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Anthropomorphism is, at its most general, the assignment of human characteristics to objects, events, or nonhuman animals. Notably, belying this neutral definition is a non-neutral connotation to the word, and to the phenomenon it describes. Specifically, an "anthropomorphic" characterization is generally held to be an *erroneous* one: at best premature or incomplete, and at worst dangerously misleading. That an anthropomorphism is, further, *incorrect* as a description, is often assumed.

Anthropomorphizing is a natural human tendency, thought to be the result of a perceptual system designed to find order in a complex world. Contemporary humans tend, perhaps like our forebears, to interpret a landscape entirely free of human presence as thick with human faces: on a slab of rock, in the gnarl of a tree knot, in the waxing moon, in a pendulous flower. The lexicon used to describe the human body is pervasive in our descriptions of nature: the shoulder of a hillside, the arms of a tree, the fingers of a stream, the waist of a peninsula--all examples of what literary criticism calls "personification."

Of the greatest import to the present study of human-animal interactions are anthropomorphisms of animals as having attributes and mental states (especially cognitive and emotional states) similar to human attributes and mental states. Pets are regular subjects: a dog's low, rapid tail-wagging explained as guilt for eating a shoe; a cat rubbing against its owner interpreted as an expression of fondness. Wild animals are no less immune: two red-tailed hawks who have established residency atop a building on Fifth Avenue in New York City have been called "in love;" their journey an "odyssey;" and the male as "daring," "self-assured," and an "ambassador to the wild." Research in the recently developed field of cognitive ethology in essence accumulates empirical data on just the kinds of mental states that anthropomorphisms claim (without the backing of science): the purposes, feelings, motivations, and cognition of animals. Thus, the science and the attributions are interwoven. This is the form of anthropomorphism with which we will be most concerned in this essay.

Questions asked by scientists interested in the subject include: What is the history of our use of anthropomorphism? What does it mean--originally and by implication? Is it a bane or a blessing? Why do we anthropomorphize at all? All are addressed herein.

A brief history of anthropomorphism

Anthropomorphic representation dates at least to Paleolithic art of forty thousand years ago, when some drawings of animals included characteristically human features. Anthropomorphisms have appeared in human writings for thousands of years; reproach for such projections for nearly as long. The term originally referred to the blasphemous description of gods as having human forms. Indeed, religious scholars suggest that all religious systems include anthropomorphisms. Ancient societies similarly projected motives and emotions onto natural phenomena--angry winds, vengeful storms--and animals and natural events were often named and ascribed personalities. Later, even physics was influenced by an anthropomorphic teleology begun with Aristotle. A rock's tumble downward was described not as the result of a force between bodies,

but as the rock acting to achieve the desired end of being on the ground. Xenophanes (sixth century B.C.) is well documented as the first to give voice to the negative tone of anthropomorphism, to call it an error. Modern critiques date to seventeenth-century philosophers Francis Bacon and Benedictus Spinoza. In fact, the rise in modern science is matched by the diminishment and increasing censure of anthropomorphic descriptions of natural phenomena. Still, both ancient and modern literature and folk psychology are replete with anthropomorphic language. The characterizations of Aesop--the happy dog, the persistent tortoise, the industrious ant--resonate and endure today.

In current usage, anthropomorphism is tinged with the bad flavor that the anecdotalism of late-nineteenth-century scientists like Charles Darwin and George Romanes left in science's mouth. While on the one hand epitomizing "modern science," Darwin also embraced a classically anthropomorphic attitude toward animals. Based on anecdotes and personal experiences, Darwin and his followers ascribed everything from emotions to insight to animals with abandon--and the future sciences of zoology, biology, and ethology developed in reaction against their usage. A comparison of the languages of description makes the distinction clear. Darwin spoke of "ants chasing and pretending to bite each other, like so many puppies" (1871/448). A century later, a more typical description of the study of ants (taken from a biological research group's website) investigates "the presence of neurochemical mechanisms underlying the phenomena of social reward and social cohesion in ant colonies," and "the role of homo- and heterospecific social context in the control of the expression/suppression of ant behaviour." Similarly, while Darwin noted that dogs could be variously magnanimous and sensible, shameful and modest, sensible and proud, these words are notably absent from contemporary ethological descriptions of dogs.

