CHAPTER 13

Hunting the Elk by Imitating the Reindeer: A Critical Approach to Ecological Anthropology and the Problems of Adaptation and Resilience among Hunter-Gatherers

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Abstract

Within ecological anthropology it is a widely held assumption that small-scale indigenous societies will undergo unprecedented change as a result of global warming and the dramatic ecological effects that it brings about. This chapter reveals that this is not necessarily the case. Drawing on ethnographic data from the Yukaghirs, a Siberian group of indigenous hunters, it is shown that hunter-gatherer communities can be confronted with radical ecological changes, without this leading to simultaneous change in the symbolic makeup of their subsistence practices. In making this argument, the chapter questions the view that ecological pressure is the prime mover behind the production of cultural forms.

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In a few pockets at the margins of the globe live small and scattered groups of people, who continue to exist in intimate contact with the natural world, using only relatively simple technology for their survival. These societies, which customarily go by the name 'hunter-gatherers' number in total only a few thousand peoples. They have been widely used as representatives of what our ancestors may have

been like when living in their natural habitat. Despite recent criticisms of using living hunter-gatherers as models of human evolution, pointing to all the ways in which they are not appropriate illustrations of our natural human condition (see, e.g., Ingold 2000: 58, Suzman 2001), I belong to those who believe that these peoples can teach us a good deal about the range of possibilities of human adaptation (Krupnik 1993, Bernard 1999). At a time when, in the light of current and future climatic changes, researchers, and policy makers are working to identify frameworks and developing analytical tools for analysing human adaptation, it appears useful to look at the most apparently 'simple' of human societies, those who are most directly dependent on the land for their survival, to find out how they respond to these changes. Perhaps then we can get a better grip on the extent to which adjustments to climatic and other ecological pressures will affect core elements within human cultural forms.

It is almost a truism to claim that small-scale indigenous peoples, marked as they are by spiritual beliefs, cosmologies, and worldviews that are firmly situated in their everyday, subsistence-related activities, will undergo unprecedented change as a result of global warming and the dramatic ecological effects that it brings about. It is no surprise, therefore, that this is the commonly adopted position within what can broadly be characterized as 'ecological anthropology'. But while it may appear sufficiently obvious to need no further comment, I am not so sure that this position actually holds true when we begin testing it empirically. In fact, I intend to show that there is no obvious conjunction of environment and culture, in that hunter-gatherer communities can be confronted with radical ecological changes without this leading to simultaneous changes within their subsistence practices, worldview and cosmological make-up.

In making my argument, I shall challenge two different approaches of ecological anthropology. One is situated within the tradition of 'cultural ecology' and is concerned with 'the anthropology of climate change'. In the version discussed here, it emphasizes the role of 'traditional ecological knowledge' (TEK) as evidence for global climate change. I oppose this idea as based in a misguided view of culture as providing a translucent window on the objective

physical reality out there. Drawing on my Yukaghir ethnography, I show that there is no such thing as a simple one-to-one correspondence or fidelity between a culture's symbols and the physical world they represent. We cannot, therefore, assume that indigenous peoples' mythology, rituals, and all the other elements of culture will provide us with a straightforward, accurate, referential insight into what goes on in the natural world.

The other approach criticized belongs to the tradition of 'evolutionary ecology' and is referred to as the 'optimal foraging theory'. It suggests that hunter-gatherers undergo an evolutionary process towards optimizing their subsistence practices, and that symbolic and cultural practices are essentially impeding this optimisation. What this theory neglects, however, is that the pursuit of symbolically defined goals is essentially human, even in the seemingly most practical moments, such as during hunting. Also here do the Yukaghirs serve as evidence as their hunting practices are abundant with symbolic meaning. The question of adaptation, therefore, can never be reduced to narrowly behavioural aspects.

Without denying that there is always an absolute barrier to adaptation, beyond which a community is no longer able to maintain its cultural heritage, I end up by proposing an alternative view to the two ecological approaches discussed, namely that ecological pressures never produce cultural forms – that is, the physical environment never determines symbolic structures, meanings, and values and cannot, therefore, be seen as the prime mover in the production of culture. Instead, I hold that the symbolic content of these cultural forms are in some important way both their means and their end.

But I am running ahead of myself. There is much ground to be cleared before these arguments can be sustained. To begin this clearance, I need first to introduce the people with whom my analysis is concerned and their environment.

