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# Understanding Eskimo Science

*Traditional hunters' insights into the natural world are worth rediscovering.*

**Richard Nelson**

Just below the Arctic Circle in the boreal forest of interior Alaska; an amber afternoon in mid-November; the temperature -20°; the air adrift with frost crystals, presaging the onset of deeper cold.

Five men—Koyukon Indians—lean over the carcass of an exceptionally large black bear. For two days they've traversed the Koyukuk River valley, searching for bears that have recently entered hibernation dens. The animals are in prime condition at this season but extremely hard to find. Den entrances, hidden beneath 18 inches of powdery snow, are betrayed only by the subtlest of clues—patches where no grass protrudes from the surface because it's been clawed away for insulation, faint concavities hinting of footprint depressions in the moss below.

Earlier this morning the hunters took a yearling bear. In accordance with Koyukon tradition, they followed elaborate rules for the proper treatment of killed animals. For example, the bear's feet were removed first, to keep its spirit from wandering. Also, certain parts were to be eaten away from the village, at a kind of funeral feast. All the rest would be eaten either at home or at community events, as people here have done for countless generations.

Koyukon hunters know that an animal's life ebbs slowly, that it remains aware and sensitive to how people treat its body. This is especially true for the potent and demanding spirit of the bear.

The leader of the hunting group is Moses Sam, a man in his 60s who has trapped in this territory since childhood. He is known for his detailed knowledge of the land and for his extraordinary success as a bear hunter. "No one else has that kind of luck with bears," I've been told. "Some people are born with it. He always takes good care of his animals—respects them. That's how he keeps his luck."

Moses pulls a small knife from his pocket, kneels beside the bear's head, and carefully slits the clear domes of its eyes. "Now," he explains softly, "the bear won't see if one of us makes a mistake or does something wrong."

Contemporary Americans are likely to find this story exotic, but over the course of time episodes like this have been utterly commonplace, the essence of people's relationship to the natural world. After all, for 99 percent of human history we lived exclusively as hunter-gatherers; by comparison, agriculture has existed only for a moment and urban societies scarcely more than a blink.

From this perspective, much of human experience over the past several million years lies beyond our grasp. Probably no society has been so deeply alienated as ours from the community of nature, has viewed the natural world from a greater distance of mind, has lapsed into a murkier comprehension of its connections with the sustaining envi-

ronment. Because of this, we have great difficulty understanding our rootedness to earth, our affinities with nonhuman life.

I believe it's essential that we learn from traditional societies, especially those whose livelihood depends on the harvest of a wild environment—hunters, fishers, trappers, and gatherers. These people have accumulated bodies of knowledge much like our own sciences. And they can give us vital insights about responsible membership in the community of life, insights founded on a wisdom we'd long forgotten and now are beginning to rediscover.

Since the mid-1960s I have worked as an ethnographer in Alaska, living intermittently in remote northern communities and recording native traditions centered around the natural world. I spent about two years in Koyukon Indian villages and just over a year with Inupiaq Eskimos on the Arctic coast—traveling by dog team and snowmobile, recording traditional knowledge, and learning the hunter's way.

Eskimos have long inhabited some of the harshest environments on earth, and they are among the most exquisitely adapted of all human groups. Because plant life is so scarce in their northern terrain, Eskimos depend more than any other people on hunting.

Eskimos are famous for the cleverness of their technology—kayaks, harpoons, skin clothing, snow houses, dog teams. But I believe their greatest genius, and the

basis of their success, lies in the less tangible realm of the intellect—the nexus of mind and nature. For what repeatedly struck me above all else was their profound knowledge of the environment.

Several times, when my Inupiaq hunting companion did something especially clever, he'd point to his head and declare: "You see—Eskimo scientist!" At first I took it as hyperbole, but as time went by I realized he was speaking the truth. Scientists had often come to his village, and he saw in them a familiar commitment to the empirical method.

Traditional Inupiaq hunters spend a lifetime acquiring knowledge—from others in the community and from their own observations. If they are to survive, they must have absolutely reliable information. When I first went to live with Inupiaq people, I doubted many things they told me. But the longer I stayed, the more I trusted their teachings.

