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What Are Animals?

I grew up on the Isle of Wight. "That southern island / Where the wild Tennyson became a fossil," W. H. Auden called it. A century ago it was very popular with poets. Today it is just a quaint English seaside resort: silent in the winter, bustling with tourists in the summer.

In 1994, long after I'd left on my travels, one Barry Horne woke up the sleepy Isle of Wight. He planted a succession of bombs. One in a pharmacy, another in a car parts store, a third in a fishing tackle supplier, and a fourth in a Cancer Research charity shop. The largest bomb caused nearly £3 million (about $5 million) of damage to the pharmacy. Horne chose that store because the parent company (Britain's largest pharmacy chain, Boots The Chemist) had in his view reneged on a promise to stop selling products tested on animals. The car parts store belonged to the same group as the pharmacy, so it had to go too. Fishing tackle—Horne was presumably objecting to angling. Cancer Research shops specialize in used clothing and household goods, sold by volunteers to raise money for research into cures for cancer. Where could be the objection to such good works? Cancer research

involves animal experimentation, so the charity shop was a legitimate target also. He hid a bomb in a packet of cigarettes, which he stuffed into a leather bag. A Mrs. Woods bought the bag and took it away with her on a trip. Not knowing she was carrying a bomb, she let her children, aged three and six, play with her bag's contents. They found the fake pack of cigarettes. Fortunately, the device failed to explode.

I'm very puzzled by Horne. One thing I'd like to know is why he chose the Isle of Wight for his attacks. He was from Northampton, many miles away. Perhaps he had memories of a particularly miserable summer holiday on the beaches of the Isle of Wight. I resent that he chose to target a place so special to me.

But clearly for those of you not brought up on the Isle of Wight, the question is, Why would he plant bombs anywhere at all? Two things are worth noting here. The first is that there can be no doubting Horne's sincerity. In November 2001 he died of liver failure as a consequence of a hunger strike while serving an eighteen-year sentence for arson. He was trying to pressure the British government to set up an enquiry into animal experimentation.

The second important point is that Horne was not the British equivalent of the Unabomber (Theodore Kaczynski, a loner in Montana who directed bombs primarily at university personnel out of a deluded grudge against society). Horne was a member of the Animal Liberation Front—a group which refers to him on their web site as a "courageous fighter" with "thousands of supporters." It is difficult to gauge the degree of support for animal rights groups in the general population with any accuracy, but it is certainly not negligible: Horne's funeral was attended by three hundred people. So, though Horne obviously represents an extreme case, violent protest against what we do to animals is not limited to just one maverick.

I'm not trying to claim that all animal rights activists are vicious brutes, or that all the uses to which we put animals are defensible. What I am interested in is the range of attitudes in our society toward animals. Why, for example, given that Horne felt driven to wreak his vengeance on the Isle of Wight, did he choose to focus on shops? If he had to attack someone, why not the farmers on the

hills? They do a lot more to animals on a day-to-day basis than the shopkeepers in the valleys. If Horne was trying to convert us all to a way of life less likely to harm animals, wouldn't we be more readily convinced to give up eating meat than medical treatment? Meat eating is nothing but an indulgence. Our animal-tested medications, on the other hand, are of proven effectiveness.

Even Linda McCartney, next to Mahatma Gandhi the most famous vegetarian and animal lover of the twentieth century, was fed anticancer drugs as she lay dying—drugs that had been tested on animals. News reports on this are conflicting: either her family did not themselves know that these drugs had been tested on animals, or they knew but were so desperate to see her get better that they did not tell her.

Barry Horne clearly thought he knew what animals were. He was so completely convinced that animals are sentient and worthy of protection that he was willing to lay down his life for them. Linda McCartney clearly also suffered little ambivalence in her attitude toward animals.

Sometimes I wish I could share their certainty.

What are animals—really? What should we make of them? Are they machines: complicated, intricate, beautiful perhaps, but fundamentally mechanical? Or are they something else; something conscious and thoughtful? Are animals possessed of some special spark that sets them off from the mechanical and vegetable worlds? Could they be both at once—conscious machines? Human beings have always lived among other species, and we fret, now perhaps more than ever, over the correct way to deal with them. How can we treat animals appropriately if we don't even know what they are?

