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# Animal Ethics and the Scientific Study of Animals: Bridging the “Is” and the “Ought”

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# Essays in Philosophy

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## Animal Ethics and the Scientific Study of Animals: Bridging the “Is” and the “Ought”<sup>\*\*</sup>

**Abstract:** From ancient Greece to the present, philosophers have variously emphasized either the similarities or the differences between humans and nonhuman animals as a basis for ethical conclusions. Thus animal ethics has traditionally involved both factual claims, usually about animals’ mental states and capacities, and ethical claims about their moral standing. However, even in modern animal ethics the factual claims are often scientifically uninformed, involve broad generalizations about diverse taxonomic groups, and show little agreement about how to resolve the contradictions. Research in cognitive ethology and animal welfare science provides empirical material and a set of emerging methods for testing the plausibility of claims about animal mentation and thus for clarifying the interests and needs of animals. We suggest that progress in animal ethics requires both philosophically informed science to provide an empirically grounded understanding of animals, and scientifically informed philosophy to explore the ethical implications that follow.

### Introduction.

As human opinion wavered from century to century, two distinct attitudes toward beasts have stood out prominently. Sometimes men have held the anthropomorphic view that animals and men are very much alike, with the same emotions and similar mental powers...At times other men have held stubbornly to the anthropocentric opinion that this is a man’s world and that an unbridgeable chasm yawns between the human race and the other species. <sup>3/4</sup> Dix Harwood, *Love for Animals and How It Developed in Great Britain* (1928)<sup>1</sup>

The history of animal ethics in Western discourse, Harwood advises us, demonstrates an enduring tension between those who emphasize the similarities between humans and other species, and those who emphasize the differences. And, as he went on to demonstrate, historical changes in factual beliefs about the similarity of humans and animals were accompanied by changing ethical beliefs about the moral standing of animals.

### The Historical Debate.

The disagreement dates back to ancient Greece. Sextus Empiricus, an important figure in the development of the Greek school of philosophical skepticism, reported the Pythagorean side of the debate:

Pythagoras and Empedocles and the rest of the Italians<sup>2</sup> say that we have a fellowship not only with one another and the gods but also with the irrational animals.<sup>3</sup> For there is a single spirit which pervades the whole world as a sort of soul and which unites us with them. That is why, if we kill them and eat their flesh, we commit injustice and impiety, inasmuch as we are killing our kin.<sup>4</sup>

The most detailed account of the Pythagorean view came from the fourth-century neo-Platonist Porphyry. He opposed the Stoics who, he says, deny all reason to other species,<sup>5</sup> whereas, for Porphyry, the difference in reason between humans and animals:

appears to consist, as Aristotle somewhere says,<sup>6</sup> not in essence, but in the more and the less... It does not follow, if we have more intelligence than other animals, that on this account they are to be deprived of intelligence; as neither must it be said, that partridges do not fly, because hawks fly higher...brutes are rational animals, reason in most of them being imperfect. Since, however, justice pertains to rational beings as our opponents say, how is it possible not to admit, that we should act justly toward brutes.<sup>7</sup>

The “opponents” cited by Porphyry were the Stoics who, in Porphyry's view, insisted that we share no relevant common attributes with animals that would oblige us to treat them with justice. The earliest recorded statement of this kind came from the fourth century BC historian Xenophon, who, in his *Memorabilia* (I, iv, 2), has his friend Socrates proclaim man corporeally unique “in possessing erect posture, hands, speech, sexual appetite ‘unbroken to old age,’” and psychically unique “in his knowledge of the gods, ability to anticipate and therefore provide against hunger and thirst, cold and heat, and in his ability to learn.”<sup>8</sup> Accordingly, Xenophon tells us, God has a special love for man, and “the beasts are born and bred for man’s sake.” (IV, iii, 9-12). Similarly, the Roman emperor and Stoic philosopher Marcus Aurelius maintained that only humans are rational, social, and capable of, and hence entitled to, justice. The animals are entitled to generous treatment and no more: “As to the animals which have not reason...do thou, since thou have reason, and they have none, make use of them with a generous and liberal spirit. But toward human beings, as they have reason, behave in a social spirit...”<sup>9</sup> To the animals we have an obligation which arises from the generosity of the human spirit; to our fellow humans we have a far greater obligation which arises from our common rational nature and kinship.

