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## What are Animals? Why Anthropomorphism is Still Not a Scientific Approach to Behavior

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Before Darwin, the relationship of humans to the rest of creation was straightforward. Animals had instincts and habits: humans were blessed with rationality and language. Darwin's recognition of the interrelatedness of all living things made this position untenable. Around the time of the publication of Darwin's theory of evolution by natural selection, people began to use the term "anthropomorphism" to describe the attribution of human qualities to nonhuman animals. The rise of Behaviorism (e.g., Watson, 1913) led to a concentration on observable phenomena and treated 'anthropomorphism' only in a pejorative sense. Ethology, which arose in the 1930s, shared the Behaviorists' distaste for anthropomorphic and mentalistic explanations (e.g., Tinbergen, 1951). This reticence was punctured by Griffin in 1976. Griffin argued that all animal species are consciously aware and consequently, anthropomorphism is an entirely appropriate way of thinking about animals. Several contemporary authors have attempted to 'tame' anthropomorphism into a respectable branch of psychology. Burghardt (1991) coined the term "critical anthropomorphism" to distinguish the inevitable ("naïve") anthropomorphic impulses that human beings uncritically bring to other species, from a sophisticated anthropomorphism. This latter type of anthropomorphism uses the assumption that animals have private experiences as an "heuristic method to formulate research agendas that result in publicly verifiable data that move our understanding of behavior forward" (Burghardt, 1991, p. 86). I shall argue that, as I put it once before, "the reintroduction of anthropomorphism risks bringing back the dirty bathwater as we rescue the baby" (Wynne, 2004). The study of animal cognition will only proceed effectively once it rids itself of pre-scientific notions like anthropomorphism.

Anthropomorphism – the ascription to animals of human psychological qualities – is presently undergoing something of a revival. Several thoughtful commentators have suggested that, while it cannot be good science to view members of different species as just like us (what Frans de Waal, 2002, colorfully labelled "Bambification"), some other forms of anthropomorphism can be constructive and helpful to comparative psychologists. These proposals include Gordon Burghardt's "critical anthropomorphism" (1991), Marc Bekoff's "biocentric anthropomorphism" (2000) and Frans de Waal's "animal-centered anthropomorphism" (1997). Though there are differences between these approaches, they share the belief that projecting oneself into the situation of a member of another species can lead to the production of useful hypotheses for further scientific study.

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I shall argue that anthropomorphism, even of the reformed varieties, should have no place in an objective science of comparative psychology. Fundamentally this is because anthropomorphism is a form of mentalism, and as such is not amenable to objective study. Labelling animal behaviors with everyday terms from lay psychology does not explain anything. Rather it is an example of the nominalist fallacy – the belief that naming something explains it (Blumberg & Wasserman, 1995). To see how we got to the present situation it is useful to start with a little history.

### *A Brief History of Anthropomorphism*

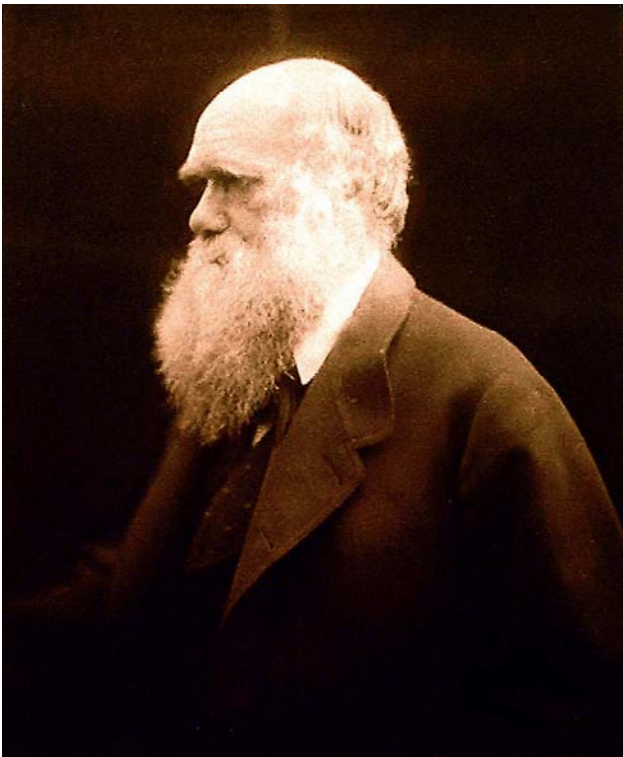
Back in the bad old days BD (Before Darwin) the relationship of humans to the rest of creation was quite straightforward. Animals were brutes and people were special. Humans had been generated in a separate act of creation. Where animals made do with instinct and habit, we were blessed with rationality and language – two things that placed us closer to the angels and lifted us above the rest of the earth's creatures. Descartes had argued that animals were machines, compli-

cated machines, but machines nonetheless. They were governed by the same laws as inanimate matter. Human bodies had a machine-like aspect to them, but they also possessed a god-given immortal soul which gave them rationality – what we would today call intelligence and consciousness.

