

COLIN SCOTT

## 9. Science for the West, Myth for the Rest?

### *The Case of James Bay Cree Knowledge Construction*

DO CREE HUNTERS PRACTICE SCIENCE? The answer to this question would seem to depend on whether one defines science according to universal features, or culturally specific ones. If one means by science a social activity that draws deductive inferences from first premises, that these inferences are deliberately and systematically verified in relation to experience, and that models of the world are reflexively adjusted to conform to observed regularities in the course of events, then, yes, Cree hunters practice science—as surely all human societies do. At the same time, the paradigms and social contexts of Cree science differ markedly from those of Western science—accustomed as we are in the West to a “root metaphor”<sup>1</sup> of impersonal causal forces that opposes “nature” to “mind,” “spirit,” and “culture,” and conditioned as we also are to view legitimate scientific procedure and production as the prerogative of particular professional and institutionalized elites. While there is no a priori reason to expect that knowledge generated out of non-Western paradigms or social processes should be empirically or predictively less adequate, it has been an effect of Western ethnocentrism to construe non-Western knowledge processes as “pseudoscientific,” “protoscientific,” or merely “unscientific.”<sup>2</sup> Western science, in fostering an ideology of knowledge that supports its own elite status, has assisted the exclusion and disqualification of innumerable “subjugated knowledges” (Foucault 1980).

Indigenous ecological knowledge finds renewed voice, however, in answer to the environmental anxieties of Western industrial societies, as well as aboriginal people’s demands to decolonize and to directly manage environmental resources to which they assert primary rights. The Cree of James Bay, Canada, are such a people. Any account of Cree knowledge occupies a context in which jurisdiction for resources is actively contested, in which “science” is invoked both to attack and defend Cree opposition to invasive development projects sponsored by external governments, and in which indigenous knowledge is both advocated and opposed as a basis for deciding development issues.

I do not directly address these political dimensions in this chapter. I focus on the more particular task of exploring how practical, empirical knowledge flows from root metaphors (paradigms) that are not generally associated with “scientific” results in Western thought. The exploration focuses on the way in which root metaphors of pan-species personhood,

communication, and reciprocity inform literal models of animal behavior and hunting practice; and how the latter reciprocally transmute the terms of metaphor, as experience is interpreted and actions are formulated.

One conclusion of earlier twentieth-century ethnography, in a line leading from Malinowski through Evans-Pritchard, is that in all societies (including Western civilization) practices dubbed “magical” and “mystical” coexist with rational/empirical processes. Both anthropologists were alert to

the danger of double selection by which (“primitive” peoples) are described entirely in terms of their mystical beliefs, ignoring much of their empirical behavior in everyday life, and by which Europeans are described entirely in terms of scientific rational-logical thought, when they too do not inhabit this mental universe all the time. (Tambiah 1990, 92)

Both anthropologists knew that “a person can in a certain context behave mystically, and then switch in another context to a practical empirical everyday frame of mind” (ibid).<sup>3</sup> This legacy poses two problems of immediate concern for anthropology: how do we get beyond the artificial dichotomy that separates Western and non-Western forms of knowledge, simultaneously discrediting and romanticizing the latter; and how are logical/empirical and mystical/magical aspects of thought related, in all traditions?

Perhaps we have begun to see that the distance separating the scientist and the shaman is not so great as was once imagined. But the evolutionary opposition of science for “the West” to myth and magic for “the rest” is far from dissolved; Western self-conception remains profoundly involved with images of rational “self” versus mystical “other.” Several trends in late twentieth-century anthropology, to be sure, have continued to erode this dichotomy. Ethnoscience fieldwork since the 1960s has brought into view empirically elaborate nomenclatures and classification systems from a wide range of “traditional” societies. In the structuralism of Lévi-Strauss (1966), these empirical categories, or “percepts,” were signs in the bricolage of mythical thought, which could be seen as the “science of the concrete.” The structures of mythical thought can produce scientific results because the mind, perception, and the external world share a common “natural” foundation. For Lévi-Strauss (as for Evans-Pritchard before him) the structures of reason in myth and magic are not fundamentally different from those of science (1966, 1973). Yet in Lévi-Strauss, the science-myth opposition is salvaged via the obscure notion that mythical “signs” are somehow limited and contained by their empirical signifiers, while the “concepts” of science are more free (1966, 18–20).

In other scholarship, ecological adaptation in non-Western societies

is seen as systemically reinforced by symbolic structures or cosmologies. Reichel-Dolmatoff (1976) demonstrated the formal compatibility between mythico-ritual structures and ecosystemic principles among Amazonian Tukano. And Rappaport (1968, 1979) showed that supernatural categories—and their ritual entailments—in the “cognized model” of the Maring have homeostatic functions and effects within the analyst’s “operational model” of highland New Guinea ecosystems. When the structural or functional connections between abstract cosmology and material ecosystems are the constructs of the analyst, however, it can appear as if the “totalizing” view of Western science has captured what remained unconscious or invisible to native subjects. The intellectual processes involved in framing practical knowledge within cosmological categories, from the actors’ point of view, remain largely obscure. The adaptation of native cosmologies to their material-historical environments can then appear to be fortuitously functional, a happy congruence of symbolic and material structures (if functionality and congruence are to be believed); or the outcome of blind selective forces; rather than the outcome of theoretical work and proactive environmental management on the actors’ parts.

With the upsurge of multidisciplinary interest in “traditional ecological knowledge,” models explicitly held by indigenous people in areas as diverse as forestry, fisheries, and physical geography are being paid increasing attention by western science specialists, who have in some cases established extremely productive long-term dialogues with local experts (see Berkes 1977; Johannes 1981, 1989; Nietschmann 1989). The idea that local experts are often better informed than their scientific peers is at last receiving significant acknowledgment beyond the boundaries of anthropology. Anthropologists may find that we have less knowledge to share with local experts than do our colleagues in biophysical sciences about specific domains of local knowledge, and in this respect we may be at an initial disadvantage in striking up mutually interesting conversations with local experts. On the other hand, anthropology is unique in the degree to which it emphasizes the more inclusive cultural contexts of our local teachers and values ways of translating indigenous knowledge that reflect the symbolic and institutional contexts in which the knowledge is generated. If the sharing of knowledge were to be reduced to a skimming-off by Western specialists of indigenous empirical insights, and their mere insertion into existing Western paradigms, then it would be an impoverished and failed exchange that would ultimately contribute to undermining indigenous societies and cultures.

