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## Man and other animals

While much of the talk in big science this past year has centred on new breakthroughs in biotechnology, nanotechnology, computers and more esoteric questions such as the age of our universe, a quieter story has been unfolding behind the scenes in laboratories around the world — one whose impact on human perception and our understanding of the world is likely to be even more profound. And, strangely, the companies sponsoring the research are McDonald's, Burger King, KFC and other fast food purveyors.

Pressured by animal rights activists and by growing public support for the humane treatment of animals, these companies have financed research into, among other things, the emotional, mental and behavioural states of our fellow creatures. What the researchers are finding is unsettling. It appears that many of our fellow creatures are more like us than we had ever imagined. They feel pain, suffer, experience stress, affection, excitement — and even love.

Studies on pigs' social behaviour at Purdue University in the US, for example, have found that they crave affection and are easily depressed if isolated or denied playtime with each other. The lack of mental and physical stimuli can result in deterioration of health and increased incidence of diseases. The EU has taken such studies to heart and has outlawed the use of isolating pig stalls by 2012, and mandated their replacement with open-air stalls. In Germany, the government is encouraging pig farmers to give each pig 20 seconds of human contact every day and to provide them with two or three toys to prevent them fighting.

The pig study only scratches the surface of what is going on in the field of research into animal emotions and cognitive abilities. Researchers were stunned recently by the publication of an article in the prestigious journal *Science* reporting on the conceptual abilities of New Caledonian crows. In controlled experiments, scientists at

Oxford University reported that two birds named Betty and Abel were given a choice between using two tools, one a straight wire, the other a hooked wire, to snag a piece of meat from inside a tube. Both chose the hooked wire. But then, unexpectedly, Abel, the more dominant male, stole Betty's hook, leaving her only with a straight wire. Unphased, Betty used her beak to wedge the wire in a crack and then bent it with her beak to produce a hook, like the one stolen from her. She then snagged the food from inside the tube. Researchers repeated the experiment 10 more times giving her straight wires, and she fashioned a hook out of the wire nine times, demonstrating a sophisticated ability to create tools.

Then there is the story of Alex the African grey parrot, who was able to master tasks previously thought to be the preserve of human beings. Alex can identify more than 40 objects and seven colours, and can add and separate objects into categories.

Equally impressive is Koko, a gorilla who was taught sign language, has mastered more than 1,000 signs and understands several thousand English words. On human IQ tests, she scores between 70 and 95, putting her in the slow learner — but not retarded — category.

Tool-making and developing language skills are just two of the many attributes we thought were exclusive to our species. Self-awareness is another. Philosophers and animal behaviourists have long argued that other animals are not capable of self-awareness because they lack a sense of individualism. Not so, according to a spate of new studies. At the Washington National Zoo, orangutans given mirrors explore parts of their bodies they can't see otherwise, showing a sense of self. An orangutan named Chantek at the Atlanta Zoo used a mirror to groom his teeth and adjust his sunglasses, says his trainer.

When it comes to the ultimate test of what distinguishes humans from the other creatures, scientists have long believed that mourning for the dead represents the real divide. Other animals have no sense of their mortality

and are unable to comprehend the concept of their own death. But animals, it appears, experience grief. Elephants will often stand next to their dead kin for days, in silence, occasionally touching their bodies with their trunks. Kenyan biologist Joyce Poole, who has studied African elephants for 25 years, says that elephant behaviour towards their dead "leaves me with little doubt that they experience deep emotion and have some understanding of death."

We also know that virtually all animals play, especially when young. Anyone who has ever observed the antics of puppies, kittens or bear cubs cannot help but notice the similarities in the way they play and our own children. Recent studies in the brain chemistry of rats show that when they play, their brains release large amounts of dopamine, a neurochemical associated with pleasure and excitement in human beings.

Noting the striking similarities in brain anatomy and chemistry of humans and other animals, Steven Sivy, a behavioural scientist at Gettysburg College in Pennsylvania, asks a question increasingly on the minds of other researchers: "If you believe in evolution by natural selection, how can you believe that feelings suddenly appeared, out of the blue, with human beings?"

The new findings of researchers are a far cry from the conceptions espoused by orthodox science. Until very recently, scientists were still advancing the idea that most creatures behaved by sheer instinct, and that what appeared to be learned behaviour was merely genetically wired activity. Now we know that geese have to teach their goslings their migration routes. In fact, we are finding out that learning is passed on from parent to offspring far more often than not and that most animals engage in learned experience brought on by continued experimentation and trial-and-error problem-solving.

So what does all of this portend for the way we treat our fellow creatures? What about the thousands of animals sub-

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jected each year to painful laboratory experiments? Or the millions of domestic animals raised under inhumane conditions and destined for slaughter and human consumption. Should we ban leg-hold traps and discourage the sale and purchase of fur coats? And what about killing animals for sport? Fox hunting in England, bull-fighting in Spain, cock-fighting in Mexico? What about entertainment? Should lions be caged in zoos, should elephants be made to perform in circuses?

These questions are beginning to be raised in courtrooms and in legislation around the world. Today, Harvard and 25 other law schools in the US have introduced law courses on animal rights, and an increasing number of cases representing the rights of animals are entering the court system. Germany recently became the first government in the world to guarantee animal rights in its constitution.

The human journey is, at its core, about the extension of empathy to broader and more inclusive domains. At first, the empathy extended only to kin and tribe. Eventually it was extended to people of like-minded values — a common religion, nationality or ideology. In the 19th century, the first humane societies were established, extending the empathy to include our fellow creatures. Today, millions of people, under the banner of the animal rights movement, are continuing to deepen and to expand human concern for, and empathy toward, our fellow creatures.

The current studies into animals' emotions, cognition and behaviour open up a new phase in the human journey, allowing us to both expand and deepen our empathy — this time, to include the broader community of creatures who live alongside us.

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