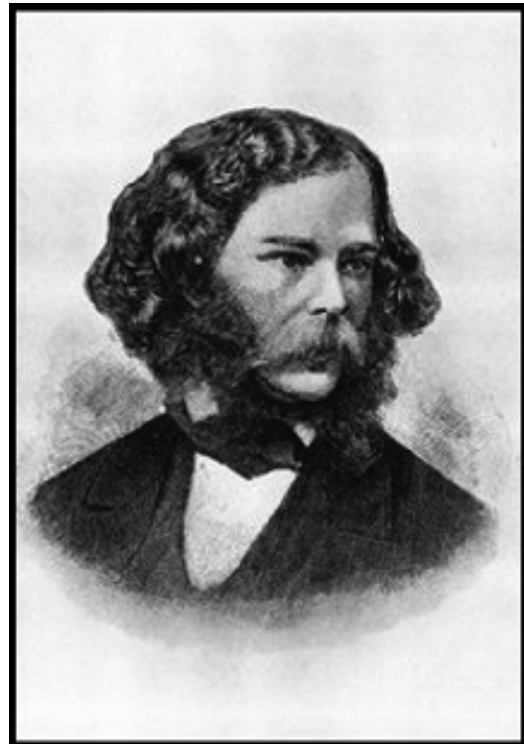
After Darwin (AD) this idea of a hard and fast line between humans and other species became untenable. In the first published statement of his theory of evolution by natural selection, *On The Origin of Species by Means of Natural Selection or the Preservation of Favoured Races in the Struggle for Life*, finally published after nearly two decades of procrastination in 1859, Darwin avoided saying much about humans. On the last page he noted simply, “Light will be thrown on the origin of man and his history” (p. 488). The co-discoverer of the theory of natural selection, Alfred Russel Wallace, did not accept that evolution could have any relevance to human psychology (Wallace, 1869). Darwin, however, disagreed and in 1871 published a major work setting out the similarities between human and animal minds: *The Descent of Man and Selection in Relation to Sex*. In that volume, Darwin pointed out that there was “no fundamental

difference between man and the higher mammals in their mental faculties,” though he was also careful to note on the same page that the “difference in mental power between the highest ape and the lowest savage” is “immense” (Darwin, 1871, p. 45).

For centuries, “anthropomorphism” had referred to the ascription to angels and God of human qualities (‘anthros’ – man; ‘morphos’ – form). This commonplace of medieval theology was banned by Bishop Etienne Tempier’s Condemnations of 1277 (Daston, 2005). According to the Oxford English Dictionary (2006), it was George Herbert Lewes who was the first to extend the usage of this word to animals, in a work first published in 1858, the year in which Darwin’s revolutionary evolutionary ideas became public through a presentation at the Linnean Society. Lewes, a Victorian polymath, wrote in his *Sea-side Studies at Ilfracombe, Tenby, the Scilly Isles, and Jersey* that, in considering the vision of mollusks (which, he believed, had only rudimentary sensitivity to light), “We speak with large latitude of anthropomorphism when we speak of the ‘vision’ of these animals... Molluscan vision is not human vision; nor in accurate language is it vision at all...” (1860, p. 359). He went on, “...we are incessantly at fault in our tendency to anthropomorphise, a tendency which causes us to interpret the actions of animals according to the analogies of human nature” (1860, p. 385).



**Figure 1.** Charles Darwin as photographed by Julia Margaret Cameron on the Isle of Wight on a return visit in 1868. This copy was given to Darwin by Samuel H. Scudder. Scudder was an American admirer of Darwin’s, and one of the early editors of *Science* magazine. Underneath this print Darwin wrote, “I like this Photograph very much better than any other which has been taken of me. Ch. Darwin.” Copyright © 1999 The American Photography Museum, Inc. All Rights Reserved. Obtained with permission.



**Figure 2.** George Henry Lewes, originator of the application of the term ‘anthropomorphism’ to animals. Image from Wikipedia in public domain.

Darwin's own approach to animals, in the *Descent* and also in *The Expression of Emotions in Man and Animals* (1872), was quite clearly anthropomorphic in intent (though, now that all of Darwin's published works have been digitized, it is possible to state definitively that he never used the term himself, <http://darwin-online.org.uk/>). Darwin was out to prove that humans and animals shared many psychological qualities. He argued that one could observe in man, "the same senses as the lower animals," consequently, "his fundamental intuitions must be the same." He went on, "Man has also some few instincts in common [with other species, such] as that of self-preservation, sexual love, the love of the mother for her new-born offspring, the desire possessed by the latter to suck, and so forth" (Darwin, 1871, p. 66). Other aspects of psychology struck Darwin as being shared between humans and other species too: "the lower animals, like man, manifestly feel pleasure and pain, happiness and misery" (1871, p. 69). Darwin admitted only that "man... is capable of incomparably greater and more rapid improvement than is any other animal...; and this is mainly due to his power of speaking and handing down his acquired knowledge" (1871, p. 79).