A number of anthropological studies have addressed the way in which mythico-ritual categories are implicated in actors’ modeling of social-environmental practice in situational, strategic discourse about material

activity (see Feit 1973, 1978; Nelson 1983; Scott 1989; Brightman 1993). It is this general issue to which the present paper contributes, through consideration of the ethnography of James Bay Cree hunting knowledge. I do not argue that all mythical and ritual symbolism is necessarily directed toward some logic of practical social or environmental knowledge. But I want to highlight that central, recurring propositions within these symbolic discourses are better understood in this way than as mystical precepts; and indeed, our understanding of practical knowledge cannot be adequately formulated without reference to the root metaphors most vividly condensed in myth and ritual.

Here I will proceed in three steps: first, to discuss the significance of ordinary experience within Cree cosmology and epistemology; second, to consider how the “figurative” language of metaphor interacts with the “literal” language of practical/empirical experience (i.e., how paradigms relate to the ordering of empirical experience); and third, to present examples from Cree goose hunting that illustrate the alternation between literal and figurative aspects of knowledge, each providing context and definition to the other.

### Signs in Cree Epistemology

As Hesse (1980), following Black (1962), has argued is true for scientific practice, “literal” or “observation” languages are shaped by the use of metaphor in theory—models are expressions of metaphor; and description, the literal reporting of observed regularities, is not independent or invariant of changes in explanatory models. Observation language “like all natural languages is continually being extended by metaphoric uses” (122). As certain root metaphors become conventionalized, as certain paradigms persist, their presence in observation language becomes less noticeable—they become literally implicit in the empirical description of experience. So it is that we may be largely unconscious of the metaphysical paradigms that underlie our own understandings of the world, while those of other knowledge traditions strike us as exotic, improbable, even “superstitious.”

It is only in moments of unusual reflexive insight, for example, that modern Westerners are conscious of the extent to which a (meta-)physics of impersonal forces imposes itself on our perception of “nature.” So embedded are the Cartesian myths of the dualities of mind-body, culture-nature, that we tend to privilege models of physical causality, rather than relations of consciousness or significance, in our perception even of sentient nature. It is true that we have begun to culturalize animals in animal

communications studies, and to naturalize culture in anthropological ecology. But our conventional attitude is to assume fundamental differences between people and animals, while exploring the nature of their connections. The Cree disposition seems rather the converse: to assume common connections among people, animals, and other entities while exploring the nature of their differences. The connectedness assumed by the Cree reminds me of what Gregory Bateson (1979) has termed the “pattern which connects,”<sup>4</sup> patterns of dancing, interacting parts within larger patterns, the stories “shared by all mind or minds, whether ours or those of redwood forests and sea anemones,” the “aesthetic unity” of the world.

In Cree, there is no word corresponding to our term “nature.” There is a word *pimaatisiwin* (life), which includes human as well as animal “persons.” The word for “person,” *iyyiyuu*, can itself be glossed as “he lives.” Humans, animals, spirits, and several geophysical agents are perceived to have qualities of personhood. All persons engage in a reciprocally communicative reality. Human persons are not set over and against a material context of inert nature, but rather are one species of person in a network of reciprocating persons. These reciprocative interactions constitute the events of experience.

Again, there is no Cree category for “culture” that would make it the special province of humans. Cree do, however, have terms that resemble notions of “sign vehicle” (*chischinawaachaawapihtawaawan*) and the “meaning/interpretant” (*iishchiishwaamaakan*) of a sign. Cognates of these terms, incorporating the morpheme *-chis-*, evoke the ubiquity of signs in experience. They include *chischaaimaau* (s/he knows [him/her]); *chischaaitamuun* (information, knowledge); *chischinutihaau* (s/he leads, directs, guides [him/her]); *chischinuwaasinaakusuu* (s/he is used for a sign or s/he gives a sign); and *chischiwaahiicheu* (s/he prophecies) (MacKenzie 1982). Animal actions, particular qualities and features in the bodies of animals, weather, dream images and events, visions, and religious symbols all fall within the Cree notion of “sign,” with signs constituting knowledge or guidance for actors. Not only humans, but animals and other nonhuman persons send, interpret, and respond to signs pertinent to various domains of human action: hunting success or failure, birth and death, and, implicit to these, the circumstances of reciprocity between persons in the world.

Signs, then, are part and parcel of action, perception, and experience—of life itself. The term *pimaatisiwin* (life) was translated by one Cree man as “continuous birth.” Consciousness (*umituunaachikanich*, glossed by the same man as “mind and heart, thought and feeling”) is at

the threshold of unfolding events, of continuous birth. One consequence of this construction of the world is that an attitude of dogmatic certainty about what one knows is not only untruthful but disrespectful. There are many signs of recurrence and regularity in experience, but interpretations cannot be certain or absolute. To expect a definite future outcome on the basis of signs in the past or present, for example, may presume too much about the cooperation of other persons. Someone (human, animal, or spirit) could even retaliate by frustrating hunters' intentions.

### Relating and Differentiating as Complementary Aspects of Knowledge

Since events are the actions of various mutually responsive persons, human action is subject simultaneously to moral and technical criteria of evaluation. This is a commonly remarked feature of worldview for many egalitarian societies. Roy Wagner (1977, 1981) attributes it to the prominence of figurative ("differentiating") signification in traditional societies, by contrast to the literal ("relational") bent of signification in Western culture. While I think the opposition is misplaced as one of societal types, the theoretical grounds on which it is presented are illuminating for present purposes.

