

Animal Issues

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If Horses Had Hands . . .

ABSTRACT

This paper examines the contentious and confused notion of anthropomorphism. Beginning with an overview of the term's etymology and present use, it examines the arguments of those who believe it to be unscientific and demeaning, and those who believe it to be an inevitable and useful pragmatic strategy. The German philosopher Heidegger (1937/1984) raises the more serious objection, though, that as a concept anthropomorphism is not even meaningful. Supplementing his argument with examples drawn from evolutionary theory and elsewhere, the paper concludes that use of the term, anthropomorphism, commits one to an undesirable anthropocentrism, which shackles thought concerning the possible relationships between human and nonhuman animal beings.

*But if horses or oxen or lions had hands
or could draw with their hands and accomplish such
works as men,
horses would draw the figures of the gods as similar
to horses,
and the oxen as similar to oxen,
and they would make the bodies
of the sort which each of them had.*

Xenophanes of Colophon, *Fragments*, p. 25²

The term, anthropomorphism, Greek in etymology, originally referred to the practice of attributing human form or traits to the deities. Xenophanes' fragment usually is taken to be a wry criticism—perhaps aimed principally at Homer—of this fanciful tradition. Characterizing the divine as an assortment of capricious and petulant individuals, Xenophanes seems to be suggesting, is laughable and rather naïve. His contention that cattle, lions, or horses, given the opportunity, would project their likenesses in a similarly parochial fashion in effect is a kind of *reductio ad absurdum*.³ The Christian anthropomorphite heresies of the fourth and tenth centuries similarly were condemned for their overly literal reading of certain biblical passages “His all-seeing Eye,” “His everlasting Arms” and for their ensuing attribution to God of a corporeal form (Herbermann et al., 1907/1914).

It was not until the mid-nineteenth century that the term, anthropomorphism, moved closer to its contemporary meaning and began to refer to the practice of attributing human characteristics to entities other than deities, such as abstract ideas or “anything impersonal or irrational” (Murray 1986, p. 513). This came to include animals. One of the earliest recorded uses in this sense occurs in Lewes (1858), in which the author warns against attributing “vision” or “alarm” to molluscs (pp. 255, 341).⁴ “As we are just now looking with scientific seriousness at our animals, we will discard all anthropomorphic interpretations,” he says. Lewes's caution, and his use of the term, anthropomorphic, to identify that caution, was the beginning of a particular kind of vigilance that has endured and, indeed, flourished both in scientific and philosophical discourse.

Three Ways

Today, the term, anthropomorphism, tends to be used in any one of three distinct ways. With decreasing regularity, it is employed, in its very literal sense, to refer to the practice of attributing physical human form to some nonhuman being, as did the Christian anthropomorphite heretics.

Second, it refers to the over-enthusiastic attribution of distinctively human activities and attitudes to real or imaginary creatures, a practice frequently encountered in children's stories. Rupert the bear (Bestall, 1970) and his chums, anthropoid one-and-all, invariably dress in carefully pressed jerseys

and blazers and enjoy flying kites, foxing dastardly pirates, and solving all manner of seemingly impenetrable mysteries.

The third use is the one most frequently encountered in scientific and philosophical literature and refers to the practice of attributing intentionality, purpose, or volition to some creature or abstraction that (allegedly) does not have these things. This particular charge of anthropomorphism is frequently leveled at dotting animal behaviorists or sloppy evolutionary theorists who are careless in the terminology they employ. The suggestion that a particular aspect of a species has been “designed” by evolution or that evolution has been vitalistically or teleologically “working toward” some ideal type, fall under this heading.⁵

