

Animals in the Human Mind

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How should we treat animals? The answer to this question will depend in part on what (or who) we perceive animals to be. In this chapter, we will look briefly at some different traditional beliefs about the nature of animals, and how these 'factual' beliefs (about what animals are like) have influenced ethical beliefs (about how animals should be treated). We will also consider how beliefs about animals in modern Western culture have gradually been reshaped by science, and the ethical implications of this evolving scientific understanding. Thus, the chapter also introduces a discussion, to be pursued later, about the interplay between science and ethics.

Animal Mythology

But since that sounds a bit cerebral, let's start with a story:

Long, long ago, a woman fell from the Sky World, down towards the world below which was completely covered by water. A flock of water birds saw her and made a great blanket with their bodies and carried her on their backs, but she was too heavy and so they lowered her to the water below. There, a giant turtle said that they could put her on his back. Then, one by one, the beaver, the otter and other

animals dove down to try to bring soil from under the water. Finally, one creature succeeded. When the soil was placed on the back of the turtle, it grew and multiplied until there was land as far as the woman could see.¹

This story (Figure 1.1) describes the start of human life on Earth according to the Kanien'kehá:ka (Mohawk), Anishinaabe (including Ojibway) and many of the related cultures of the woodlands of central North America. These were people who survived harsh northern winters in part by hunting animals, and the story was one of many that reminded them how profoundly their existence depended on the assistance – even the pity – of other creatures.²



Figure 1.1 ‘Skywoman’ by Shelley Niro, illustrating the creation story of the Kanien'kehá:ka (Mohawk) people. Source: Photo by H. Foster. Reproduced courtesy of Shelley Niro and Canadian Museum of History, D2004-11229.

1 I have condensed this from a longer version in *Kanien'kehá:ka Creation Story*, published by Mohawk Language Custodian Association, Kanehsatà:ke, Canada, 2016. For another version, see Johnston, B. (1976). *Ojibway Heritage*. Lincoln: University of Nebraska Press. The toad is often credited with being the animal who successfully carried the soil.

2 Johnston (1976).

The Maasai are a herding people of Eastern Africa whose food supply and distinctive culture depend utterly on the cattle that they raise. Their creation story affirms their role as people who received cattle as a gift from God and it sets them apart from the neighbouring hunter-gatherer culture known as the Dorobo:

Long ago when sky and earth were one, a Maasai elder came upon the first Dorobo who was eating an elephant that he had just killed. The Maasai (in curiosity) followed him to his home. Watching from a distance, the Maasai heard God say to the Dorobo, 'Come to me tomorrow for I have something to give you'. That night, the Maasai slept in the nearby bushes and the next morning, just before dawn, he went to the place where God had spoken to the Dorobo. But the Dorobo did not come. Then God asked the Maasai, 'Where is the Dorobo?', and the Maasai replied that he did not know. God then brought a bark-rope from the sky and began to let down a great many cattle. Finally, the Dorobo came. He was angry and shot the bark-rope with an arrow. God then caused the cattle to stop descending, and he moved up into the sky, and was never seen on the earth again. Thus, all the cattle which the Maasai now own were first given to them by God, and because the Dorobo did not listen to God, he must hunt wild animals for his food.³

The Jain religion arose in a culture where sedentary agriculture was already established, and where there was no practical necessity either to raise animals as the Maasai had done or to hunt them for food. The Jain view of animals is captured not in a creation narrative, but in a complex cosmology that sees humans, animals and the natural world as parts of a continuous and interwoven process of life, death and rebirth. As Jain scholar Christopher Chapple has explained, Jain taxonomy sees all life-forms as falling into five levels which are distinguished by their sensory capacities. The lowest, including earth, air and plants, possess only the sense of touch. The second, including worms, leeches, oysters and snails, also have the sense of taste. The third, including most insects and spiders, add the sense of smell. The fourth, including butterflies, flies and bees, also possess the ability to see. And the highest (fifth), including reptiles, birds, mammals and humans, have all these senses plus the ability to hear. According to this view of the world, all life forms have value, but the more complex beings have more value than the simplest. Humans remain the highest of all: a virtuous animal may be rewarded by being reborn in human form, and only from human form one can achieve the ultimate state of spiritual liberation. Nonetheless, as Chapple notes, the Jain faith 'seeks to uphold and respect animals as being fundamentally not different from ourselves'.⁴

Associated with each of these views about the nature of animals and the human-animal relationship are certain correlated ethical beliefs about how animals should be

3 This is an edited version of the story as recorded by Kenny, M.G. (1981). *Mirror in the forest: The Dorobo hunter-gatherers as an image of the other*. *Africa*, 51: 477–495.