The basic idea is simple enough. In positing relations between things, we depend on some implicit definition of those things; conversely, to distinguish and define the things themselves, we depend on an implicit context of relations among them. The literal and the figurative are complementary and mutually dependent aspects of any knowledge construct. Depending on where we focus our attention when we shape a knowledge construct, we either relate the perceptibly differentiated, or differentiate the perceptibly relational. To choose a common example, for Western science, "natural" objects are implicit in the cause-effect constructions relating them. Objects are combined into total relational patterns that comprise a context (which, at the most inclusive level, we call "nature"). Natural objects and nature at large are experienced as innate; as "naturally" separate from the scientific culture that represents them. Figurative signification, on the other hand, focuses explicitly on defining objects or entities via metaphors that examine the similarities and differences among them; but implicit in those metaphors is a relational context (relations of reciprocity, for example, among many non-Western peoples).

When non-Western peoples focus on the analogies among themselves and other phenomena in the world, they tend to precipitate their own conventional social context (e.g., communicative reciprocity) as the in-

nate character of phenomena in general. Western science tends no less to precipitate its own conventional social context: surely the technical mastery of an objectified nature is metaphorically connected to centralized social hierarchy and control. The separation of culture from nature depends not on a preponderance of literal-mindedness per se, but on which metaphors are used to frame the literal.

The complementary of the literal and the figurative help us to realize that the distinction between myth and science is not structural, but procedural. Myth, in a narrow and derogatory sense, is the dogmatic application of constituent metaphors as literal truths. There is myth, in this sense, in all science. At the same time, no science can embrace the world except through the creative extension of metaphors to emergent experience. We rework our metaphors as our models address particular contexts of experience. Myths in a broader, paradigmatic sense are condensed expressions of root metaphors that reflect the genius of particular knowledge traditions.

Let us return to the point that the interdependence of the figurative and the literal entails the integration of moral and technical aspects of knowledge. The Pacific cultures discussed by Wagner, much like Cree culture, view the world as an innate realization of a conventional social order of reciprocity. For Cree, as we have noted, communicative exchange is extended so ubiquitously to nonhuman domains that it constitutes a root metaphor or paradigm for knowledge in general. Myth, ritual, dreams, and hunting scenarios all express respectful solicitude as the preferred relation among “persons” in the hunter’s world. The mental and physical activity of the hunter is directed at maintaining standing in this network, by being generous and respectful to humans and nonhumans, and by ensuring that what is received is in correct proportion. Where moral standards of positive reciprocity are deviated from, its negative corollary ensues: in all contexts, generosity dwindles in response to disrespect and greed.

But the viability of these common premises depends on the rigorous discernment of differences among persons. “It is,” as Wagner (1977, 398) has said, “by maintaining a precise awareness of these differences, by differentiating himself and by differentiating the various beings in an appropriate manner, that man precipitates (or from the actor’s point of view, invokes) a beneficent relational flow.” Here I want to emphasize the creative use of metaphor in interpreting events in specific practical contexts, and to illustrate how permutations of the metaphor of communicative reciprocity vary situationally with the material phenomena that serve as its signifiers.



### Metaphors of Eating and Sexuality: Distinguishing Human and Nonhuman

In certain sacred contexts, the identities of hunters and animals are so passionately condensed in the metaphors connecting them, that the aspect of similarity virtually eclipses the aspect of difference. But in most practical contexts, the differences between hunters and animals as reciprocating agents are in the foreground. The definition of these differences flows from quite deliberate relational models that connect hunters and game metonymically—in consumer/consumed complementarity and in cause-effect orders that include other environmental agents such as winds, tides, and topographical features.

Reciprocity among humans is distinguished from reciprocity between humans and animals. In the first instance, biological structures of human reproduction signify a fundamental separation and asymmetry between human community and animal community, in respect of the former consuming the latter. The justification of this asymmetry is no trivial matter. Several Cree myths are concerned with human sexuality as a metaphor for the killing and eating of game, and vice versa. When humans get the terms of their metaphors confused and begin marrying animals or eating other humans (that is, failing to differentiate correctly), the results are impossibly comic or tragic (Preston 1975, 1978). That an animal be available for human consumption is an index of respect and love between hunter and animal; to contemplate the consumption of other humans is horrifying.

The metaphoric juxtaposition/separation of humans and animals is the occasion for much humorous discourse linking the pursuit of sexual partners to the pursuit of game. Hunting and sexuality share a vocabulary: *mitwaaschaau* can mean both “he shoots” and “he ejaculates”; *paaschikan* can refer to both “shotgun” and “penis”; *pukw* to both “gunpowder” and “sperm”; and *spichinaakin* to both “gun sheath” and “condom.” But analogy, along with humor, is as much about separation as about similarity. The *atuush*, or “cannibal” figure subverts this separation of human from animal, of sex from food. In one bawdy myth, a cannibal copulates with a woman hunted by his son, before roasting and eating her reproductive organs. In consequence, he consumes his own sperm. He and his son, greatly weakened, are nearly overcome by the superior spiritual power of true human beings.

Another myth illustrates the necessity of killing animals, while respecting certain parameters for doing so. It concerns a supernatural character, Chischihp, who never ate. Chischihp thinks of the food animals whom he loves as his “pets,” or “dogs.” In this he differs from Cree hunters. Hunters



also refer affectionately to certain species as their “pets,” but normally it would be the species that an individual hunter is privileged to kill with unusual success. Chischihp would never have begun killing his “pets” had he not met two human sisters on a river journey and desired them for wives. They accept his proposal, but insist that he kill beaver and moose for them. When he objects, they threaten to abandon him. He relents, kills the animals, and eventually, surreptitiously, begins to eat some of the meat himself. However, he goes from excessive abstinence to excessive indulgence, with both the animals and the women, in his imperfect conversion to human status. When he returns to his village, he selfishly hides his wives, preventing their attendance at a public dance. At the dance, he adorns himself with the fatty internal organs and membranes of the moose. These parts are esteemed food delicacies, and their ostentatious display is grossly disrespectful of the animal gift. His wives, for their part, respond with infidelity. Chischihp discovers them sleeping with a lover, whom he promptly murders. He is now classified as a *pwaat*, a subhuman person who lurks at the margins of true human community and who shares some attributes of cannibals. Through treachery, he escapes the wrath of his village, drowns his wives, and is himself transformed into a species of edible waterfowl, the form in which he is known to Cree hunters today.