As I grew up on the Isle of Wight, the relationship I and my family and friends had with animals expressed the same ambivalence to be found anywhere in the industrial world. We loved our pets, and at some level we knew that the meat on our table had come from animals that lived on the hills around us and that were not dressed up in bows for their birthdays, invited to sleep on their owners' beds, or talked to like bona fide human beings. We lived this dichotomy but, as far as I remember, were little troubled by it.

In those days the butchers' shops still had sawdust on the floor and cuts of meat in the window. The meat wasn't packaged on little plastic trays but cut from recognizable limbs of cattle, pigs, and sheep. And yet I don't ever remember being shocked by this. It was just the way of the world.

James Serpell of the University of Pennsylvania expresses the contradictions in our attitudes toward animals very clearly: "At one extreme are the animals we call pets. They make little or no practical or economic contribution to human society, yet we nurture and care for them like our own kith and kin, and display outrage and disgust when they are subjected to ill-treatment. At the other extreme we have animals like the pig on which a major section of our economy depends, supremely useful animals in every respect. . . . We pickle its trotters, make black puddings from its blood, sausages from its intestines, and expensive and durable leathergoods from its skin. We even emulsify its thick white fat for the production of ersatz ice-cream. And in return for this outstanding contribution we treat pigs like worthless objects devoid of feelings and sensations."

Can pigs feel? Are they capable of sensations? How would we know? And why doesn't anyone seem to care one way or another? The great mass of pig-eating humanity may not be bothered about the emotional and sensory worlds of the beast that ended up as bacon on the breakfast table, but to me more surprisingly, the animal liberation movement does not seem greatly interested either: The North American Press Office of the Animal Liberation Front issues an annual report on direct action by any individual or organization to liberate animals in the United States or Canada. The 2001 edition—dedicated to Barry Horne—documents the rescue of five thousand animals, not one of them a pig. Why not?

Many people are fascinated and intrigued by animals, and yet very few seem to be aware of the work that has been done in the last fifty years to improve our understanding of animal minds. True, there are a couple of high-profile "discoveries" that everybody knows about. If I had a penny for every time I have been told that chimpanzees are genetically as nearly identical to us as makes no difference and, given appropriate training, can communicate in

human language, I would have a great pile of small change. My pockets would also drag if I collected coinage each time I am told that dolphins use an elaborate language among themselves that we are not smart enough to decode. But aside from these high-profile (and highly questionable) discoveries, the public at large just draws a blank. This book is my attempt to fill in some of that blankness, to bring some of the discoveries of modern animal behavior science to a wider audience.

THE SIMILARITY SANDWICH

What I want to do in this book is sweep all the debris of traditional views of animals, now mixed up with mauled science, right off the table and start again—that is, start with the reliable knowledge we have of what animals do. I have often been disappointed by how little scientific work is done on the psychology of animals. Too many psychologists define their sphere of interest as exclusively their own species, just *Homo sapiens*: How limited! So many exciting things have been discovered about all kinds of species. Just yesterday I was reading about the bolas spider that lures moths by imitating moth pheromones. In a transspecies war of the sexes, the female bolas spider imitates the attractant pheromone of the female moth, so only male moths are attracted to her. The spider has no web: when the moth gets close enough, she hurls a sticky ball (bolas) of silk at the moth to capture him. In America, bolas spiders just swing the bolas back and then out: in Africa and Australia these spiders swirl their bolases around like a lasso before lashing out at the moth. Either way, the moth gets caught, paralyzed, and wrapped in silk.

There is enough science out there to lay the foundation for an objective understanding of animals. I am convinced that we are beginning to know what animals are. And I can tell you up front: animals are not like us. But in many respects they are like us.

Other species are not like us. But they are also like us. I see a "not like us—like us—not like us" sandwich. It looks like this:

The bottom layer is a layer of dissimilarity. Each species on this

planet lives in a unique sensory world. The sonar of the hunting bat (and the moth, its prey). The ultraviolet light seen by birds; the infrared of insects. The rich sense of smell dogs enjoy. The electric and magnetic fields to which some fish and a few other animals are sensitive. (The obscure Australian duck-billed platypus can tell if a battery has any current left in it—though there are easier methods of testing batteries.) Birds pick up on changes in air pressure. At this level there is no denying the diversity in the animal kingdom.