Further conceptual considerations

The historical result, as we shall see, is the often presumptive dismissal of anthropomorphism. Recent writers have claimed it to be sentimental and sloppy, at once libertine and lazy. Before discussing the current debate about its use, a brief interlude to introduce some attempts to understand anthropomorphism as more a rhetorical device than a metaphysical assertion:

It could be argued that anthropomorphism (of animals) is a particular kind of metaphorical description--and it would profit from such a claim, as metaphor is granted an immunity in application not extended to anthropomorphism. "My love is a red, red rose" may in fact be an odd or unhelpful description of one's love, to some audiences, but it would not typically be subject to complaints that it is *prima facie* inappropriate. "My dog loves that little poodle", however, is taken as a claim with a different level of standards for acceptance.

A look at how anthropomorphizers or metaphorists might respond to challenges and questions about their use of language makes this clear. With an anthropomorphism of this kind, if a user is asked "Is your dog *really, truly* in love with the poodle?", the anthropomorphizer might assent--"Yes, he is"--or might clarify, "Well, I don't know that he *loves* her as much as just *lusts* after her." In other words, the anthropomorphizer ordinarily treats his claim as a literal claim, and addresses any challenge by maintaining the claim or by refining it to clarify his meaning. Any retreat from the literal claim ("Oh, I didn't mean he was *really, truly* in love with the poodle")

withdraws the entire assertion. It eliminates the anthropomorphism outright; it does not merely refine the trope.

By contrast, the metaphor-maker is *distinguishing* his usage from the literal meaning of the word. If asked "Is your love *really, truly* a red, red rose," the metaphorist surely replies, "No, not *really*"--and explains that he meant that she is vibrant like a rose, delicate like a rose, etcetera, but that the turn of phrase was not meant to be taken literally. The metaphor may be judged by listeners as "better" or "worse"--more or less poetic or evocative--, but not as a use of language to describe the world in a way that contemporary science might verify. Most anthropomorphizers of animals do not seem to be using words metaphorically, insofar as they are prepared to defend their language use as a strict literal use, and as making a claim which would be verified (or refuted) by the methods of science. In this way, though anthropomorphism sometimes uses images shared by metaphor-makers, it is otherwise distinct from metaphor.

More powerful is the proposal that anthropomorphism is less a straightforward factual claim than a form of analogy. Structurally, the claim of the attribution of poodle-love could be described as equivalent to an inference of the presence of analogous emotions, given a myriad of other (physical and behavioral) similarities between dogs and humans. In other words, the speaker may clarify, it may not be "love" per se, but it is *like* love: he follows her around, he wags his tail uncontrollably when she appears, he persists in attempting to mount her...and so on: more or less just like human love.

This is credible, although it does not exempt anthropomorphizers from criticism on factual grounds: even if the claim is more attenuated than originally thought, it is still (in most cases) without scientific support. And even if all anthropomorphisms are simply analogies relying on particular similarities between the target and the source, not all such analogies are anthropomorphisms: forming analogies between humans and other animals is regularly considered *nonanthropomorphic*. For instance, dissection of a sheep's brain in a class on human cognition is not taken to be an anthropomorphic activity. On the other hand, the protest outside the classroom airing claims about the suffering of the sacrificed sheep may be.

Arguments against and for anthropomorphism

Even as analogy, anthropomorphism earns disapproval from most commentators. This is unsurprising, given the long-term negative cast on such attributions. However, more recently a new debate has emerged in ethology and psychology over the phenomenon, matching, at its extremes, those who think that it is irredeemably erroneous and anathema to science against those who argue that anthropomorphizing is potentially useful. We will consider each position briefly.

The primary complaint heard extends the reaction to the anecdotalism of Darwin and others: anthropomorphism is not based in science. There is no objective theory formation or testing, no careful consideration of evidence; there is just unreflective application of human descriptions to non-humans. Anthropomorphism is a category error, some argue: the treatment of an entity (an animal) as a member of a class (things with minds) to which it does not belong; or the comparison of that entity to one (such as a human) belonging in a different category. Describing

a dog as feeling guilt is like saying that ideas are green. Those who assert that there are distinctively human traits might so argue: if the trait is, by definition, what separates humans from animals, then to treat an animal as possessing the trait is a logical error. If consciousness is a defining characteristic of humans, for instance, to claim consciousness in non-humans is a category mistake.