Human reproduction, then, demands the consumption of animals as positively as it prohibits the consumption of other humans; but there are respectful parameters for both interspecies consumption and intraspecies sexuality that are specific to the form of “reciprocity” in question.

### Knowledge Construction in Cree Hunting

I want to go on now to illustrate how the literal interpretation of animal behavior in the environmental context impels the further figurative differentiation of human and nonhuman persons. Cree hunters continually refer to human and animal capacities as interpretants of one another. The family structure, leadership, memory, and communication processes of animals are all explored as analogs of corresponding human qualities, both individual and social.<sup>5</sup> Here I focus on Canada goose hunting and resource management strategies. Goose hunting is a major ritual and economic event during the exceptionally rich fall and spring migrations along the coasts of Hudson and James Bays. Geese as objects of knowledge are extremely important both ritually and economically—they account for as much as one-quarter of all annual subsistence production for coastal Cree.

There are advantages to the Cree paradigm of a sentient, communicative world that transcends but includes humanity. It has oriented Cree to aspects of animal behavior that Western science, inured by Cartesian metaphors of mechanical nature, has admitted rather belatedly. Lorenz (1979) observes that for the “higher” animals, the expression of emotion involves substantially the same neuromuscular system as in humans. Geese possess some quite “human” affective qualities, including loyalty, jealousy, and grief; furthermore, these qualities are manifest in the context of striking similarities in courtship, mating, and the rearing of young. “The family and social life of wild geese exhibits an enormous number of striking parallels with human behavior,” Lorenz observes; “Let no one think it is misleading anthropomorphism to say so” (192).

Lorenz finds a greater gulf separating the rational faculties of geese and humans. Yet here, too, ethologists are finding that animals classify elements of environment with some sophistication:

Animals create a taxonomy appropriate to their species and ecological niche. Thus predators, for instance, distinguish different categories of prey—by size, appearance, odor, and other signifiers—thus forestalling wastefully indiscriminate attacks. Vice-versa, many potential prey distinguish among different kinds of predators as we observe from their use of sundry warning signs, variations in their flight-distances and flight-reactions. (Sebeok 1975, 93–4)

Sebeok has argued that for animals, as for humans, aesthetics are intimately linked to the extraction and reconstruction of structures from salient environmental features, “even when the process or the product is disunited from its proper biological context” (1975, 61).

The interpretations of Cree hunters suggest that geese are quite apt at learning in what contexts to expect predation, at learning to distinguish predatory from nonpredatory humans, and at communicating appropriate behavioral adaptations to other geese. In other words, there is substantial flexibility for geese to “reinterpret” environmental signs, and this learning is communicated among geese to ramify socially.

It is therefore important for hunters to arrive at precise estimations of goose learning and communication, particularly in relation to themselves as predators. It is heuristically useful but not in itself sufficient to assume, on the basis of the culturally pervasive paradigm, that capacities of intelligence and communication are shared by geese and humans. Hunters need to know more about what is shared and what is different, and in what measure. The more the respective capacities of geese and humans are specifically formulated (i.e., differentiated), the more “literally” they

contribute to effective hunting scenarios. The interpretation/modeling of hunting experience is an ongoing refinement of hunters' knowledge of the specific capacities of geese, and the basis for adjustments in hunting practice.

Hunters arrange landscapes that will be attractive and nonthreatening to geese, while exercising caution so that geese will not learn to associate unusual details with the possible presence of hunters. Decoys and goose calls are iconic approximations by hunters of the semiotic landscape of geese. Hunters recognize differences among species of geese. Canada goose decoys must be realistic in profile and must be kept heading into the wind, properly spaced, with decoys appearing in both feeding and alert postures. Generally speaking, greater numbers of decoys are more effective. Snow geese are less sensitive to profile or number of decoys, but respond strongly to color. Two or three white plastic buckets or white rags displayed prominently on a hillside, in conjunction with calling, are sufficient.

The honking of geese is imitated to get the attention of an approaching flock once it is near enough to spot decoys. When the geese have seen the decoys and "made up their minds" to fly over to land, hunters stop calling, or switch to two or three long, low "welcoming" calls at gentle intervals. Calling should be used sparingly—novice hunters must learn both to imitate goose calls accurately, and to know when not to call. If a flock in the air has chosen not to respond to calls but to continue on and away from blinds and decoys, hunters should cease calling, because geese may recognize that such calls are unnatural. When there is less wind, the geese hear calls (and mistakes) more keenly. When a hunter is especially skilled at calling geese, others may prefer to keep silent to reduce the risk of detection.

Neither the semiotic conventions of geese, nor their interpretation and manipulation by hunters, are static. Geese, like hunters, are said to "know the land." Their ability to recontextualize certain perceptual features as signifying the presence of hunters is the potential undoing of the latter, as geese "get wise." For this reason, hunters' precautions to minimize visual and auditory signs of their own presence go well beyond the use of blinds at actual hunting spots. Camps are kept at some distance from concentrations of geese, and are well-hidden in the bush. Snowmobiles and chainsaws are not used near concentrations of geese. Ideally, the only birds on the territory that will be immediately aware of hunters' presence are those from small flocks actually fired on at hunting sites. Shooting on calm days is generally avoided, because the sound of shooting carries over a wide area without a wind to muffle and disperse it. Shooting after

dusk is also avoided, because the flame visible at night at the end of a fired shotgun is said to terrify geese. Similarly, the use of lights outdoors at night is restricted.

Hunters' experience is that geese will not return to a hunting spot that has been used too regularly, or where they have been frightened badly. The Wemindji community area along the coast of James Bay is divided into several goose hunting territories, each used by up to a dozen hunters from a number of households linked agnatically, affinally, and by friendship. Hunting activities for each group are under the supervision of a senior "shooting boss." Each territory includes a number of viable hunting spots, and all hunters on a territory are expected to use one and the same spot on any given day, allowing all other spots to "rest." Normally, a new site is chosen each day, so that hunting spots are rotated. In this way, the migrating geese will not learn to expect hunters at any particular location, and will be respectfully permitted to rest and feed undisturbed over the majority of the territory on any given day. At hunting sites, when geese are killed, it should be done accurately and efficiently, to minimize disturbance and to avoid the waste of injured birds that escape.