Objectors and Objections

It has tended to be those intent on what Lewes (1858) called “scientific seriousness” who have objected most to anthropomorphic language in the discussion of animals. The neo-behaviorist Kennedy (1992) who has been one of the most consistent and vocal critics of anthropomorphism, has objected to it precisely because, he says, it is unscientific.⁶ Amounting to a kind of modern day animism, or vitalism (pp. 3, 4, 9, 13,14, 157, 159) anthropomorphism assumes more than it explains by unthinkingly attributing all manner of mental states to animals (self-awareness, thought, purpose, mental images) without demonstrating that these states exist (pp. 157-160). In short, Kennedy argues, when looking at animal behavior, anthropomorphism confuses function with cause (p. 166). As such, it is a fatal mistake for any inquiry (p. 31) and a drag on the study of the true mechanisms behind animal activities (p. 5).⁷

Even beyond any narrowly defined scientific endeavor, though, there is a sense in which anthropomorphism always is seen as a mistaken approach. Implicit within the very concept of anthropomorphism is the idea that uniquely human traits are being attributed to creatures or beings to whom they do not belong. Indeed, if it were believed that the traits in question actually might be shared, if God or molluscs might have that particular quality or characteristic in common with humanity, there would be no need to draw attention to this state of affairs with such a unique and highly specific term: The inquiry would be an open question concerning degrees of commonality (we

will return to this in a moment). Anthropomorphism, as the reckless assignation of human traits to the brutes, is a projection, a kind of fetishism entirely inappropriate in any genuinely analytic enterprise. The very suggestion that a theory or approach is anthropomorphic is, implicitly, always an accusation.

There appear to be two distinct hazards here. On the one hand, such anthropomorphism is in danger of demeaning humans by failing to appreciate their unique traits. The popular science writer Budiansky (1998) refers to the “wonderful gift and . . . wonderful curse” that is consciousness, which “all the evidence suggests, is not in the realm of the sentient experiences of other creatures.” (pp. 193-194). Anthropomorphism risks misrepresenting what is distinctive, and perhaps even superior, in humanity. On the other hand, it might be argued, we are not doing any favors to the animals. By focusing on what the nonhuman animal shares with the human one, we are in danger of missing all that is peculiar and proper to the animal. “We try so hard to show that chimpanzees, or monkeys, or dogs, or cats, or rats, or chickens, or fish are like us in their thoughts and feelings; in so doing, we do nothing but denigrate what they really are.” (Budiansky, 1998, p. 194)⁸

An Equine Example

An oft-recounted equine example furnishes a good illustration. At the beginning of the twentieth century, in Berlin, Wilhelm von Osten, an elderly schoolmaster, presented to the public and scientific community a horse who, he claimed, possessed extraordinary mental abilities, approaching those of a human being. Clever Hans, as he was known, communicated with his caregiver (master)—and with anyone else who cared to make his acquaintance—by tapping his right forehoof an appropriate number of times or by nodding or shaking his head to indicate yes and no. Among his many feats were the ability to pick out colored cloths, tell the time, solve complex mathematical equations, identify musical intervals and scores, read and spell (though, admittedly, in German only), and even answer questions about European politics (Pfungst, 1911/1965, pp. 18-24).⁹

In Pfungst (1911/1965), Rosenthal reports that a hoax was suspected. However, a committee of 13 respected professionals—including a psychologist, a phys-

iologist, a veterinarian, a director of the Berlin zoo, and a circus manager—certified that Hans was not responding to cues, intentional or otherwise, from his trainer or any other person. Incredible though it seemed, Hans appeared to possess a power of abstract thought uncannily close to that of humans, and pretty well educated humans at that.¹⁰

After extensive and meticulous experimentation by Pfungst (1911/1965), the psychologist charged with the task of undertaking a serious scientific inquiry into Hans' abilities, it was found eventually that questioners were, by means of their body language, unconsciously providing subtle, almost undetectable, cues to which Hans was responding. As Hans tapped his hoof, observers tended to tense up very slightly in anticipation of the correct answer. When he reached the right number of taps, they relaxed or provided other inadvertent cues, which he noticed.¹¹ This finding was taken to indicate that Hans was exhibiting none of the complex cognitive faculties that had been claimed for him, and the case since has been considered a cautionary tale for animal behaviorists.