The debate has continued throughout the history of Western thought. In the Middle Ages St. Augustine announced in distinctly Stoic vein in *The Catholic and Manichaeon Ways of Life* that “we see and appreciate from their cries that animals die with pain. But man disregards this in a beast, with which, as having no rational soul, he is linked by no community of law.”<sup>10</sup> By contrast, William Langland in *Piers the Ploughman* lauded the superior reason of the animals. Having commented on how he learned to love his Creator from the lessons taught by the animals, and how he was in awe of their accomplishments, he concluded: “Yet the thing that moved me most, and changed my way of thinking, was that Reason ruled and cared for all the beasts, except only for man and his mate; for many a time they wandered ungoverned by Reason.”<sup>11</sup> If, for Langland, it was reason in animals that requires our consideration for their interests, for St. Bernardine of Siena it was their morality: “Look at the pigs who have so much

compassion for each other, that when one of them squeals, the others will run to help...And you children who steal the baby swallows. What do other swallows do? They all gather together to try to help the fledglings...Man is more evil than the birds.”<sup>12</sup>

In the Renaissance the battle lines were firmly drawn. For example, René Descartes claimed that animals are fundamentally different from humans in being only “extended things” (*res extensa*), while humans are, in addition, “thinking things” (*res cogitans*). In the *Second Meditation*, for example, he wrote:

I may by chance look out of a window and notice some men passing in the street, at the sight of whom I do not fail to say that I see men...and nevertheless what do I see from this window except hats and clothes...? But I judge that they are men and thus I comprehend, solely by the faculty of judgment which resides in my mind, that which I believed I saw with my eyes.<sup>13</sup>

To Descartes, mere animals possess no such faculty of judgment. This proved an affront to the logician and Catholic priest Pierre Gassendi. He had already declared: “I restore reason to the animals; I find no distinction between the understanding and the imagination.”<sup>14</sup> Now he took Descartes firmly to task. The dog, he insisted, “also perceives that a man, or his master, is hidden under the hat and clothes, and even under a variety of different forms...if likewise a dog realizes that there is a man underneath when he sees nothing but his hat and clothes, is it not true, I say, that you should also think that the existence of a mentality like yours is evidenced by the dog.”<sup>15</sup> For Descartes, the animals’ lack of rationality permitted their exploitative use in animal experimentation. By contrast, Gassendi argued that their possession of rationality increased our responsibilities toward them: “There is no pretence for saying that any right has been granted to us by [moral] law to kill any of those animals which are not destructive or pernicious to the human race.”<sup>16</sup> In a letter to his friend Johann van Helmont, he even went so far as to argue a good case for vegetarianism,<sup>17</sup> though it seems unlikely he followed his own prescriptions.

Notoriously, in the Enlightenment era, Immanuel Kant announced the categorical imperative, but declared animals incapable of benefiting from it. Thus in the *Foundations of the Metaphysics of Morals* (1785), he formulated the imperative as: “Act in such a manner that you treat humanity, both in your own person and that of any other, always as an end and never solely as a means.”<sup>18</sup> Despite his claim that “we can judge the heart of a man by his treatment of animals,” our duty is toward ourselves and our character, not toward the animals themselves. For Kant, “Animals are not self-conscious and are there merely as a means to an end. The end is man.”<sup>19</sup> By contrast, Johann Wolfgang Goethe borrowed the categorical imperative to accommodate the interests of animals. Convinced as he was, partly based on his anatomical investigations, that human-animal parallels were complete, save for the human possession of a moral sense,<sup>20</sup> which he regarded as a cultural acquisition, Goethe concluded in his *Metamorphose der Tiere* that “Each animal is an end in itself” (*Zweck sein selbst ist jegliches Tier*).<sup>21</sup> This was in direct imitation of one of Kant’s formulations of the imperative: “Humankind and in general each rational being exists as an end in itself,” as *Zweck an sich selbst*.<sup>22</sup> Correspondingly in *Faust: Part Two* he tells the godhead: “You lead the ranks of living

creatures before me/ To teach me to know my brothers/ Of the still bush, the air, and water.”<sup>23</sup>  
The kinship of animals with humans requires a corresponding obligation on our part. Each animal is to be treated as an end in itself.

Thus, although the criteria of relevance have not always been the same — varying from reason to kinship to a moral sense to sociality to a common soul to self-consciousness — writers through the ages have disagreed about whether humans and other species possess similar relevant attributes, usually seen as mental attributes; and this claim about the nature of animals has usually determined whether, or how much, other species are entitled to moral consideration.