4 Chapple, C.K. (2006). *Inherent value without nostalgia: animals and the Jaina tradition*. In: *A Communion of Subjects: Animals in Religion, Science and Ethics* (ed. P. Waldau and K. Patton), 241–249. New York: Columbia University Press. The quotation is on page 248.

treated. Among the North American hunting people, the Innu of northern Canada provide one of the most authentic examples because their culture survived intact long after the more southern cultures had been influenced by European contact. In the 1930s, an anthropologist recorded the elaborate lengths to which the Innu went in order not to offend the animals they had killed. The most important of their prey was the bear, and it required the greatest demonstrations of respect. Out of courtesy, people referred to a slain bear not by the common name for bear, but by polite euphemisms such as the 'Great Food'. To avoid offending the bear, people did not cut off the tail, nor sever the right arm from the paw, nor eat the meat outdoors, and only the oldest man in the community could eat the head and the right arm. The bear's skull was treated with particular reverence: it was carefully cleaned, provided with beads and other gifts and was erected on a pole so that the bear could continue to see (Figure 1.2).⁵

These practices of the Innu are sometimes said to reflect 'reverence' for animals, although this use of the term is controversial given that much of the veneration occurred after deliberate killing. Nonetheless, the customs showed a clear recognition that animals are ethically significant beings and that harms done to them are important enough to require appropriate expressions of gratitude and respect. This deferential treatment of animals was also seen as serving a practical function. The Innu people depended on animals for their own survival, and they believed that successful hunting required the

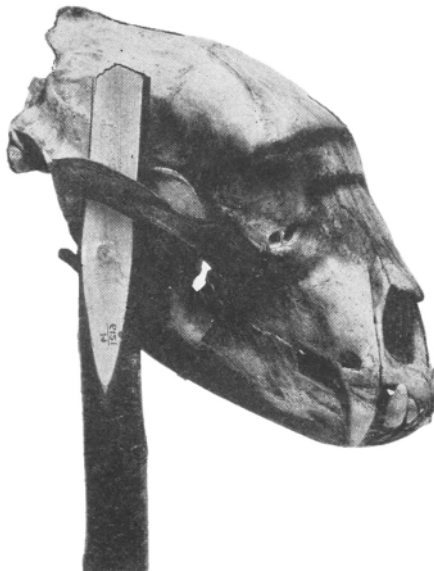


Figure 1.2 A bear skull in the Innu culture, cleaned and erected on a pole so that the bear could continue to see. Source: Speck (1935) reproduced with permission of University of Oklahoma Press.

⁵ Speck, F.G. (1935). *Naskapi, the Savage Hunters of the Labrador Peninsula*. Norman: University of Oklahoma Press. The culture that Speck called Naskapi/Montagnais is now commonly called Innu.

cooperation of animals who would allow themselves to be killed. If animals took offence at humans, then a hunting people could starve. Worse yet, animals could be dangerous; alone in the wilderness, hoping to subdue a bear with simple technology, an Innu hunter could not assume the power imbalance that modern hunters take for granted. Thus, a display of reverence was a way of making peace with the animal world, of reconciling other species to the human need to exploit them, and of securing the animals' continued cooperation in the hunt.

For pastoralist people like the Maasai, the belief that they had received cattle from God was linked to an ethic of responsibility for domestic animals and pride in providing them with diligent care. Anthropologist John Galaty, after working for decades with pastoralists in East Africa, described the intimate social bonds that occur between these people and their animals:

'Among the Maasai, when a cow, goat or sheep is born, it often falls into the hands of a person who is calming the mother animal. As a newborn struggles to stand, it is praised by onlooking herders. At night, calves and small stock are kept in a small room within the Maasai house, not too far from the fire, to keep warm and safe, and throughout the night the breaths of livestock create a low tone, in harmony with human breathing. Each night, pastoral males and females check the bodies of all livestock for wounds or abrasions or infections after a day of grazing and apply poultices and herbal medicines. Animals are continuously monitored, cleaned and cured by humans, accompanied by an ongoing patter of human-animal speech, sounds, calls, whistles and songs that constitute a customary mode of oral communicative exchanges between them...'⁶

For the Jains, with their view of the continuity of life forms, the guiding ethical principle is *ahimsa* – meaning non-violence – and taking care not to harm other beings is a key virtue. Devout Jains will sweep a path in front of themselves to avoid stepping on ants and other small creatures; they will not eat outdoors because they might consume flying insects by accident; they may even breathe through a mask and filter their water before they drink it. The principle applies to a lesser degree to plants; thus, it is better to eat cherries, which can be harvested without harming the tree, rather than carrots whose consumption causes the plant to die. When walking outdoors, monks and nuns will even avoid raising their arms so as not to frighten or disturb animals.⁷ Naturally, their world-view makes it impossible for devout Jains to be farmers who, in tilling the soil, would harm countless creatures ranging from burrowing rodents to the tiny soil organisms that play a lesser but still significant role in the Jain world.

