The Emotional Lives of Animals

A Leading Scientist Explores Animal Joy, Sorrow, and Empathy — and Why They Matter

"A work of rare beauty and insight."
— *Best Friends*

"A glorious, moving, important book to enjoy and share."
— Ingrid Newkirk

Marc Bekoff

Foreword by Jane Goodall

Foreword

I am very pleased to be writing a foreword for this important book, for it deals with a subject — animal emotions — that is crucial to a proper understanding of animals and their relationship to ourselves. Throughout my childhood I was fascinated with animals of all sorts — I watched them, learned from them, and loved them. At the age of ten I developed a very special relationship with an extraordinarily intelligent mixed-breed dog, Rusty, who became my constant companion. He, along with the three successive cats, two guinea pigs, one golden hamster, one canary, and two tortoises with whom we shared our house and our hearts, taught me that animals, at least those with reasonably complex brains, have vivid and distinct personalities, minds capable of some kind of rational thought, and above all, feelings.

And then, in 1960, I had the extraordinary opportunity to learn about the chimpanzees of the Gombe National Park in Tanzania. Knowing nothing of scientific method, I simply recorded everything I saw. It was fortunate that I was patient, for during the first few months they fled whenever they saw the strange white ape who had appeared so suddenly in their midst. The first individual to lose his fear I named David Greybeard. He was a strikingly handsome adult male, with large eyes set far apart. With

his gentle but determined personality he was, as I ultimately discovered, a real leader. David's calm acceptance of my presence helped other members of his community to realize that I was not, after all, such a frightening creature. Then, many of them became aggressive, treating me to the kind of intimidation displays normally directed at leopards or large snakes. But eventually they relaxed, and as I gradually gained their trust, they allowed me to move into their world — always on their terms. I got to know the various vivid personalities: David's close companion Goliath, who was, as I eventually realized, the alpha male; high-ranking, assertive Flo and her large family; timid Olly with her far-from-timid daughter, Gilka; irritable JB; Jomeo, the inadvertent clown — and all the rest.

After a year Louis Leakey arranged for me to go to Cambridge University to work toward a PhD in ethology. There I was criticized for my lack of scientific method, for naming the chimpanzees rather than assigning each a number, for "giving" them personalities, and for maintaining they had minds and emotions. For these, I was told sternly, were attributes reserved for the human animal. I was even reprimanded for referring to a male chimpanzee as "he" and a female "she": Didn't I know that "it" was the correct way to refer to an animal? Well, a *nonhuman* animal. And so, for the most part, my observations were written off as merely those of a naive young woman who had had no university education. Yet it had been that very *lack of qualifications*, along with my passion for learning about animals in the wild, that had appealed to my mentor, the late Louis S. B. Leakey. He wanted an observer whose mind was unbiased by what he felt was the reductionist thinking of scientists in the early sixties. Indeed, ethologists, along with many philosophers and theologians, argued that personality, mind, and emotions were uniquely human attributes and that the behavior of other-than-human animals was for the most part merely a response to some environmental or social stimulus.

But I could not accept this — it absolutely contradicted all I had learned during my years with Rusty and my new experiences with the chimpanzees. Fortunately, I had a wise thesis supervisor, Professor Robert Hinde. He

himself was known for his rigorous scientific mind and his intolerance of fuzzy thinking. Yet he had named all the rhesus monkeys he was studying and wrote of them, unashamedly, as he's and she's. It was Robert Hinde who taught me to express my common sense but ethologically revolutionary ideas in a way that would protect me from too much hostile scientific criticism. For example, I could not say, "Fifi was happy," since I could not *prove* this: but I could say, "Fifi behaved in such a way that, had she been human, we would say she was happy"!

During the late sixties, more and more biologists went into the field and started long-term studies on all manner of animal species: apes, monkeys, elephants, whales, dolphins, wolves, and so on. And these studies made it clear that animal behavior is far more complex than was originally admitted by Western science. There was increasingly compelling evidence that we are not alone in the universe, not the only creatures with minds capable of solving problems, capable of love and hate, joy and sorrow, fear and despair. Certainly we are not the only animals who experience pain and suffering. In other words, there is no sharp line between the human animal and the rest of the animal kingdom. It is a blurred line, and becoming more so all the time.