### **The Modern Debate.**

Modern approaches to animal ethics display a similar tension. On the one hand, some ethicists attribute characteristics to animals that are similar to those of humans and propose that animals and humans should be treated with the same principles of equality, rights and justice. To take a standard example, Peter Singer used two criteria — behavioral signs of pain, and possession of a nervous system similar to that of humans<sup>24</sup> — to identify a broad class of animals that he considered to be capable of suffering, and on this basis he proposed “extending the principle of equality to nonhuman animals.”<sup>25</sup> Similarly, David DeGrazia argued that many animals (including all vertebrates) are sentient and hence worthy of moral concern.<sup>26</sup> His argument began with human phenomenology which helps “categorize mental states and informs us of what they feel like,”<sup>27</sup> and he argued that we can conclude that animals share the same states based on Singer’s two criteria plus a third: that the mental state in question serves an important biological function for the animal in its particular environmental niche. Tom Regan painted a rich and human-like portrait of the mental lives of animals, claiming that they — at least “mentally normal mammals of a year or more”<sup>28</sup> — possess:

beliefs and desires; perception, memory, and a sense of the future, including their own future; an emotional life together with feelings of pleasure and pain; preference- and welfare-interests; the ability to initiate action in pursuit of their desires and goals; a psychophysical identity over time; and an individual welfare in the sense that their experiential life fares well or ill for them..<sup>29</sup>

Regan used this portrait of animals in developing his rights-based ethic from which he concluded that current uses of animals in agriculture, hunting, trapping, science and education should cease.

On the other hand, opposing ethicists claim there is a fundamental dissimilarity between humans and other species, and argue correspondingly that we are fully entitled to use animals for food, experimentation, and other purposes. While accepting that “all mammals, at least, have beliefs, desires and sensations,” Peter Carruthers nonetheless claimed that “human beings are unique amongst members of the animal kingdom in possessing conscious mental states.”<sup>30</sup> Carruthers thus considered that the beliefs, desires and sensations of animals are not consciously experienced, and even “their pains must all be non-conscious ones.” He concluded, “since their pains are non-conscious, they make no real claims upon our sympathy.” Hence, “there is no

basis for extending moral protection to animals beyond that which is already provided.”<sup>31</sup>

In *Against Liberation: Putting Animals in Perspective*, Michael Leahy allowed a certain degree of consciousness in other species, but still saw a great gulf between humans and nonhuman animals. For example, he claimed that an animal “will be aware of its prey in that it consciously perceives, pursues, and devours it,” but, given that the animal lacks language “there will be no possibility of *self*-consciousness entering the equation.”<sup>32</sup> In the same vein, Leahy remarked that many emotions, such as grief, need to be seen as “linguistic transactions”; he acknowledged that animals can “manifest relatively short-term distress at, say, the loss of a mate” but “without language it cannot *consider* its plight.”<sup>33</sup> Thus, he concluded, “lacking language, animal behavior does not have *meaning* for them as it can for us.”<sup>34</sup> And on that basis Leahy defended the traditional use of animals, for food and research, for example, against claims that such use violates basic ethical principles.

In some respects, R.G. Frey, in *Interests and Rights: The Case against Animals*, went further. He claimed that because animals do not have language, they lack not only self-consciousness but beliefs as well. Lacking beliefs and self-consciousness, they cannot have consciously held desires. And lacking such desires, Frey concluded “that animals have neither interests nor moral rights.”<sup>35</sup>

Thus, in the modern debate as in the historical one, we often see philosophers falling into Harwood’s two camps, some attributing characteristics to animals that make them appear similar to humans in the possession of beliefs, desires, consciousness, self-awareness and other features, which are interpreted to entail human responsibilities toward other species, while others claim a fundamental dissimilarity which they see as justifying the continued use of animals for human purposes.

## **The Two Tasks.**

Throughout both the historical and the modern debate we see philosophers attempting two distinct tasks. One is the ethical task of determining the appropriate moral principles and how they should be applied to animals; the other is the factual task of describing the relevant attributes — especially the mental attributes — of animals. Historically, “philosophy” included both ethics and the study of the natural world. Thus at the time of Pythagoras or Marcus Aurelius or Gassendi the philosopher’s task was seen to be both normative and scientific. Today, however, these endeavors are largely distinct, and when ethicists attempt the factual task of understanding the mental attributes of animals, their efforts are marked by three features which, when viewed from the vantage point of those engaged in the empirical study of animals, seem unlikely to resolve the debates.