The message from these various examples – the Innu, the Maasai and the Jains – is that human cultures possess what we might call an 'animal mythology'. By mythology I do not mean incorrect or outmoded beliefs, but a set of fundamental assumptions and

6 Galaty, J.G. (2014). Animal spirits and mimetic affinities: the semiotics of intimacy in African human/animal identities. *Critique of Anthropology*, 34: 30–47. The quotation, slightly edited for clarity, is on pages 39–40.

7 Chapple (2006).

values that we see in the enduring stories, art and ideas of a culture, and which serve (in the words of historian Ronald Wright) as ‘the maps by which cultures navigate through time’.⁸ This animal mythology involves two elements. One consists of ‘factual’ beliefs about the nature of animals and their historical relationship to people. The other is a correlated set of evaluative and ethical beliefs about the importance of animals and appropriate conduct towards them. As we will see, if the factual beliefs evolve and change, the evaluative and ethical beliefs are likely to change as well.

Western Animal Mythology Today

It is tempting to imagine that modern Western culture, with its emphasis on science and rational thought, has abandoned any form of animal mythology and adopted a purely scientific understanding of animals and purely rational conclusions about how animals should be treated. To correct this idea, let’s briefly consider how differently we portray and treat three types of animals.

In modern Western culture, one of the most valued animals is, of course, the domestic dog. Dogs appear in countless stories and works of art, both traditional and contemporary, as the chief animal companion and ‘best friend’ of humans. Greyfriars Bobby, a Skye terrier owned by an ageing shepherd, became one of Edinburgh’s most celebrated citizens by spending the rest of his life guarding the gravesite of his deceased owner.⁹ Lassie, the faithful collie sold by an impoverished family to a wealthy landowner, demonstrated both her loyalty and her intelligence by making the seemingly impossible journey back to her original home.¹⁰ And in real life, Western practices are largely consistent with this uniquely positive portrayal: dogs are treated as members of human families, given distinctive names, rescued from abuse by public institutions and totally exempted from slaughter for human food.

Ironically, the animal at the lowest end of the value scale has traditionally been the dog’s close relative, the wolf. For much of Western history, the wolf has been cast as the arch-enemy of humans. In traditional folk tales, wolves connive to eat children and the elderly, and the death of a wolf, no matter how gruesome, is invariably a source of satisfaction. When the ‘three little pigs’ killed the wolf by boiling him alive, this was merely a satisfactory ending to the tale; had the reverse occurred, the story would have been horrific, even by the grim standard of traditional children’s literature. And again, real-life treatment of wolves in the West has fit this negative image: for centuries, we have hunted, trapped and poisoned wolves with few scruples.

The animals kept for food production in the West fall between these two extremes. As hundreds of children’s stories attest, the farm animals are a source of great interest and sometimes sympathy, pride and friendship, and they are essential elements of the

8 Wright, R. (1992). *Stolen Continents: Conquest and Resistance in the Americas*. Boston: Houghton Mifflin. The quotation is on page 5.

9 Atkinson, E. (1912). *Greyfriars Bobby*. New York: Harper and Brothers.

10 Knight, E.M. (1940). *Lassie Come Home*. New York: Holt, Rinehart and Winston.

rural landscape. They are certainly seen as worthy of care, and bear none of the negative loading associated with wolves. Nonetheless, they are valued more for their usefulness than for their loyalty, intelligence or individuality. Hence, Jack (who climbed the beanstalk) remained a sympathetic but gullible figure after selling the family cow for a few beans; had he sold the family dog, we would regard him as heartless.

Given these very diverse attitudes, a person on a working farm today might start the morning by taking an ageing dog to a veterinarian to prolong the dog's life; then come home and ship a group of six-month-old pigs for slaughter, taking care not to cause them unnecessary distress while loading them into the vehicle; and then set out a trap to do away with a pesky coyote that had been seen nearby. Objectively, those three animal species are roughly similar in their level of mental functioning, their capacity for suffering and probably most other attributes which (rationally) might make them worthy of moral concern. The fact that we treat them so differently shows that Western culture does have an animal mythology which is reflected in its stories and art, and which has a profound influence on human behaviour.

The Tension in Western Animal Mythology

Actually, Western culture has *two* major animal mythologies which have been vying for prominence for millennia. As historian Dix Harwood has pointed out, the nature of animals has been one of the longest-running debates in Western thought. One tradition, Harwood wrote, holds that humans and animals 'are very much alike, with the same emotions and similar mental processes'. The opposing view considers 'that an unbridgeable chasm yawns between the human race and the other species'.¹¹ The debate has been made more persistent and more passionate because of its implications for human self-definition: do we see ourselves as little more than beasts, or little less than gods?