**Figure 3.** "The same [dog as in previous picture] in a humble and affectionate frame of mind." *The Expression of Emotions in Man and Animals*. Charles Darwin (1882, p. 53, Figure 6). Reproduced with permission from *The Complete Work of Charles Darwin Online* (<http://darwin-online.org.uk/>).

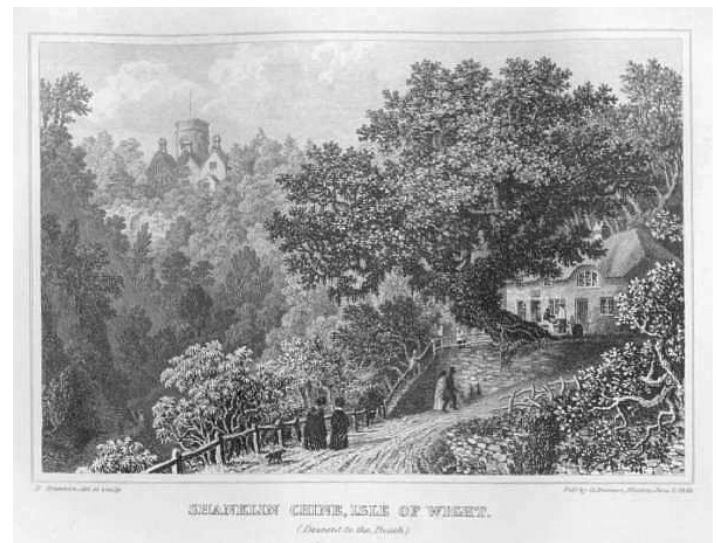
It is worth quoting Darwin's view on the similarities in psychology between humans and animals at some length:

It has, I think, now been shewn that man and the higher animals, especially the Primates, have some few instincts in common. All have the same senses, intuitions, and sensations,—similar passions, affections, and emotions, even the more complex ones, such as jealousy, suspicion, emulation, gratitude, and magnanimity; they practice deceit and are revengeful; they are sometimes susceptible to ridicule, and even have a sense of humour; they feel wonder and curiosity; they possess the same faculties of imitation,

attention, deliberation, choice, memory, imagination, the association of ideas, and reason, though in very different degrees. The individuals of the same species graduate in intellect from absolute imbecility to high excellence. They are also liable to insanity, though far less often than in the case of man. Nevertheless, many authors have insisted that man is divided by an insuperable barrier from all the lower animals in his mental faculties. I formerly made a collection of above a score of such aphorisms, but they are almost worthless, as their wide difference and number prove the difficulty, if not the impossibility, of the attempt. It has been asserted that man alone is capable of progressive improvement; that he alone makes use of tools or fire, domesticates other animals, or possesses property; that no animal has the power of abstraction, or of forming general concepts, is self-conscious and comprehends itself; that no animal employs language; that man alone has a sense of beauty, is liable to caprice, has the feeling of gratitude mystery, etc.; believes in God, or is endowed with a conscience (1871, p. 79).

Darwin went on to argue that at least incipient hints of all of these qualities could be observed in nonhuman species. Language is suggested in the communicative noises of animals. Even belief in god is prefigured "in the deep love of a dog for his master, associated with complete submission, some fear, and perhaps other feelings" (1871, p. 96).

Since Darwin was not a professor, he had no students in the ordinary sense (Browne, 2003). He did, however, encour-



**Figure 4.** Shanklin Chine, Isle of Wight from "Brannon's Picture of The Isle of Wight" (Brannon, G. 1849). Darwin started the *Origin of Species* here in 1858. He wrote to his friend, J. D. Hooker, "we think this the nicest sea-side place, which we have ever seen." The present author spent most of his childhood in Shanklin. Reproduced pursuant to the Project Gutenberg™ license.



age some younger followers. His key successor in the realm of animal intelligence was George Romanes. Romanes has often been ridiculed for writing of human qualities in a wide range of animal species. It is only fair, however, to point out that Romanes was continuing in a manner that was clearly laid out for him by Darwin.



**Figure 5.** *George John Romanes, early defender of animal anthropomorphism. Frontispiece to The Life and Letters of George John Romanes by Ethel D. Romanes & George J. Romanes (1896). Longmans, Green. London. Image from Wikipedia in public domain.*

Romanes had a very different position on the value of anthropomorphism from Lewes. In his major text, *Animal Intelligence* (1883), Romanes started out by arguing from the premise that “the external indications of mental processes which we observe in animals are trustworthy, so ...we are justified in inferring particular mental states from particular bodily actions.” He continued, “It follows that in consistency we must everywhere apply the same criteria. For instance, if we find a dog or a monkey exhibiting marked expressions of affection, sympathy, jealousy, rage, etc., few persons are sceptical enough to doubt that the complete analogy which these expressions afford with those which are manifested by man, sufficiently prove the existence of mental states analogous to those in man of which these expressions are the outward and visible signs” (1883, p. 8-9). Romanes recognized that some people might be hesitant to follow these analogies through to animals very different from ourselves, like bees

and ants, but he concludes:

If we observe an ant or a bee apparently exhibiting sympathy or rage, we must either conclude that some psychological state resembling that of sympathy or rage is present, or else refuse to think about the subject at all; from the observable facts there is no other inference open. Therefore, having full regard to the progressive weakening of the analogy from human to brute psychology as we recede through the animal kingdom downwards from man, still, as it is the only analogy available, I shall follow it throughout the animal series (1883, p. 9).