This rather perverse conclusion ignores that Hans actually was demonstrating a fantastically keen ability to read the attitudes and behaviors of those around him, an ability far exceeding that of the trained human scientists conducting the experiments. In fact, Hans was so good at this that even when Pfungst (1911/1965) had discovered what was going on, and intentionally tried to suppress his own cues, Hans still was able to ascertain the correct answers (p. *xii*). The anthropomorphic attitude, shared by Hans's enthusiasts and detractors alike, blinded them to his truly impressive talents. Hans may not have had hands, but he was clever after his own fashion, and the error had been to characterize his abilities in terms of human accomplishments.

The objections to anthropomorphism, which argue that it demeans both human and animal, suggest, then, that significant differences between the two are being ignored. Derrida (2002), the philosopher who, above all others, has sought to highlight diversity and heterogeneity, has suggested that flouting *this* difference would be a "stupid memory lapse," would be just "too asinine" (*bête*) (p. 398). Anthropomorphism is a disservice both to man and to beast and an affront to true scientific or philosophical thought.

Discussion

Responses and Defenses

There have been two main responses to these attacks on anthropomorphism. First, it has been argued that discussion of animals inevitably will involve anthropomorphism and that it is not something about which we should complain too loudly. Kennedy (1992) has emphasized this point. He suggests that anthropomorphic thinking is “. . . built into us,” and that we could not abandon it even if we wanted to.

It is dinned into us culturally from earliest childhood. It has presumably also been “pre-programmed” into our hereditary make-up by natural selection, perhaps because it proved to be useful for predicting and controlling the behaviour of animals. (pp. 5, 28, 29, 31, 167)

Budiansky (1998) also suggests that anthropomorphism is a hardwired, evolved trait, arguing that,

. . . (n)atural selection may have favoured our tendency to anthropomorphize . . . Being good at thinking ‘what would I do in his position’ can help us calculate what our rivals may be up to and outsmart them . . . (O)ur tendency to anthropomorphize the animals we hunt may have given us a huge advantage in anticipating their habits and their evasions. (p. xviii)¹²

This explanation of the inevitability of anthropomorphism, and the evolutionary advantage that it bestows, suggests a second potential defense of anthropomorphism.

The psychologist Burghardt (1985) has suggested that “anthropomorphism can be a pragmatic strategy” which “aids in formulating testable hypotheses” (pp. 916, 905). Excessive rigor in avoiding potentially misleading terminology leads, he suggests, to rigor mortis in devising pertinent questions; therefore, researchers should feel free to ask, “‘Well, if I were a rat faced with this problem what would I do?’” or “‘Does that monkey want his rival to think there is a leopard in that tree?’” (p. 916).¹³ The data used in formulating working hypotheses should arise, Burghardt argues, from all manner of sources, including one’s own prior experience, anecdotes, imagining being

the animal, insight from observing one's maiden aunt (p. 917). Burghardt calls this "critical anthropomorphism." He suggests that it is both useful and healthy for the purpose of speculative enquiry—just so long as we remember that we are not seeking to verify postulated characteristics or attributes but are using this strategy as an exploratory, investigative tool (pp. 916-918).

Variations on this pragmatic approach are recommended by the primatologist de Waal (2001) who calls it "heuristic anthropomorphism"¹⁴ and the philosopher Dennett (1987, 1996, pp. 35-54) who calls it "the intentional stance." Even Kennedy (1992, pp. 9, 158, 159) and Budiansky (1998, pp. 33-36), who call it "mock anthropomorphism," consider it a useful "metaphorical" mode of thinking about the development of particular species or of the processes of evolution. These writers, however, issue stern warnings about the danger of conflating anthropomorphic language with anthropomorphic thinking.¹⁵

A More Fundamental Question

Both the objections to anthropomorphism (that it denigrates man and animal) and the responses they have elicited (that it is inevitable and informative) are superseded, or rather preceded, by a more fundamental question. This concern, which renders problematic the very notion of anthropomorphism, has been articulated most clearly by Heidegger (1937/1984).