Ancient Greece provided the first well-documented example of the opposing views as brilliantly described by classicist Richard Sorabji. The followers of Pythagoras (born about 580 BC) argued for kinship between humans and other species because we are made from the same elements, we are permeated by the same breath, and animals and humans alike possess the same reincarnated souls. On this basis, the Pythagoreans famously practised moral vegetarianism. On the other side of the argument, Aristotle (382–322 BC) concluded that although humans and animals share many characteristics such as perception and emotion, humans alone have the capacity for *logos* or reason. Thinkers of the Stoic and Epicurean schools – rivals to the Pythagoreans – made this view of animals the basis for their ethical position that animals fall outside the realm of moral concern.¹²

11 Harwood, D. (1928). *Love for Animals and How it Developed in Great Britain*. Republished 2002 as *Dix Harwood's Love for Animals and How it Developed in Great Britain (1928)* (ed. R. Preece and D. Fraser). Lewiston, USA: Edwin Mellen Press. The quotation is on page 6.

12 Sorabji, R. (1993). *Animal Minds and Human Morals: The Origins of the Western Debate*. Ithaca, USA: Cornell University Press.

Among mediaeval Christian thinkers, we see a similar polarisation. St. Francis of Assisi (1181–1226), who saw a cosmic unity joining humankind with all of nature, addressed the birds and animals as his brothers and sisters. St. Thomas Aquinas (1225–1274), although encouraging kind treatment of other creatures, saw them as fundamentally different because (he claimed) only humans have immortal souls.¹³

The same debate has extended into more recent times. In France, René Descartes (1596–1650) famously claimed that there is a fundamental difference between humans and animals because humans have a unique capacity for rational thought which, in Descartes' view, is the essence of human life. On this basis, Descartes (or at least his followers) saw animals as machine-like entities acting without thought or feeling.¹⁴ By contrast, Descartes' countryman Voltaire (1694–1778) vehemently denounced this view. In his *Philosophical Dictionary*, he opened the entry on animals with the words: 'What a pitiful, what a sorry thing to have said that animals are machines bereft of understanding and feeling', and he went on to ask, '... has nature arranged all the means of feeling in this animal, so that it may not feel?'¹⁵

Again, in the German Enlightenment, the philosopher Immanuel Kant (1724–1804) emphasised the difference between humans and animals. His approach to ethics was based on the claim that we should treat our fellow humans not as means to our ends but as ends in themselves, whereas animals (he claimed) 'are not self-conscious and are there merely as a means to an end. The end is man'.¹⁶ By contrast, the poet Johann Wolfgang von Goethe (1749–1832) believed strongly in a continuity linking humans and the other species and proposed that 'each animal is an end in itself'.¹⁷

And a remarkably similar tension persists in modern philosophy, with some contemporary philosophers emphasising our similarity to animals while others emphasise our differences.

13 Preece, R. (1999). *Animals and Nature: Cultural Myths, Cultural Realities*. Vancouver: University of British Columbia Press. But note Preece's comment that 'soul' had a somewhat different meaning in St. Thomas' time than it does today.

14 Descartes, R. (1637). Discourse on the method for properly conducting reason and searching for truth in the sciences. Republished 1984–1991 in: *The Philosophical Writings of Descartes*, Vol. 1 (ed. and trans. J. Cottingham, R. Stoothoff, D. Murdoch and A. Kenny). Cambridge, UK: Cambridge University Press. There has been controversy over whether Descartes, in denying thought to animals, also denied feeling. For different views, see Cottingham, J. (1993). *A Descartes Dictionary*. Oxford: Blackwell; and Steiner, G. (1998). Descartes on the moral status of animals. *Archiv für Geschichte der Philosophie*, 80: 268–291.

15 Voltaire F.-M.A. (1764). *A Philosophical Dictionary*. Republished 1924 (trans. H.I. Woolf). New York: Knopf. The quotation is from the entry entitled 'Animals' on page 18.

16 Preece (1999). The quotation is on page 123.

17 Preece, R. (2003). Darwinism, Christianity, and the great vivisection debate. *Journal of the History of Ideas*, 64: 399–420. The quotation is on page 409.

Science and Our Evolving View of Animals

Against this background of ongoing disagreement, however, we can also discern a general shift in how animals are perceived in Western culture. If we look at mediaeval depictions of the biblical creation story (Figure 1.3 – the story is described in Chapter 2), we can imagine the vast difference between humans and animals in the mind of the artist. First was a difference in appearance: the animals had four legs and fur, or wings and feathers, or fins and scales – they looked nothing like the smooth-skinned biped that had been fashioned to resemble God. Second, humans had a different origin. People had not been created simply as one species among many, but in a separate act of creation that set them apart from the natural world. And third, at least according to official Christian church which sided with St. Thomas Aquinas, humans possessed a unique spiritual nature that animals did not share. Thus, although the ordinary women and men who raised and cared for animals may have had a more nuanced understanding, the prevailing view in mediaeval times seems to have been that people and animals differ fundamentally in at least three respects: different appearance, different origin and different inner life.