The middle layer is a layer of similarity. Here we find basic psychological processes like learning and some kinds of memory, along with simple forms of concept formation, such as identifying objects as being the same or different from other objects and a basic sense of time and number. All of these seem be common to a wide range of species and to operate in similar ways in animals as diverse as chicks and chimpanzees, spiders and squirrel monkeys.

It is not always easy to be sure whether something belongs in the middle layer (similarity) or the bottom layer (dissimilarity) of the sandwich. Studies on reasoning and problem solving, for example, do not seem to reveal many differences between species. But then again, so few species have been studied. And tool use (one of the few activities suggestive of reasoning that can be observed in the field) is definitely very different from species to species (and absent in most). Maybe it isn't a ham sandwich, but one filled with something that can squish into the bread—something like cream cheese? The boundary between the first two levels is not a firm one. My point is that every animal's world is different, just as every animal's lifestyle and niche are different. And yet there are also commonalities in animal minds, because we are all living on the same planet and descended from the same slimy ancestors.

But when we come to the bread on top of the sandwich, we notice something very different. After forty years of trying we can say definitively that no nonhuman primate (or any other species) has ever developed anything equivalent to human language. The hens in the chook house will never "hatch an elaborate plot to escape from the clutches of the menacing Mrs. Tweedy" (to quote from the web site for the movie *Chicken Run*). Most nonhuman species show very little interest even in imitating each other—let alone

communicating with each other and coordinating their activity. Even chimpanzees, though they may recognize themselves in mirrors, are very slow to understand the motives of other individuals. They seem no better able to place themselves imaginatively into the shoes (or paws or hoofs) of another individual than are autistic children. This is a very surprising fact, and one that animal behavior scientists have been reluctant to face up to. There really is a difference between humans and other animals. A pretty big difference. The psychological abilities that make human culture possible—enthusiasm to imitate others, language, and the ability to place oneself imaginatively into another's perspective on events—are almost entirely lacking in any other species. They didn't have to be: we *are* all related, and we *do* share a great many psychological qualities with other species. But, as it turns out, we really are different from them in crucial respects.

DARWINIAN ACID

Acknowledging that the similarity sandwich has bread (that is, dissimilarity) on top, that there is something different about us humans, is a hard-wrung admission for me. I am a hard-core Darwinian. I believe that all species on this planet are related, some more closely than others, and that our common stock diverges through a process of selection. Some of us survive and thrive, have children and grandchildren. Others are left on the slag heap of (evolutionary) history. So long as children somewhat resemble their parents, natural selection will shape us to fit our environment.

In a wonderful exploration of Darwin's theory, Daniel Dennett, philosopher at Tufts University, called natural selection *universal acid*. He meant that it is an idea so powerful that nothing can contain it: it eats through every barrier. I like Dennett's metaphor because it emphasizes how difficult—even dangerous—it can be to work with very powerful ideas.

For example: We share 98.4 percent of our DNA with chimpanzees, and probably even more with bonobos (also known as pygmy chimpanzees). Does this mean that chimpanzees and per-

haps other great apes share human self-awareness and are entitled to similar protection under the law as we are? This is what a group calling itself The Great Ape Project claims. The Great Ape Project includes among its supporters such luminaries as Oxford biologist Richard Dawkins (author of *The Selfish Gene*), Peter Singer (Princeton ethicist and author of *Animal Liberation*, one of the founding documents of the modern animal protection movement), animal rights lawyer and author of *Rattling the Cage* Steven Wise, and leading chimpologist Jane Goodall, who has studied chimpanzees in the wild for over forty years.

Another example: The notion of evolutionary continuity does not just apply to our closest relatives, the great apes; all animals on this planet are our relatives to a greater or lesser degree. Does this mean that they are all conscious (as the Harvard zoologist Donald Griffin has claimed in *Animal Minds: Beyond Cognition to Consciousness*), or at least that they all think (as Harvard psychologist Marc Hauser argues in *Wild Minds*)?

