Cognitive Relatives and Moral Relations

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The close kinship between humans, chimpanzees, gorillas, and orangutans is a central theme among participants in the debate about human treatment of the other apes, and it is a point emphasized by numerous contributors to the Great Ape Project. Richard Dawkins (1994) makes the point vivid by imagining a chain of daughters holding their mothers' hands starting on the African coast. Barely 300 miles inland would be an individual ancestor of both humans and chimpanzees. In a subsequent issue of *Etica & Animali* dedicated to the Great Ape Project, Maxine Sheets-Johnstone (1996) chides philosophers for failing to recognize the importance of evolutionary history for a proper understanding of who we humans are, and where we have come from. What we need, she says, is "not a different conception of nonhuman animals ... but a different conception of ourselves."

By delivering the message that we humans are apes, these authors and others seek to establish an empathetic bond between ourselves and our primate cousins. Empathy is probably the single most important determinant of actual human moral behavior, including the treatment of nonhuman animals. Given the applied nature of questions about the treatment of captive apes, it is entirely appropriate that the close relationship between us should be highlighted. But the role that relatedness should play in ethical theory is less clear (a point Dawkins acknowledges). To the extent that legal and regulatory challenges to keeping apes in captivity are likely to be based on principles of theory, it is important to understand what roles evolutionary theory can play in deriving such principles.

In the ethical literature on animal rights, phylogenetic relatedness plays no direct role in determining the moral status of animals. Rather, various capacities such as the ability to experience pain, to suffer, to be an intentional agent, to participate intentionally in reciprocal social arrangements, and to be self-aware have been put forward as the relevant factors for moral consideration. From this perspective, the relationship of humans to chimpanzees and the other great apes is indirectly of interest to ethical questions insofar as it is directly relevant to the likelihood that we humans share certain basic mental capacities with our ape cousins (Crisp 1996). But the capacities themselves are assumed to be attributable on the basis of behavioral and neurological properties of the animals themselves, independent of their historical or phylogenetic provenance. Indeed, for a truly non-anthropocentric, -primatocentric, or -taxocentric

ethic, it is essential that such determinations be made independently of membership in any particular phyletic group because of the possibility of convergent evolution -- the independent evolution of similar traits in distantly related species.

Relatedness is thus secondary to the attribution of mental characteristics in the development of an adequate theoretical framework for resolving ethical questions about animals. Nonetheless, evolutionary theory has a very significant role to play in any adequate conceptualization of the mind itself. An important development has been the development of what Donald Griffin (1978) has called "cognitive ethology" -- the attempt to graft Darwinian ideas about mental continuity onto comparative methods of classical ethology (see Allen & Bekoff 1997, esp. chapter 1). With her thoroughly systematic approach, Ruth Millikan's work in the philosophy of mind (Millikan 1984, 1993) provides an example of the potential for evolutionary ideas to alter our very conception of mind. Millikan has developed a theory of mental states that has its roots in the general biological treatment of adaptive characters and that allows her to treat the inherent meaning or content of mental states in terms of biological function. The result is a theory that can properly accommodate the enormous variety of mental capacities that we find in the animal kingdom without forcing theories of mind into an all-or-nothing approach that sometimes seems to be the consequence of other philosophical views (see Allen & Bekoff 1997, chapters 6 and 9). For instance, whereas Dennett (1987) seems to regard his intentional stance as a phenomenon that is illusory in the absence of completely general rationality, Millikan's approach provides a realist conception of intentionality linked to a conception of biological functions that allows intentional attributions to be predicated on the basis of domain-specific adaptations.