Figure 1.3 God bringing forth Adam after having created animals and the natural world. From the 'Morgan Crusader Bible', believed to have been created around 1250, likely in Paris. Source: Reproduced with permission of The Morgan Library & Museum, New York, MSM.638.

But over the centuries, the beliefs that made humans seem unique have gradually been chipped away, and scientific research has played a large role in wielding the hammer.

The first perception to fall was that humans and animals differ fundamentally in appearance. Anatomy was one of the first topics of scientific research in Europe,¹⁸ and by the 1500s cadavers were being researched with an intensity that other scientists devoted to cataloguing the night sky. And anatomists, like geographical explorers, staked their claims by giving their names to new-found anatomical entities: the tubes of Fallopius, the canals of Eustachius, the fissure of Sylvius.

And this scientific investigation was no ivory-tower affair. ‘Dissecting theatres’ (Figure 1.4) sprouted up across Europe in the major centres of learning, and they allowed the public to witness the dissection of an animal or, where it was legal, of a human criminal cut down from the gallows. Through such research, and this remarkably direct form of public education, people came to recognise that humans and other vertebrates are built on the same anatomical template, with similar organs and a similar arrangement of bones despite the variations that lead, for example, to a hand in one



Figure 1.4 View of the Leiden anatomical theatre, depicted by Bartholomeus Dolendo circa 1609. Source: Reproduced with permission of Leiden University Library, Department of Special Collections, COLLBN port. 315 III n. 21.

18 Singer, C. (1957). *A Short History of Anatomy from the Greeks to Harvey*. New York: Dover Publications.

species and a wing in another. According to Harwood, the anatomical resemblance between humans and other species ‘was obvious to comparatively few in 1600; in 1700 nearly everybody recognized it’.¹⁹

With the anatomical similarity thus established, the 1700s and 1800s saw scientists and others struggling to grasp the implications of this new knowledge. As early as 1734, the English poet Alexander Pope (1688–1744) used the common metaphor of the ‘Great Chain of Being’ to propose that all life is interconnected, from God and ‘natures ethereal’ down to those tiny creatures that ‘no eye can see’:

Vast chain of being, which from God began,
Natures ethereal, human, angel, man,
Beast, bird, fish, insect, what no eye can see,
No glass can reach; from infinite to thee...
Nothing is foreign; parts relate to whole;
One all-extending, all-preserving, soul
Connects each being, greatest with the least;
Made beast in aid of man, and man of beast....²⁰

For Pope, the similarity of humans and other species caused this kind of cosmic speculation, but for Carl Linnaeus (1707–1778) – the Swedish scientist who created the binomial system of classifying plants and animals – it created a delicate political problem. In 1747, when pondering how humans might fit into his taxonomic system, Linnaeus wrote to a fellow naturalist that he could find no features of humans that were distinct enough to justify placing them in a separate genus; to Linnaeus, humans looked like a species of great apes. But realising the furor that would ensue, Linnaeus finally put humans in a separate genus called *Homo*, noting ‘if I had called man an ape, or vice versa, I would have fallen under the ban of the ecclesiastics’.²¹

By the end of the 1700s, the discussion had shifted from metaphysical claims about the interconnectedness of life to the more concrete idea that the anatomical similarities might be due to a common ancestry. In his work *Zoonomia*, the brilliant and diverse English intellectual Erasmus Darwin (1731–1802) questioned whether species are immutable entities. Might not one species be somehow transformed into another? In fact, he wrote (some years before the birth of his famous grandson Charles), ‘...would it be too bold to imagine, that all warm-blooded animals have arisen from one living filament...?’²²

19 Harwood (1928), above, page 156.

20 Pope, A. (1734). An essay on man. Republished 1948 in: *Alexander Pope: Selected Works* (ed. L. Kronenberger), 97–137. New York: The Modern Library. The quotation (following Preece, 1999, page 121) combines Epistle 1, Section 8, lines 5–8, and Epistle 3, Section 1, lines 21–26.

21 Sagan, C. and Druyen, A. (1992). *Shadows of Forgotten Ancestors: A Search for Who We Are*. New York: Random House. The quotation is on page 274.

22 Darwin, E. (1796). *Zoonomia; Or, the Laws of Organic Life*, Vol. 1. Republished 1801. London: J. Johnson. The quotation is in ‘Generation’, Section 39.