First, many of the claims about animals made by ethicists are broad generalizations about very diverse taxonomic groups. Many ethicists speak in general terms about “animals” with little or no attempt at subdivision. For example, when Leahy argued that animals lack self-consciousness, and when Carruthers claimed that animals lack conscious mental states, they appeared to include all animal species from invertebrates to the great apes. Regan was more

precise in limiting his claims to mature mammals, but the rich and human-like portrait of mental life that he attributes to this group — including a sense of their own future and a psychophysical identity over time — makes a plausible fit to the behavior we observe in chimpanzees but less so in, say, hamsters. Singer’s call for the interests of animals to be respected would, in theory, allow for taxonomic distinctions, and Singer acknowledged that interests will vary across taxonomic groups; in practice, however, Singer paid little attention to taxonomic differences, proposing, for example, that consumers refuse to purchase products that have been “tested on animals.”<sup>36</sup>

Second, many of the claims are grounded only loosely, if at all, on empirical observations. To be sure, Singer made some use of empirical observations; for example, he referred to two scientific publications when including crustaceans as animals capable of possessing interests,<sup>37</sup> and he used a description of chimpanzee behavior, recorded and interpreted by Jane Goodall, to portray chimpanzees as capable of devising plans for the future, arguing on this basis that such an animal “must be aware of itself as a distinct entity, existing over time.”<sup>38</sup> Still his use of empirical evidence was sporadic and selective. Leahy made more extensive use of animal behavior research, but he dismissed the work of Goodall as “intellectually relaxed,”<sup>39</sup> stating a preference for “instinctive” explanations of behavior that avoid any reference to mental states, rather than the kind of cognitive explanation that Goodall and others provide. Regan’s chapter entitled “Animal Welfare” in *The Case for Animal Rights* (1983), which discusses the attributes of animals, contained 28 footnotes, mostly to the work of other philosophers, and virtually none to the growing body of scientific research on animal welfare.

Third, in arriving at their very different conclusions about the mental capacities and mental states of other animals, philosophers have shown no agreement over the kind of methods that would allow their contradictory claims to be tested or resolved. As we have noted, some made reference to empirical studies, but usually in a selective rather than a comprehensive way. Others used quite different approaches. Carruthers and Frey, for example, relied in part on reflecting on the nature of human consciousness. Carruthers proposed that:

a conscious experience is a state whose existence and content are available to be consciously thought about (that is, available for description in acts of thinking that are themselves made available to further acts of thinking).<sup>40</sup>

Assuming that “no one would seriously maintain that dogs, cats, sheep, cattle, pigs, or chickens consciously think things to themselves,” he concluded that “the experience of all these creatures will be of the non-conscious variety.”<sup>41</sup> Frey, like Leahy, emphasized the role played by language in the human experience of consciousness and self-consciousness, arguing on this basis that animals, lacking language, could not have comparable experiential states. Regan was particularly eclectic in developing his view of animal minds. His “Cumulative Argument” for animal consciousness involved a heterogeneous mixture of elements, including an appeal to commonsense understanding of animals, the fact that people attribute consciousness to animals in ordinary use of language, a claim that the behavior of animals is consistent with their being conscious, a recognition that evolution makes animal consciousness a theoretical possibility, and various other arguments.

Perhaps as a result of these three features, the modern debate often seems not to have advanced greatly beyond the stage reached in the historical debate between the Pythagoreans and the Stoics, or Descartes and Gassendi, or those Enlightenment philosophers who thought of animals as means and those who described them as ends, with both sides making broad generalizations about "animals" that simply contradict those of their opponents, with little (or mainly selective) use of empirical observations to justify those claims; and, lacking any agreement on an appropriate methodology for resolving the contradictions, it is hard to imagine that the current approaches will move toward consensus.

### **Cognitive Ethology and Animal Welfare Science.**

Perhaps, then, it would be more productive to try a different approach for the factual task of understanding the mental states and mental capacities of other species — an approach that acknowledges the immense diversity of animals, and one that uses empirical data and explicit methodology for testing the plausibility of claims about the mental capacities and mental states of animals. Two fields of science are potential contributors.