Yet unfortunately, there are countless people among both the scientific and lay communities who still genuinely believe that animals are just objects, activated by responses to environmental stimuli. And only too often these people, consciously or unconsciously, reject our attempts to persuade them otherwise. After all, it is easier to do unpleasant things to unfeeling objects — to subject them to painful experiments, raise them in intensive factory farms, and hunt, trap, eat, and otherwise exploit them — than it is to do these things to sapient, sentient beings. Fear in a monkey, a dog, or a pig being is probably experienced in much the same way as it is in a human being. Young animals, human or otherwise, show such similar behavior when they are well fed and secure — frisking, gamboling, pirouetting, bouncing, somersaulting — that it is hard not to believe they are not expressing very similar feelings. They are, in

other words, full of *joie de vivre* — they are happy. I have watched chimpanzee children, after the death of their mothers, show behavior similar to clinical depression in grieving human children — hunched posture, rocking, dull staring eyes, lack of interest in events around them. If human children can suffer from grief, so too can chimpanzee children. Sometimes, in this state of grieving, chimpanzee orphans — like Flint and Kristal — die.

It is becoming increasingly obvious, and there is now excellent scientific backing to support this, that animals can be very therapeutic, very healing. They play an important role in decreasing high blood pressure, reducing antisocial behavior in prisoners, and helping children with learning disabilities to read. Elderly people, living alone, can be saved from depression caused by loneliness, or feelings of uselessness, when they share their lives with a beloved cat or dog. This is not just because animals are soft, furry, and warm. It is because these animal healers seem to empathize with their humans, understand their needs — and love them. These animals, in other words, are a great deal more than objects whose behavior is triggered by stimulus and response. A mechanical stuffed toy animal, no matter how skillfully crafted, no matter how lifelike it appears, will never take the place of a living, feeling, and loving animal.

The more people understand that animals, especially group-living mammals with complex brains, have rich emotional lives and, above all, are capable of suffering — mentally as well as physically — the sooner we may succeed in changing the inappropriate ways in which so many millions of animals are treated. In fact, most people have no idea what goes on in medical research labs. And they do not know — and do not want to know — about the billions of animals raised in stinking, unsanitary, and unbelievably cramped spaces in factory farms. Nor do they understand the cruelty involved in training animals to perform for circuses and other forms of entertainment. Unfortunately, so long as some

scientists continue to uphold (at least in their professional lives) the mistaken view that other-than-human beings are mere *things*, this will be used to condone inhumane behavior of this sort.

That is why I am so glad that Marc has written this book. Undaunted by the sometimes vicious criticism from his peers that has been leveled at him throughout most of his professional life, he has continued to study and write about the personalities and emotions of other-than-human animals. And now in *The Emotional Lives of Animals* he has pulled together the growing body of scientific evidence that supports the existence of a variety of emotions in other animals, richly illustrated by his own careful observations and conclusions. He argues forcefully that the time has come for acceptance of this body of information across the board. He suggests, in fact, that it is a waste of time even to ask if chimpanzees, elephants, dogs, and so on experience happiness, sadness, despair, and anger — that this is self-evident to anyone who has spent time or shared his or her life in a meaningful way with animals. Instead of continuing to try to *prove* the obvious, surely the time has come to *accept* that animal beings, like human beings, express emotions, and to ask different questions — as he does in this book. Why did emotions evolve in the first place? What useful purpose do they serve?

The Emotional Lives of Animals adds a strong voice to the growing chorus of those who are trying to change attitudes toward the animal beings with whom we share this planet. Combining careful scientific methodology with intuition and common sense, this book will be a great tool for those who are struggling to improve the lives of animals in environments where, so often, there is an almost total lack of understanding. I only hope it will persuade many people to reconsider the way they treat animals in the future.

— Jane Goodall, PhD, DBE,
founder, the Jane Goodall Institute,
and United Nations Messenger of Peace

PREFACE

The Gift of Animal Emotions

Welcome to the fascinating world of animal emotions. As a scientist who's studied animal passions and beastly virtues for more than thirty years, I consider myself very fortunate. I love what I do. I love learning about animals, and I love sharing with others what my colleagues and I discover. Whenever I observe or work with animals, I get to contribute to science and develop social relationships at the same time, and to me, there's no conflict between those two activities.

Before I begin, however, I'd like to address an important matter of terminology. In discussions of "animal emotions," we sometimes forget that humans are also animals. However, it's cumbersome to use the phrase "nonhuman animals" to refer to beings we typically call "animals." And so in this book I use the word *animals* to mean "nonhuman animals" — realizing of course that we're all animals, and hopeful that this linguistic shorthand won't perpetuate any "forgetfulness."