If these precautions are not taken, geese on the territory will grow increasingly anxious about human presence and adjust their behavior accordingly. Even a fraction of geese too badly frightened communicate their alarm to other geese, which could lead to a reduction in the population staying on the territory, or to incremental avoidance by geese of the spot where the fright occurred. Since the same geese are on the migration route in successive seasons, and since young geese are said to learn their habits from their parents, a hunting spot that has been mishandled can take several seasons to recover.

I will give one example of how changes in goose behavior are effected by hunting activity. In early autumn, when the tide is high and the wind is brisk and onshore from James Bay, the geese fly from the coastal bays to the offshore islands in the bay, early in the morning. They do so to feed on berries there, partly because high tides, onshore wind, and rough waves make it impossible to feed on the eelgrass that grows in shallow water in the coastal bays. The berries, now ripened, are much relished by the geese, besides. This relational model is of key importance in hunters' decisions about where and when to locate themselves to wait for geese. When experience fails to confirm the expected relations, amendments to the model ensue.

It has in fact developed in recent years that geese are less prone than before to fly to hunters waiting on the islands, even when there have been plenty of geese in the coastal bays, plenty of berries on the islands, and

favorable circumstances of wind and tide. The interpretation of this decline by experienced hunters is as follows. In recent years, population growth and wage and transfer payment income have led to an increase in the number of and mobility of hunters who have greater access to motorized water craft. This means that any hunting location in the coastal community area is generally accessible within twenty minutes to two hours' travel from the settlement.

Significantly, these settlement-based hunters do not independently enter the more management-sensitive coastal bays, where concentrations of geese rest at night and also feed when the tide is low. Only when such a bay is being hunted as part of a rotational strategy, under the leadership of a "shooting boss," are hunters from the settlement welcome to join. But offshore islands can be used with much less risk of disturbance to the main concentrations of geese in the bays, particularly when there is enough wind to prevent the sound of shooting from carrying far. It has developed as a sort of community compromise between full-time hunters based in camps and wage-earning part-time hunters, who are less flexible as to the times they can hunt, that the islands can be used without direct supervision and coordination by shooting bosses. This allows settlement-based wage-earners to hunt on their days off or after work, even when conditions are not suitable for hunting in the bays.

However, because this hunting at the islands has become more frequent and is no longer coordinated in regular rotation, the geese have come increasingly to expect hunters at the islands. Consequently, there have been more geese flying inland instead of offshore when they leave the bays to feed. Hunting geese inland is less productive and more difficult, so geese have learned not to expect hunters there. They therefore fly lower and less cautiously inland than along the coast and offshore islands.

The kind of interpretation just summarized, and the hunting strategies entailed, involve years, in some cases generations, of practical empirical investigation into how much and what kinds of interactions with hunters the geese will tolerate, without withdrawing from strategic locations. The relational models conventionally signified by this experience help to define goose communication as different in degrees and respects from human communication. Literal interpretations precipitate a figurative complement—the differentiation of human from goose communication, or of goose communication from that of some other animals.

Some of the attributes of goose communication per se are best contemplated anecdotally. Here, metaphors that evoke human leadership, speech, and so on, are evident, but the hunting situations referred to are themselves key interpretants of the appropriate extent and application of the metaphor.

A friend and I were sitting in our blinds early one spring. A few larger flocks were heading north, but they were too high and were not coming into our calls and decoys. There was a lake nearby, perhaps a half-kilometer back into the bush but within earshot. We could hear the gabbling of numerous geese there. They hardly flew all day, until in mid-afternoon one solitary bird came low over the trees toward us. It wheeled to land among the decoys, an easy shot. We fired half-a-dozen shots, somehow missing, and the goose fled back in the direction of the lake. My companion speculated on the consequences of our poor shooting a few moments later: “Probably that goose told the other ones over there: ‘If I don’t come back, it’s okay to come on over.’” No more geese flew our way from the lake that day. Geese, apparently, could communicate to other geese about phenomena that the latter have not experienced directly. “Scouting” among geese is observed in a variety of contexts, and presumably the behavior of these scouts conveys something about attractive versus dangerous situations. A variety of calls and postures, in flight and on the ground, are distinguished by Cree hunters—from messages of invitation to those of caution and alarm.

On another occasion later the same spring, the same companion and I were waiting for geese on an east-west elevated ridge between two coastal bays. The geese, who were leaving the bay to the south to continue their migration northward, would fly over the ridge. The highest, treeless portion of the ridge was perhaps two hundred meters in length, affording hunters a view of approaching flocks. It happened several times that a flock would cross too far east or too far west of where we sat, so we would be unable to get a shot. This seemed random enough, but then one or more flocks following at intervals of several hundred meters would cross at the same spot as the first flock, again evading us. I wondered if winds might account for this regularity, but rejected that possibility because the flocks had crossed at the same points even when they had approached the ridge from quite different trajectories. We were well-hidden, and the flocks were clearly unable to see us. I was ready to attribute the pattern of evasion to episodes of unfortunate coincidence until my companion remarked: “It always seems to happen like that. I guess they know there’s hunters around. They see where the flock ahead of them went over, and they see nothing happens to them, so they think, ‘Might as well go over there!’”

This incident was used by my host to instruct me in the attentiveness of individual flocks to the activity of other flocks in selecting a course of action. The safe patterns of a few geese are copied by many, in a context where older geese who are the leaders have learned to expect hunters. It became clear to me how avoidance of certain situations and preference

for others could ramify socially among geese, resulting in general behavioral changes for the population as a whole.

At the same time, several aspects of goose awareness and communication remain esoteric. The capacity of animals to anticipate some events is considered superior to, and beyond the ken of many humans. Goose behavior of certain kinds is a predictor of approaching weather; geese begin their preparations before hunters would otherwise be aware of impending changes. Or again, in years when the local berry crop has failed, most geese on the fall migration have been observed to fly, very high up, right on past the James Bay coast. What is outstanding to hunters is that the flocks seem not to have to land to know that the feeding is poor. One interpretation of this phenomenon relates again to scouting behavior, although the precise mechanism of information transfer is ambiguous. In other interpretations, it is supposed that animals experience dream images and corporeal symptoms of the kind that can also alert humans to future or distant events—notable but not particularly unusual premonitions in the Cree world.