The pioneers of ethology, Konrad Lorenz and Niko Tinbergen, were themselves skeptical of the possibility of engaging in a serious scientific study of animal mentality. Given that their efforts to establish ethology as a scientific discipline took place during the height of behaviorism in psychology, it is hardly surprising that they did not emphasize the notion of mental continuity that Charles Darwin had promoted in his book *The Descent of Man*. Darwin, of course, had strong reasons for wanting to emphasize continuity in all respects between humans and the rest of nature, as illustrated in the following passage:

> If no organic being excepting man had possessed any mental power, or if his powers had been of a wholly different nature from those of the lower animals, then we should never have been able to convince ourselves that our high faculties had been gradually developed. But it can be shewn that there is no fundamental difference of this kind. We must also admit that there is a much wider interval in mental power between one of the lowest fishes, as a lamprey or lancelet, and one of the higher apes, than between an ape and a man; yet this interval is filled up by numberless gradations. --Charles Darwin (1871, p. 445)

Contrary to what this passage might suggest, there is not likely to be any single scale along which we can rank lampreys to humans with respect to mental capacities. For

a start, all living organisms are the tips of the so-called tree of life. Humans are not descended from lampreys, and even though we share a common ancestor there is no route from that ancestor to humans through, for example, rabbits, or even through chimpanzees. Thus there is no evolutionary reason to expect that rabbits or chimpanzees should lie somewhere midway between humans and any other organism on any particular scale, whether it is of intelligence or ear shape.

If we have learned anything at all from contemporary cognitive science, it is that the human mind is modular -- our minds are designed and implemented around a number of specific domains and operations, and it is quite possible for these modules to operate in a relatively isolated fashion. Thus, for instance, a recent discovery in evolutionary psychology is that our ability to reason about social rules, evolved in the cauldron of primate sociality, may be a modular system that is distinct from our ability to reason about abstract logical principles (Cummins 1998). Minds, despite how they may seem from the inside, are not general purpose devices. The result of such discoveries is a realization that it is not appropriate to ask "Can animals reason?" -- as did Descartes, and before him, Aristotle -- when instead we should be asking whether they can reason about some specific thing or another. Again, this puts pressure on the idea of a single scale of intelligence or mind on which all organisms might be arrayed.

This attack on the idea of a single scale cannot be construed as an attack on the idea of continuity generally. While any trait of any organism *may* be the novel feature that sets that lineage apart from others, the general lesson from evolutionary biology is that evolution is both conservative and convergent. It is conservative in the sense that useful characteristics, once evolved, tend to be preserved. It is convergent in the sense that common solutions to common problems are frequently reached by different paths. These principles should lead us to expect elements of mind to be found across a variety of species. But each case must be considered on its own merits. Early defenders of Darwin's views about mental continuity, such as George Romanes, were well aware of these issues, and their discussions led to specific methodological recommendations, such as Lloyd Morgan's canon: never attribute a higher psychical cause when a lower one is available.

Why, then, did the investigation of mental capacities in non humans effectively disappear from science during the early part of the 20th century? The rise of behaviorism coincided not just with the realization that greater objectivity was required in the description of animal behavior, but also with the positivist movement in the philosophy of science, with its emphasis on directly observable events and strict empirical testing of scientific hypotheses. In the face of this apparent onslaught of hard-headed logicality, it was hard to see how to defend investigations of such ephemeral notions as mind and consciousness as science. The philosophical problem of other minds had come to roost.

Positivist philosophy of science was, and continues to be, I am convinced, a good and essential force in the maturation of science. But it was not the final word, and the revival of the ideas of turn-of-the-century physicist Pierre Duhem by the philosopher Willard Quine during the mid 20th century brought this into focus (Quine 1953). Duhem's thesis was that no scientific hypothesis is ever tested in isolation, but only against the

background of numerous other hypotheses and factual claims. Quine went further to argue that while experience remains the court in which our beliefs are tested, there is no tenable distinction to be drawn between science on the one hand, or mathematics and philosophy on the other. Theories from all the disciplines constitute an interconnected network that can be modified to provide the highest overall coherence with our observations. But (and here I depart perhaps from Quine's own view) if our best explanation of nonhuman animal behavior postulates mental capacities, as it does for human behavior, then it is appropriately scientific to speak in such terms.