One is cognitive ethology — a field which attempts to build a picture of the mental, information-processing capacities of different animal species, based largely on observations and experiments concerning their behavior. The field had clear antecedents in the comparative psychology studies of a century ago, and in the work of field naturalists who, by the 1960s, were recording the complex behavior and social relations of known individuals of mentally advanced species such as chimpanzees and baboons. Many of these observations seemed impossible to explain in stimulus-response terms; this led investigators to postulate mental processes — such as planning, intention, and deception — in the animals they studied. To take one well known example, Jane Goodall recorded the case of a chimpanzee who rose in social status by collecting empty kerosene cans and banging them together noisily while charging into a group of other chimpanzees. Goodall, obviously recognizing that theories of instinctive behavior could not plausibly account for such actions, proposed that the chimpanzee used intelligence and planning to carry out these displays.<sup>42</sup>

These field observations have been supplemented by studies of animal communication through the use of American Sign Language and other means. These have provided unique opportunities to explore the mental processes of animals. In one example, the gorilla Koko, when shown a picture of herself at her birthday party, signed “me love happy Koko there,” indicating that Koko retained, and could reflect on, memories of her past life.<sup>43</sup>

Drawing on these and other studies, Hart and Karmel asked the broader question of whether great apes and monkeys show evidence of having a sense of self.<sup>44</sup> They proposed that five elements comprise a sense of self: (1) objective self-awareness, or the ability to distinguish oneself from the rest of the world; (2) subjective self-awareness, consisting of identification or emotional involvement with those stimuli that correspond to oneself; (3) possession of personal memories; (4) the ability to form representations of oneself, and (5) the ability to hold theories about oneself, such as what parts of oneself are central and how different facets of oneself are interrelated. Reviewing the available literature, Hart and Karmel concluded that the great apes



(chimpanzees, gorillas, and orangutans) show evidence of possessing the first four attributes, but no evidence of the fifth, whereas monkeys show relatively little evidence of possessing a basic sense of self. They thus concluded there is a qualitative difference between monkeys and the great apes, whereas the difference between the great apes and humans is “largely quantitative.”<sup>45</sup>

The work of cognitive ethologists, although largely motivated by a simple desire to understand animal mentation, raises many philosophical issues that need to be explored.<sup>46</sup> For example, what is the role of language in the various types of self-awareness, and does lack of language make these states morally less relevant? What are appropriate criteria for assigning the term “person” — with all its moral implications — to a being? Are animals that show empathy and concern for others more deserving of concern for themselves? If a species of animal does not show evidence of self-awareness, how should we take account of the possibility that we are simply unable to recognize the relevant signs?

Despite the importance of understanding the cognitive powers of animals, it is their affective states — hedonically negative or positive experiences, such as pain, fear, frustration, and pleasure — that are at the heart of much ethical concern about the human treatment of animals, and these states have become a major focus of research in the field of animal welfare science. The field grew out of the proposal by W.H. Thorpe in 1965 that scientists should use the tools of science to understand the many features that make up the welfare of animals.<sup>47</sup> Thorpe indicated, for example, how research could be used to detect pain and discomfort, to identify environments that animals prefer, and to understand the capacity to form learned fear of humans. He also noted the problem of animals prevented from carrying out types of natural behavior that they are strongly motivated to perform. He cited, for example, “the night-long agitated flutterings of a migratory bird confined in a cage during migration time,” and he suggested that this would give rise to “prolonged and intense emotional disturbances.” Building on these recommendations, by the 1970s scientists were beginning to publish papers with titles like “Frustration in the Fowl”<sup>48</sup> and “Do Hens Suffer in Battery Cages?”<sup>49</sup> This was followed in 1980 by M. S. Dawkins’ *Animal Suffering: The Science of Animal Welfare*,<sup>50</sup> and by the 1990s a sizeable literature had developed on scientific means of assessing and mitigating a wide range of affective states and motivations.

To take one example, American mink (*Mustela vison*) are active, partially aquatic carnivores which are often raised for their fur in restrictive cages. In the wild, mink perform a wide range of behavior that is impossible in captivity; for example, they swim, rest in several nest sites, survey the environment from raised perching places, and explore the burrows of potential prey animals. In one study,<sup>51</sup> mink in standard cages were trained to push against weighted doors for access to various resources, including a tunnel, a raised platform, an alternative nest box, and a small pool of water where they could swim. The experimenters then varied the amount of weight that the mink had to lift in order to open different doors. Some resources, such as the tunnel and the raised platform, were used when the price of entry was low, but not when it was high. For other resources, notably the pool of water, the mink worked harder and harder as the price increased, and maintained a relatively high rate of use. The authors concluded that “caging mink in fur farms does cause the animals frustration, mainly because they are prevented from