This commonalty returns us to the premise of a communicative, reciprocal network that unifies the holistic world. This premise is metaphysically prior to the more particular differentiation of persons in the world—and it is at this level that hunters, animals, geophysical forces, and even God are ultimately of one mind, as it were. Consistent with this premise is the notion that encounters, thoughts, dreams, and rituals involving hunter-animal exchange both index and influence the state of reciprocity that obtains at a given point in time.

### Animal and Human Reciprocators

I have mentioned the effect of metaphors of eating and sexuality in establishing a fundamental difference between human-human and animal-human reciprocity. I'll go on now to illustrate how ritual delineations of reciprocity between humans and animals contain, at the same time, abstract but quite literal constructions of social-ecological principles. The life cycle of the hunter, seasonal cycles, the social roles of men and women are all marked by ritual phases that reflect these principles. A few examples will suffice.

Early in the spring season, the geese killed on the first day of the hunt are cooked and a small share is distributed by a respected woman elder to everyone in a camp. This is done no matter how few the geese or how large the camp, and regardless of who killed the geese. Then, the following geese are saved for a few days until there are enough so that every man, woman, and child in the hunting group receives one, two, or more



geese, depending on how many have been killed. Again, the distribution is made by a respected elder of the camp, and without regard to who killed the geese. The group then feasts, with each household roasting some of the geese it has received. This process is considered to be an “invitation” to the geese, since animals are said to come more readily to hunters who share them with others. Only after this feast is it possible for the household to accumulate geese for its own consumption. Significantly, the feast occurs while it is still to be determined whether the migration will linger, ensuring bounty, or pass quickly. Failure to contribute generously to the feast can account for poor luck in hunting later on.

A hunter in his blind often “smokes to the game” (*pwaatikswaau*), or sings goose songs. Tobacco was a traditionally valued item of exchange, and smoke is an appropriate vehicle of exchange with creatures of the air. Hunters’ songs express spiritual and aesthetic aspects of the exchange, and include vivid images of the ways in which geese fall to the hunter. When a goose has fallen, the gift is respectfully admired by the hunter and later received as a guest into the lodge by the women of the hunter’s household. The women take care to use every part of the goose possible, to avoid spoilage, and to dispose respectfully of the few remains. The cartilage tracheae, including the windpipe and voice organ of the goose, are hung from a tree branch where, poetically, the passing wind carries their call, beckoning geese in future seasons to renew the exchange.<sup>6</sup> When the migration has nearly passed and the last of the geese are departing, the hunter bids them farewell, expressing the hope that, granted continued life, he will be able to see them again on their return.

This ritual complex advances two general propositions about human-animal reciprocity that are of key ecological concern. The first is that respectful activity toward the animals enhances the readiness with which they give themselves, or are given by God, to hunters. The second is that sharing of animal gifts among hunters is an important dimension of respect for the animals. Both propositions are implicit in ritual enactments of the special obligations of hunters toward game, if game animals are to fulfill their own special role in supplying hunters. And both propositions convey literally understood truths about ecological relations.<sup>7</sup>

What is involved in the first of these general propositions? The empirical availability of geese, as we have seen, varies with their treatment by hunters. The specification of “respectful” treatment in day-to-day hunting is as complex as the many situations of interaction, but the general and key notion is that technical efficiency in killing animals must be balanced by restraint, and that only the latter can really guarantee the long-term viability of the former.

A hunter must strive for impeccable technique, both in the interest of his own security and to avoid undue suffering or disturbance to the animals. A hunter who, in spite of his effort, cannot kill animals will be disappointed, but he should keep trying and not be too disappointed because it is wrong to expect more than is freely offered. Perhaps the hunter is not receiving more because the partner is not in the position to give. The wise hunter directs his efforts elsewhere if, after trying hard, it is apparent that a particular species doesn't want to be caught. On the other hand, it is wrong to accept more than one needs, even if it can be taken with the means at one's disposal. The generosity of a partner can be over-taxed.

There is a rather concise set of symbols to summarize and express this balance between efficiency and self-restraint. First, when a hunter who normally kills perhaps fifty geese in a season suddenly kills, let us suppose, three times that number, it is taken as a sign that the hunter has not long to live. It is not surprising, then, that when an individual hunter has accumulated a larger than average kill early in the season, he sometimes stops for the remainder of the season, or lets a younger and less experienced hunter in the household bring home the geese. Collective restraint is also exercised after a particularly abundant daily kill has been made, when all hunters on the territory let the geese rest for a day or two.

There is a second symbol for the perils of excessive killing—the albino Canada goose. Such geese must not be killed under any circumstances or the hunter will find it very difficult to kill geese thereafter. Thirdly, there is the sandhill crane, a relatively uncommon bird on the east coast of James Bay, that is most numerous when there is an unusual abundance of migrating geese feeding and resting in the coastal bays. It is permitted to shoot the crane, but it must be perfectly done. To miss a shot is a sign of the hunter's impending death or that of a near relative. Fourthly, there is a rarely reported Canada goose that is said to bear a luminous collar over its neck and across its breast. The hunter fortunate enough to see this goose must kill it with a single clean shot and retrieve it almost the moment it touches the ground. Otherwise, the collar dissipates, passing to another goose. But the impeccable hunter may reach it in time and retain the collar as a charm. The geese will thereafter fly to such a hunter, even when he is not well-hidden.