Romanes does seem a little discomfited by the point to which his reasoning has brought him. He admits that as we “get down as low as insects” there is clearly a “progressive weakening of the analogy” of human to animal minds, but he nonetheless, “confidently assert[s] ...that the known facts of human psychology furnish the best available pattern of the probable facts of insect psychology.” He summarizes his approach thus:

Just as the theologians tell us—and logically enough—that if there is a Divine Mind, the best, and indeed only, conception we can form of it is that which is formed on the analogy, however imperfect, supplied by the human mind; so with ‘inverted anthropomorphism’ we must apply a similar consideration with a similar conclusion to the animal mind. The mental states of an insect may be widely different from those of a man, and yet most probably the nearest conception that we can form of their true nature is that which we form by assimilating them to the pattern of the only mental states with which we are actually acquainted. And this consideration, it is needless to point out, has a special validity to the evolutionist, inasmuch as upon his theory there must be a no less than a physiological, continuity a psychological, extending throughout the length and breadth of the animal kingdom (1883, p. 9-10).

From my reading of Darwin, I would argue that there is not much in Romanes’s *Animal Intelligence* with which Darwin (who had died the year before, in 1882) would have disagreed. Romanes describes how he had considered restricting himself only to anecdotes about animals that had been recorded by “observers well known as competent.” He decided not to follow this route because, “the most remarkable instances of the display of intelligence were recorded by persons bearing names more or less unknown to fame” (1883, p. viii). Consequently Romanes’s accounts of animal psychology tend to be credulous. It is this gullibility, I believe, and not a general philosophical distinction, which distinguishes Romanes’s writing on animal psychology from Darwin’s - - though the difference is not great, and at least one careful commentator has come to the exact opposite conclusion and rated Darwin the more gullible collector (Boakes, 1984).



**Figure 6.** Conwy Lloyd Morgan, early critic of animal anthropomorphism. Image copyright the University of Bristol. Reproduced with permission.

A decade after Romanes's *Animal Intelligence*, another British writer, Conwy Lloyd Morgan, in his *Introduction to Comparative Psychology* (1894), published what has been perceived as a critique of Romanes's work. Skinner (1938) argued that Morgan was trying to dispense with mental categories in the explanation of animal behavior. It is true that Morgan, with his "basal principle" (or "canon" as it has become known), was attempting to add some discipline to Romanes's attempts to account for animal behavior. It is not accurate, however, to ascribe to Morgan a desire to eschew mentalism and anthropomorphism in comparative psychology. His principle stated that, "In no case may we interpret an action as the outcome of the exercise of a higher psychical faculty, if it can be interpreted as the outcome of the exercise of one which stands lower in the psychological scale" (1894, p. 53). Morgan acknowledged that, "we are forced, as men, to gauge the psychical level of the animal in terms of the only mind of which we have first-hand knowledge, namely the human mind" (1894, p. 55). However, he also argued that the principles of evolution forced a recognition that different species would possess different "psychical faculties" in different degrees. This included the possibility that an animal species could possess a faculty in a higher degree than does a human. This "method of variation" as Morgan called it, was "the least anthropomorphic, and therefore the most difficult" (1894, p. 58) of the alternatives he considered for understanding animals. Notwithstanding his desire to constrain anthropomorphism, Morgan remained committed to a mentalistic interpretation of animal behavior. In the Preface to his book he wrote, "It would be an inestimable boon to comparative psychology, if all those who venture to discuss the problems with which this science deals would submit to some preparatory discipline in the methods and results of introspective observation" (1894, p. xii). Morgan agreed entirely with Romanes that "the human mind [be used] as a



**Figure 7.** Lloyd Morgan's dog Tony lifting a gate latch with the back of his head. "...the lifting of the latch was unquestionably hit on by accident, and the trick was only rendered habitual by repeated association in the same situation of the chance act and the happy escape. Once firmly established, however, the behavior remained constant throughout the remainder of the dog's life, some five or six years. And, I may add, I could not succeed, notwithstanding much expenditure of biscuits, in teaching him to lift the latch more elegantly with his muzzle instead of the back of his head..." Morgan, C. L. (1930). *The Animal Mind*. London, E. Arnold & Co. Reproduced from <http://www.pigeon.psy.tufts.edu/psych26/morgan.htm> with permission of Robert Cook.

key by which to read the brute mind." What Morgan sought was not a parsimony that eschewed mentalism in the study of animal minds, but rather a parsimonious mentalism for comparative psychology. George Miller (1962) accurately encapsulated Morgan's position thus: "all that Morgan hoped for were a few reasonable rules for playing the anthropomorphic game."