During his second lecture course on Nietzsche, Heidegger (1937/1984) points out that, in order even to raise "suspicions" (*Bedenken*) concerning anthropomorphism, one must assume that one knows "ahead of time" what human beings are (pp. 98-105).¹⁶ To be able to claim that a characterization or representation of some being assigns to it a quality or state that is distinctively human, one would need to know just what it is about human beings, in themselves that makes them the kind of beings they are.

However, this question concerning the nature of human beings, the question "who is man," is one that, according to Heidegger (1937/1984) rarely is properly asked and certainly has not been answered satisfactorily. Without posing and answering this question, any suspicions concerning "humanization," as well as all refutations tendered, do not make sense. They amount, says Heidegger, to mere "idle talk" (*Gerede*), to "superficial and specious discussion" (p. 102).

Heidegger (1937/1984) is right to argue that the claim that anthropomorphism is a potential danger, for philosophical enquiry depends on far more than has been adequately established. This is true of anthropomorphism both as a term and as a concept, if we can separate the two for a moment.

There can be no doubt that there are certainly cases when behavior that might usefully be described as distinctively human is attributed to animals. Rupert already has helped establish this much for us (Bestall, 1970). It is unfortunate, however, that a special term—anthropomorphism—has been appropriated to describe this practice. An asymmetry is in place here that renders the expression prejudicial. What of those occasions when behavior characteristic of bears is attributed erroneously to humans? Or to wolves? Or fish? How often does one encounter accusations of “arktomorphism”?¹⁷

Terminology

That there are no equivalent terms for other species seems to imply that there is something rather special about humans, bursting as they are with a whole host of unique qualities that we cannot resist attributing to other beings. If occasion arises when it seems important to point out that bears really do not indulge in the kinds of activities practiced by Rupert (Bestall, 1970), it would perhaps be more informative, and less hasty, to draw attention to these errors in their specificity (“hang about, real bears don’t wear clothes!”), rather than unnecessarily entangling the revelation in rather loaded terminology. My suspicion is that simply by employing the term, anthropomorphism, one already has adopted a set of unexamined assumptions about human beings and begun to engage in Heidegger’s (1937/1984) *Gerede*.

The objection here is to more than just the terminology. We can, in fact, go further than Heidegger’s (1937/1984) claim that we have not yet adequately answered (or even asked) the question “who is man?”. The designation of any quality or attribute as distinctively human, a designation required by the concept of anthropomorphism, is unwarranted, I would argue, even were we able, by means as yet unknown, to identify a characteristic or attribute as being uniquely human.

Convergent Evolution

It is dangerous and misleading to suppose that attributes or behaviors “belong” to the creatures who display them, even in those cases where these creatures seem to be the only ones who exhibit a particular quality. This point perhaps is demonstrated best by an example of convergent evolution, the phenomenon whereby the same adaptation is evident in entirely unrelated creatures.

Bats (order *Chiroptera*) are well-known for their distinctive means of navigation: sonar, also known as echolocation.¹⁸ This ingenious ability is so different from anything experienced by humans that it has prompted the philosopher Nagel (1974) to claim, notoriously, that it literally is impossible for us to imagine what it is like to be a bat (pp. 435-450).¹⁹

As Dawkins (1986) has pointed out, sonar by no means is unique to bats. It has evolved, independently, in two different genera of birds; in dolphins, and whales and, to a lesser extent, in shrews; rats; and seals. Even in bats, it probably has evolved on two separate occasions, in two distinct groups (pp. 94-107).²⁰ It was suspected in the eighteenth century and confirmed in the 1930s that bats could “see with their ears,” although not until the 1950s was this verified in dolphins (Fenton, 1998, pp. 24-27).

