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ANIMAL THINKING

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It is taboo among many members of our species to give serious consideration to the awareness, creativity, or intelligence of other creatures. The prohibition has been around for quite a while — perhaps since the time we began writing things down. Non- literate or oral cultures, like those indigenous to North America, maintain a wealth of stories in which animals figure as central characters — as teachers, tricksters, gods, and guides. Not so in literate culture. If one locates a piece of literature that treats animals as sentient, experiencing beings, it is likely to be written only for children, or to be the transcription of an older oral tradition, as are the folk tales collected by the brothers Grimm.

Animal Thinking, (Harvard University Press, 1984), by Donald R. Griffin, threatens to undermine this very civilized taboo. In it the author accepts the "challenge...to venture across the species boundary and try to gather satisfactory information about what other species may think or feel." Griffin is no dilettante; he is one of the elder statesmen of American biology. He has been recognized as a pioneer in the study of animal behaviour since the discovery he made together with Robert Galambos, while Griffin was still a graduate student at Harvard, that bats use a unique sonar sensory system for navigation. His current work in what he terms "cognitive ethology," therefore, is not easily ignored or consigned to the "fringe science" basket. His book is in fact having an influence on practicing ethologists and behavioral ecologists, expanding the speculative boundaries of these fields. There is no telling how in the long term this scientific turn toward the psyche of other organisms will affect the assumptions that structure modern culture. For Griffin's work coincides not only with the spread of environmental awareness but with the rapid growth of a movement for "animal liberation" both within the formal philosophy and in the culture at large.

Nevertheless, we should realize that Griffin in no way associates himself with this movement and has not written this book out of moral indignation or sympathy for the suffering of other animals at the hands of humans. He has raised the question of animal intelligence simply because he has found it increasingly difficult to comprehend the behavior of the animals he has studied without postulating some degree of innovative awareness. In his own words, the "as-

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sumption of a human monopoly on conscious thinking becomes more and more difficult to defend as we learn about the ingenuity of animals in coping with problems in their normal lives."

The book may be read as an overview of many of the most interesting discoveries in animal ethology. After a brief review of the philosophical problems entailed in understanding "other minds," Griffin launches into a discussion of the conscious innovation that may well be present even in the most mundane animal behaviours associated with food gathering, from the selective leaf- eating of earthworms to the early morning pilfering of cream from milk bottles on British doorsteps by thousands of birds in the 1930s. Here we learn of the shell-breaking tactics of certain crows on the coast of British Columbia, who choose their whelks carefully, carry them aloft, and then drop them — above only the most suitable flat rocks — from the optimum height necessary to break open the shells without shattering the contents. (Later we read of ravens who similarly drop rocks on scientists trying to observe their behaviour.) After retrieving the whelks, the crows sometimes dip them into fresh water puddles before eating them, apparently to remove fragments of the shell.

Later chapters survey predator/prey relations, animal architecture, and the preparation of tools. Griffin offers examples of tool use by a variety of nonhumans, and indicates the extent to which these behaviors must remain scientific puzzles if we refuse to acknowledge the awareness and foresight of these animals. Many readers will know that chimpanzees use sticks to probe for insects; few realize that certain birds utilize a similar technique. The Galapagos woodpecker finch, for example, first selects a cactus spine or twig, modifies it if necessary by shortening it or removing protrusions, then holds it in its bill and probes for insects in crevices. Both finches and jays have been seen holding onto such twigs to use again when next needed. This cleverness is reminiscent of the California sea otter, which retains particularly good stones for future use. The otter will keep such a stone tucked under one armpit as it dives for food, then use it to hammer shellfish loose from their underwater anchorage. Later, floating on its back, it may pound open the shells against the stone, which it holds on its abdomen. Apparently otters use such tools only when necessary; it is not a stereotyped behavior but a creative one, applied in particular situations.

In fact, most animals, vertebrates and invertebrates alike, are able to alter their behavior to deal with conditions that vary within a natural range. Human experimenters, however, often introduce some utterly contrived variable into the animal's situation and then, when the animal fails to behave in what we humans can easily see would be the most efficient manner, conclude that its behavior must be thoroughly programmed, rigid, and unconscious. Yet, as Griffin asserts, "a lack of versatility in the face of wholly unprecedented circumstances does not necessarily mean that the behavior is unconscious."