swimming.”<sup>52</sup>

Revealing as it is, such research raises important philosophical issues. Can we conclude from the evidence that mink experience a *desire* to swim, perhaps analogous to the desire for companionship among socially isolated humans? Does the mink’s lack of language make such a state less real to the mink, or morally less important, than an analogous desire by language-using humans? What scientific evidence would justify applying the term “suffering” — with all its moral implications — to mink that are prevented from swimming? Does evidence that captive animals have a strong motivation for a resource imply that their keepers have a moral obligation to provide it? The mink experiment was done largely because of ethical concerns about the proper treatment of animals, but, as these questions show, there is a key role for philosophers to play in helping to identify the moral implications of the empirical evidence.

### **Incorporating Science into the Ethical Debate.**

We are not suggesting, of course, that knowledge obtained systematically from scientific research trumps other ways of understanding the mental states of animals. Judgement, insight, and logic, for example, obviously have roles to play.

Nor are we suggesting that the scientific study of animal mentation is without its own limitations and philosophical problems. Although the field dates back to the nineteenth century,<sup>53</sup> influential voices in twentieth century psychology and ethology claimed that science should not attempt to understand the mental states of animals, nor use mental states in causal explanations of animal behavior.<sup>54</sup> As a result, the modern scientific study of animal mentation is a relatively young area of research, and much remains to be done to provide generally accepted methodology and criteria for settling questions about cognition and affective states of animals.<sup>55</sup> To take one example, the performance of self-directed movements in a mirror has often been taken as evidence of self-awareness, but this interpretation is not universally accepted.<sup>56</sup> What science offers, however, is a wealth of empirical material and an emerging methodology, undergoing refinement through debate and experimentation, which should not be ignored or used in a merely selective way when making claims about animal mentation.

Nor do we suggest that philosophers have been uniformly inattentive to the potential contributions of science. As an admirable example, David DeGrazia made extensive use of scientific information in developing his arguments about feelings, self-awareness and other mental states in animals.<sup>57</sup> Bernard Rollin, in proposing that we should nurture and fulfill the specific “nature” of different types of animals in our care, recognized the key role of science in determining the features that make up an animal’s “nature”.<sup>58</sup> In a similar vein, James Rachels argued that various human rights depend on the human species having certain attributes, and that we should ascribe similar rights to other species depending on whether those species actually share the same attributes. As Rachels noted, this approach will “avoid the trap of lumping all nonhuman animals together.”<sup>59</sup>

Despite these sound ventures, however, far too much remains at the level of ungrounded speculation and excessive generalization, which a marriage of science and ethics may help us

overcome. We suggest that future progress in animal ethics will require a combination of scientifically informed philosophy and philosophically informed science. Philosophy is needed especially to explore the ethical implications of our understanding of animals. This entails a range of philosophical projects: examining the moral relevance of the capacity to use language, clarifying the nature of our understanding of other minds, analyzing morally significant concepts such as desire, suffering, and personhood, and clarifying the circumstances under which these concepts can be rightly used in discussions of other species. Science is needed to provide a more nuanced, disciplined and empirically grounded understanding of animals as a basis for ethical reflection. Separately, they provide a measure of understanding. Taken together, they offer a great deal more.

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### Notes.

1. Dix Harwood's *Love for Animals and How It Developed in Great Britain* (1928), edited, introduced, and annotated by Rod Preece and David Fraser. (Lampeter: Mellen Animal Rights Library, 2002), 6. Harwood's use of the terms "anthropomorphic" and "anthropocentric" may jar the expectations of modern readers. In behavioral biology "anthropomorphic" has come to mean attributing human traits to other species; and "anthropocentric" is used by ethicists for ethical thinking that considers only human interests; in both cases, a degree of error is often implied.
2. That is, the Greek followers of Pythagoras, many of whom resided in the Greek colonies of Magna Graecia in Italy, as did Pythagoras himself after spending his youth at Samos in Ionia. Empedocles (c. 495BC to c. 435BC) lived in the Greek colony of Acaragas in Sicily and appears to have been the first to condemn animal sacrifice on the grounds of its cruelty to the slaughtered animals. Very little of the writings of the early Pythagoreans remains, and none of Pythagoras himself. Thus one is required to rely on commentaries by later scholars.
3. The use of the phrase "irrational animals" does not suggest that either the Pythagoreans or Sextus Empiricus thought of animals as lacking in reason. Rather, it was simply a concession to contemporary linguistic convention.
4. Sextus Empiricus, *Against the Mathematicians*, 9, 127-9.
5. Porphyry exaggerates the universality of the Stoic denial of animal reason. Thus, for example, Chrysippus, the most eminent of the Stoic philosophers save for Zeno, allowed the dog "even to share in the far-famed 'Dialectic.'" See Sextus Empiricus, *Outlines of Pyrrhonism*, 1.14.
6. Perhaps Porphyry is referring to the *Historia Animalium* (588: A8), where Aristotle writes: "just as in man we find knowledge, wisdom and sagacity, so in certain animals there exists some other natural propensity akin to these."