The field of animal emotions — which is a specific area of focus within the larger scientific discipline of cognitive ethology, or the study of animal minds — has changed a great deal in the past thirty years. When I first began my studies, researchers were almost all skeptics who spent their time wondering if dogs, cats, chimpanzees, and other animals

felt anything. Since feelings don't fit under a microscope, these scientists usually didn't find any — and as I like to say, I'm glad I wasn't their dog! But thankfully, there are fewer and fewer skeptics today, and while debates over *whether* animals have emotions still occur, the question of real importance is becoming *why* animal emotions have evolved the way they have. In fact, the paradigm is shifting to such an extent that the burden of proof now falls more often to those who still argue that animals don't experience emotions. My colleagues and I no longer have to put tentative quotes around such words as *happy* or *sad* when we write about an animal's inner life. If our dog, Fido, is observed to be angry or frightened, we can say so with the same certainty with which we discuss human emotions. Scientific journals and the popular press regularly publish stories and reports on joy in rats and grief in elephants, and no one blinks.

It's bad biology to argue against the existence of animal emotions. Scientific research in evolutionary biology, cognitive ethology, and social neuroscience supports the view that numerous and diverse animals have rich and deep emotional lives. Emotions have evolved as adaptations in numerous species, and they serve as a social glue to bond animals with one another. Emotions also catalyze and regulate a wide variety of social encounters among friends, lovers, and competitors, and they permit animals to protect themselves adaptively and flexibly using various behavior patterns in a wide variety of venues.

Charles Darwin's well-accepted ideas about evolutionary continuity, that differences among species are differences in degree rather than kind, argue strongly for the presence of animal emotions, empathy, and moral behavior. In practice, continuity allows us to "connect the evolutionary dots" among different species to highlight similarities in evolved traits, including individual feelings and passions. What we have since learned about animal emotions and empathy fits well with what we know about the lifestyles of different species — how complex their social interactions and social networks are. Emotions, empathy, and knowing

right from wrong are keys to survival, without which animals — both human and nonhuman — would perish. That's how important they are.

And there are always surprises. Just when we think we've seen it all, new scientific data and stories appear that force us to rethink what we know and to revise our stereotypes. For example, just after receiving the galley proofs of this book, I came across a story in the December 2, 2006 issue of *New Scientist* magazine about emotions in whales. It turns out that humpback whales, fin whales, killer whales, and sperm whales possess spindle cells in the same area of their brains as spindle cells in human brains. This brain region is linked with social organization, empathy, intuition about the feelings of others, as well as rapid, gut reactions. Spindle cells, once thought to be unique to humans and other great apes, are believed to be important in processing emotions. And whales actually have more of them than humans do.

All mammals (including humans) share neuroanatomical structures and neurochemical pathways that are important for feelings, but do all animals feel the same things? Research has shown that mice are empathic rodents, but it turns out that they're fun-loving as well. We also will hear stories of pleasure-seeking iguanas, a horse with a sense of humor, amorous whales, elephants who suffer from psychological flashbacks and posttraumatic stress disorder, a grieving otter, a bereaved donkey, pissed-off baboons, sentient fish, and a sighted dog who served as a "seeing-eye dog" for his canine buddy.

While we might expect to find close, enduring, and endearing emotional relationships forming between members of the same species, improbable relationships often occur between animals of wildly different species, even between animals who are normally predator and prey! Such is the case with Aochan, a rat snake, who befriended a dwarf hamster named Gohan, at Tokyo's Mutsugoro Okoku Zoo.

If a snake and a hamster can become friends, then why not humans and other animals? Of course, they do all the time. But it's not just human emotions at play in these relationships; the emotions of animals

attract us and bond us as well. During a series of lectures I gave at the Assistance Dog Institute in Santa Rosa, California, in August 2006, I was able to observe the interactions between people with a wide range of disabilities and the dogs who were their lifelines. As I watched the nuanced, nitty-gritty details of communication that occurred through voice and movements, each person and his or her dog displayed a strong reciprocal social bond that was clearly based on mutual respect and feeling. Both beings, human and canine, shared an enduring emotional attachment that went far beyond "mere training."

I often begin my lectures with the question: "Is there anyone in this audience who thinks that dogs don't have feelings — that they don't experience joy and sadness?" I've never had an enthusiastic response to this question, even in scientific gatherings, though on occasion a hand or two goes up slowly, usually halfway, as the person glances around to see if anyone is watching. But if I ask, "How many of you believe that dogs have feelings?" then almost every hand waves wildly and people smile and nod in vigorous agreement. To live with a dog is to know firsthand that animals have feelings. It's a no-brainer. We map their feelings by observing their behavior, guided by the analogy of our own emotional templates, and we do it very reliably. And today, I'm happy to say, even the majority of scientists agree with what seems like common sense to everyone else.

Recognizing that animals have emotions is important because animal feelings matter. Animals are sentient beings who experience the ups and downs of daily life, and we must respect this when we interact with them. Animals are not only the companions we live with, care for, and love, they are also the billions of other domesticated animals who live on farms and in slaughterhouses and provide us with food and clothing. And wild animals are continually faced with trying to share our ever-crowded world.