The Yukaghir and their changing environment

The Yukaghirs are a small group of paleo-Siberian hunters who inhabit the upper tributaries of the Kolyma River in north-eastern Yakutia (Sakha) within the Russian Federation. They are remarkable

in having survived centuries of demographic decline (Jochelson 1926) and in having maintained an almost pure hunting economy throughout all the vicissitudes of Sovietisation (Willerslev 2007a). Today the Yukaghirs number no more than about a thousand, and while all the surrounding indigenous groups have turned to reindeer or cattle breeding, they have continued living almost exclusively from hunting and even today the dog is their only domestic animal.

The Sub-arctic forest environment of the Yukaghirs is the coldest humanly inhabited place on earth with winter temperatures as low as minus 65 degrees Celsius. Winter starts with the first snowfall in early October and persists into late May. In fact there are only seventy to eighty frost-free days in the course of the whole year (Ivanov 1999: 153). Despite the cold and the darkness, the people continue to hunt throughout the winter. This dependency on hunting has deepened after the disbanding of the Soviet state farms in 1991 and the economical crisis that followed, which has situated the Yukaghirs outside the Russian wage-employment and cash economy (Willerslev 2007a: 7). Today people have largely returned to a pure subsistence-based lifestyle and the great majority is totally reliant on hunting for their survival. Apart from bread, tea, and tobacco, no imported food products are consumed on a daily basis. Old people, women, and children set nets for fish, gather berries, and set hoop snares for white grouse and hares near the settlement, while the men travel deep into the forest to hunt for big game, especially elk – the Asian 'cousin' of the American moose – which is by far the most important game animal in the present-day subsistence economy of the Yukaghirs. Today elk meat accounts for fifty percent or more of the people's total intake of calories (ibid. 30).

This absolute dependency on the elk is relatively recent, however. The animal entered the Upper Kolyma region in large numbers only in the 1970s, where it replaced the wild reindeer, which had been the mainstay of the local economy since the ancient past. Huge flocks of reindeer numbering thousands vanished almost over night, leaving behind scraggly groups of tens or even less. Today it is a rare event indeed to kill a reindeer in Yukaghir country. In contrast, the elk has steadily increased in numbers. On a trip at any length from

the Yukaghir settlement, it is quite common to encounter one or more elks and see the tracks of many more.

This fluctuation in game populations may have been caused by local landscape responses, such as lichen recovery cycles and short or medium-term local climatic shifts (Krupnik 1993: 147-48), but it might also be directly or indirectly related to global warming, caused by the increased burning of oil, coal, and gas, since the Industrial Revolution. The world's radically shifting climate is currently most visible in the Arctic regions, and it seems quite certain that north Siberia is heating up faster than anywhere else in the world. The area's permafrost, spanning thousands of square kilometres, has started to thaw for the first time since it formed at the end of the last ice age (ACIA 2005; Weller 2000), and as the ground collapses, the landscape turns into a mass of shallow lakes and marshland. In addition, the warmer climate gives rise to massive forest fires throughout the summer. This combination of warmer climate, wetlands, and low forest country, springing from the ashes of the burned down forest, makes a perfect habitat for the elk, whose numbers and range increase rapidly during warm periods, and especially following forest fires (Krupnik 1993: 149). By contrast, the reindeer, which lives on lichen and prefers cold and dry winters, must, during periods of warmer climate, make a general shift to the north. Indeed, as the Yukaghirs themselves are aware, the elk and the reindeer are 'antagonistic' animal species: favourable ecological conditions for the one are unfavourable for the other.

Now, the question I want to explore here is how the Yukaghirs, who find themselves at the mercy of environmental changes far beyond their control, have adapted in response to the extreme instability of their shifting natural world. For we may ask: if indeed adaptation means the adjustments that populations make in response to current or predicted environmental changes (Nelson, Adger and Brown 2007: 397), then how do the Yukaghirs, who are fully dependent on concentrated animal resources for their survival and can do little to control them, face up to the radical fluctuation in game populations?