7. Porphyry, *On Abstinence from Animal Food*, trans. Thomas Taylor ( c.1793) (Fontwell: Centaur, 1965), 140-1.
8. See Arthur O. Lovejoy and George Boas, *Primitivism and Related Ideas in Antiquity* (Baltimore: Johns Hopkins, 1997 [1935]), 389.
9. George Long, trans., *The Meditations of the Emperor Marcus Aurelius Antoninus* (New York: A.L. Burt, n.d. [ c. 1900], VI, 23; 196-7.
10. Book 2, Chapter 17. Nonetheless, elsewhere Augustine exhibits a modest degree of respect for other species. See, for example, *De natura boni*, 12. 16; *The City of God*, Bk. xix, ch. 14; *Confessions*, Bk. 4, ch. 3; book 7, ch. 12.
11. William Langland, *Piers the Ploughman*, translated into modern English with an introduction by J.F. Goodridge (Harmondsworth: Penguin, 1959), pt. 2, Bk. xi, 138.
12. Quoted in Michael W. Fox, *St. Francis of Assisi, Animals and Nature* (Washington, DC: Center for Respect of Life and Environment, 1989), 3.
13. Quoted in Pierre Gassendi, *Metaphysical Colloquy, or Doubts and Rebuttals concerning the Metaphysics of René Descartes* (1642), rebuttal to Meditation 2, Doubt 7, in *The Selected Works of Pierre Gassendi*, trans. Craig B. Bush (New York: Johnson Reprint Corporation, 1972), 197.
14. Pierre Gassendi, Preface to *Exercises in the Form of Paradoxes in Refutation of the Aristotelians* (1624) in *The Selected Works of Pierre Gassendi*, 73.
15. Metaphysical Colloquy, rebuttal to Meditation 2, Doubt 7, in *Selected Works*, 198.
16. Quoted in Howard Williams, *The Ethics of Diet: A Catena of Authorities Deprecatory of the Practice of Flesh-Eating* (London: F. Pitman, 1883), 104, citing Gassendi, Physics, Bk. II, “De Virtutibus.”
17. Excerpted in *ibid.*, 104.
18. Immanuel Kant, *Grundlegung der Metaphysik der Sitten* (Hamburg: Meiner, 1994), 52: “Handle so, dass du die Menschheit, sowohl in deiner Person als auch in der Person eines jeden anderen, jederzeit zugleich als Zweck, niemals bloss als Mittel brauchst.” Variants of the imperative may also be found on pages 42-3.
19. Immanuel Kant, “Duties toward Animals and Spirits” in *Lectures on Ethics* ( c. 1780), trans. Louis Infield (New York: Harper and Row, 1963 [1930]), 240, 241.
20. In *Das Göttliche* (“Divinity”; c. 1785) he declared: “For that alone/ Distinguishes him/ From all beings/ That we know.” *Sämmtliche Werke, nach Epochen seines Schaffens* (München: Carl Hanser Verlag, 1986-92), Band 2.1, 90. (Denn das allein/ unterscheidet ihn/ von allen Wesen/ die wir kennen).