Our relationship with other animals is a complex, ambiguous, challenging, and frustrating affair, and we must continually reassess how we

should interact with our nonhuman kin. Part of this reassessment involves asking difficult questions, and making sure our actions match our understandings and beliefs. Thus, I often ask researchers who conduct invasive work with animals or people who work on factory farms: "Would you do that to your dog?" Some are startled by this question, but it's a very important one to ask. If we wouldn't do something to our companion animals that we do daily to mice, rats, monkeys, pigs, cows, elephants, chimpanzees, or even noncompanion cats and dogs, we need to ask ourselves why.

Humans have enormous power to affect the world any way we choose. Daily, we silence sentience in innumerable animals. However, we also know that we're not the only sentient creatures with feelings, and with this knowledge comes the enormous responsibility and obligation to treat other beings with respect, appreciation, compassion, and love. There's no doubt whatsoever that, when it comes to what we can and cannot do to other animals, it's their emotions that should inform our discussions and our actions on their behalf, and we can always do more for them. This is a forward-looking book of hope that stresses that we must be imaginative in our interactions with other animals.

Emotions are the gifts of our ancestors. We have them and so do other animals. We must never forget this.

CHAPTER 1

The Case for Animal Emotions and Why They Matter

Many animals display their feelings openly, publicly, for anyone to see. And when we pay attention, what we see outside tells us lots about what's happening inside an individual's head and heart. As we'll find, careful scientific research is validating what we intuitively understand: that animals feel, and their emotions are as important to them as ours are to us.

A few years ago my friend Rod and I were riding our bicycles around Boulder, Colorado, when we witnessed a very interesting encounter among five magpies. Magpies are corvids, a very intelligent family of birds. One magpie had obviously been hit by a car and was lying dead on the side of the road. The four other magpies were standing around him. One approached the corpse, gently pecked at it — just as an elephant noses the carcass of another elephant — and stepped back. Another magpie did the same thing. Next, one of the magpies flew off, brought back some grass, and laid it by the corpse. Another magpie did the same. Then, all four magpies stood vigil for a few seconds and one by one flew off.

Were these birds thinking about what they were doing? Were they showing magpie respect for their friend? Or were they merely acting *as*

if they cared? Were they just animal automatons? I feel comfortable answering these questions, in order: yes, yes, no, no. Rod was astounded by how deliberate the birds were. He asked me if this was normal magpie behavior, and I told him that I'd never seen anything like this before and hadn't read any accounts of grieving magpies. We can't know what they were actually thinking or feeling, but reading their actions there's no reason not to believe these birds were saying a magpie farewell to their friend.

Despite the more than three decades I've spent studying animal species, I never cease learning from the individuals I encounter. Red foxes live near my mountain home outside of Boulder, Colorado. As I stare into the eyes of a red fox sitting by my study and watching me type, or as I observe red fox pups playing with one another or a female red fox burying her mate, I can't help but reflect deeply on what it's like to be these individuals sharing my hillside. Many animals live on the surrounding land — coyotes, mountain lions, porcupines, raccoons, black bears, a wide variety of birds, and lizards, along with many dogs and cats. Through the years, they've been my friends and teachers.

In my musings about animal emotions I also can't help wondering, What about the insects? Do even mosquitoes have emotional lives? Of course, mosquitoes have tiny brains and lack the neural apparatus necessary for the evolution of emotions, so it's doubtful they do. But in truth, we just don't know. One day, perhaps we'll figure out a way to determine this. More important, however, would it make a difference to us if they did? It should, just as it should make a difference to us that other animals have emotions. Knowing that animals feel — and being able to understand them when they express joy, grief, jealousy, and anger — allows us to connect with them and also to consider their points of view when we interact with them. Knowledge about animal passions should make a difference in how we view, represent, and treat our fellow beings.

THICK SKIN AND TENDER HEARTS:
Babyl the Elephant and Her Unconditional Friends

A recent trip to Kenya and Tanzania opened my eyes to the world of elephants, who are some of the most amazing beings I've ever seen. Observing large groups of wild elephants close up I could feel their majestic presence, awareness, and emotions. These firsthand experiences were wholly different than seeing captive elephants, who often live alone, in the confines and unnatural settings of a zoo, and my visit was deeply spiritual, inspirational, and transformative.

While we were watching a group of wild elephants living in the Samburu Reserve in Northern Kenya, we noted that one of them, Babyl, walked very slowly. We learned that she was crippled and that she couldn't travel as fast as the rest of the herd. However, we saw that the elephants in Babyl's group didn't leave her behind; they waited for her. When I asked our guide, the elephant expert Iain Douglas-Hamilton, about this, he said that these elephants always waited for Babyl, and they'd been doing so for years. They would walk for a while, then stop and look around to see where Babyl was. Depending on how she was doing, they'd either wait or proceed. Iain said the matriarch even fed her on occasion.