The anthropology of climate change

We find suggestive answers to these questions among contemporary anthropologists, developing perspectives on the impact of global climate change on small-scale indigenous communities. Some of these scholars predict that the rapidly shifting climate is going to have far-reaching cultural implications, entailing a loss of the particular intimate human-environmental relationships that substantiate indigenous worldviews (see e.g. Salick & Byg 2007, Crate & Nuttall 2009). One such argument is promoted by Susan Crate (2008), who assesses the Siberian Sakha's (a neighbouring group of the Yukaghirs) vulnerability to global warming. She states

> We need not be overconfident about our research partners' capacity to adapt ... as anthropologists we need to grapple with the implications of the loss of the animals and plants that are central to a people's daily subsistence practices, cycles of annual events, and sacred cosmologies. The cultural implications could be analogous to the dis - orientation, alienation, and loss of meaning in life that take place when people are removed from their environment of origin, when Native Americans were moved onto reservations [...]. It follows that the result will be great loss of wisdom, of cosmologies and worldviews, and of the human-environment interactions that are a culture's core. (Crate 2008: 573)

Thus, Crate's overall message is that climate and culture in many indigenous worldviews, such as that of the Sakha, are inextricably linked and that the impact of the rapidly shifting climate on the people's subsistence oriented cosmology will be devastating. Yet it is exactly here that we confront the contradictory thesis that Crate confusingly appears to entertain: On the one hand, she argues 'that global climate change – its causes, effects, and amelioration – is intimately and ultimately about culture' in that it 'is caused by the multiple drivers of Western consumer culture' (Crate 2008:570). On the other hand, when it comes to small-scale indigenous peoples, such as the Sakha with their relatively simple technologies, she considers ecological pressures to structure entire institutions and belief systems. Thus, what Crate in fact seems to suggest, is that small-scale

indigenous communities are somehow directly influenced by ecological pressures in a way that urban Westerners are not, so that among the former nature is first, only then to be embraced by symbolic forms of culture. But is it really the case that that climate and culture among indigenous peoples are associated in a sequence in which the former directly shapes the latter? Even if there is little doubt that all human populations are ultimately subject to the same ecological laws that affect any animal population and that human beings, therefore, must maintain an adaptive relationship with their environments, I find little evidence in the empirical data presented by Crate to support her assertion that the Sakha's religious beliefs, cosmologies and worldviews are directly shaped by climatic or other kinds of environmental pressures.

A case in point is Crate's chief ethnographic example of what she sees as an illuminating incidence of 'traditional environmental knowledge' (TEK). She quotes a Sakha elder, who recounts an age-old myth of the 'bull of winter' (ibid. 570). The man concludes his tale by saying that 'it seems that now with the warming, perhaps the bull of winter will no longer be', and Crate interprets this as a direct and unswerving testimony of the Sakha's experience of global climate change and the loss of traditional culture that it entails (ibid. 583-84). On this basis, she suggests developing 'research scenarios', which among other things, involve the development of 'elder-knowledge programs focusing on climate change ... and then exchanging Western science information with them' (ibid. 583). But how can Crate be sure that what her Sakha informants are talking about is in fact global climate change? Well, she can't.

The trouble is that Crate's analytical starting point is the commonsensical view of culture as somehow providing a translucent window to the objective physical reality out there. In line with this view, cultural symbols, such as myths, rituals, and cosmological beliefs, are thought of as somehow transparent; Crate thus believes that she can look through them to the actuality they point to. But her unquestioning acceptance of the referential capacity of indigenous symbols to offer us access to physical reality is at best intellectually naive. I am not denying that that a myth, such as the 'bull of winter', talks about real things. Indeed, its function is to do exactly

that. But it does so in a particular way, giving things a mystical quality, which is not that of a scientific explanation (see Barthes 1970: 143). Indeed, this is the reason why the 'bull of winter' is a symbol and not the actual winter. If in fact the mythical animal somehow constituted the winter in a literal sense, there would be no talk of symbols here at all. My point is that it is a mistake to believe that indigenous culture is literally literal in containing a straightforward accurate, referential correspondence to what goes on in the natural world. Rather, human culture is always symbolic, not natural – and it is this very feature that separates us from nature (see Sahlins 1977).

The optimal foraging theory

With this criticism in mind, let me turn to the evolutionary limb of ecological anthropology, which is marked by a broadly Darwinian bent. In particular, I want to focus on what goes under the heading of the 'optimal foraging theory' – currently one of the most influential approaches within hunter-gatherer studies. To my knowledge, the theory is not directly liked with current debates about climate change, but it has a good deal to say about the nature of human adaptation and the actions needed in response to shifting resources. I can only treat the theory here in bold strokes, but it is fair to say that its overall claim is that hunter-gatherers' subsistence behaviours are subject to natural selection as are all other primates. Energy and time spent in searching and capturing animals must be offset by the caloric and nutrient value of the animals that are caught. Basically this means that the hunters with more efficient foraging strategies will have a reproductive advantage over those with less efficient strategies. In this regard, the theory is yet another expression of the rather widespread assertion that the primary shaping cause in the development of human behaviour is the imperatives of survival under shifting ecological pressure (see e.g. Harris 1977).