So, what we have here is a picture of scientific investigation where observable facts may be used to defend theoretic claims about processes and entities that may themselves be far from directly observable. Current physics has, of course, been quick to make use of inferences of this kind to posit and investigate all manner of otherwise recalcitrant phenomena. But psychologists and ethologists have not been so keen to embrace the lesson and return to mentalistic hypotheses about animal behavior.

This reluctance is somewhat understandable for what comparative psychology lacks, modern physics has in abundance in the form of sophisticated mathematical analysis linking theory to observation. In the present state of play it is hard to imagine what a similarly mathematical theory of mind might be like, and there may even be reasons to suspect that there will be no such thing forthcoming.

Is this fatal to the attempt to develop cognitive ethology? I think not, although it remains to be seen whether cognitive ethologists can meet the charges of all their critics. There are, however, some grounds for optimism, and what I want to do next is to identify some specific areas where such optimism may be justified.

There are two very hard topics that all attempts to study animal behavior and cognition must come to grips with. One is the topic of conscious awareness. Without a doubt this particular topic has been the single biggest bludgeon used by critics to bash cognitive ethology, and especially by critics of Donald Griffin's attempts to make scientists face up to the task of giving an adequate scientific account of consciousness in non human animals. Griffin himself is regarded by some as a defector, for his early reputation was based on exquisite physical analyses of the echolocation abilities of bats -- biological "hard" science at its best. Here is a pair of quotes that illustrate the common attitudes:

> A Griffin bat is a miniature physics lab. So imagine the consternation among behavioristic ethologists when Mr. Griffin came out a decade ago, with "The Question of Animal Awareness," as a sentimental softy. . . . For Mr. Griffin, all this [cleverness] suggests consciousness. He´s wrong. If such cleverness were enough to demonstrate consciousness, scientists could do the job over coffee and philosophers could have packed up their scholarly apparatus years ago. --Helena Cronin (1992, p. 14)

> We submit that it is this very goal of investigating animal consciousness that, although grand and romantic, falls far outside the scope of a scientific psychology that has struggled for the better part of the past century to eschew such

> tantalizing, but ultimately unsubstantiable, analyses of subjective mental experience. --Mark Blumberg and Edward Wasserman (1995, p. 133)

In fact, Blumberg and Wasserman, like some other critics of cognitive ethology, conflate the difficult issue of consciousness with the perhaps more general issue of meaning in animal psychology. As evidence for this I take their dismissive comments about my own work with primatologist Marc Hauser (Blumberg & Wasserman 1995) to show that they have not carefully drawn the distinction between consciousness, a subject we made no mention of, and animal concepts -- the sole focus of our work at that point (Allen & Hauser 1991).

Philosophers, and some psychologists, have been generally more careful to consider questions about the meaning or "content" of mental states separately from questions about their "phenomenology" or subjective feel. Both are difficult issues, but some, although not all, philosophers think that a divide and conquer strategy has the best hope of progress.

Phenomenological consciousness is, without doubt, the more recalcitrant of the two. The subject of nonhuman phenomenology was brought to the fore by philosopher Thomas Nagel's famous paper "What is it Like to Be a Bat?" (Nagel 1974). Indeed Donald Griffin credits Nagel for stirring his own interest in this topic leading to the publication of his 1976 book *The Question of Animal Awareness*.

Nagel, however, starts off by assuming that there is something that it is like to be bat -- that bats do have a phenomenology. But this is an assumption that the sternest critics are not even willing to grant. Some of these critics are motivated by the generic problem of other minds -- the question of how knowledge of other minds is possible -- to deny even the possibility of a scientific study of human consciousness. By focusing their attacks on those who would study consciousness of nonhuman animals, I believe that these critics are being rather disingenuous. Their complaints would not get much of a hearing, say, at the meetings of the Society for Neuroscience where attempts to understand the neural bases of human consciousness are well underway. Nor should general skeptical worries about knowledge of other minds carry much weight -- any more, say, than general skepticism about the nature of the external world should carry any weight among physicists.