But by what means might such evolution have occurred? Early evolutionists imagined a process of gradual transformation whereby characteristics acquired by one animal during its life are somehow passed on to its offspring: if a proto-giraffe stretches to reach the tree tops, its offspring may be born with longer necks.²³ Then, in the 1850s, Charles Darwin and Alfred Russel Wallace proposed the mechanism that is now generally accepted. Nature, they suggested, produces an over-abundance of animals varying in certain ways. Some of these variants are better adapted to survive and reproduce, and those that are better adapted leave more descendants than the others. Through this process of ‘natural selection’, they claimed that new species gradually emerge. And the massive amount of evidence collected by Darwin gave the idea of natural selection a plausibility that previous evolutionary theories had lacked.

Thus, by the late 1800s, the perception that humans possess a unique physical form had long been abandoned, and the seeds had been sown for a belief in a common origin. Where mediaeval thinkers had seen a ‘Great Chain of Being’ with God and other heavenly beings at the top, animals (from higher to lower) beneath and humans as a special kind of being that bridges the natural and supernatural realms, evolutionists saw instead a kind of family tree wherein *Homo sapiens* counted as one species among countless others, most closely related to a small group of primates with opposing thumbs and large brains, and sharing its more distant ancestry with all the animal kingdom.

Science and the Minds of Animals

But even if humans shared their femurs and their origins with other species, surely they were still unique in being rational, emotional and spiritual beings as evidenced especially by their use of language. Yet, even this claim came to be challenged.

One challenge came from Charles Darwin himself. In 1872, the year when he published the final edition of *On the Origin of Species*, Darwin produced a much less famous book entitled *The Expression of the Emotions in Man and Animals*, in which he proposed that many species share similar emotional experiences – fear, pain, pleasure, affection, anger – and often express them in similar ways (Figure 1.5).²⁴

Darwin’s contemporary George Romanes took up this theme with a book entitled *Animal Intelligence*.²⁵ Romanes set out to classify the mental powers of the different animal species, much as a comparative anatomist might classify variations in anatomical traits. His method was to collect narrative accounts illustrating the mental abilities of animals, but relying only on observers whom he considered trustworthy or on

23 Preece (1999), especially pages 157–159; Lamarck, J.B. (1809). *Philosophie Zoologique*. Republished 1984 as *Zoological Philosophy: An Exposition with Regard to the Natural History of Animals* (trans. H. Elliot). Chicago: The University of Chicago Press.

24 Darwin, C. (1872). *The Expression of the Emotions in Man and Animals*. Republished 1965. Chicago: University of Chicago Press.

25 Romanes, G.J. (1891). *Animal Intelligence*. New York: D. Appleton and Company.

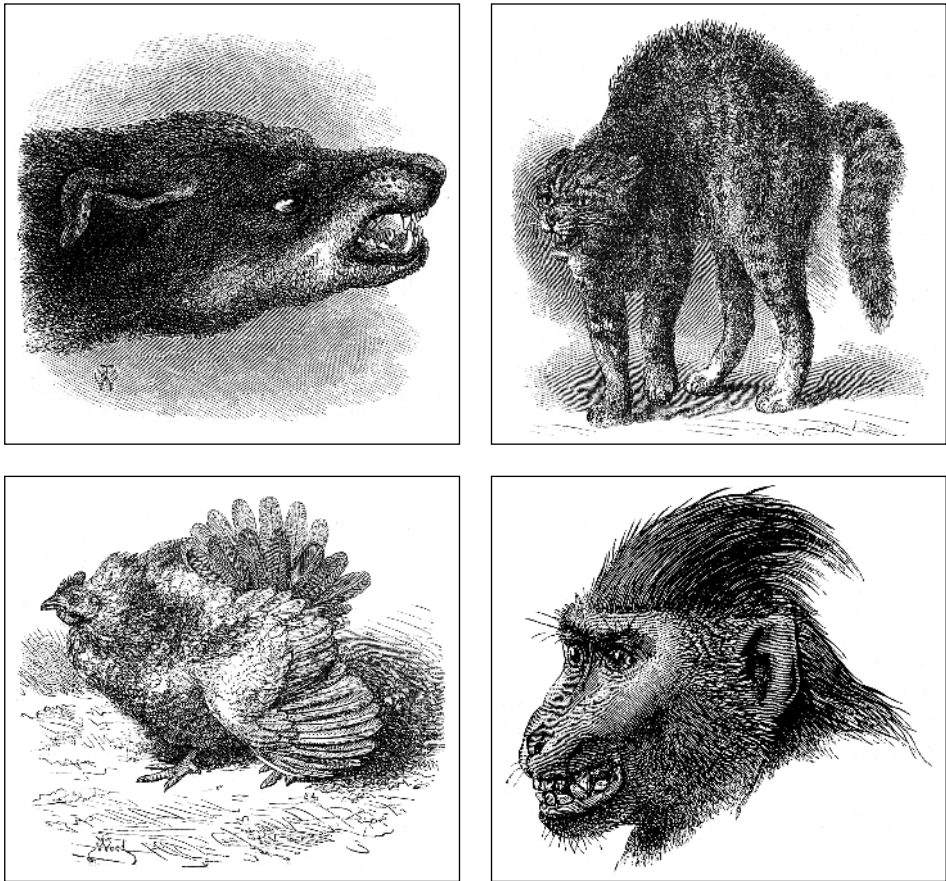


Figure 1.5 Four examples of animals displaying emotions as depicted in Charles Darwin's *The Expression of the Emotions in Man and Animals* (1872). Darwin described the behaviour as follows:

- 'When a dog is on the point of springing on his antagonist, he utters a savage growl; the ears are pressed closely backwards, and the upper lip is retracted out of the way of his teeth, especially of his canines' (page 117).
- 'Cats, when terrified, stand at full height, and arch their backs in a well-known and ridiculous fashion. They spit, hiss, or growl' (page 128–129).
- 'When a dog approaches a common hen with her chickens, she spreads out her wings, raises her tail, ruffles all her feathers, and, looking as ferocious as possible, dashes at the intruder' (page 97).
- '*Cynopithecus niger* [referring to Sulawesi crested macaques] draw back their ears and utter a slight jabbering noise, when they are pleased by being caressed ... the corners of the mouth are at the same time drawn backwards and upwards, so that the teeth are exposed. Hence, this expression would never be recognised by a stranger as one of pleasure'. Source: Wellcome Collection / Wikimedia Commons / CC BY 4.0.

observations that were ‘corroborated by similar or analogous observations made by other and independent observers’.²⁶ Romanes amassed a large body of evidence showing the various intellectual powers of animals arranged from molluscs, insects and other invertebrates through reptiles, fish, birds, mammals and (as the final chapter) monkeys, baboons and apes. As one example, Romanes described the behaviour of an elephant that had developed a disease of the eyes and had been blind for several days. A local doctor agreed to try treating one of the eyes with silver nitrate, a remedy commonly used for similar eye ailments in humans.

‘The animal was accordingly made to lie down, and when the nitrate of silver was applied, uttered a terrific roar at the acute pain which it occasioned. But the effect of the application was wonderful, for the eye was in a great degree restored, and the elephant could partially see. The doctor was in consequence ready to operate similarly on the other eye on the following day; and the animal, when he was brought out and heard the doctor’s voice, laid down of himself, placed his head quietly on one side, curled up his trunk, [and] drew in his breath like a human being about to endure a painful operation’.²⁷

Other scientists used more experimental approaches to understand animal intelligence. In 1927, primatologist Robert M. Yerkes published *The Mind of a Gorilla* based on his experiences in studying ‘Congo’, a captive gorilla aged about five years. Yerkes devised numerous experiments that required the gorilla to use a stick or to make a stack of wooden boxes in order to reach food. He noted in particular that Congo’s behaviour often failed to follow the pattern one would expect if she learned simply by trial and error. Instead of attempting a large number of different responses until she hit upon a solution, Congo often seemed to solve a problem by observation, reflection and insight. But Yerkes also expressed doubt over the ability of such experiments to reveal the true mental capacity of other species. ‘As likely as not’, he wrote, ‘the experiment is so contrived as to give the animal meager opportunity to utilize its peculiar adaptive or expressive capacities’.²⁸

Despite these intriguing beginnings, during the middle decades of the twentieth century the scientific study of animal behaviour moved in different directions.²⁹ Under the influence of a school of thought known as Positivism, the early attempts to understand the emotions and mental processes of animals were largely abandoned, and people looked instead for more mechanistic explanations – brain mechanisms, hormonal changes, ecological triggers – that could account for behaviour without any need to invoke the animals’ thoughts, emotions and other experiential states.

By about 1970, however, a different generation of scientists was beginning to restore the cognitive and emotional processes of animals as a subject for scientific study. One of

26 Romanes (1891), page ix.

27 Romanes (1891), page 399.

28 Yerkes, R.M. (1927). *The Mind of a Gorilla. Genetic Psychology Monographs*, 2: 1–193. The quotation is on page 137.

29 Rollin, B.E. (1990). *The Unheeded Cry*. Oxford: Oxford University Press.

the pioneers (as we noted earlier) was Jane Goodall who studied chimpanzees not only to collect numerical data so as to calculate norms and averages for the species, but using methods closer to cultural anthropology – studying animals more as persons with individuality, unique life histories and complex social and mental lives. One of Goodall's most touching narratives concerned the chimpanzee whom she called 'Flint', a young male who, even at the mature age of eight years, was still strongly attached to his ageing mother, Flo. Here, as an example of her work, is Goodall's description of Flint's reaction when his mother died:

'So far as we know, Flint was the only one with Flo when she died; he was in a tree overhead when we found her. After a while he approached the body, bending right down to stare into her dead eyes. He reached to touch her, briefly groomed her arm, and then moved away...