Now, according to the principles of this theory, the concrete task at hand for the evolutionary ecologist consists in predicting how, under given environmental conditions, a hunter should behave, assuming that the overriding objective is to maximize the balance between the energy intake from harvested resources and the energy

costs of procurement. Bruce Winterhalder, one of the foremost exponents of the theory, presents an empirical example of this in his study of the Cree Indians of northern Ontario, who apparently hew closely to the balance sheet of energy and time expected to calories obtained (Winterhalder 1981a: 86-89).

But what about the numerous examples of hunting cultures throughout history which seem far from optimal in their subsistence strategies, the sceptic might ask. Winterhalder is quite aware of this problem and finds an explanation within the local culture itself. Thus, he explicitly singles out the 'cultural goals', situated within systems of belief and meaning, as the key reason for the disjunction 'between modelled optima and observed behaviors' (1981b: 16). Likewise, Robert Foley (1985: 237), another follower of the theory, argues that built into the human capacity for culture are a number of characteristics that 'may inhibit the achievement of optimality'. In other words, the ideal hunter in the optimal foraging theory is a creature, rather like his animal counterpart, that is totally free from cultural constraints to act out of pure, calculated self-interest of maximizing resources. Indeed, as Tim Ingold has recently pointed out:

> Nothing is more revealing of this attitude than the commonplace habit of denoting the activities of hunting and gathering by the single word "foraging"... the concept ... has an established usage in the field of ecology, to denote the feeding behaviour of animals of all kinds, and it is by extension from this field that the anthropological use of the term is explicitly derived. (Ingold 2000: 58)

Thus, when Bruce Winterhalder and Eric Smith (1981: x) note that 'the subsistence patterns of human foragers are fairly analogous to those of other species and are thus more easily studied by ecological models', they are in fact suggesting that hunter-gatherers have never really extricated themselves from the natural world. But to equate the subsistence efforts of hunter-gatherers to animal foraging behaviour is to misconstrue dramatically the actual hunting practices of these peoples, which, as we shall see below, are abundant with symbolic significance. As such, the optimal foraging theory is a prime example of what Gilles Deleuze and Félix Guatteri (1977) call 'interpretation as impoverishment'. It is what happens when the lived

complexity of human life is 'rewritten' within the confined limits of mathematical modelling.

Ecological determinisms

To be sure, the two eco-anthropological approaches described above, that of Crate, who seeks to develop perspectives on global climate change's impact on small-scale indigenous cultures, and the followers of the optimal foraging theory, appear at first glance to be very unlikely bedfellows, among other things because, whereas the former focuses on climate change as being 'ultimately about culture' (Crate 2008: 570), the latter relegate culture to a kind of epilogue, something which may intervene negatively on a group's ability for survival and reproduction.

On closer inspection, however, the two theories have a rather similar take on the human-environment interface. First, Crate's phrasing in terms of 'adaptation', 'vulnerability', and 'resilience' – the main terminology used to address global climate change – is also used by the optimal foraging theory. This terminology developed outside anthropology in population and landscape ecology and applied resource management, and has a strong mathematical focus on modelling (Nelson, Adger & Brown 2007: 398). As such the terminology provides an aura of being scientific. The climate, and the food resources that depend on it, acquire the extraordinary and limitless capacity to shape indigenous peoples' behaviour and modes of thinking. And since subsistence, like indigenous culture, is understood to be directly shaped – if not actually determined – by the natural environment, all transformations in human practical doings or cultural forms are explained by ecological changes in energy calculations, adaptability and other so-called 'hard' facts.

But how hard are these facts really and how valid are the assumptions on which they rest? For we may ask: Is it really reasonable to expect that the adaptation of small-scale indigenous societies to climate change and other forms of ecological pressures directly shapes core aspects of their subsistence efforts (as suggested by the optimal foraging theory), let alone poses an imminent threat to their cultural heritage (as suggested by Crate)? I don't think so. In my view, both

theories underline the over-simplification and danger of assuming that ecology is somehow the secret essence of the livelihood of so-called 'primitive' peoples.