But perhaps there is a more specific issue here that pertains only to nonhuman minds -- call it " the problem of other species of mind". If language convinces us that other humans are conscious, what can languageless creatures do to convince us? Some philosophers (Jamieson 1998; Searle 1999) believe that this question presupposes a general strategy of inferring mentality from behavior which is doomed to failure. They argue that this strategy should be abandoned in favor of more commonsense methods for directly recognizing or perceiving that nonhuman animals are conscious. I believe, however, that the inferential strategy should not be so readily abandoned, and that it is possible to improve the strategy.

One approach has, of course, been the attempt to teach human languages to members of other species -- chimpanzees, gorillas, dolphins, and parrots, among others.

The specific interpretations of these experiments depend on their details which will be discussed in other chapters of this book. But I think the same general worry can be launched at all of them, and it is one of the worries that Cronin launched at Griffin in the quotation above. When it comes to specific claims about the conscious phenomenology of animals, what is missing is a general theoretical reason for thinking that the particular behaviors are relevant evidence for conscious awareness.

Arguments from analogy to human behavior and experience can only take us part of the way because the strategy is inherently weak. For any target property P that we take to be a correlate of consciousness in humans, it is possible to find some some other property Q that humans possess and other animals lack, and one can then use the absence of Q to reject the analogy. It is necessary to justify a tighter connection between the target property P and consciousness than mere co-occurrence of P with consciousness in humans. (See Allen 1998 for a more detailed discussion of the analogy argument.) Here I wish to give a brief indication of how considerations about the evolution of consciousness can be used to reorient this debate.

As I mentioned, the focus in Nagel's paper was the question of what it is like to be a bat, but I have been suggesting that the more fundamental question is whether it is like anything at all to be a bat. This suggests the possibility that bats are really little zombies, flying around catching insects and avoiding obstacles without any awareness. This possibility of zombiehood has also been raised by philosophers concerned with human consciousness, in thought experiments involving entities whose behavior is completely indistinguishable from regular human beings but lacking entirely any subjective awareness. Quite apart from questions about the coherence if such a thought experiment, the conception of consciousness that is underlying it leaves us, I believe, with a complete mystery about what the point of being conscious would be. If, after all, a nonconscious being could behave identically to a conscious one, then there would seem to be no obvious biological function for consciousness itself.

What good is consciousness? Too simplistic a view of this is often promoted via what I call the "light bulb" model of consciousness. In this model some physical stimulus -- say a pinprick -- causes the light to come on -- a conscious pain -- which in turn causes the reaction of withdrawing the affected part of the body. The trouble with this picture is that the light bulb seems completely superfluous -- the stimulus might as well be wired directly to the response. And indeed the neurological evidence seems to support this. Recently decapitated alligators will, for instance, swipe very precisely with their limbs at the point of a scalpel incision despite the fact, presumably, that we can safely say "no brain, no pain!"

More sophisticated ideas about the functions of consciousness need to developed, and Marc Bekoff and I try to do this in chapter 8 of our book *Species of Mind* (Allen & Bekoff 1997). The idea that we pursue is that phenomenological consciousness enables an organism to learn and adjust to errors derived from its sensory perceptions. To illustrate this point very briefly, consider an organism that follows a signal that normally signifies the presence of food, and imagine that the organism reaches the source of the signal and finds no food. Either of two things may have happened: either there never was

any food there in the first place -- it was a false signal, or the organism got there too late and the food had already been snapped up by a faster competitor. The adaptive responses to these alternatives is different. In the first case, the organism would do better to respond less vigorously to similar presentations of the signal. In the second case, it would do better to respond more vigorously to similar presentations. To distinguish these two cases the organism requires some way of comparing the meaning of the signal to the facts of the case. Or, to put it slightly differently, it would benefit if it could distinguish the sensory appearance ("food over there") from the reality, where there is a difference.

This suggests an important function for perceptual consciousness: the discrimination of particular appearances from the corresponding reality. Indeed, on this view of function, the philosophers' description of conscious states as "appearance states" is apropos. Adaptation to perceptual error may not be the only function of such states, but it is a good place, we think, to start looking for evidence of consciousness in nonhuman animals. Furthermore we can associate this function with a class of ecological problems that it would behoove any organism to solve if it lives long enough for learning to be adaptive, hence putting the problem into an evolutionary framework.