In the latter part of his book, Griffin leads the reader into the rich field of animal communication, outlining his theory that communication provides "a window

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on animal minds." He feels that by learning the communicative signals utilized by other organisms, we may gain better access to their subjective experiences and "thoughts." He examines the suggestive work now being done by those scientists teaching forms of abstract communication to apes — mostly using American Sign Language — and those whose efforts to document the cognitive capacity of porpoises are continually thwarted by the mischievous behavior of these cetaceans, who, I suspect, are often bored by anthropocentric experiments.

Perhaps if students of animal behavior simply accepted the possibility of real awareness in animals, they would design more imaginative experiments and would thus learn far more interesting things. The rule of parsimony, however, dictates that an investigator should hold to the simplest possible explanation of what he or she observes. In the study of animal behavior, this was translated into a severe injunction (formalized by C. Lloyd Morgan in 1897) to suppose entirely mechanical explanations even for those complex behaviors that *seem* to involve some modicum of consciousness. Such apparent consciousness has been assumed to be nothing more than illusion and, until now, scientists who ventured to speak of the subjective experience of the animals they studied were considered unscientific by their peers. But Griffin has forcefully called into question this interpretation of the rule of parsimony. He now believes that it is far more parsimonious to assume some continuity of consciousness across the whole animal world than to have to account for the newly discovered (or rediscovered) richness of animal behavior in entirely mechanistic terms.

Interestingly, the continuity of awareness that Griffin postulates is not the common hierarchical vision we have come to expect, with humans standing at the apex of a pyramid, while invertebrates and still "lower" organisms form the ignorant base. Griffin is well aware of the tendency to allow for consciousness only in those organisms that most resemble ourselves, and he thinks it is wrong. As his book indicates, if we allow the possibility of nonhuman intelligence, then even insects appear to be candidates for some degree of innovative awareness.

The assassin bug, for instance, disguises itself to escape detection by its termite prey by gluing small pieces of the termite's nest to its head, back, and sides. African weaver ants clearly employ a number of discrete gestures to communicate with each other about specific activities and even pass on "second-hand information" by means of such gestures. While dogmatic mechanists assume that all such behavior is entirely "programmed" in the DNA, Griffin implies that this is an untenable assumption. However complex such inherited programs may be, they must still be adapted to the contingencies of the immediate situation in which an organism finds itself.

For this reason, the distinguished physicist Erwin Schrodinger, writing thirty years ago in his book *Mind and Matter*, cautioned against restricting consciousness to human beings, or even to animals. He suggested that awareness occurs wherever life must adjust itself to fresh situations. Therefore he associated consciousness with the ongoing self-education of organic matter in general. Griffin

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takes a slightly more cautious, Darwinian stance, arguing simply for the adaptive *economy* of conscious thinking in many creatures, particularly the insects, whose central nervous systems are very small. He doubts that the genetic instructions stored in such diminutive nervous systems could prescribe all of the detailed actions carried out by ants and other insects, and suggests that the ants' behavior could be motivated by simple thoughts like "Let's pull those two leaves closer," rather than by an entirely determinate program specifying every flexion and extension of each appendage. In other words, he feels that it may be far simpler for genetic material to encode a predisposition for certain general mental images, or *thoughts*, than for it to specify all behavior directly. Throughout his book, then, we find Griffin wondering about such things as whether foraging blackbirds ask themselves "Will there be lots of insects here?", or whether a female mason bee, after she locates an empty snail shell and deposits eggs and food within its spiral chamber, thinks "Now I want to close the rest of this cavity," before sealing the shell with chewed-up leaves and a wall of pebbles.