Why did the other elephants in the herd act this way? Babyl could do little for them, so there seemed no reason for or practical gain in helping her. The only obvious conclusion we could draw was that the other elephants cared for Babyl, and so they adjusted their behavior to allow her to remain with the group.

Friendship and empathy go a long way. And Babyl's friends aren't an isolated example. In October 2006 in a small village in eastern India, a group of fourteen elephants crashed through a village looking for a group member who had fallen into a ditch and drowned. Residents had already buried the seventeen-year-old female elephant, but still, thousands of people were forced to flee their homes as the other elephants searched and rampaged for more than three days.

THE HEART *IS* THE MATTER

In September 2006 there was a meeting about animal welfare called "The Heart of the Matter." It's nice to see scientists finally using the word *heart*, for the heart is the matter.

I study animal emotions and I love what I do. Over the course of my career, I've studied a wide variety of animals — coyotes, wolves, dogs, Adélie penguins, archer fish, western evening grosbeaks, and Steller's jays — and I've tackled a wide range of questions, dealing with everything from social behavior, social organization, and social development to communication, play, antipredatory behavior, aggression, parental behavior, and morality. To me, the evidence for animal emotions is impossible to deny, and it is widely supported by our current knowledge in animal behavior, neurobiology, and evolutionary biology.

In fact, the study of animal emotions is a dynamic and rapidly developing field of science, and there's no shortage of interest in animal emotions among scientists and average folks alike. In March 2005 about six hundred people from more than fifty nations gathered in London at a landmark meeting sponsored by the Compassion in World Farming Trust to learn more about animal sentience, animal consciousness, and the emotional lives of animals. In October 2006 the World Society for the Protection of Animals organized a conference in Rio de Janeiro to discuss how to improve animal welfare on farms and in research labs. Organizers expected about two hundred people, but twice that many attended, coming predominantly from Brazil and surrounding countries. The favorable response to the meetings in London and Rio is indicative that the time really has arrived for us to come to terms with the emotional lives of animals.

Stories about animal emotions and our complicated interrelationships with animals appear with increasing frequency in the press, from prestigious scientific journals like *Science*, *Nature*, *Trends in Ecology and Evolution*, and the *Proceedings of the National Academy of Sciences* to the *New York Times*, *Psychology Today*, *Scientific American*, *Time*, *The Economist*,

and even *Reader's Digest*. The emotional lives of animals was even the subject of a surprise hit movie, *The March of the Penguins*. Released in summer 2005, the documentary poignantly depicts penguin feelings and demonstrates how they experience suffering but also how they endure the most extreme challenges as they care for their eggs and their young.

Nevertheless, despite mounting scientific evidence and widespread popular belief, a decreasing few within the scientific community remain skeptical. Some still doubt that animal emotions even exist, and many who believe they do exist tend to think animal emotions must be lesser than human ones. This seems to me an outdated and even irresponsible point of view, and my main goal in this chapter — and indeed throughout the book — is to show that animal emotions exist, that they are important to humans, and that this knowledge should influence how we treat our fellow animals.

In discussing animal emotions, I focus mainly on behavioral data and anecdotal stories, weaving in recent discoveries in social neuroscience to show how a combination of common sense and scientific data — what I call "science sense" — makes a strong case for the existence of beastly passions. While stories drive much of my discussion, I bring in scientific studies as necessary for support.

However, once we agree that animal emotions exist and that they matter — which is what a great many people already believe — then what? Then we must consider ethics. We must look to our actions and see if they are consistent with our knowledge and beliefs. I feel strongly that ethics should always inform science. We should always strive to merge knowledge, action, and compassion. Indeed, that is always the heart of the matter.

WHAT ARE EMOTIONS?

It is very difficult to answer the question, "What are emotions?" Most of us know emotions when we see them but find it difficult to define

them. Are they physical, mental, or both? As a scientist, I feel safe saying that emotions are psychological phenomena that help in behavioral management and control; they are phenomena that emote us, that make us move. A distinction is often made between "emotional responses" to physical reactions and "feelings" that arise from thoughts. Emotional responses show that the body is responding to certain external stimuli. For example, we see an oncoming car about to hit us and we feel fear — increasing our heart rate, blood pressure, and body temperature. But actually, the fear isn't felt until the brain responds to the physiological changes that were a reaction to seeing the oncoming car.

