation of the work of reindeer herders, and the preservation of paternalistic relations. A gift is one way of maintaining hierarchy and symbolic dominance. The neocolonial hierarchy is the gifts of the white man's civilization (Ssorin-Chaikov). The use of a tractor and an all-terrain vehicle entailed the creation of a new network of social relations, including power relations both between neighboring brigades and with the village and representatives of the state, and in the post-Soviet era, directly with mining companies.

The implementation of tractors and all-terrain vehicles in reindeer husbandry took place in industrially developed or industrializing regions, where road construction and gold mining were developing, and also where the terrain allowed it. Reindeer breeders initially got second hand machinery (Batsaev, 2001). The snowmobile revolution also occurred in regions with a system of roads providing delivery of goods and fuel, or already affected by the influence of oil and gas production. It was also mentioned that "the physical conditions in much of Fennoscandia are more favorable for the diffusion of individual mechanized transport" (Stammler, 2013: 230). Thus, the introduction of such innovations requires conditions determined by physical and geographical characteristics and the development of the economy of a particular region. But this does not explain the characteristics of borrowings, which are influenced by sociocultural factors (Istomin, 2015b).

A culture of reindeer breeders having ties with Yakut horse breeders develops in a different vector. In Yakutia, where in some regions the Evens practice northern horse breeding along with reindeer herding, deer and horses, as well as cars and tractors were used to move firewood to high-altitude summer pastures (the author's field data). Yakut horses are unpretentious; almost all year round they can be fed by pasture. The use of Yakut horses for these migrations was more environmentally friendly compared to the use of mechanized transport (Gurvich, Sokolova, 1991: 222).

What were the consequences of using mechanized equipment in reindeer husbandry? I will touch upon only a few of them, as this process continues; new types

of transport appear, tricycles, ATVs in particular, which requires additional research. At first the use of mechanized transport in reindeer husbandry had no effect on Even pack-riding and especially harnessed modes of transportation (Popova, 1981: 276), but after 15–20 years pack-riding reindeer husbandry in many reindeer husbandry teams of the "Heyday of the North" state farm almost disappeared, while the sledge reindeer husbandry was significantly reduced. In 1972, all Even-reindeer herders in the North Even district still had sledding deer, in 1973–1974 the first tractors appeared, and in 1976 the Evens, who lived on the coast of the Sea of Okhotsk in the Gizhiga region, stopped riding reindeer, then they stopped teaching reindeer altogether, as they "thought to migrate by tractors" (the author's field data, 1997). Mechanical transport was used in the survey and planning of new routes. Intensity of movement decreased, the energy of reindeer herders was saved by reducing labor costs for grazing and migrating, especially in winter, and transportation of property was facilitated. As a result, reindeer herders could better maintain reindeer numbers and improve planned targets. The need to train a large number of deer for winter teams and waste time catching deer for migrating became irrelevant (Popova, 1981: 280).

The introduction of technology to some extent leveled the culture of the Chukchi and Evens, as the latter abandoned riding and pack riding. Modern reindeer herders in the north of Yakutia are increasingly using snowmobiles and devoting less time to training deer, and some reindeer herders have very few working deer (for harness) and *uchakhs* (for riding) (Kaduk, 2017: 167).

The long-term dependence of reindeer herders on the state and a significant reduction in their former autonomy became especially noticeable in the late 1990s, when the state switched to a different, capitalist ("market") form of economy and its resources became limited.

Using technology, it became easier to make migrations, but there were not enough tractors or diesel fuel. The lack of fuel in those years led to a reduction in the number of trips during migrations in summer, when there are traditionally many people in a nomadic camp. "Before, many people joined the migration in summer, now their number will decrease, because we can't make more than one trip" (the author's field data, 1997). The lack of money, goods and fuel during the *perestroika* years caused a decrease in the mobility of the nomadic population throughout the North, including hunters, and also affected the social structure of nomadic communities and made people think about returning to previous practices or their elements. The head of the North-

Even district V. Prokazin in an interview in 1997 noted that "the Koryaks understood that they were in trouble, and began to increase the number of sled deer." This was confirmed by local Evens, "We have a neighboring state farm Parensky, they still have many sled deers. They teach them every year. But we've became lazy, probably" (the author's field data, 1997). This problem of dependency is well recognized by the people themselves:

From the 1997 field diary, recorded from Marfa Fyodorovna:

> Now life is forcing us to return to the old ways of grazing deer, for example, without tractors, because it is difficult to find fuel and spare parts. But returning to former practices is very difficult, and for some of us it is impossible. Earlier in Soviet times, there was a policy of facilitating the work of reindeer herders, and we realized that it was possible to make migrations in easier conditions. For example, I used to migrate on deer back, and now I'm unlikely to sit on a deer" (another woman who was present during the conversation said, "If you want to live, and make migrations, you will get on a deer's back!") … Previously, it took at least one day to prepare for travelling; women sorted things out, repaired *mungurks* (soft pack bags made of skin – *A.S.*), picked up things by weight so that the pack did not slip to the side. And now they throw everything, whatever it could be, into the tractor and on the sleigh that the tractor carries, while they themselves ride light-handed, thinking it is hard to travel like this and they are tired. … Previously, 10 deer were loaded up, and all the basic things were placed, but now we carry a lot of extra things that we cannot part with, which would not have happened in a traditional nomadic life. Before, everything accumulated gradually — sled deer were trained, a harness was made. We gradually got 20 sledge and pack deer. Each family had 7–10 sled deer, 6 families had 60 deer, they needed to be caught and tied, each *mungurka* needs to be checked on the eve of the journey. And today they throw things on a sled just like that, as nothing will happen to them anyway" (the author's field data, 1997).

In these thoughts about cultural changes, reflection, which is constantly present but not always pronounced, is clearly visible. In my opinion, the key idea of this statement consists in the gradualness of labor efforts and their result, correlated with traditional time: this is the temporality that was peculiar to this particular culture and changed with state intervention in reindeer husbandry.

Petr P. Suzdalov from Yakutia spoke of the same thing, "We had such a (nomadic — *A.S.*) life, during which we did not understand whether it was hard or not, we lived that way, and that's all." Only in comparison with and at an interface with a temporality of a different level does an evaluation of innovations appear, "We know that it's bad that

we use Buran, tractors, helicopters, but we do so. Now you cannot send anyone young for a far distance on foot" (the author's field data, 1993).

The reflections of the reindeer herders themselves indicate the irreversible nature of the changes, as well as their predetermination, which is difficult or impossible to avoid, although ethnocultural and personal components play a significant role in the perception of innovations. They are adapted to the individual and specific nomadic group, which maintains the variability of local cultures. It also creates the mixed (hybrid) forms of materiality and the economy, and reindeer husbandry methods that are the most effective in these specific conditions.

Depending on the specific natural, cultural, economic, and goal-setting conditions, hunters and reindeer herders use one or another type of transport at their disposal. The increase in choices requires more thought and physical effort that life entails in several temporal dimensions. The optimal solution should take into account the whole range of energy and material capabilities and costs. Thus, technology subordinates the human to itself, which complicates the reindeer breeding economy and changes people.

Machinery makes a noise, which is unacceptable for hunters-reindeer herders of the taiga zone if they go hunting large hoofed animals (usually on foot or riding a deer). At the same time, it is suitable for checking traps on trapper's trails (Mertenz, 2015). Noise is not as important for reindeer herders as it is for hunters, and yet the Evens in the Borogonsk settlement of the Bulunsk ulus of the Republic of Sakha (Yakutia) use snowmobiles mainly to move between the mobile camp and the village in winter, while sledges with harnessed deer are usually used in winter to observe the herd (Kaduk, 2017: 167). Mechanized means of transport, as a rule, connect the camps and the village, because villages have a source of energy, namely fuel and products produced in cities. Therefore, "external" trips to supply bases and villages (the definition of "shuttle" (Davydov, 2018) is well suited for them)) are carried out on snowmobiles or tractors, all-terrain vehicles, while internal trips are carried out on deer (riding or on sledges) or on foot; tractors are also used during migrations (Fig. 5).

Modern mechanized vehicles have become an integral part of nomadic life. The vulnerability of equipment caused by breakdowns, the need to always have a supply and source of fuel and spare parts, the rhythm of reindeer husbandry in specific physico-geographical and ethnocultural conditions have forced indigenous peoples to maintain pack-riding and riding reindeer husbandry (especially in Yakutia). One of the brigades of the Moma Evens had pack riding deer (because it is impossible to drive in the sledges in the mountains), sledges, and snowmobiles, and there were cars and

Fig. 5. Mobile camp of the reindeer herders. North-Even district, Magadan Region, 1997

tractors in the state farm. One of the brigades of the North-Even region has several deer on stand-by, which are accustomed to harnessing to sledges. As a reindeer herder Endo (Andrei) from the Upper Omolon said, "We can go for a ride or by sledges, our old man (brigadier) has reindeer here, he can ride sledges in winter, but it's easier for us to ride a tractor" (the author's field data, 2002).