But do other animals really think verbal, sentencelike thoughts? The major difficulty, so easily overlooked, with speculations about whether nonhuman animals are or are not conscious is the fact that nobody really knows what "consciousness" is. Ever since Plato, and increasingly since Descartes, Western culture has come to identify consciousness with the act of thinking. Descartes, whose famous dictum "I think therefore I am" established *thought* as the purest form of awareness, also argued that humans are fundamentally different from all animals. He claimed that animals are entirely mechanical automata lacking any subjective awareness, while humans have, in addition to their mechanical body, an immaterial soul that interacts with the body and is the source of all clear and precise thoughts.

It is the one great irony of Griffin's book that while he is attempting to undo the lingering Cartesian conviction that nonhumans are unconscious robots, he, like most cognitive scientists, accepts uncritically Descartes's prior assumption that real consciousness is equivalent to thinking. Given this equation, if Griffin wishes to demonstrate that other animals are conscious, he must show that they can think semantic thoughts as we do. More crudely, if he assumes, with Descartes, that the mind and the body are two different things, then to demonstrate that other animals may be conscious he must show that they, too, may have minds that are separate from their bodies.

The myriad patterns of animal behavior that Griffin describes in his book do indeed give evidence of conscious, attentive, even imaginative awareness — but whether this awareness resembles linguistic thinking I do not know. It seems equally plausible that the abstract, verbal thinking we carry on in our heads is a very recent acquisition of our species, born in the process of becoming literate. An odd notion, perhaps, but consider: With literacy comes an ability to separate one's thoughts from the immediate situation, recording them for

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perusal in another time and place. Literacy thus brings the ability to abstract oneself from the present, the capacity for sustained reflection on a "past" and a "future" (the secret origin of linear time and of "history"). Most important, literacy establishes the real sense of a mind that is materially separable from one's body — the experience of thoughts that can be put down on paper, bound in books, and stacked in libraries. Nonliterate, oral cultures do not distinguish the mind from the living body as easily as we do — they speak of the body itself as an intelligent, self-sensing, often magic presence. Nor do they qualitatively differentiate themselves from the other animals as readily as we. An Eskimo man, for instance, refers to the time before contact with European culture in this manner. "In the very earliest time, when both people and animals lived on earth, a person could become an animal if he wanted to, and an animal could become a human being. Sometimes they were people, and sometimes animals, and there was no difference. All spoke the same language...."(*Shaking the Pumpkin*, Jerome Rothenberg, Ed.)

It may be that the linguistic thinking we mistakenly equate with consciousness is overlaid on a deeper kind of thinking made up more of songs than of sentences, a consciousness more attuned to the rhythm of seasons and the breath — an intelligence of the body, so to speak, better suited to reading tracks on the forest floor than to reading words printed in lines on a page. If we began to recognize, beneath our recent theoretical awareness, the more embodied awareness that supports it, we might be better able to comprehend the nonverbal intelligence of other animals.

From this perspective, teaching chimpanzees our own language does not prove that chimps can become conscious — it is probable that they are already conscious — it only shows that we can induce them to slip into our particular form of (un)consciousness, where meaning is largely displaced from the immediacy of the present. Griffin and other cognitive ethologists speak disappointedly about the fact that other animals seem so embedded in the present, and that "most instances of animal communication seem to relate only to the communicator's situation here and now." They imply that such embeddedness indicates dullness, and fail to realize that a nuanced experience of the present requires an alertness and an attentiveness that few humans today could muster. Access to the here-and-now, the rich miracle of the present, is the goal of all contemplative and yogic techniques, yet other organisms may be our finest guides into this dimension.

There are other, lesser ironies here. While Griffin disparages the "computer envy" of his more reductive colleagues, he is unable to free himself from their mechanomorphic terminology. He, too, uses "neural templates," "central motor programs," and other technological metaphors. But we cannot blame him for this. There is, as yet, no rigorous language to describe the sort of intuitive, biological empathy that may well comprise the greater part of animal (and indeed, human) communication. Meanwhile, working with the materials at

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hand, Griffin has written an important and fascinating book, even a landmark in the study of animal behavior. For Donald Griffin it is already clear that every scientific study of other animals is an instance of potential communication between one species and another. This book marks one place where science is beginning to shift its sights away from the mirage of a finished objectivity toward the more vital human need for communication and conviviality with the other modes of awareness that inhabit, and even constitute, this living world.

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