After Flo's death [Flint] became increasingly depressed and lethargic.... By the second week Flint was spending most of his time lying on the ground, often under thick clumps of vegetation, always close to where he had last seen Flo. His eyes, which sank ever deeper in his head, acquired a glossy lustre and sometimes he stared unwinkingly ahead with a gaze that gave the impression of insanity. He ate seldom, and by the end of the third week had lost more than a third of his weight. Within a few days he was dead.

Flint's death was a tragedy in every way; at the same time it is an amazing testimony to the depth and significance of the affectionate bond which can unite a chimpanzee child to his mother'.³⁰

Accompanying these natural-history observations were other remarkable developments. In a series of three books beginning with *The Question of Animal Awareness* in 1976, behavioural scientist Donald Griffin helped to re-stimulate scientific interest in the mental lives of animals.³¹ Other scientists took up the challenge by producing studies of the cognitive powers and stages of mental development of animals. Before the end of the century, scientific books began to appear with such frankly mentalistic titles as *How Monkeys See the World: Inside the Mind of Another Species* and *Reaching into Thought: The Minds of the Great Apes* – titles that harked back to Romanes and Yerkes, but that would have been scarcely thinkable for scientific books during the intervening decades.³² The result of all this scientific activity has been a shift in human

30 Goodall (1971). The quotation is from 'Postscript 1972' on pages 261–262 of the edition published by Fontana Books, London, 1973.

31 Griffin, D.R. (1976). *The Question of Animal Awareness*. New York: Rockefeller University Press; Griffin, D.R. (1984). *Animal Thinking*. Cambridge, USA: Harvard University Press; Griffin, D.R. (1992). *Animal Minds*. Chicago: University of Chicago Press.

32 Cheney, D.L. and Seyfarth, R.M. (1990). *How Monkeys See the World: Inside the Mind of Another Species*. Chicago: University of Chicago Press.; Russon, A.E., Parker, S.T. and Bard, K.A. (eds) (1996). *Reaching into Thought: The Minds of the Great Apes*. New York: Cambridge University Press.

perception of animals to the point that some species, at least, are now widely seen as experiencing complex mental and emotional lives.

This further shrinking of the human–animal divide in the late twentieth century was accompanied by a dramatic increase in ethical concern for animals, to the point that practices that had seemed modern and progressive in the mid-1900s – keeping hens in small cages, doing harmful research on chimpanzees – became controversial or even illegal.

To be clear, science was not the only factor that caused this change. For one thing, with the demographic shift from rural to urban living, plus the change from horses to automobiles, many people experienced animals as companions rather than merely utilitarian providers of food or transportation. Also, the end of two World Wars and the Great Depression brought greater quality of life to people in the industrialised countries and freed them to be concerned about matters other than personal security and necessities. And the media, from nature films to animated cartoons, depicted animals sometimes as fascinating natural beings and sometimes as sympathetic humanised ones. But whatever the role of these other factors, the altered scientific understanding of animals reinforced and gave weight to the altered popular understanding.

To summarise, Western perceptions of animals, which have always been pulled between the two poles of emphasising our similarities with other species and emphasising our differences, have evolved slowly over several centuries and rapidly over the past 50 years. By the end of the twentieth century, the gap that people in the West perceived between humans and other species had narrowed substantially. In particular, humans and other species were seen as sharing a common anatomical form, a common evolutionary ancestry and, in the case of some species, a complex mental and emotional life. As the perceived gap between humans and animals became progressively smaller, people directed more attention and sympathy towards animals. This set the stage for greater concern about our treatment of animals, and ultimately led to science being mandated to help clarify how we can understand and improve animal welfare.

Summing Up

Cultures have what we might call ‘animal mythologies’ that are captured in their art and stories. These mythologies include beliefs about what animals are like (dogs are faithful, wolves are dangerous) and correlated ethical beliefs about how animals should be treated.

In Western culture, we see two very different perceptions of animals that have competed since antiquity. One sees humans and animals as fundamentally similar; the other sees fundamental differences based on (for example) the belief that animals do not possess language, use reason or have souls.

Recent centuries have seen a shift towards emphasising the similarities based in part on contributions from science:

- the early anatomical discoveries that vertebrate animals are constructed on a common template,

- then the evolutionary view that humans and other species evolved from common ancestors,
- and most recently, research indicating complex cognitive and emotional capabilities in at least some non-human species.

These contributions from science, combined with many other elements of Western culture, have caused a pronounced shift towards seeing animals as sharing important characteristics with humans, and this in turn contributed to growing ethical concern about how animals should be treated.