To summarize:

- (1) Too many geese killed (excessive killing) = Hunter's death
- (2) Albino goose killed (excessive killing) = Hunter's poverty (curtailment of gifts)

- (3) Crane attempted but not killed impeccably (“insufficient” killing) = Hunter’s death
- (4) Collar-bearing goose killed impeccably (“sufficient” killing) = Hunter’s wealth (abundance of gifts)

This symbolic set signifies that the hunter must practice both excellence and restraint in the killing of game if he is to live well and avoid poverty or death. There is such a thing as “insufficient” killing, expressed in its negative form in the sanction of death when the crane is attempted but failed, and in its positive form in the reward of food wealth when the collar-bearer is impeccably taken. But there is also the possibility of “excessive” killing, expressed in a strong negative form in the sanction of death for killing too much game, and in the milder negative form of poverty for killing an albino. Symbols of the importance of impeccability have “literal” implications where efficiency and excellence in a demanding environment make the difference between prosperity and poverty, life and death. But symbols of the necessity for restraint are equally intelligible in literal terms because the generosity of animals is empirically exhaustible. Geese hunted too noisily or too often in the same place, too much game killed and too little allowed to escape, could lead objectively to dwindling exchange with hunters and to poverty in animal gifts, synonymous in the not too distant past with death.

Let us now turn to the second of the general propositions cited earlier—that positive reciprocity in human society enhances reciprocity with geese. In what literal sense could interspecies reciprocity depend on human reciprocity? Ever more important than sharing food, given households’ pride in their autonomy, is sharing the opportunities to kill geese or other game. I have already mentioned that the management of a hunting territory is a delicate matter, requiring a cooperative strategy. Cooperation becomes impossible when generosity is not maintained. For example, if a hunting boss “saves” a rich build-up of geese, then hunts it for the sole benefit of his immediate household without notifying other hunters who would normally be entitled to join in, his reputation as a leader is seriously damaged. Other hunters then feel justified in hunting when and where they choose on such a territory, with the possible result that rotational management becomes impractical. The geese become increasingly wary, or move elsewhere, and hunting productivity on the territory declines. The animal gift, in this literal sense, depends quite literally on human generosity, and it is this social knowledge more than any other factor that accounts for restraint and regimentation in hunting. Social and ecological reciprocity are not just formally interdependent, as

inferences from the same root metaphor or paradigm, but interdependent also in human practice.

Both propositions depend on situational elaboration of the reciprocity metaphor; one could say that the empirical contexts of both geese and hunters are assimilated to the terms of the metaphor. It is not as though reciprocity applies “literally” to social relations but only “metaphorically” to relations with animals. Neither set of relations can be said to represent the “primary” meaning—both are part of a reciprocating socio-environmental continuum; but human-animal differences are elaborated and exploited in empirical detail to produce informative permutations of reciprocity across numerous phenomenal domains.

In certain ritual contexts, the identity of the hunter merges radically with that of the animal, a merging accomplished through body-spirit reciprocity. The death of a hunter in a dream is a common omen of an important food animal about to be given in waking life. In a dream, the goose may be a guardian of the hunter’s power and essence and may protect him from sorcery. Throughout his life, the hunter receives the gift of geese, and at a hunter’s death, it is often a goose that represents his soul on its journey from this life. At the time of a hunter’s death, a solitary goose may fly low overhead, or land near the mourning relatives, acting quite unafraid. The hunter’s experience of animals as interpretants of his essential self renders all the more poignant the inevitable separation of hunter from prey, and all the more compelling the morality that joins them in the reciprocity of life-giving and life-taking. The transcendence of this tension at significant moments—the death of an animal, a dream encounter, or the death of a hunter—is the experience of the sacred.

## Conclusions

The achievements of indigenous ecological knowledge, as illustrated in the case of Cree hunters, are neither mysterious nor coincidental—they result from intellectual processes not qualitatively different from those of Western science. Western science is distinctive not through any greater logical coherence or empirical fidelity, nor any lesser involvement with metaphysical premises, but through its engagement of particular root metaphors in specific social institutional and socioenvironmental settings. Any number of root metaphors, situationally elaborated in the course of practical engagement with the world, may inform rational explanation and the effective organization of empirical experience. Equally, any number of the same metaphors may obstruct effective knowledge through a dogmatic and misplaced literalism.

Knowledge traditions reflect the morality of the social practices and paradigms in which knowledge is framed. Numerous studies have found that the “anthropomorphic” paradigms of egalitarian hunters and horticulturalists not only generate practical knowledge consistent with the insights of scientific ecology, but simultaneously cultivate an ethic of environmental responsibility that for Western societies has proven elusive.<sup>8</sup> If the inclusion of humans in a figurative world of analogous other-than-human persons promotes environmental responsibility, this depends on the condition of reciprocity in the human society concerned—not on any predominance of figurative versus literal thinking. All societies, whether egalitarian or hierarchical, establish metaphorical connections between the social and the environmental. In all knowledge traditions, literal modeling defines and redefines the relations among objects in the world, relations which in turn are assimilated to the meaning of root metaphors as they are applied in particular situations and contexts. Cree hunters are not less concerned than Western scientists with literal interpretation; nor are Western scientists less involved in figurative invention than Cree hunters. The conventional social context of Western science tends to hierarchy and centralized control, however, and this is the morality that is metaphorically projected onto our own relations with “nature.” For this very reason, the historical disqualification and subjugation of indigenous knowledge is intimately linked to Western culture’s domination of nature.

## Notes

The ethnography and much of the analysis in this chapter was previously published as Scott (1989). For the publication of *Naked Science*, I was asked to rewrite it with a more general audience in mind. The introduction and conclusions are new, and some technicalities of anthropological semiotics in the body have been clarified or eliminated.

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1. Certain metaphors are so pervasive in a knowledge discourse as to constitute what have been termed “paradigms” or “archetypes” (Black 1962). Others have called them “root metaphors” (Pepper 1942; Ortnier 1973) or “metaphoric networks” (Ricoeur 1977). In this chapter, I use the terms “root metaphor” and “paradigm” synonymously.

2. Not to mention the polemical deployment of other adjectives: “magical,” “irrational,” “superstitious,” “traditional,” “primitive,” etc.

3. For a thoroughgoing historical review of the anthropological analysis of knowledge and belief, see Tambiah (1990).

4. For Bateson, the “totemic analogy” between the social system of which people are the parts and the “larger ecological and biological system in which

the animals and plants and the people are all parts" (1979, 155) was a better analogy than the one that likened people, society, and nature to nineteenth-century machines.