This contingent historical fact, concerning the order in which different instances of sonar were discovered, thankfully, gave scientists no reason to suggest that dolphins are *chiropteramorphic*. That a trait has been identified in only one class of creatures thus far is no guarantee it is unique to that class of creatures: bears, bats, or life forms more alien still.²¹ That the only creatures who have been observed exhibiting trait *x* are human beings does not justify the claim that trait *x* is fundamentally and uniquely human, no matter how clever or intellectually advanced it is.

It is not inconceivable that aliens might land tomorrow who engage in all kinds of activities and behaviors that had, up until that point, only appeared on earth when humans practiced them. It would be a little perverse to claim, I think, that those extra-terrestrials were presumptively anthropomorphic in their behavior, especially if it subsequently turned out that they had evolved those same advanced traits and abilities long before the ancestors of *homo sapiens* had thought to come down from the trees.²² Better, at this stage at

least, to recognize and identify the quality in its own right and to leave as an open or empirical question its instantiation (or not) in a diversity of beings.²³

Anthropocentrism

Anthropomorphism, both as term and concept, starts with the human, even though the whole question of the nature of the human has yet to be determined. Anthropomorphism as a notion, in short, is anthropocentric in a very particular sense. This variety of anthropocentrism is not one that necessarily implies human superiority. We need not understand the various species—the mollusc, the bat, the bear, the dolphin—as existing in some kind of hierarchy, at whose summit Man sits. But by invoking anthropomorphism as a term, one inevitably is committed to thinking, Man “first.” By relying on anthropomorphism as a concept, one places the human foremost. The “centrism” of which one is guilty is considered best, then, not in spatial terms, as a hierarchy, but in temporal terms, as a pre-eminence. *Anthrôpos* is central not in the sense that he is higher but in the sense that he is primary.

Anthropocentrism is a kind of species narcissism, an obsessive love of self. Just as the narcissist is self-absorbed, self-centered, so the anthropocentrist is species-centered (anthropocentric). Anthropocentrists, like Narcissus, have eyes only for themselves. This first-and-foremost anthropocentrism, this species-narcissism, which far too often is evident in philosophy,²⁴ is the foundation on which the notion of anthropomorphism rests and is, in turn, sustained by its continuing invocation.

Summary

Those who believe in anthropomorphism, those who see it about them in the discourses of science and culture, whether they are the Kennedys and Budianskys who desire to eliminate it, or the DeWaals and Burghardts who see a need to preserve it, are, we might say, modern day anthropomorphites. These anthropomorphites see animals being transformed, being given human form. They believe they see a transmutation, a metamorphosis, taking place: the Animal cast in the image of Man. With this belief, they maintain a faith in an originary distinction between Human and Animal. Like their medieval forebears, their perspective on the world starts with the human.

Anthropomorphism breezes over the awkward question concerning the nature of the human, or rather, it implicitly takes this question to have been answered. It dashes on to examine animals afterward, in second place, as if humanity and animality were not conceptualized and constituted mutually and simultaneously. This first-and-foremost anthropocentrism never should be our starting point. If, by relying on the notion of anthropomorphism, we preclude the possibility of recognizing or discovering new kinds of human-animal continuity, we are condemned to a particular kind of anthropocentrism that restricts what we can think both about human being and the being of other animals. If, on the other hand, we suspend this assumption, this implicit and uncritical prior belief in human uniqueness, the very notion of anthropomorphism fails to make sense. Budiansky (1998) a thorough-bred anthropomorphite, suggests that anthropomorphism betrays a “lack of imagination” on our part as we struggle to imagine what it would be like to be something else (p. *xvii*). Perhaps it is truer to say that the very belief in anthropomorphism betrays a lack of imagination on the part of those so thoroughly wedded to the idea that they are, first-and-foremost, human.