For example, hunters say that ringed seals surfacing in open leads—wide cracks in the sea ice—can reliably forecast the weather. Because an unexpected gale might set people adrift on the pack ice, accurate prediction is a matter of life and death. When seals rise chest-high in the water, snout pointed skyward, not going anywhere in particular, it indicates stable weather, the Inupiaq say. But if they surface briefly, head low, snout parallel to the water, and show themselves only once or twice, watch for a sudden storm. And take special heed if you've also noticed the sled dogs howling incessantly, stars twinkling erratically, or the current running strong from the south. As time passed, my own experiences with seals and winter storms affirmed what the Eskimos said.

Like a young Inupiaq in training, I gradually grew less skeptical and started to apply what I was told. For example, had I ever been rushed by a polar bear, I would have jumped away to the animal's right side. Inupiaq elders say polar bears are left-handed, so you have a slightly better chance to avoid their right paw, which is slower and less accurate. I'm pleased to say I never had the chance for a field test. But in judging assertions like this, remember that Eskimos have had close contact with polar bears for several thousand years.

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During winter, ringed and bearded seals maintain tunnel-like breathing holes in ice that is many feet thick. These holes are often capped with an igloo-shaped dome created by water sloshing onto the surface when the animal enters from below. Inupiaq elders told me that polar bears are clever enough to excavate around the base of this dome, leaving it perfectly intact but weak enough that a hard swat will shatter the ice and smash the seal's skull. I couldn't help wondering if this were really true; but then a younger man told me he'd recently followed the tracks of a bear that had excavated one seal hole after another, exactly as the elders had described.

In the village where I lived, the most respected hunter was Igruk, a man in his 70s. He had an extraordinary sense of animals—a gift for understanding and predicting their behavior. Although he was no longer quick and strong, he joined a crew hunting bowhead whales during the spring migration, his main role being that of adviser. Each time Igruk spotted a whale coming from the south, he counted the number of blows, timed how long it stayed down, and noted the distance it traveled along the open lead, until it vanished toward the north. This way he learned to predict, with uncanny accuracy, where hunters could expect the whale to resurface.

I believe the expert Inupiaq hunter possesses as much knowledge as a highly trained scientist in our own society, although the information may be of a different sort. Volumes could be written on the behavior, ecology, and utilization of Arctic animals—polar bear, walrus, bowhead whale, beluga, bearded seal, ringed seal, caribou, musk ox, and others—based entirely on Eskimo knowledge.

Comparable bodies of knowledge existed in every Native American culture

before the time of Columbus. Since then, even in the far north, Western education and cultural change have steadily eroded these traditions. Reflecting on a time before Europeans arrived, we can imagine the whole array of North American animal species—deer, elk, black bear, wolf, mountain lion, beaver, coyote, Canada goose, ruffed grouse, passenger pigeon, northern pike—each known in hundreds of different ways by tribal communities; the entire continent, sheathed in intricate webs of knowledge. Taken as a whole, this composed a vast intellectual legacy, born of intimacy with the natural world. Sadly, not more than a hint of it has ever been recorded.

Like other Native Americans, the Inupiaq acquired their knowledge through gradual accretion of naturalistic observations—year after year, lifetime after lifetime, generation after generation, century after century. Modern science often relies on other techniques—specialized full-time observation, controlled experiments, captive-animal studies, technological devices like radio collars—which can provide similar information much more quickly.

Yet Eskimo people have learned not only *about* animals but also *from* them. Polar bears hunt seals not only by waiting at their winter breathing holes, but also by stalking seals that crawl up on the ice to bask in the spring warmth. Both methods depend on being silent, staying downwind, keeping out of sight, and moving only when the seal is asleep or distracted. According to the elders, a stalking bear will even use one paw to cover its conspicuous black nose.

Inupiaq methods for hunting seals, both at breathing holes and atop the spring ice, are nearly identical to those of the polar bear. Is this a case of independent invention? Or did ancestral Eskimos learn the techniques by watching polar bears, who had perfected an adaptation to the sea-ice-environment long before humans arrived in the Arctic?

The hunter's genius centers on knowing an animal's behavior so well he can turn it to his advantage. For instance, Igruk once saw a polar bear far off across flat ice, where he couldn't stalk it without being seen. But he knew an old technique of mimicking a seal. He lay down

in plain sight, conspicuous in his dark parka and pants, then lifted and dropped his head like a seal, scratched the ice, and imitated flippers with his hands. The bear mistook his pursuer for prey. Each time Igruk lifted his head the animal kept still; whenever Igruk “slept” the bear crept closer. When it came near enough, a gunshot pierced the snowy silence. That night, polar bear meat was shared among the villagers.