The American, Edward Thorndike, took the next step towards ridding animal psychology of mentalism and anthropomorphism in his *Animal Intelligence* (1911). Thorndike is widely credited with introducing the experimental method to the study of animal psychology. He was a scathing critic of the mentalistic anthropomorphic explanations of animal behavior that had preceded him, but he was not altogether free of these tendencies himself. When discussing problem-solving in capuchin monkeys, for example, Thorndike wrote: "Monkeys seem to enjoy strange places; they revel, if I may be permitted an anthropomorphism, in novel objects. They like to have feelings as they do to make movements. The fact of mental life is to them its own reward" (1911, p. 238).

It was John B. Watson who totally rejected anthropomorphism in his *Behaviorism* of 1913. Watson considered the

approach of Darwin, Romanes and Morgan, working by analogy from human consciousness to animal experience, “absurd.”

Any other hypothesis than that which admits the independent value of behavior material, regardless of any bearing such material may have upon consciousness, will inevitably force us to the absurd position of attempting to *construct* the conscious content of the animal whose behavior we have been studying. On this view, after having determined our animal’s ...various problems and its various ways of solving them -- we should still feel that the task is unfinished and that the results are worthless, until we can interpret them by analogy in the light of consciousness. ...Surely this doctrine which calls for an analogical interpretation of all behavior data may be shown to be false: the position that the standing of an observation upon behavior is determined by its fruitfulness in yielding results which are interpretable only in the narrow realm of (really human) consciousness (Watson, 1913, p. 159).

Watson’s prohibition on anthropomorphism echoed the thirteenth century condemnation of anthropomorphism as a way of understanding god and the angels. Anthropomorphism had come to stand for mentalistic, folk-psychological ways of understanding animals, and the new objective science of behaviorist psychology stood for the removal of these older ways of thinking.

### *Ethology*

In the 1930s, an alternative school for the objective study of animal behavior grew up outside psychology departments. The discipline of ethology defined itself in large part in opposition to the psychological approach of its day. Ethologists studied (and still prefer to study) the spontaneous, species-typical behaviors of a range of animal species in their natural habitats – or close simulacra. This stands in contrast to psychologists who more typically study behaviors which are conserved across species in a small set of animals kept in artificial laboratory environments.

In defining ethology, however, the founders of that field, Niko Tinbergen and Konrad Lorenz, held on to one tenant of the behaviorist psychology to which they were in many other ways ideologically opposed. They wanted theirs to be an objective science of behavior and rejected mentalism and anthropomorphism outright. Tinbergen, in the volume that defined the field of ethology, *The Study of Instinct* (1951), wrote: “Because subjective phenomena cannot be observed objectively in animals, it is idle either to claim or to deny their existence.” At a conference in 1959 he expressed himself even more strongly: according to Richard Burkhardt (2005, p. 434), “[Tinbergen’s] commitment to the objective study of behavior [w]as ‘a matter of principle with no compromise possible.’ He commented further: ‘Some may say our view

is very narrow. All right, it is narrow; but we feel we must recognize that science is a limited occupation and is only one way of meeting nature.’” Lorenz may not have been quite as committed to keeping mentalism out of ethology but he allowed himself to be swayed by Tinbergen on this matter. As Gordon Burghardt put it, “Lorenz put it on the back burner, whereas Tinbergen ordered it out of the kitchen” (Burghardt, 1985, p. 909).

Therefore, the rise of ethology alone does not seem to have greatly changed attitudes towards mentalism in psychology, in general, and comparative psychology, in particular. However, the addition of the cognitive revolution to ethology seems to have set up the conditions for this change. George Miller has characterized the rise of cognitive views as a “counterrevolution:...the cognitive counter-revolution in psychology brought the mind back into experimental psychology” (Miller, 2003, p. 141). This revolution in psychology, which most people date from the 1950s and 1960s, was slow to make its presence felt on the study of animals. By the mid 1970s, however, students of animal behavior were taking an interest in cognitive approaches. One direction this took, especially among psychologists, was a renewed interest in intervening variables (e.g., Hulse, Fowler, & Honig, 1978). Such variables are derived from observed behavior and not intrinsically anthropomorphic. The other direction was laid out by ethologist Donald Griffin, famous for his discovery of the echo navigation of bats in the 1940s, in his *The Question of Animal Awareness*, 1976. Though the origins of Griffin’s ideas are obscure, according to an obituary by one of his students, Griffin was more influenced by the complexity of animal behavior combined with discussions with Princeton philosopher Robert Nagel than by anything coming out of psychology at that time (Gould, 2004). In his “thin but deeply subversive volume” (Gould, 2004, p. 1) Griffin introduced the term “cognitive ethology.” He laid out his position thus:

Ethologists and comparative psychologists have discovered increasing complexities in animal behavior during the past few decades...The flexibility and appropriateness of such behavior suggest not only that complex processes occur within animal brains, but that these events may have much in common with our own mental experiences...this book will examine both the pertinent evidence and its general significance in the hope of stimulating renewed interest in, and investigation of, the possibility that mental experiences occur in animals and have important effects on behavior (1976, p. 3-4).