Feelings, on the other hand, are psychological phenomena, events that happen solely in an individual's brain. An external event may trigger one emotion, such as anger or grief, but upon reflection we may decide we feel differently. We may interpret our emotions. Feelings express themselves as different moods. Feelings help us and influence how we interact with others in a wide variety of different social situations.

Charles Darwin, the first scientist to study animal emotions systematically, recognized six universal emotions: anger, happiness, sadness, disgust, fear, and surprise. He maintained these core emotions help us deal rapidly with a wide variety of circumstances and help us to get along in a complex social world. Others have since added to his list. Stuart Walton, in his book *A Natural History of Human Emotions*, adds jealousy, contempt, shame, and embarrassment to Darwin's core group, while the neuroscientist Antonio Damasio (in *Descartes' Error*) says that social emotions also include sympathy, guilt, pride, envy, admiration, and indignation. It's interesting that none of these researchers mention love.

Which, if any, of these emotions do animals experience? And do animals experience any emotions that humans do not? This is a very interesting question. Ethologist Joyce Poole, who has studied elephants for many years, states: "While I feel confident that elephants feel some emotions that we do not, and vice versa, I also believe that we experience many emotions in common."

If Poole is right, then there may be some emotions that animals experience that humans will never understand, but there are many that we do. Aren't animals, human and nonhuman alike, happy when playing or when reuniting with a loved one? Don't animals become sad after losing a close friend? When wolves reunite, wagging their tails loosely to and fro in a circle, whining and jumping about, are they not displaying happiness? What about elephants who reunite in a greeting celebration, flapping their ears and spinning about and emitting a vocalization known as a "greeting rumble" — is this not happiness? Likewise, what name but grief can we give to the emotion that animals display when they remove themselves from their social group, sulk after the death of a friend, stop eating, and even die? Surely, despite differences, all species must share a similar core of emotions.

PRIMARY AND SECONDARY EMOTIONS

Researchers usually recognize two different types of emotions, primary and secondary emotions. *Primary* emotions are considered to be basic inborn emotions. These include generalized rapid, reflex-like ("automatic," or hardwired) fear and fight-or-flight responses to stimuli that represent danger. They require no conscious thought and include Darwin's six universal emotions: fear, anger, disgust, surprise, sadness, and happiness. Animals can perform a primary fear response, such as avoiding an object, almost unconsciously, before they have even recognized the object generating the reaction. Loud raucous sounds, certain odors, objects flying overhead: these and other such stimuli are often inborn signals for "danger" that cause an automatic avoidance reaction. There's little or no room for error when confronted with a dangerous stimulus, so natural selection has resulted in innate reactions that are crucial to individual survival.

Primary emotions are wired into the brain's evolutionarily old limbic system (especially the amygdala); this is the "emotional" part of the

brain (so named by Paul MacLean in 1952). The physical structures in the limbic system and similar emotional circuits are shared among many different species and provide a neural substrate for primary emotions. In his three-brains-in-one (or triune brain) theory, MacLean identifies the reptilian, or primitive, brain (possessed by fish, amphibians, reptiles, birds, and mammals); the limbic, or paleomammalian, brain (possessed by all mammals); and the neocortical, or "rational" neomammalian, brain (possessed by a few mammals, such as primates and humans) — all packaged into the cranium. Each is connected to the other two, but each also has its own capacities. While the limbic system seems to be the main area of the brain in which many emotions reside, current research now indicates that not all emotions are necessarily packaged into a single system, and there may be more than one emotional system in the brain.

Secondary emotions are more complex emotions, and they involve higher brain centers in the cerebral cortex. They could involve core emotions of fear and anger, or they could be more nuanced, involving such things as regret, longing, or jealousy. Secondary emotions are not automatic: they are processed in the brain, and the individual thinks about them and considers what to do about them — what action is the best one to perform in a certain situation. Conscious thought and secondary emotions can influence how we respond to situations that bring forth primary emotions: We may duck as an unseen object flies overhead, but as we recognize that it's only a shadow, we will refrain from running and instead, feeling a twinge of embarrassment, quickly straighten up and pretend nothing is wrong.

Thinking about the emotion allows for *flexibility* of response in changing situations after evaluating which of a variety of actions would be the most appropriate to perform in the specific situation. Sometimes, if someone is bothering you, it might be appropriate to get away from them, and sometimes this might create an even worse social situation — depending on who the person is and what kind of consequences you fear. Although most emotional responses are unconsciously generated —

they occur without thinking — we learn to try to think before acting. Thinking allows us to make connections between feelings and actions, and this allows for variability and flexibility in our behavior so that, depending on the social situation, we always do the right thing. In this way, evidence of emotions in any creature is also an important step in determining sentience and self-awareness.