21. Ibid, Band 13.1, 153.
22. “Der Mensch und überhaupt jedes vernünftige Wesen existiert als Zweck an sich selbst nicht bloss als Mittel zum beliebigen Gebrauche für diesen oder jenen Willen.” *Grundlegung der Metaphysik der Sitten*, 2. Abschnitt.
23. “Du führst die Reihen der Lebendigen/ Vor mir vorbei, und lehrst mich, meine Brüder/ Im stillen Busch, in Luft und wasser kennen.” From “Waldhöhle” in *Sämmtliche Werke*, Band 6.1. 629.
24. Peter Singer, *Animal Liberation*, 2nd edition (New York: Avon Books, 1990), 11, 171.
25. Peter Singer, *Practical Ethics* (Cambridge: Cambridge University Press, 1979), 51.
26. David DeGrazia, *Animal Rights: A Very Short Introduction* (Oxford: Oxford University Press, 2002).
27. Ibid., 42.
28. Tom Regan, *The Case for Animal Rights* (Berkeley: University of California Press, 1983), 278.
29. Ibid., 243.
30. Peter Carruthers, *The Animals Issue: Moral Theory in Practice* (Cambridge: Cambridge University Press, 1992), 184,186.
31. Ibid., 189, 190, 196.
32. M.P.T. Leahy, *Against Liberation: Putting Animals in Perspective* (London: Routledge, 1991), 156.
33. Ibid.,133.
34. Ibid., 139.
35. R.G. Frey, *Interests and Rights: The Case against Animals* (Oxford: Clarendon Press, 1980), 167.
36. Singer, *Animal Liberation*, 2nd edition, 94.
37. Ibid., 174.
38. Singer, *Practical Ethics*, 96.
39. Leahy, *Against Liberation*, 37.
40. Carruthers, *The Animals Issue*, 181.
41. Ibid., 184.

42. J. Goodall, *In the Shadow of Man* (London: Wm Collins, 1971)
43. Francine Patterson and Eugene Linden, *The Education of Koko* (New York: Holt, 1981), 86.
44. D. Hart and M.P. Karmel, "Self-Awareness and Self-Knowledge in Humans, Apes, and Monkeys" in A.E. Russon, K.A. Bard and S.T. Parker, eds., *Reaching into Thought: The Minds of the Great Apes* (Cambridge: Cambridge University Press, 1997), 325-347.
45. *Ibid.*, 342.
46. See M. Bekoff, "Cognitive Ethology and the Treatment of Non-Human Animals: How Matters of Mind Inform Matters of Welfare," *Animal Welfare*, 3, 1994, 75-96.
47. W. H. Thorpe, "The Assessment of Pain and Distress in Animals" in *Report of the Technical Committee to Enquire into the Welfare of Animals Kept under Intensive Livestock Husbandry Systems* (F. W. Rogers Brambell, chairman) (London: HMSO, 1965), Appendix III, 71-79.
48. I. J. H. Duncan, "Frustration in the Fowl" in B. M. Freeman and R. F. Gordon, eds., *Aspects of Poultry Behaviour* (Edinburgh: British Poultry Science Ltd., 1970), 15-31.
49. M. S. Dawkins, "Do Hens Suffer in Battery Cages? Environmental Preferences and Welfare," *Animal Behaviour*, 25, 1977, 1034-1046.
50. M.S. Dawkins, *Animal Suffering: The Science of Animal Welfare* (London: Chapman and Hall, 1980).
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52. *Ibid.*, 36.
53. Most notably, but far from solely, with Charles Darwin's *The Expression of the Emotions in Man and Animals* (Chicago: University of Chicago Press, 1965 [1872]).
54. See Bernard E. Rollin, *The Unheeded Cry* (Oxford: Oxford University Press, 1990).
55. See, for example, M.S. Dawkins, *Through Our Eyes Only?: The Search for Animal Consciousness* (Oxford: W.H. Freeman, 1993); M. Dol, S. Kasanmoentalib, S. Lijmbach, E. Rivas, & R. van den Bos (editors), *Animal Consciousness and Animal Ethics* (Assen: Van Gorcum, 1997); J.K. Kirkwood, R.C. Hubrecht, S. Wickens, H. O'Leary, & S. Oakeley (editors), *Consciousness, Cognition and Animal Welfare*. (Supplement to *Animal Welfare*, Volume 10) (Wheathampstead: Universities Federation for Animal Welfare, 2001).
56. For example, C.M. Heyes, "Reflections on self-recognition in primates," *Animal Behaviour*, 1994, 47, 909-919.
57. D. DeGrazia, *Taking Animals Seriously: Mental Life and Moral Status*. (Cambridge: Cambridge University Press, 1996).

58. Bernard E. Rollin, "Animal Production and the New Social Ethic for Animals" in *Food Animal Well-Being* (West Lafayette: Purdue University Office of Agricultural Research Programs, 1993), 3-13.

59. James Rachels, "Why Animals Have a Right to Liberty" in T. Regan and P. Singer, eds., *Animal Rights and Human Obligations* (Englewood Cliffs, NJ: Prentice Hall, 1989), 123.

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