Let me give my warning some substance by returning to the Yukaghirs. My aim is twofold: I want to show that the Yukaghirs, although they too belong to the category of so-called 'foragers' and inhabit one of the world's harshest environments, where ecological pressures are most direct, organize their subsistence efforts, just like any other human society, around symbolically defined goals – as opposed to the narrowly utilitarian and functional goals of the optimal foraging theory. Moreover, I intend to show that Yukaghir hunters, although they imitate their prey, are by no means identical with that which they represent through imitation. I take this as evidence that Yukaghir symbolic culture, even during its seemingly most practical and goal-directed moments, functions completely differently from mirrors and, therefore, does not and cannot faithfully reflect the ecological state of affairs in the natural world.

Animal imitation

For the Yukaghir, hunting is an exercise in trickery in which the hunter undergoes a long process of preparations by which his body is transformed into the image of his prey. Accordingly, hunters will visit the sauna on the evening before leaving for the forest, where, instead of using soap, they wipe themselves with whisks from birch trees. They say that the animal recognises the attractive smell of birch and does not flee, but comes closer to the hunter (Willerslev 2004). Moreover, small children, who are said to have a particularly strong human odour, are kept away from hunters. At home, affection for children is expressed by sniffing. Parents apply their noses to the napes of their children's necks and inhale their odour. However, when a hunter sets off for the forest, he rarely embraces his offspring. This is in order to avoid contamination with their odour. The same goes for sexual intercourse, which is banned before any hunt, because of the stench it leaves on the body (ibid.). Likewise, hunters will, when leaving for the forest, dress up in skin coats worn with their hair outward, take on headgear with characteristic protruding

ears, and they will put on skis covered with smooth leg skins, so as to sound like the animal when moving in snow. When hunting, then, Yukaghirs cease to be extraneous bodies, alien to the forest world and to the animal hunted.

Now, mimetic capacities such as this have been characteristic of human beings since prehistoric times. According to Steward Guthrie (1993: 134-36), animal imitations in material art can already be observed in Neolithic cultures. They also appear in ritual objects resembling various animal creatures and objects of the world and in the ways these objects have been used to influence reality through magical practices, as has been described by Sir James Frazer (1960). But what is the nature of this kind of mimicry? Are we to regard it as a perennial instinct of all life forms, one that does not essentially differ in animals and humans? Indeed, this is the view of Charles Darwin in his evolutionary account of mimesis as an offensive or defensive adaptation, a way of surprising prey or tricking predators. He writes:

> Assuming that an insect originally happened to resemble in some degree a dead twig or a decayed leaf, and that it varied slightly in many ways, then all the variations which rendered the insect at all more like any such object, and thus favoured its escape, would be preserved, whilst other variations would be neglected and ultimately lost; or, if they rendered the insect at all less like the imitated object would be eliminated. (Darwin 1958: 205)

Is the Yukaghir hunter's imitation of his prey a concrete example of this Darwinian process of 'natural mimicry'? If we subscribe to the optimal foraging theory, the answer could only be 'yes', because, as Winterhalder (1981a: 66) himself has stated, 'The forager's choices make up a strategy of adjustment to ecological conditions, an adaptive pattern resulting from evolutionary processes'. I for my part, however, take this narrow stance of evolutionary adaptedness to be fundamentally misguided, and the best way to demonstrate it is to move deeper into my Yukaghir ethnography.

Let me begin by pointing out that Yukaghirs do not conceptualize the hunter's imitation of his prey as a purely technical manipu-

lation of nature. Rather, they see it as the climax of a long process of sexual seduction (Willerslev 2004). The prey is generally conceptualized as a female lover, who needs to 'give herself up' to the male hunter out of sexual desire for him. For this reason, hunters' terminology is replete with symbolic parallels between hunting and sexual seduction. It is also for this reason that hunters' fur clothing should be carefully and beautifully made (see Chassonnet 1988). When imitating his prey, the hunter will then set in motion an ideal reflection of the animal, which in turn cannot resist submitting to such self-reflection. Hunters say that the animal is so pleased by what it sees that it throws itself at them. Similarly, the night before the hunt, the hunter's soul, *ayibii*, will leave the body during his nightly dreams and travel to the house of the animal master-spirit in the shape of an animal. The spirit will then perceive the *ayibii* as a harmless lover and a member of the family and the two will jump into bed. The feelings of sexual desire that the hunter's *ayibii* evokes in the spirit during their nightly intercourse is then extended to the spirit's physical counterpart: the animal prey. So, when the hunter locates it the next morning and starts imitating its bodily movements, smell, and appearance, the animal will, at least ideally, run towards him in the expectation of experience a climax of sexual excitement, and he can shoot it dead (Willerslev 2004). Thus, what we are dealing with is in principle two analogous hunts: the 'physical' hunt of the hunter seducing the animal, and preceding this, the 'symbolic' hunt in which the hunter's *ayibii* seduces the animal's spirit. Each is, so to speak, the shadow mirror image of the other.