DOGS ARE HAPPY, NOT "HAPPY"

The reason a dog has so many friends is that he wags his tail instead of his tongue. — ANONYMOUS

We've all seen it. Maddy and Mickey, two of my friend's dogs, regularly have playdates at my house when their human companions are away. They arrive bounding around wildly in play, panting and barking, their wagging tails seemingly propelling them through space. They try to play with anyone who's available, whirling around to catch their own tail, running amok and knocking down anything and anyone in their way, stopping only for a taunting pause and then jumping into play once again. There's no question about it: these dogs are having fun!

For most people, spending half an hour with a dog is all the "proof" they need that animals have emotions, for dogs don't hide what they feel. The Nobel Prize–winning ethologist Konrad Lorenz gave us a very simple and common example when he noted how publicly emotional dogs are when they're anticipating going on a walk. Lorenz wrote in *Man Meets Dog*: "The owner says without special intonation and avoiding mention of the dog's name, 'I don't know whether I'll take him or not.' At once the dog is on the spot, wagging his tail and dancing with excitement. . . . Should his master say, 'I don't think I'll take him, after all,' the expectantly pricked ears will drop sadly. . . . On the final pronouncement, 'I'll leave him at home,' the dog turns dejectedly away and lies down again."

Thankfully, the dismissively skeptical line that animals only act "as if" they're feeling joy, grief, anger, or pain is now essentially dead. I know no practicing researcher who doesn't attribute emotions to their companion animals — who doesn't freely anthropomorphize — at home or at cocktail parties, regardless of what they do at work. (This anthropomorphizing is nothing to be ashamed of, by the way; as Alexandra Horowitz and I have argued, and as I show in chapter 5, these scientists are simply doing what comes naturally. Anthropomorphizing is an evolved perceptual strategy; we've been shaped by natural selection to view animals in this way.) Indeed, behavioral and neurobiological studies have consistently shown, and it is now largely accepted as fact, that animals share the primary emotions, those instinctual reactions to the world we call fear, anger, surprise, sadness, disgust, and joy.

Scientists now agree on the universality of the primary emotions based on studies that show that humans and animals share similar chemical and neurobiological systems. For instance, animals are frequently used to develop and to test drugs for human use in mental disorders, and a recent study shows that mice can be a good model for sadness and introversion. After mice are bullied or consistently dominated by other mice, they become withdrawn, and these depressed mice respond to such human drugs as the antidepressant Prozac. In another example, suicidal rats — or rats who have toxoplasmosis and develop a suicidal attraction to cats — can be successfully treated with antipsychotic drugs. When given haloperidol, which is used to control schizophrenia, their fondness for cats decreases greatly. The veterinarian Nicholas Dodman suggests using similar drugs along with behavioral conditioning for problem dogs and cats. If animals respond to these drugs as humans do, then it's highly likely that they have similar neural underpinnings to their emotions and probably similar feelings.

Scientific data and numerous stories indicate that animals feel a wealth of secondary emotions as well. Many people already know this simply

through everyday observation of their pets. Science has been slower to accept this "common wisdom," but that's perhaps to be expected; one important function of science is to "objectively" validate direct, subjective experience.

Empathy or compassion is an important secondary emotion to identify in animals, for it demonstrates a selfless caring for others. Recall Babyl and her caring friends. While I was in Homer, Alaska, I read a similar story about two grizzly bear cubs who stuck together after they were orphaned when their mother was shot near the Russian River. The female cub remained with her wounded sibling, though he limped, swam very slowly, and needed help to get food. An observer noted, "She came out and got a fish, and pulled it back, and then she let the other one eat." The young female obviously cared for her brother, and her support was crucial for his survival.

There's also a story of a troop of about a hundred rhesus monkeys in Tezpur, India, that brought traffic to a halt after a baby monkey was hit by a car. The monkeys encircled the injured infant, whose hind legs were crushed and who lay in the road unable to move, and blocked all traffic. A government official reported that the monkeys were angry, and a local shopkeeper said: "It was very emotional. . . . Some of them massaged its legs. Finally, they left the scene carrying the injured baby with them."

In one classic study, a hungry rhesus monkey would not take food if doing so subjected another monkey to an electric shock, and there is a more recent scientific study on empathy in mice. In this study, either one or both members of a pair of adult mice were injected with acetic acid, causing them to writhe in pain, so that researchers could observe whether or not these rodents have the capacity to feel for others who are in pain. Researchers discovered that mice who watch their peers in pain are more sensitive to it themselves and that an injected mouse writhed more if its partner was also writhing. Mice used visual cues to generate the

empathic response, although they typically use scent in many of their social encounters. So, as we see in the stories that open this chapter, animals (including mice) possess empathy. In addition, it's also known that the empathic response in mice is mediated by the same brain mechanisms as in human empathy.