I will return to the story of K. Khan'kan about a trip for the slaughter of reindeer, an excerpt from which was given above. On the way to the herd, due to an unexpected thaw at the river crossing, a tractor fell through the ice, then a Buran snowmobile broke down. In the end, the ski mount was broken, which the author used to return to the village. It became possible to overcome all these difficulties with the help of the human factor, namely his own knowledge and skills, as well as social and mutual help, including not only family or ethnic relations, but also corporate and territorial relations in terms of location. The hybrid knowledge needed by the nomad today and the energy of social relations in the North are perhaps the most reliable forms of energy.

> At 7 am the old man woke me up. Breakfast was ready and the kettle boiled. …
>
> "You, Kostya, have a good meal, otherwise you will get hungry on the way." In eight to nine hours, you'll be exhausted. In short, you'll have to walk till the evening. But it is not that bad, as the weather is clear, frosty … Skis are on deer skins, you will quickly slide on them. Take some food for the trip, you'll be feeling hungry," the hunter instructed me (Khan'kan, 2007: 71, 84).

Conclusions. Innovations related to adaptation to the natural environment, ethno-cultural contacts and the influence of the state have significantly changed the life of reindeer herders in the Northeast, their temporal regimes, the world of things, the logic of movements, social relations, and strengthened ties with the state and industry. At the same time, they have made the life of reindeer herders more vulnerable to external factors.

The autonomy of the reindeer breeders was ensured by cultural adaptation, relying on the internal resources of the culture, and was largely controlled by the people themselves. The advent of machines and mechanisms requiring fuel and spare parts led to the fact that this autonomy underwent significant adjustment, "tying" the nomads to the modern industrial state, making these connections visible, necessary and stable, and sometimes irreversible. People can no longer and do not want to abandon the new economic conditions in reindeer husbandry, since the traditional migration was one of the most energy-consuming activities for the nomads, though it was brought to automatism in the sense of consistency and the logistics of actions. It involves a slow gradual sequence correlated with the rhythm of traditional life, conditioned by biological rhythms, the accumulation of deer, material things and skills.

In the 20th century, the state became a source of additional energy for the peoples of the North in the context of cultural transformations. However, tough administration, the lack of flexibility and variability in the organization of labor in state farms, and underestimation of the potential of traditional culture led to a loss of energy and inefficiency. New technologies introduced features that indicate a cultural shift and need in-depth study by ethnographic methods into everyday life and the system of migrations (Mertenz, 2015).

Modernization, understood as a change in the traditional model of nature management, the introduction of new forms, methods, bio- and technical devices in the life of nomads, is an ongoing process that runs with varying degrees of intensity. F. Stammler, describing innovations among the Yamal Nenets mentioned that they "have influenced the ways in which people see, feel, experience but also think and reason about the land they live on (Stammler, 2013: 233). This ongoing process affects not only the technology of reindeer husbandry itself, the perception of land, but also the system of social relations and causes cultural shift. Social relations and ties remain one of the main energy factors among the peoples of the North: they are still the means that so far have worked without fail.

According to my field notes, the Evens in the world where they leave after death have no room for mechanized means of transport. "According to our custom, there is already an idea about the way you will leave for that world. I imagine that I will go there on deer of my own, they will take me there. I will be there with my dog. All my beloved things, all that I had will be there" (the author's field data, 1998). Will there be innovations and borrowings, and if so, which ones? This discrepancy between life here and there probably represents the psychological mechanism of adaptation and cultural defence, and deserves special research.

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Нарты, оленегонные собаки и трактора: энергетика инноваций и культурный сдвиг

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В статье рассматриваются три знаковых инновации, которые появились в культуре неоседлых эвенов Магаданской области за последние 80 лет: нарты (1930-е годы), оленегонные собаки (1940–50-е годы) и трактора (1960-1970-е годы). Прослеживаются причины и истоки этих заимствований, а также вызванный ими системный кумулятивный эффект. Активные инновации были связаны с адаптацией эвенов-оленеводов к природной и этнической среде, начавшиеся с их выхода на территорию Северо-Востока. Форсированные инновации были вызваны влиянием государства, поставившего целью перевести часть кочевников на оседлость, а также вкладывавшего значительные ресурсы и энергию в модификацию оленеводства как отрасли сельского

хозяйства. В результате адаптации к реалиям постсоветской экономики вновь появилось большое разнообразие локальных вариантов культуры, усложненной заимствованиями и привязанной к матрице государства, однако сохраняющей запасные варианты на случай отказа технологических устройств. Инновации рассматриваются в статье, с одной стороны, как следствие процессов пересечения разных темпоральных режимов в результате этносоциальных контактов и влияния государства, а с другой, как механизм культурного сдвига.

Ключевые слова: эвены, Северо-Восток России, инновации, вклад государства, культурный сдвиг.

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