Thus, among Yukaghirs - and I suspect among many other groups of hunter-gatherers too - the world is not seen in terms of an antinomy between technical know-how and symbolic know-how. Rather, the two are completely intertwined and not conceptually distinguished. It makes little sense, therefore, to separate the two analytically as do the optimal foraging theory, when it reduces hunting to its narrowly behavioural aspect.

This becomes even more apparent when we consider Yukaghir mythology. In Siberia, as elsewhere in the Arctic, it is a widely held belief that in mythical times, not only humans but also animals held

human form and lived and behaved like humans (see Bogoras 1904-1909: 283, Willerslev 2007b: 34-35). Indeed, this is why the Yukaghirs say that animals, when back in their own land and households, take on human appearances (Willerslev 2007a: 84). At some point in ancient times, certain humans died as a result of fighting, by which process they lost their human bodily attributes and became physically distinct as various animal species. However, hunters talk about their prey as having an innate desire to re-establish the original order of things by seducing the hunter into believing that what he sees is not an animal but a fellow human being. Thus, Yukaghir myths are full of stories in which hunters are at risk of being carried away by their animal prey and undergoing an irreversible metamorphosis (Willerslev 2007a: 89-94; Willerslev 2004). Such return to an initial state would effectively mean converting back into a mythical existence from which human beings have taken such great effort to break free. For this reason, hunters must kill the animal before its exposes its concealed human nature. Only in overcoming the animal before it retains its humanity can the existing order with its manifold species be sustained.

What we can conclude from this, then, is that the actual killing of the prey does more than simply providing the hunter with meat. In fact, the meat is less a measure of utility than it is a symbol of having secured the cosmos from totally collapsing. In this sense, the hunt's material pay-off is secondary to its symbolic pay-off. Hence, even during their seemingly most practical and subsistence-directed activity, the Yukaghirs pursue above all symbolically defined goals. The imposition of symbolic meaning on the natural world is the major end of Yukaghir hunting, something which is underscored by the fact that hunters often say that 'the honour of winning over the game is more important than the meat it provides'. What makes the hunt 'deep' in the Geertzian sense of the Balinese Cockfight (Geertz 1973: 433-53) is, therefore, not utility as such, but what hunting is made to represent symbolically, which is a theatrical re-enactment of the beginning of time, the instant the cosmos was created through inter-species fighting. Each hunt is in this sense a world unto itself, a particulate eruption of cosmological order, with all that this entails of human triumph and utter nonhuman defeat.

Hunting the elk by imitating the reindeer

All of this, however, constitutes only part of my argument, which I shall attempt to bring to an even more fundamental level of analysis. It happens that Yukaghir imitation of their primary prey, the elk, is in fact not modelled on the behaviour of this animal, but on the wild reindeer, which, as I have already described, dominated the peoples' subsistence economy until recently. The hunters used to dress themselves up for the reindeer, imitating its movements, sounds and smells in exactly same manner as they now do with the elk. For readers experienced in reindeer hunting, it might be known that this animal can be rather easily tricked by means of simple imitation. Richard Nelson, for example, cites a Koyukon Indian, recalling how, by means of a simple trick of mimicry, he made an entire herd of wild reindeer draw near to him:

> [I walked] openly towards them, my arms upstretched like antlers. They saw me immediately but only stared in bewilderment ... By the same ploy I made them turn again, and again, each time drawing nearer, until less than fifty yards separated us. I had the entire herd corralled at one end of the expansive ridgetop. (Nelson 1993: 171)

Now while the reindeer is relatively small in size, not particularly wary and often foolishly unafraid, the elk is different. It is the largest northland deer, weighing more than 1,000 pounds. While the animal's hearing and sense of smell are exceptionally acute, its eyesight is extremely poor: it is most likely short-sighted and due to a shortage of cones which give colour sensitivity to vision, it is not aware of colour either. Thus, the elk is unlikely to get any acuity or sharpness of detail of the approaching hunter, mimicking its movements and appearance. And it certainly cannot detect any of his fur clothing's highly decorated details of bands and beadwork, which he has donned in its honour. Moreover, to approach an elk by means of mimicry can be extremely dangerous, especially during the mating season. I have recorded countless stories about elk that have seen through the hunter's trick of imitation and attacked him. The elk will flatten its ears as a sign of aggression and the hunter must slowly

withdraw. Otherwise, he will be trampled to death by the enormous animal.