I want now to turn to the other difficult issue facing cognitive ethologists -- that of the meaning or semantic content of thoughts. The major interest of philosophers developing accounts of semantic content has been to give a theory of the content of human thought. As such, progress in this area is encouraging. But there remain philosophers and scientists who think that there are special problems facing attempts to attribute semantic content to animal thoughts. These special problems can be brought into focus by considering the notion of a concept and its applicability to non-human animals.

There has been much work by comparative psychologists purporting to show that animals categorize objects (and photographs of objects) in ways comparable to humans. But a persistent problem with all such studies is that mere categorization does not seem to entail conceptual abilities. For instance, it is known that many species of ant will remove dead nestmates from the nest, and that they do so on the basis of a chemical cue -- the production of an acid which is a byproduct of the decomposition of the dead ant's body. The fact that ants will remove pieces of paper and even other live ants that have been artificially marked with this chemical cue argues against any conceptual recognition of death in these animals. The worry about ants, pigeons, or apes successfully trained on a discrimination task, is that the discrimination is being made on the basis of a purely perceptual cue that reveals nothing about the animal's cognitive or conceptual structure.

Even though we may be convinced that, for example, the pigeon's discrimination capacity is more sophisticated than an ant's, there still remains a problem of interpretation. Pigeons have for instance, been trained to discriminate between photographs of trees and photographs that do not contain trees, and to discriminate photographs of human faces from those containing none. But even if we think the pigeon really can make more or less the same judgement as a human about the categories of the photographs, would it be correct to attribute a concept of tree or person? Critics have

suggested that such a move is unwarranted because the concept identified in English with the word 'tree' is closely related to numerous other concepts, e.g. plant, trunk, root, leaf -- that the pigeon may lack; it is even associated to some technical notions -- perhaps xylem and phloem that the pigeon certainly lacks. Yet, if the pigeon does not think of trees as we do, how can it be correct to say that it has the concept of tree?

These and other problems have led some critics of cognitive ethology to recommend against the further pursuit of studies of animal mind. Are things truly hopeless? I think not. It is worth looking in a little more detail at the argument, such as it is, that a number of philosophers, including Daniel Dennett, Steven Stich, and Alexander Rosenberg, have been tempted to give against the possibility of using notions of mental content for scientific purposes. It goes as follows:

> 1. Because nonhuman animals do not have the same associations between concepts as we do (e.g. "bone" is associated with "skeleton"), it is imprecise to use human language to describe the contents of their thoughts (can Fido really think of a bone if he doesn't have the concept of a skeleton?).
>
> 2. Precision -- that is, precise content specification -- is required for the scientific objective of predicting behavior.
>
> Hence: 3. The use of human language to describe animal thought contents is unsuitable for scientific purposes.

Bekoff and I argue that both premises of this argument are questionable (Allen & Bekoff 1997, chapter 5). While it may be true that we cannot simply map our English dictionary into the thoughts of a gorilla, it does not follow that we cannot adequately construct ways to describe the gorilla's thought contents. It may be hard, but that is still a long way from being impossible. I would add that in the philosophical discussion of these matters there is generally a lot of loose talk about concepts such as "the concept of tree" and "our concept tree" as if humans all shared one concept of trees. More sensitivity to human variability on these matters might lead to more sophistication about nonhuman animal concepts (Allen 2000).

The second premise is also questionable because it assumes that precise prediction is the proper measure of scientific respectability. In fact, modeling of complex systems is another goal that may be independent of precise prediction. We may, for example, understand the general principles of tornado dynamics well before we can predict the information and course of any particular tornado. Likewise, modeling of animal behavior at the level of concepts may provide understanding but not precise predictive power.

Where now does this leave the topic of concepts? Well, as with consciousness what is need is a more theory-based approach to concept attribution. In 1991, Marc Hauser and I suggested that we should seek evidence of a level of representation that is somewhat independent of perceptual information and representation.