5. One might observe that a consequence of this sort of analogical thinking is to anthropomorphize animals, but that would assume the primacy of the human term in the metaphor. Animal qualities react with perhaps equal force on understandings of humans, so that animal behavior can become a model for human relations. Preston (1978, 152) has suggested that the goose as exemplar of Cree ideals of social coordination, grace, and composure may be "better" than human.

6. The sequence here described in abbreviated fashion is one variation on a general ritual structure for "bringing home animals" (see Tanner 1979).

7. Feit (1973, 1978) has offered seminal discussions of the ecological significance of respect for animal gifts, to which my own analysis owes a great deal. Animals are felt to be given at times and places in which, by virtue of numerical availability and characteristic behavioral traits, they present themselves to the hunter's weapons or traps with maximum efficiency and minimum struggle. When hunters notice animals becoming scarce and difficult to catch, they say it is because the animals are "angry," perhaps because hunters have been taking too many. The respectful response is to stop hunting the species in question until it once again is more freely given.

8. See Rappaport (1968); Reichel-Dolmatoff (1976); Wagner (1977); Feit (1978); Nelson (1983); Bennett (1983); Scott (1983).

## References

- Bateson, Gregory. 1979. *Mind and Nature: A Necessary Unity*. Toronto, Canada: Bantam Books.
- Bennett, David. 1983. "Some Aspects of Aboriginal and Non-Aboriginal Notions of Responsibility to Non-Human Animals." *Australian Aboriginal Studies* (2):19–24.
- Berkes, Fikret. 1977. "Fishery Resource Use in a Subarctic Indian Community." *Human Ecology* 5(4):289–307.
- Black, M. 1962. "Metaphor." In *Models and Metaphors*, edited by M. Black. Ithaca, New York: Cornell University Press.
- Brightman, Robert. 1993. *Grateful Prey: Rock Cree Human-Animal Relationships*. Berkeley: University of California Press.
- Feit, H. 1973. "The Ethno-Ecology of the Waswanipi Cree: Or How Hunters Can Manage Their Resources." In *Cultural Ecology: Readings on Canadian Indians and Eskimos*, edited by Bruce Cox. Toronto, Canada: McClelland and Stewart.
- . 1978. "Waswanipi Realities and Adaptations: Resource Management among Subarctic Hunters." Ph.D. diss. McGill University.
- Foucault, Michel. 1980. *Power/Knowledge: Selected Interviews and Other Writings 1972–1977*. New York: Pantheon Books.

- Hesse, Mary B. 1980. *Revolutions and Reconstructions in the Philosophy of Science*. Bloomington: Indiana University Press.
- Johannes, Robert E. 1981. *Words of the Lagoon—Fishing and Marine Lore in the Palau District of Micronesia*. Berkeley: University of California Press.
- . 1989. “Fishing and Traditional Knowledge.” In *Traditional Ecological Knowledge: A Collection of Essays*, edited by R. E. Johannes. Gland, Switzerland: International Union for the Conservation of Nature.
- Lévi-Strauss, Claude. 1966. *The Savage Mind*. Chicago: University of Chicago Press.
- . 1973. “Structuralism and Ecology.” *Social Science Information* 12 (1): 7–23.
- Lorenz, Konrad. 1979. *The Year of the Greylag Goose*. New York: Harcourt Brace Jovanovich.
- Mackenzie, Marguerite. 1982. *Cree Dictionary*. Val d’Or, Quebec: Cree School Board.
- Nelson, Richard. 1983. *Make Prayers to the Raven: A Koyukon View of the Northern Forest*. Chicago: University of Chicago Press.
- Nietschmann, Bernard. 1989. “Traditional Sea Territories, Resources and Rights in Torres Strait.” In *A Sea of Small Boats. Cultural Survival Report* 26, edited by John Cordell. Cambridge, Massachusetts: Cultural Survival.
- Ortner, Sherry. 1973. “On Key Symbols.” *American Anthropologist* 75 (5): 1338–46.
- Pepper, Stephen. 1942. *World Hypotheses*. Berkeley: University of California Press.
- Preston, Richard. 1975. *Cree Narrative: Expressing the Personal Meanings of Events*. Canadian Ethnology Service Paper No. 30, Mercury Series. Ottawa, Canada: National Museum of Man.
- . 1978. “La Relation Sacrée Entre les Cris et les Oies.” *Recherches amérindiennes au Québec* 8(2):147–52.
- Rappaport, Roy. 1968. *Pigs for the Ancestors*. New Haven: Yale University Press.
- . 1979. *Ecology, Meaning and Religion*. Richmond, Virginia: North Atlantic Books.
- Reichel-Dolmatoff, Gerardo. 1976. “Cosmology as Ecological Analysis: A View from the Rain Forest.” *Man* 11 (3):307–18.
- Ricoeur, Paul. 1977. *The Rule of Metaphor: Multidisciplinary Studies in the Creation of Meaning in Language*. Toronto, Canada: University of Toronto Press.
- Scott, Colin. 1983. “The Semiotics of Material Life among Wemindji Cree Hunters.” Ph.D. diss. McGill University.
- . 1989. “Knowledge Construction among Cree Hunters: Metaphors and Literal Understanding.” *Journal de la Société des Américanistes* 75:193–208.
- Sebeok, Thomas. 1975. “Zoosemiotics: At the Intersection of Nature and Culture.” In *The Tell-Tale Sign: A Survey of Semiotics*, edited by Thomas Sebeok. Lisse, Netherlands: Peter de Ridder Press.



- Tambiah, Stanley. 1990. *Magic, Science, Religion and the Scope of Rationality*. Cambridge, U.K.: Cambridge University Press.
- Tanner, Adrian. 1979. *Bringing Home Animals: Religious Ideology and Mode of Production of the Mistassini Cree Hunters*. St. John's: Institute of Social and Economic Research, Memorial University.
- Wagner, Roy. 1977. "Scientific and Indigenous Papuan Conceptualization of the Innate: A Semiotic Critique of the Ecological Perspective." In *Subsistence and Survival: Rural Ecology in the Pacific*, edited by Timothy P. Bayliss-Smith and Richard G. Feacham. New York: Academic Press.
- . 1981. *The Invention of Culture*. Chicago: University of Chicago Press.