It is beyond doubt that the elk is most effectively hunted with the help of dogs, which can surround the animal and keep it occupied until the hunter gets within shooting distance – something which is impossible in reindeer hunting, as the animal will simply run away. Yukaghirs do hunt elk with dogs, but regard it as an inferior form of hunting. In fact, hunters – like the Russians – who only hunt elk with the help of dogs are highly disparaged as amateurs who do not understand what hunting is all about and who simply miss the point of the game. So, despite its ineffectiveness and the high risk involved, Yukaghirs insist on killing elk by means of animal imitation. It is not that they are ignorant of the elk's particular behaviour and how it differs from that of the reindeer. Though they only express it in so many words, they claim to continue with their animal imitations because they have a persistent faith in and commitment to the ways of the past.

Now what are we to make of this apparently irrational hunting strategy, which Yukaghirs engage in passionately, despite the fact that their energy might be better spent hunting in different ways? Surely, the supporters of the optimal foraging theory would interpret this as a prime example of how cultural goals of hunters have a negative impact and 'may inhibit the achievement of optimality' (Foley 1985: 237). But despite the logical force of their scientism, I venture to claim that their interpretation is entirely mistaken. There are in fact very good reasons for why hunters do what they do, although this may not be easily visible to scholars enslaved to the alleged hard facts of science. What I have in mind is a so-called cultural explanation, which rather than situating rationality in the impersonal laws of evolution, situates it in the eye of the cultural actor.

The Yukaghir cosmos is in effect a hall of mirrors, as the various dimensions of reality are conceived as replicas or reflections of the others. For example, the world of the dead is conceived as a shadowy mirror image of the world of the living, populated with souls of people, animals, and objects found in this world. Likewise, the much feared evil spirits, the *Abasylar,* are said to live in camps and villages,

travel about the country on sledges and go hunting for prey as do human beings. Only for them, the game to be hunted is the souls of men, whom they call their little 'elk' (Jochelson 1926: 302-3). From a human point of view, the *Absylar* have monstrous and terrifying features, such as hanging eyes, half bodies and large mouths full of teeth. Yet from the viewpoint of the *Abasylar* themselves, they are the ones who are humans, while human shamans, who may attack and kill them, are regarded as *Abasylar* – that is, as evil spirits. Also, humans and animals are locked in a pattern of mutual replication. Thus, as I have already noted, animals and their associated spiritual beings are said to take on human shapes and live lives analogous to those of humans when in their own land and households.

To sum up, the world of the Yukaghirs is by and large a mimeticized world: Everything is paired with an almost endless number of mimetic doubles of itself, which extend in all directions and continually mirror and echo one another. In semantic terms, this implies that the Yukaghir cosmos of representation is made up of a symbolic order of tightly interconnected signifiers that permeate most aspects of life. Most of these signifiers are cross-referentially linked in an inter-textual and inter-discursive way (Bakhtin 1981: 291; Kristeva 1986: 37). Hence, signifiers from different discourses, such as e.g. hunting and relations of gender, are meaningfully interconnected with each other. This means that an utterance, such as 'hunting is sex', which may appear among hunters in the forest, is semantically connected not only to other hunting slogans, but also to the entire symbolic order of interconnected signifiers. The tightness of this symbolic structure is secured by the fact that it is based on a very limited number of 'master-signifiers', which are surrounded with an aura of enlarged importance as they provide a meta-cultural commentary upon the whole matter of living in a 'hall-of-mirrors' world. One such master-signifier is the hunter's mimetic encounter with his prey, which, as we have seen, coordinates and brings into focus the mimetic principle of the whole Yukaghir cosmos, and which is reproduced over and over again in the different contexts of hunting.

Now, bearing the tightness of this cultural order of signification in mind, to radically alter one's hunting strategy and bring an end to the imitation of prey would have far-reaching consequences. It

would not simply mean a change in one's subsistence efforts, but would simultaneously imply contesting all the other signifiers, with which the master-signifier of hunting is inter-discursively linked, thus contesting the whole cultural order of representation. This could easily cause the entire symbolic system to collapse, with all that this entails regarding cultural instability and the possible development of maladaptive cultural practices that could hold the seeds of the people's own destruction.