For example, suppose I were to pick on someone in your group and, without the rest of the group knowing that I had done this, give this person a drug that suppresses his vital signs, such as pulse, breathing, etc., making the person appear to be dead. I could then sit back and watch while you all go through the motions of starting resuscitation and calling for an ambulance. Suppose I then step forward and provide the antidote to the drug. Assuming you get over your annoyance with me, if I were to play the same trick the next day I wager that you would all look to me rather than going through the same motions. You are not bound to treat something as dead just because it provides perceptual evidence for being dead. Your judgments about death can transcend the particular perceptual cues.

If this is correct, what such results would reveal is a theoretical reason for attributing a two-track representational system of what we can call percepts and concepts. Why might such a two-track system have evolved? To facilitate certain kinds of learning, I have suggested. Not every species faces the same learning problems, so we might expect varying abilities to represent the world conceptually, just as we find great variation in the ability -- for instance -- to fly.

Finally, I would like to bring the discussion back to the ethics of keeping great apes in captivity. I would reiterate the point that ethical and regulatory issues will necessarily be based on principles other than evolutionary relatedness. Evolutionary theory is very important for conceptualizing the nature of all species of mind. And while there are no direct arguments from mental capacity to moral status, moral judgments must be informed by the facts about animal cognition and consciousness. Furthermore, consistency demands that that whatever connections between mentality and moral status we apply to humans must be applied equally to other apes.

No simple blanket statements about cognition or consciousness can cover all apes. Captivity involves confinement in a variety of conditions ranging from small cages to entire wildlife reserves. Different apes have evolved under different conditions and may, for example, consequently require different amounts of freedom to range and have evolved different capacities for perceiving and reasoning about captivity and confinement. Prehistoric humans were extremely peripatetic, colonizing almost every conceivable environment on the planet, from arctic tundra to tropical deserts, and from coastal marshes to the high mountains. Whether this wanderlust is part of our genetic or cultural heritage, it helps to account for the high value we place on freedom to roam. Individuals of other species might be satisfied by freedom to range within smaller areas than the entire planet. There will surely be individual differences too, but these differences must be empirically investigated.

Captivity also denies choice to the captive organisms. As with cognition of space, the cognitive capacities that animals bring to bear on the choices they make are also likely to vary widely between species. A fundamental tenet of liberal political theory is the right of individuals to choose their own destinies. One of the most basic rights in any liberal democracy is the freedom to emigrate. No one's participation in a society should be coerced, for participants must be willing contractors, if a very plausible version of social contract theory is to have any force. This line of thought is represented in the

contribution to the *Etica and Animali* special issue by B. Galdikas and Gary Shapiro (1996), where choice is the central feature of their approach to orangutan ethics.

No zoo would last 10 minutes without physical barriers to the animals' escape. Zoos deny the opportunity to choose to emigrate. Indeed, as the planet becomes increasingly affected by human population growth, even large wildlife reserves are becoming more zoo-like in that they do not allow free migration of nominally wild animals across park boundaries. Some psychologists argue that basic movements of animals, such as approaching food, are not intentionally chosen (Heyes & Dickinson 1990), but these conclusions are based on laboratory studies that may have limited application to a proper understanding of animal cognition (Allen & Bekoff 1995). If, indeed, members of other species choose where to go, then we are faced with the possibility that we should respect those choices.

The development of ethically correct policies for captivity of animals will depend on taking into account both species-specific and individual differences in the ways that individuals perceive and conceptualize the spaces in which they live, and the choices with which they are presented. A fully evolutionary approach to cognition, a cognitive ethology, that is not just limited to the great apes or to primates is the best hope we have for understanding such perceptions and conceptions. Such an approach is an important component of the development of Sheets-Johnstone's "different conception of ourselves" -- a conception of ourselves as primates, linked by evolution to other primates and to nature. It is also a necessary step towards the development of what Dawkins (1994) calls a "continuously distributed morality" -- the natural destination for our evolving sense of morality.

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