A traditional hunter like Igruk plumbs the depths of his intellect—his capacity to manipulate complex knowledge. But he also delves into his animal nature, drawing from intuitions of sense and body and heart: feeling the wind’s touch, listening for the tick of moving ice, peering from crannies, hiding as if he himself were the hunted. He moves in a world of eyes, where everything watches—the bear, the seal, the wind, the moon and stars, the drifting ice, the silent waters below. He is beholden to powers we have long forgotten or ignored.

In Western society we rest comfortably on our own accepted truths about the nature of nature. We treat the environment as if it were numb to our presence and blind to our behavior. Yet despite our certainty on this matter, accounts of traditional people throughout the world reveal that most of humankind has concluded otherwise. Perhaps our scientific method really does follow the path to a single, absolute truth. But there may be wisdom in accepting other possibilities and opening ourselves to different views of the world.

I remember asking a Koyukon man about the behavior and temperament of the Canada goose. He described it as a gentle and good-natured animal, then added: “Even if [a goose] had the power to knock you over, I don’t think it would do it.”

For me, his words carried a deep metaphorical wisdom. They exemplified the Koyukon people’s own restraint toward the world around them. And they offered a contrast to our culture, in which possessing the power to overwhelm the en-

vironment has long been sufficient justification for its use.

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We often think of this continent as having been a pristine wilderness when the first Europeans arrived. Yet for at least 12,000 years, and possibly twice that long, Native American people had inhabited and intensively utilized the land; had gathered, hunted, fished, settled, and cultivated; had learned the terrain in all its details, infusing it with meaning and memory; and had shaped every aspect of their life around it. That humans could sustain membership in a natural community for such an enormous span of time without profoundly degrading it fairly staggers the imagination. And it gives strong testimony to the adaptation of mind—the braiding together of knowledge and ideology—that linked North America’s indigenous people with their environment.

A Koyukon elder, who took it upon himself to be my teacher, was fond of telling me: “Each animal knows way more than you do.” He spoke as if it summarized all that he understood and believed.

This statement epitomizes relationships to the natural world among many Native American people. And it goes far in explaining the diversity and fecundity of life on our continent when the first sailing ship approached these shores.

There’s been much discussion in recent years about what biologist E. O. Wilson has termed “biophilia”—a deep, pervasive, ubiquitous, all-embracing affinity for nonhuman life. Evidence for this “instinct” may be elusive in Western cultures, but not among traditional societies. People like the Koyukon manifest biophilia in virtually all dimensions of their existence. Connectedness with non-

human life infuses the whole spectrum of their thought, behavior, and belief.

It’s often said that a fish might have no concept of water, never having left it. In the same way, traditional peoples might never stand far enough outside themselves to imagine a generalized concept of biophilia. Perhaps it would be impossible for people to intimately bound with the natural world, people who recognize that all nature is our own embracing community. Perhaps, to bring a word like *biophilia* into their language, they would first need to separate themselves from nature.

**I**n April 1971 I was in a whaling camp several miles off the Arctic coast with a group of Inupiaq hunters, including Igruk, who understood animals so well he almost seemed to enter their minds.

Onshore winds had closed the lead that migrating whales usually follow, but one large opening remained, and here the Inupiaq men placed their camp. For a couple of days there had been no whales, so everyone stayed inside the warm tent, talking and relaxing. The old man rested on a soft bed of caribou skins with his eyes closed. Then, suddenly, he interrupted the conversation: “I think a whale is coming, and perhaps it will surface very close....”

To my amazement everyone jumped into action, although none had seen or heard anything except Igruk’s words. Only he stayed behind, while the others rushed for the water’s edge. I was last to leave the tent. Seconds after I stepped outside, a broad, shining back cleaved the still water near the opposite side of the opening, accompanied by the burst of a whale’s blow.

Later, when I asked how he’d known, Igruk said, “There was a ringing inside my ears.” I have no explanation other than his; I can only report what I saw. None of the Inupiaq crew members even commented afterward, as if nothing out of the ordinary had happened.