Griffin’s form of dualism, where ‘consciousness’ is an information processing ability in addition to the activity of the brain, has not found many followers. Allen and Bekoff, (1997, p. 153) refer to, “...Griffin’s puzzling view that consciousness might help organisms such as honeybees by



compensating for the limited processing power afforded by their relatively small nervous systems.” But Griffin’s general push for more tolerance for mentalistic anthropomorphism has found much support from researchers under the rubric of “cognitive ethology” and to some degree in the new field of “animal cognition.”

### *Modern Anthropomorphism*

Several authors have attempted to meld the discipline of the objective schools of animal behavior such as behaviorism and classical ethology with the freedom to consider mental processes put forward by Griffin. In doing so, they have proposed modified forms of anthropomorphism. Foremost among those trying to make anthropomorphism do useful work for comparative psychologists and ethologists is Gordon Burghardt (1985; 1991; 2004; Rivas & Burghardt, 2002). Rivas and Burghardt suggest that, “Like the poor, anthropomorphism will always be with us” (2002, p. 9) but they argue that not all anthropomorphism is bad. The kind of anthropomorphism that must be avoided by serious students of animal behavior is unwitting “naïve anthropomorphism.” This is when someone allows their natural tendency to see living things as having a human-like mentality to operate in an “unacknowledged, unrecognized [form], or used as the basis for accepting conclusions by circumventing the need to actually test them” (2002, p. 10).

This relates to the concept of “anthropomorphism by omission.” Rivas and Burghardt (2002) define this as the error of “omitting to put oneself in the animal’s shoes” (p. 11). Burghardt (1985) gives as an example the study of vervet monkey vocalizations. Prior to the work of Cheney and Seyfarth (1982) it was believed that these monkeys’ social grunts lacked semantic content because they all sounded similar to the human ear. On closer study, however, it transpired that other monkeys recognized four different signals in these grunts which had all sounded similar to humans. In this sense, according to Burghardt, science progresses better when scientists think themselves into the position of the animal under study.

Burghardt argues for a form of anthropomorphism, which he calls “critical anthropomorphism” (1991, p. 86) that is not a logical error. He defines critical anthropomorphism as a way of using the assumption that animals have private experiences, “to formulate research agendas that result in publicly verifiable data that move our understanding of behavior forward” (1991, p. 86). This view is similar to that espoused by Edward Tolman (1938) who stated:

...there seems to me every advantage in *beginning* by conceiving the situation loosely and anthropomorphically... in my future work [I] intend to go ahead imagining how, *if I were a rat*, I would behave as a result of such and such a demand combined with such and such an appetite and

such and such a degree of differentiation; and so on. And then, on the basis of such imaginings, I shall try to figure out some sort of ... rules or equations (p. 24; emphasis in original).

Burghardt and Rivas’ concept of “anthropomorphism by omission” is similar to what Frans de Waal calls “anthropodenial... a blindness to the humanlike characteristics of other animals, or the animal-like characteristics of ourselves” (de Waal, 1997, p. 51; 2002). De Waal advocates “animal-centered anthropomorphism.” Like Burghardt and Tolman, de Waal argues for “a tolerant attitude toward the borrowing of human concepts to explain animal behavior.” He argues that “anthropomorphism ought to be a nonissue in the case of anthropoid apes. But even in the case of more distant species, anthropomorphic explanations deserve serious attention.” Nonetheless he adds, “We should never accept explanations without critical reflection, but there is nothing wrong with widening the workspace of permissible hypotheses while retaining high standards of replicability and scientific scrutiny” (1999, p. 274).

Another recent reviver of anthropomorphism, Mark Bekoff, argues that “anthropomorphism allows other animals’ behavior and emotions to be accessible to us” (2000, p. 867). Acknowledging that unthinking anthropomorphism is not scientific, Bekoff (2000) argues for “biocentric anthropomorphism,” which is compatible with “rigorous science” (p. 867). Particularly in the realm of emotions, Bekoff suggests that using anthropomorphism - applying human labels to animal behaviors - causes little harm, whereas, “...closing the door on the possibility that many animals have rich emotional lives, ...will lose great opportunities to learn about the lives of animals...” (p. 869).

A related but distinct concept is that of “Theromorphism” (Timberlake, 1999, p. 256). Timberlake argues for animal-centered rather than anthropomorphic observation. Animal-centered observation implies putting oneself into the position of the animal under study but not in an anthropomorphic way. Rather, Timberlake argues for a complete objective understanding of the animal’s position. He contrasts this with anthropomorphic television programs that show us wild animals with a voice-over talking of the animals entirely as one would a human being in the same circumstances. Timberlake (1999) uses hunting lions as an example:

[we]...are asked to imagine skulking through the tall dry grass of the veldt--feeling the brush of the stalks, the looming heat of the sun... we exchange significant looks with our sisters and so coordinate a successful ambush to procure a fresh meal from a nearby heard of zebras (p. 255).