Notes

- ¹ Correspondence should be sent to Tom Tyler, Centre for Cultural Studies, University of Leeds, Old Mining Building, Leeds, West Riding of Yorkshire, LS2 9JT, UK, email: panpaniscus83@hotmail.com.
- ² Bertrand Russell once made a similarly sardonic observation regarding, not animals but the psychologists who study them: “Animals studied by Americans rush about frantically, with an incredible display of hustle and pep, and at last achieve the desired result by chance. Animals observed by Germans sit still and think, and at last evolve the solution out of their inner consciousness.” (Russell, 1927, p. 33).
- ³ See Holtsmark (1994, p. 6B). Hume (1779/1977) has Philo, in a similar spirit of gentle mockery, imagine a parallel scenario in which, on “a planet wholly inhabited by spiders (which is very possible), the idea that the world is spun from the bowels of an ‘infinite spider’ is taken seriously” (p. 51). For a more cautious reading of Xenophanes’ tantalizing fragment, though, see Leshner (1992, pp. 24-25, 89-94).
- ⁴ Murray et al. (1986) cite this text cited in the *Oxford English Dictionary* (p. 513). It also is briefly discussed in Midgley (1983, pp. 128-129).
- ⁵ For a fascinating discussion of evolution and “design,” which meticulously avoids this pitfall, see Dennett (1995), especially Part I.

- ⁶ Kennedy (1992) seems unsure whether anthropomorphism is best characterized as a virus in need of a cure (pp. 160 and 167) or vermin that should be driven underground (p. 157); but by all accounts, his antipathy is unequivocal.
- ⁷ The claim that animals are conscious is not a scientific one, Kennedy (1992) asserts, because it cannot even be tested (p. 31).
- ⁸ Note that this objection to anthropomorphism on the grounds that it demeans animals is not quite the same as that which sometimes is encountered in relation to chimps' tea parties or similar performing animals. Such protests, well-founded though they are in their own terms, do not constitute an argument against anthropomorphism per se, since they fail to apply to performances that do not so obviously demean an animal, e.g. cinematic representations of faithful collie dogs adept at child rescue. For an illuminating discussion of chimps' teaparties, (de Waal, 2001, pp. 1-5).
- ⁹ For brief discussions of both Hans and Pfungst, see Budiansky (1998, pp. xxx-xxxv) and Griffin (1992, pp. 24-26).
- ¹⁰ "Experienced educators" declared his development to be equivalent to that of a human child aged about 13 or 14 (Pfungst, 1911, p. 24).
- ¹¹ Pfungst (1911) actually constructed an elaborate instrument to amplify the questioner's head movements and measure their respiration. Rosenthal, in Pfungst (p. xii).
- ¹² Kennedy (1992) and Budiansky (1998) get themselves into something of a pickle here. On the one hand, they both are inclined to suggest that the predisposition to anthropomorphize is "hardwired" (genetically determined). Kennedy even calls it "human nature" (p. 155). On the other, though, they both are of the opinion that we should try our damndest to transcend this decidedly unscientific inclination (see Kennedy, pp. 160-168 and especially Budiansky, pp. 192-194). They are rather vague as to precisely how we might engage in this literally superhuman overcoming though, a point that the primatologist (de Waal, 2001, p. 68) delights in pointing out the contradiction here seems to arise from a clash between competing objectives. As serious-minded scientists, they seem to feel obliged to provide a plausible (*i.e.* genetic) explanation for humankind's evident and persistent anthropomorphism. But, as card-carrying humanists, they also seem bound to assert the possibility that humans can transcend this genetic programming (in order the better to pursue the goal of scientific objectivity, of course). Kennedy (1992) manages to suggest that the disease that is anthropomorphism both is and is not incurable (pp. 167 and 160, respectively).
- A further paradox arises when we think a little harder about their claim that this particular form of "teleological" or "goal-directed" thinking, as Kennedy (1992) characterizes anthropomorphism (pp. 28, 29) as an evolved trait (as any geneti-