To me these examples show the difficulties of working with Darwin's powerful acid. Darwin's theory says we are all related, not that we are all identical. Every species has its unique adaptations. To those who would say that the human mind is a unique adaptation, I would say, "Balderdash." it bears some similarities to the adaptations of other animals, and presently I'll show them to you. But to those who would say that evolution dictates that there can be nothing unique about the things we humans do (and especially what we say to each other) I would say "Balderdash" again—or possibly something stronger. I can show you differences.

Darwin's theory also says that there are no magic sparks. No divine intervention separates us humans from all the rest of creation. In denying human-style language to any other species, I am not sneaking back in some special vital spark in the human case, I am not trying to lift humans up from the beasts and closer to God. Animal lovers have hated René Descartes for centuries for suggesting that animals are machines. And some would love Darwin for allowing that animals, through their relatedness to humans, could again share that special human spark—the soul that fires the mind.

But this is to read Darwin backward: Darwin's achievement is to

let us see that we are all machines, mankind included. "Man . . . with divine face, turned towards heaven, . . . he is no exception," Darwin wrote. We are all machines: sea anemones; fish, dolphins, horses, golden retrievers, and bank managers. We are all machines designed by natural selection to solve the problems we confront in our daily lives to such a degree that we find the time to raise healthy, viable offspring who are likely to have healthy children of their own. Our minds and behavior are as much a part of the package of adaptations that sees us through life as are our anterior appendages and our feeding habits. And just as our anterior appendages and feeding habits show points of similarity and dissimilarity due to our shared (and not-so-shared) evolutionary histories and present-day environments, so too our minds and behavior are both similar and dissimilar. Counterparts to the bones in the human hand can be seen in the flippers of dolphins and the wings of bats. In just the same manner, some points of similarity can be seen between the minds of humans, dolphins, and bats. But do dolphins have "hands"? Do bats have flippers, or people wings?

To admit that humans are different does not return them to the center of the universe. I believe that you, dear reader, are a member of the species *Homo sapiens*, and I base that on nothing more than the fact that you are reading this text. Just as you can make the same reliable guess about me just by virtue of the fact that I wrote it. This is not a trivial observation. It is a distinction of some power between human minds and other minds. But it does not make the human *better*. Language is a powerful adaptation, but it is not always a power for good. Barry Horne's capacity for linguistic thought played some part in his demise. If he had not been able to formulate thoughts in words and be influenced by the words of others, he probably would not have killed himself.

The jury is still out on the whole human experiment with language and material culture. It is certainly possible that we may, through our diabolical ingenuity, create conditions on this planet that make our further survival impossible—hardly a favorable outcome from an evolutionary perspective. So acknowledging that language is a uniquely human adaptation does not return human beings to the pinnacle of some *scala naturae* (the medieval scale of

beings, from snails to angels, that still structures most people's view of the animal kingdom), nor does it return the sun to revolving around the earth, or reverse any other step in the gradual displacement of our egotistical selves from the center of the universe.

I think it is important to understand how similar and dissimilar other animals' minds are to our own. Our opinions on what it is like to be a chicken will likely influence our attitude to battery housing and sex between men and hens (a practice that Peter Singer has suggested may be no crueler than battery housing and industrialized slaughterhouses). If we believe that chimps are self-aware, then that will influence decisions about their suitability for use in research on hepatitis—a disease that affects half the world's (human) population. At the moment chimpanzees are the only medical research model for hepatitis.

There are many practical questions, from the appropriateness of eating animals to whether our cat should be allowed to go out and hunt at night, where an objective understanding of what animals really are is badly needed. But, important as these issues may be, they are not what motivate me to worry about this question. What I want to know is this: Are we human beings—*Homo sapiens:* knowing man—alone on this planet in our consciously thinking minds, or are we surrounded by knowers whose thoughts are just too alien for us to understand? To contemplate this question is to stand, not on the edge of an abyss, but on the cusp between two abysses. Either outcome would be astonishing. To know for sure that we had thinking companions on this planet would be an amazing discovery. I find that at least as stunning a possibility as the discovery of minds on other planets—let's find the other minds on our own planet first! On the other hand, to know with the certainty that science can bring that we stand unique in our reflective, thoughtful intelligence—that would also give me to pause. I'd probably have to take the dog for a walk to absorb that one.