(Timberlake notes that we are not invited to “...imagine how it feels to break the back of the zebra, eat its entrails while

it lives...”). Such imaginings, Timberlake notes, can be of no use to a scientific approach. What Timberlake argues for with his animal-centered theromorphism is to take the point of view of the lioness, “but as a lioness, not a human” (p. 256). Thus, we must ask about the sensory, perceptual and responsive worlds of the lion qua lion. The theomorphic approach differs from the anthropomorphic because it “is based on convergent information from behavior, physiology, and the results of experimental manipulations” (p. 256).

I mention Timberlake’s theromorphism only for the sake of completeness and as an example of a viable way forward. It does not, in my opinion, suffer the drawbacks of the “true” anthropomorphisms because it eschews mentalism. What the true anthropomorphisms share is a belief that the imaginative projection of one’s mentalistic self into the life of a member of another species can lead to the production of hypotheses which may prompt the production of useful objective data.

### *The Emperor’s New Anthropomorphism*

What could be wrong with the new anthropomorphisms? I accept that critical, animal-centered, biocentric anthropomorphism may be close to what Darwin had in mind when he wrote about animal psychology. They are explicitly evolutionary attempts to understand animal minds by exploiting the analogies that must exist between human and nonhuman psychology. However, I believe there are two things wrong with anthropomorphism from which the more recent reformulations by Bekoff, Burghardt, and de Waal still cannot free us.

The first concerns the names for things and might for that reason be dismissed as relatively unimportant. However, the names we give to ideas do influence how we think about them, so I think this point is worth raising. Since Bishop Tempier’s *Condemnations* in the thirteenth century, “anthropomorphism” has stood for a flawed way of thinking. According to Chambers’ *Cyclopædia; or, an Universal Dictionary of Arts and Sciences—Supplement* (1753), “anthropomorphism” is described as, “...the error of those who ascribe a human figure to the deity” (as cited in the Oxford English Dictionary online, 2006). Thus I think it a mistake to try and take this word and make it stand for a positive way of considering the relationship between human and animal psychology.

More importantly, these new forms of anthropomorphism still represent a mentalistic approach to animal psychology. Mentalism is a form of folk psychology – a set of pre-scientific beliefs about how people function (Nichols, 2002; Ravenscroft, 2004). It is not a component of modern objective psychology. It is not only behaviorism that dismissed mentalism, but ethology too. Contemporary human cognitive psychology, though it has resurrected several mentalistic concepts, is nonetheless an objective materialistic

science seeking insights through experiment (see Neisser, 1967). Though introspection is sometimes used by cognitive psychologists as a source of hypotheses, these hypotheses have to be experimentally tested before they are considered scientific theories. In addition, while there are grounds for criticising mentalistic introspection as a tool even in human psychology, the issues are not as extreme as when this method is applied across species.

Darwin’s mentalistic focus in seeking analogies between human and animal psychology is readily understood given the period in history when he was writing. At Darwin’s death in 1882, the empirical and objective science of psychology was still in its infancy (Wundt, 1874/1904, is probably the first textbook of an empirical psychology and the only one published in Darwin’s lifetime), and an empirical science of animal psychology had yet to be born (Thorndike, 1898, is arguably the earliest experimental study of animal psychology). Consequently, that Darwin, in arguing for commonalities in the psychology of humans and animals, used mentalistic folk-psychological terms is completely comprehensible within the framework available to him then.

A century and a half later, scientists interested in animal psychology do not have to appeal to mentalistic, folk-psychological explanations of behavior to make sense of the commonalities between humans and animals which evolution tells us to expect. Mentalism fails to qualify as a scientific explanation for (at least) two reasons. First, it uses ultimately non-material causes to attempt to explain behavior. It goes outside the physical world in its search for explanations. Second, mentalistic concepts are intrinsically private and thus by definition subjective, not objective. Today we not only have objective concepts from behaviorist psychology, but also from ethology, behavioral ecology and cognitive psychology, which, because of their more objective basis, form a much better platform for explaining animal behavior.

### *A Shaggy Dog Story*

Consider the behavior of a domestic dog when its owner returns home to find something broken in the house. Most dog owners, confronted with these circumstances, have seen the characteristic submissive posture in dogs which Darwin described thus: “dogs not only lower their bodies and crouch a little as they approach their masters, but sometimes throw themselves on the ground with their bellies upwards. This is a movement as completely opposite as is possible to any show of resistance” (Darwin, 1872, p. 120). The fact that dogs will show this posture if they have broken something while the owner was out of the house might be viewed as supporting Darwin’s belief that “dogs possess something very like a conscience” (Darwin, 1871, p. 103).

From the anthropomorphic perspective this might be con-



sidered an adequate explanation. If a person behaves submissively (“regretfully”) when they have broken something that belongs to somebody else, we might, in everyday language, ascribe to them “remorse” and consider our explanation closed. Thus, if we are thinking anthropomorphically – even with critical or animal-centered anthropomorphism – we put ourselves imaginatively into the paws of the dog and hypothesize that the dog too experiences remorse.