cally determined aspect of a species must be). This necessarily implies that our non-human ancestors also must have engaged in this form of thinking in some (proto?) form or other. Given that this “speculative forecasting” is supposed to be a uniquely human characteristic (pp. 31, 167), Kennedy is forced now to accept either one of two equally unpalatable conclusions. Either he is hoisted by his own petard because, by his own account, to attribute uniquely human attributes to nonhumans is a clear case of anthropomorphism. Or, he must concede that foresight and “teleological thinking” are not, in essence, uniquely human attributes, and that therefore the very charge of anthropomorphism is here ungrounded.

- ¹³ His rigor mortis quip (p. 908) is borrowed from Griffin (1981).
- ¹⁴ deWaal (2001) identifies three types of anthropomorphism—*animalcentric*, *anthropocentric*, and *heuristic* (pp. 74-78, 37-42, and 320-321).
- ¹⁵ Though none of these authors seem to be unaware of the fact, it was Kant (1783/1953) who initiated this rather pragmatic approach to anthropomorphism. Kennedy (1992) and Burghardt (1985) believe that, provided we are sufficiently wary, we can indulge in a little anthropomorphism—the better to understand the principles of evolution. Kant suggests that it is beneficial to study nature (or the Author of the world) as if it had systematic and purposive unity (desires, volitions, understanding). This “subtle anthropomorphism”, as he calls it, is a useful regulative principle of speculative reason, provided we remember that we are only applying an idea of such a being, not establishing knowledge of it (Kant, 1964, B pp. 728, 729 568, 569). See also his discussion of “symbollic anthropomorphism” (1953, §§57-8/pp. 123-8).
- ¹⁶ Heidegger (1937/1984) used the terms, *Vermenschung* and *Vermenschlichung*, translated by Krell as humanization and anthropomorphism, respectively.
- ¹⁷ The *Oxford English Dictionary* includes an entry for *zoomorphic*, a general term intended to cover any and all cases in which “the form or nature of an animal” is attributed to something, though even this is used principally only of “a deity or superhuman being” (Murray, 1986, p. 824).
- ¹⁸ For accessible accounts of bat sonar see Dawkins (1986, pp. 21-37), or, more concisely, Fenton (1998, pp. 27-32).
- ¹⁹ For a range of replies, see the sustained discussion in Dennett (1991, pp. 441-448); a rather quirky response by Hofstadter in Hofstadter & Dennett (1981, pp. 403-414); and a speculative but illuminating treatment by Dawkins (1986, pp. 33-36).
- ²⁰ Dawkins (1986) also points out that, *pace* Nagel, even (blind) humans make some use of echoes in order to find their way about (p. 23).
- ²¹ For a lively discussion of the “how and why” questions of convergent evolution, with intriguing examples, see Gould (1980), or Dawkins (1986, pp. 94-109). Both writers point out that, strictly speaking, even the most remarkable cases of

- convergent evolution do not result in absolutely (genetically) identical adaptations. But the convergence frequently is so close in entirely unrelated species that only willful pedantry would insist that the functions were different in each case.
- ²² Exactly when this “descent” occurred has been a matter of intense debate. Gould (1985) manages to combine discussion of convergent evolution and the existence of extra-terrestrial intelligence in his essay. Briefly, he suggests that the existence of the former (on earth) makes the latter (elsewhere) a possibility.
- ²³ Midgley (1983) develops this point more fully when she discusses the possibility of understanding moods and feelings in both human and nonhuman creatures (pp. 129-133).
- ²⁴ It is characteristic, for instance, of a certain hasty phenomenology that inscribes *too* quickly a distinction between “humanity” and “animalist.” (Bataille, 1989, pp. 17-25; Heidegger, 1995, pp. 176-273).

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