Conclusion

The Yukaghir case underlines the oversimplification and danger of deeming indigenous hunting practices irrational or maladaptive, just because they do not live up to the scientists' criteria for optimality. But it also underscores the point that indigenous peoples do not necessarily adjust their cultural symbols to natural demands. The Yukaghirs, as we have clearly seen, organize their productive efforts around symbolically defined goals – not the reverse. Although they at first glace appear to be at one with their environment through animal imitation, it turns out that what they are in fact mimicking is not nature as such – that is, the behavioural features of their prey – but a symbolic image of the elk, which in turn is modelled on the long gone reindeer. The implication of this cannot be overemphasized, since it strikes at the very core of the evolutionary account of mimicry. Rather than being a useful strategy of Darwinian adaptation, mimicry is more like a 'symbolic excess' that exceeds any evolution - istic proposition of adjustment to ecological conditions or pure utility.

However, the Yukaghirs' continuation of what in a narrowly utilitarian sense is an 'outdated' hunting technique that no longer mirrors the ecological features of their natural world also poses important criticisms to the concept of 'resilience' – the overall topic of this volume. The concept comes from landscape ecology and characterizes ecosystems that maintain themselves in the face of external disturbances. Recently, Neil Adger (2000) has suggested expanding the concept to include social forms as well, so that what he denotes 'social resilience' should refer to the ability of communities to cope

with external stresses and disturbances as a result of social, political, and above all environmental change. Ecological and social resilience, he suggests, are often linked through the local communities' economic dependency on ecosystems, thus making them less socially resilient to ecological pressures. This, he continues, 'is most clearly exhibited within social systems that are dependent on a single ecosystem or single resource' (Adger 2000: 350).

However, as we have clearly seen, this does not apply to the Yukaghirs. They have shown a great deal of so-called 'social resilience', despite the fact that they are almost fully dependent on a single animal species for their survival and have experienced the extreme instability of shifting animal resources along with other changes in recent times, including the collapse of the Soviet state farm system, which has made them ever more dependent on subsistence hunting. The trouble is that we cannot easily analyze social systems by using concepts developed within the natural sciences. As Adger (2000: 350) himself acknowledges, 'simply taking the concept of resilience from ecological sciences and applying it to social systems assumes that there are no essential differences in behaviour and structure between socialised institutions and ecological systems'. This is clearly contested by the Yukaghir ethnography. Not only has it been quite clearly shown that the production of cultural forms is not causally derived from ecological conditions, but even more importantly, it also shows that there is no simplified referential relation between symbolic forms and physical reality. As already argued, indigenous cultural symbols do not provide a translucent window to what goes on in the objective physical reality out there. Quite the opposite: Any cultural system of signification – including those of small-scale indigenous societies, like the Yukaghirs – acquires its meaning by means of the relationship of its signifiers to the whole chain of other signifiers in which they are entangled and these signifiers have no obvious reference to the physical environment they represent. Thus, the difference between the two domains of symbolic form and physical reality is not one of degree, but of kind, as they operate on different logical levels. What this points to then, is that the concept of 'resilience' with all its connotations of so-called 'hard' scientific facts is of little or no use to social anthropology in much the same way as

the concept of 'adaption', at least in its ordinary Darwinian meaning, makes no sense, when applied to the cultural worlds of human beings.

It also follows quite logically from all of this that it is inherently misguided to rely on TEK as a kind of corrective to scientific knowledge about climate change. Such anthropological usage is often woven out of codes that appear to represent reality not because it actually reflects the minds of indigenous peoples but because it matches our common-sense expectations about the state of the planet. As such, it gives the public what it wants, flatters its conventionality by mirroring a familiar world, but thereby impoverishes serious scholarly attempts at coming to grips with indigenous peoples' lives and modes of thinking.

I am not denying that climate change is real or that it can in extreme cases pose a threat to indigenous peoples' cultural survival. Although Arctic societies have through history shown significant adaptive capacity, there may come a point when the rate of environmental change crosses a critical line for keeping one's cultural heritage alive. Perhaps this is what Piers Vitebsky (1006: 10) points to when he quotes from his highly adaptable Siberian reindeer herders that 'if it gets too hot, they'll simply turn to camel herding'. Crate is not fond of this seemingly light-hearted statement and calls people like this for 'misinformed critics who deny the urgency to act on global climate change'. However, this urgency, I venture to suggest, is not essentially about cultural survival, since climate and other ecological kinds of pressures do not appear to produce cultural forms – that is, the physical environment never seems to determine symbolic structures, meanings and values and are, therefore, unlikely to be the prime mover in the production of culture. Rather, the symbolic content of cultural forms, such as the animal mimicry of Yukaghir hunters, is in some significant way both their means and their end.

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