Indeed, some anthropomorphisms are clearly wrong for just these reasons. Happiness is commonly attributed to an animal on the basis of an upturn of the corners of its mouth; such a "smile," however, may be a fixed physiological feature (as for dolphins) or a sign of fear or submission, not happiness (as for chimpanzees). Similarly, a yawn is likely not a sign of boredom, as might be assumed by extrapolation from our own behaviors; instead, it denotes stress.

Still, the implied suggestion that any mental ability exhibited by human beings is necessarily exclusive to humans is itself presumptuous. A number of researchers are increasingly proposing a careful application of anthropomorphic terms to explain and to predict animal behavior. Interestingly, it is the professional observers of animals who often become, with exposure and despite their training, more likely to anthropomorphize. These advocates suggest that anthropomorphisms are not necessarily incorrect. On the contrary, they say, anthropomorphisms are used in reliable ways and are useful. The comparative psychologist Donald Hebb discovered, for instance, that taking pains to eliminate anthropomorphic descriptions resulted in a *diminished* understanding of the behavior of his chimpanzees. Anthropomorphisms, carefully applied, may be coherent guides to predicting the future behavior of animals.

The advocate suggests that to treat anthropomorphism as a category error is itself an error: its appropriateness relies on its correctness, and its correctness is an empirical question, not *a priori* determinable. The category error claim's insistence on the wrongness of shared predicates between human and nonhuman animals is a vestige of the faulty notion that humans are separate from animals. Finally, some argue that anthropomorphism is inevitable: an unavoidable result of viewing objects and animals from a human perspective. (Other defenders believe this inappropriately downplays a real human ability to perceive and detect subtleties removed from our own experience.) Regardless, the endurance of anthropomorphism indicates that it is worth examining anew.

Explanations for anthropomorphism

Why do we anthropomorphize? The question can be formulated in two ways: as a question of ultimate--evolutionary--causes, and as one of proximate--local--prompts. We begin with the former.

Anthropomorphism's endurance marks it as likely useful--or at least not irreparably harmful--in explaining and predicting animal behavior. Just as the developing child uses animism--the attribution of life to the inanimate--to make sense of the sensory chaos of his environment, anthropomorphism may have arisen as a strategy to make familiar an uncertain world. In normally developing humans, our characteristic propensity to attribute agency to others will become a theory of mind and will find use in social interaction. In the development of the human

species, anthropomorphism may have provided a means by which to anticipate and understand the behavior of other animals. With themselves as models, our human forebears could ascribe motivation, desire, and understanding to animals to determine with whom they may want to cooperate, from whom they should flee, or who they want to eat.

If there is an evolutionary explanation, we might expect other animals to engage in some version of the behavior. In fact, many do appear to attribute animal characteristics to inanimate objects or occurrences: what anthropologist Stuart Guthrie has called "zoomorphism"ⁱⁱ. In *The descent of man*, Darwin described his own dog growling and barking at an open parasol moving in a breeze, as though in the presence of "some strange living agent" (1871/67). Primatologist Jane Goodall observed chimps making threats toward thunderclouds. Other ethologists have noted animals shying from, stalking, or attempting to treat as prey or playmate a variety of natural objects. Nonhuman animals seem to be subject to a similar version of animistic perception as humans.

As with all stories of the evolution of a behavior, this one can not be empirically tested. It is naught but an appealing story. A final observation asterisks the notion of the universality of anthropomorphism: what gets called an anthropomorphism varies by culture. Xenophanes observed a cultural difference in describing gods (snub noses and black hair in one region, gray eyes and redheads in another). The twentieth-century philosopher Bertrand Russell noted, only partly in jest, that the results of behavioral experiments seem to show that animals studied by Americans solve problems through an exhausting if energetic process of trial and error, while German animals come up with the answer through quiet contemplation. While in contemporary Western cultures the human/animal divide is marked by cognition and a sense of self, Japanese culture places emotional experience as central to identification as human. Scientists of both cultures might find emotional attributions anthropomorphic, but some Japanese primate researchers describe their animals as having personalities, motives, and rich inner lives. All are verboten in Western science.