The problem with an anthropomorphic explanation of this form is that nothing has been explained. There is no science of “remorse” to which we have appealed. Even as an explanation of human behavior, “remorse” is vacuous; it lacks any power to predict or control future behavior. We have committed the nominalist fallacy – the belief that to give something a name is to explain it (Blumberg & Wasserman, 1995). Far better putative hypotheses to explain a dog’s behavior under these circumstances can be drawn from objective sciences of animal behavior such as behaviorist or cognitive psychology and ethology.

I have noticed that young puppies do not show any submissive behavior in the presence of a damaged object until they have been chastised at least once upon the discovery of damage. Furthermore, a sensitive dog may show submissive behavior when its master returns home to something broken, even in cases where the owner knows that the dog is not responsible for the breakages. These two observations suggest an alternative hypothesis. Perhaps the dog is subject to Pavlovian conditioning. Perhaps the broken object is a conditioned stimulus. It is initially neutral, but when paired with chastisement (the unconditioned stimulus) it comes to evoke a response of its own. That response being the conditioned response – in the dog’s case a submissive posture. The fact that a dog, under these circumstances, adopts a particular posture as the conditioned response would appeal to knowledge about animal behavior drawn from ethology. That the dog does not produce this conditioned response unless and until the master returns home suggests that higher-order processes sometimes labeled “cognitive,” perhaps occasion-setting (Holland, 1992), may be at work.

An explanation like this, that weds Pavlovian conditioning with ethological knowledge and contributions from animal cognition, leads directly to testable predictions. If the process involved really is Pavlovian conditioning, then other Pavlovian phenomena, like blocking and overshadowing (Pearce, 1997) should be uncoverable under the right conditions. The fact that a species-typical submissive posture is involved implies that other species should show different characteristic behaviors under similar circumstances. Of course tests for Pavlovian phenomena and tests derived from ethological concepts could prove my armchair hypothesizing wrong. This, however, only shows the strength of the approach, not its weakness. It could well be the submissive

behavior of a dog under these circumstances is in fact an instance of operant conditioning, or better understood solely in terms of species typical reactions to dominant individuals without any appeal to learning processes. Whatever the case might turn out to be, this empirical approach, without appeal to mentalistic, folk-psychological notions, is the one that will lead to testable hypotheses and an objective understanding of animal behavior.

This style of explanation is no less Darwinian in the broader sense than an explanation in terms of “remorse.” Humans too show Pavlovian conditioning, higher-level cognitive processes, and species typical behaviors. This explanatory sketch will function just as well as an attempt to explain remorse in human beings as in dogs. I am inclined to think that it is more likely to be a successful account of dog behavior than of human behavior, but an advantage of this approach is that it could well lead to a more nuanced understanding of how what we casually call “remorse” in humans shares qualities with, and also differs from, what some might call “remorse” in dogs.

It is my impression that human children more readily discriminate cases where they are responsible for damage from cases where the breakages are not their responsibility, but this is an empirical question. They also, as any parent knows, develop verbal behaviors in an effort to deflect their chastisement onto other individuals. These verbal abilities also enable humans to connect one experience of “remorse” to many others, not only of their own but also those of other people, including people they may never meet. This enriches the concept very greatly.

The account I am putting forward may take a moment longer to explain than just saying “remorse” but it is nonetheless more parsimonious because it does not require the postulation of any new principles – it relies on principles well established from other studies. In addition, it is a scientific explanation that leads to predictions and may be proven wrong. Maybe this is operant conditioning, not classical. Maybe it does not have anything to do with the species typical cowering posture to a dominant animal. All these are testable empirical hypotheses. “Remorse” is not. There is no science of remorse.

I am not concerned that this explanation in terms of conditioning and species-typical reactions is not the one that Darwin would have proposed. Darwin’s writings on animal psychology are now well over one hundred years old. No geneticist today appeals to Darwin’s notions of inheritance. Similarly, the terms in which Darwin discussed psychology are now seriously outdated. That does not make his central insights any less valid. Geneticists evince no embarrassment in talking about modern, empirically derived concepts of inheritance within a Darwinian framework, and comparative psychologists should feel no different in using modern, ob-

jective concepts of animal behavior within that same framework.

### Concluding Thoughts

Anthropomorphism comes very naturally to human beings. We must be continuously on our guard against it. Small children will label any self-propelled or animal-shaped object with human agency (Serpell, 2003). The combination of both qualities creates objects that even adults have difficulty not interpreting in human terms. However, anthropomorphism must be resisted. Its drawbacks remain the same as they have always been: mentalistic folk-psychological accounts of animal psychology have no useful role to play in a modern objective science. They are non-material explanations which are the products of folk psychology and as such are not amenable to objective study. As I put it once before, “the reintroduction of anthropomorphism risks bringing back the dirty bathwater as we rescue the baby” (Wynne, 2004). The study of animal cognition will only proceed effectively once it rids itself of pre-scientific notions like anthropomorphism.



**Figure 8.** Sybille (1993 – 2004). The author’s cat. After some years, Sybille indicated she was tired of having her thoughts interpreted anthropomorphically and expressed a desire to be considered a Cartesian automaton.

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