The New York University philosopher Thomas Nagel famously wondered what, if anything, it might be like to be a bat, "seeing" a world by listening to ultrasonic echoes. His conclusion was that we could never know. But scientists happily blunder in where philosophers fear to tread. There must be something we can know

about the world of the big brown bat as it perceives in total darkness unevenness in a surface of just over one-tenth of an inch. Just as there must be something we can discover about the world of a noctuid moth—the prey of the bat. When the moth hears the bat's ultrasound switch to an attack pattern, it generates ultrasound of its own to jam the bat's sonar system.

The perceptual worlds of many species are so different from our own that it is perhaps not surprising that we have difficulty making sense of them. Rupert Sheldrake, in his popular *Dogs That Know When Their Owners Are Coming Home and Other Unexplained Powers of Animals*, is so baffled by the things that animals do that he believes we have to call in the supernatural to make sense of them. I am not willing to do that. There is nothing that animals do that will be made simpler by giving up on rational explanation.

In four of the chapters that follow I take one species (or group of species) and explore the world from that animal's perspective. I put on the skin of an insect (the honeybee) in chapter 2, a bird (the pigeon) in chapter 4, a flying mammal (the bat) in chapter 6, and a swimming mammal (the dolphin) in chapter 8. I selected these four species because their worlds were excitingly alien, but also sufficiently studied so that there is plenty to be said about them.

In the remaining chapters I tackle the three major faculties that have long been seen as discriminating humans from all other species: reasoning (chapter 3), language (chapter 5), and the ability to put oneself imaginatively into the position of another—what we could call "theory of mind" (chapter 7).

As a teenager walking our dog on the beaches of the Isle of Wight, I honestly used to think that nobody understood me better than that animal. The image of the cliffs, the beach, and the dog in winter is so deep in me it's intoxicating just to think about them. Benji has long since passed on to doggy heaven, but I still rate the companionship of animals as one of life's highest joys. And I agree with James Serpell that just because pet keeping is sentimental doesn't make it a bad thing: as Serpell says, many of life's most rewarding moments are beset with sentimentality. But I do now

strive for an objective understanding of animals. And that objectivity tells me that Benji's understanding of me was as dim and restricted to patterns of comprehension appropriate for his species as mine of him was constrained by my human thinking. That doesn't make Benji and his kind (and all the other kinds) less interesting—only more. What I want now is to get to what animals really are, not the sentimental version of what they seem to be. This isn't as easy as talking to our pets and assuming they understand us. But it is, I think, ultimately more satisfying.

FURTHER READING

The Truth about Dogs, by Stephen Budiansky (Viking, 2000). Witty, intelligent, meditative, and shocking: this is one of my favorite books on any species.

In the Company of Animals: A Study of Human-Animal Relationships, by James Serpell (Cambridge University Press, 1996). This is a modern classic on the relationship between people and other species.

Darwin's Dangerous Idea, by Daniel Dennett (Touchstone Books, 1995). Darwin's theory of evolution has inspired many good books, of which this is one of the most thoughtful and interesting.

The Animal Estate, by Harriet Ritvo (Harvard University Press, 1987). Ritvo takes as her canvas England of the Victorian age and explores the evolving attitudes toward animals during that tempestuous time.

Animal Minds: Beyond Cognition to Consciousness, by Donald R. Griffin (University of Chicago Press, 2001). Griffin takes the extreme position that all animals are conscious.

Wild Minds, by Marc Hauser (Henry Holt, 2001). Hauser is less extreme than Griffin, arguing, not that all animals are conscious, but that they all think.

The Great Ape Project: Equality beyond Humanity, edited by Paola Cavalieri and Peter Singer (St. Martin's, 1994). This is perhaps more a political work than a strictly scientific one; the various authors plead for legal protection for the great apes.