Proximate causes

Not every and not all animals are anthropomorphized: gorillas and dogs regularly are, but worms and manta rays rarely are. Some have suggested that frogs' lack of anthropomorphizable characteristics led to their dismal fate at the dissecting table when dissection was becoming a mainstay of biology classes. Why? The question as to the proximate causes may be framed thusly: What are the behaviors and physical features of animals which prompt us to anthropomorphize them?

The answer no doubt has much to do with the ease with which the animal can be mapped to the human: isomorphisms of features and similarities of movement. Aristotle noted the importance of self-locomotion to identification of an autonomous creature; in the last century, psychologists and ethologists have begun to investigate specifics. In 1944 psychologists Fritz Heider and Marianne Simmel published a now-classic paper showing that humans consistently told anthropomorphic stories to describe the behavior of geometric figures moving on a computer screen. They concluded that the timing of movements was integral to the humans' projective story-telling. More recent ethology has added contingent timing of behaviors, expressive facial and bodily reactions to others, and attention to gaze to the growing list of behavioral metrics.

Physically, phylogenetic relatedness accounts for some anthropomorphizing (e.g. of great apes and monkeys); simple ease of matching of parts may account for other differential treatment (an eel's lack of limbs, the facelessness of a limpet). In particular, discernable and flexuous facial features, the ability to form a mouth into a smile, and the ability to move the head expressively and reactively are reliable prompts to certain kinds of anthropomorphisms. Paleontologist Stephen Jay Gould and ethologist Konrad Lorenz both noted that animals with neotenized features--a large head and big eyes, for instance--may prompt affiliation and selection because these are features of human juveniles.

The future of anthropomorphism

Karl Popper proposed that hypotheses go through a process of Darwinian selection. Anthropomorphism is a prime candidate for consideration as one of these hypotheses that has survived a selection process for ideas, despite (or especially considering) scientists' struggle to replace it with behavioristic, non-attributional language. This claim does not imply that our survival as a species depends critically on the particulars of our anthropomorphisms--only that the particulars continue to beat out other explanatory theories.

The extended definition of anthropomorphism as erroneous is itself premature. What the claims of anthropomorphism *are*, often, is scientifically unproven, simply extrapolations from our own condition. This should not defame the claims on their face. The onus of science is to find means to confirm or refute these assertions. Hence the future treatment of anthropomorphism by science should include empirical testing of specific attributions. In the case of attributions of mental states, the process should include a deconstruction of the concepts attributed, and a determination of any behavioral correlates as well as what would count as confirming (or disconfirming) evidence of the presence of the attributional state.

A better understanding of what prompts anthropomorphism may yield other fruits. It may give us insight into what features are important to us in interacting with members of our own species. Further, we can look to anthropomorphisms humans make to natural objects to design robots which look and interact in ways which prompt our anthropomorphizing of them. Instead of faithful reproduction of the form and perceptual and social skills of humans--an enormous, possibly insurmountable task, as the field of Artificial Intelligence has discovered--one might focus on just those components of physical objects which lead to our anthropomorphizing: to just those behaviors which lend authenticity to a social interaction.

Finally, the status of anthropomorphism--and the content of the attributions--is relevant in the ongoing discussion of the role of animals in our society: their status as pets, their use as food and entertainment, and their treatment in medical and behavioral research. Ascribing personalities to animals is demonstrably more effective than raw statistics in getting the public's attention. And an analysis of the content--the work of cognitive ethology--will be relevant to the animal rights and animal law movements.

Historically, anthropomorphisms have been used to attempt to uncloak, demystify, or get traction in a domain unknown and perhaps unknowable--such as the subjective experience of an animal. In the domain of human-animal interactions, anthropomorphism might be best thought of as

attributions of human qualities to nonhumans not proven to bear these qualities. The science of anthrozoology may provide such proofs. Anthropomorphism will likely continue regardless.

Further Resources:

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ⁱ This term is unstable at the time of this writing: it is also used by other researchers with distinct meanings.