Of course, this study is troubling. Did the scientists need to cause such pain to reach their conclusions? Mice (and rats) currently aren't protected by the Animal Welfare Act, but perhaps these and other findings will be used to elevate their status to that of dogs, cats, and nonhuman primates when it comes to invasive experimental testing. As we see in chapter 6, the Animal Welfare Act is far from an adequate protection in itself, but it would be a start.

After this scientific study of empathy appeared, I received numerous stories about empathy in a wide variety of animals, including rodents. People who live with animals weren't surprised by the findings. CeAnn Lambert, who runs the Indiana Coyote Rescue Center, told me that one hot summer morning she saw two baby mice in a deep sink in her garage. They were trying to get out of the sink but couldn't get up the steep, slick sides. One seemed less exhausted than the other. CeAnn put some water in a lid and placed it in the sink, and immediately the more lively pup went over to get a drink. On the way to the water the mouse found a piece of food and picked it up and took it over to its littermate. The weak mouse tried to take a bite of the food while the other kept moving the food slowly toward the water. Finally, the weaker mouse got a drink. Both gained some strength and climbed out using a board that CeAnn put in the sink.

There are many more examples, but the point is that even if animal emotions aren't exactly the same as our own, or for that matter the same across species, this doesn't mean that animals don't feel. In fact, as these last stories indicate, animal emotions are not restricted to "instinctual responses," but entail what seems to be a good deal of conscious thought.

IF ANIMALS FEEL, THEN WHAT DO THEY KNOW?

Animals Have Their Secrets But Their Feelings Are Transparent

The reluctance of contemporary philosophers and scientists to embrace the view that animals have minds is primarily a fact about their philosophy and science rather than a fact about animals.

— DALE JAMIESON,
"SCIENCE, KNOWLEDGE, AND ANIMAL MINDS"

When animals bark, howl, purr, whimper, grunt, laugh, or squeal, it means something to them, and what they're saying should also mean something to us, for their feelings matter. Lynne Sharp points out in her wonderful book *Creatures Like Us?* that the interests and concerns of animals are as important to them as ours are to us. Tails talk to us about what animals are feeling, and so too do various postures, gaits, facial expressions, sounds, and odors. Sometimes I wish I had a tail and mobile ears so I could communicate more effectively with dogs and other animals, whose tails and ears tell us lots about what they're thinking and feeling. Wagging wildly or drooping between their legs, animals' tails allow us to enter into their own brand of sentience.

What animals know — and how much self-awareness they have — is a topic of wide and often heated debate. The growing scientific evidence is that they know quite a lot, but the difficulties of communicating across species may make it impossible to ever know exactly how much. My baseline concerning animal emotions and sentience is pretty simple — animals will always have their secrets, but their emotional experiences are transparent. In other words, we know that numerous animals feel a rich panoply of emotions, some of which, like empathy, require a certain level of conscious thought. Many animals display a sense of humor. A few animals, such as chimpanzees, dolphins, and elephants, have passed tests that demonstrate they possess self-awareness. Some might experience a sense of awe, and some might even be moral beings who know "right" from "wrong."

Of course, there are differences among species. We would expect variations based on social, ecological, and physical factors. However, there also are compelling similarities despite sometimes extreme differences. One common measuring stick is called "relative brain size" (brain size expressed as a ratio to body size), and indeed, just about all researchers agree that, when comparing species, relative brain size makes a difference in various aspects of behavior, including antipredatory and feeding strategies. Just what these types of differences mean, however, remains largely a mystery, but there's no evidence that it means that animals with a smaller ratio don't have rich emotional lives. Because we share old parts of the brain that are important in human emotions, namely the limbic system including the almond-shaped structure called the amygdala, focusing solely on relative brain size is misleading. We need to pay attention to what we share with other animals and not necessarily how much of it we share with them. The brains of mice, dogs, elephants, and humans differ greatly in size, but all of these species display joy and empathy.

Unfortunately, misconceptions continue, often in popular books that offer unsupported generalizations about the cognitive, emotional, and empathic capacities of animals. For example, Harvard psychologist Daniel Gilbert, in his popular bestseller *Stumbling on Happiness* claims that *"The human animal is the only animal that thinks about the future"* (Gilbert's italics) and that this "is a defining feature of our humanity." Not even the animal emotion skeptics I know would ever make this claim; there are literally volumes of data showing that individuals of many species do think about the future, from Mexican jays, red foxes, and wolves caching food for later retrieval, to a subordinate chimpanzee or wolf pretending that she doesn't see a favored food item in the presence of a dominant individual and later returning to eat it when the dominant animal isn't around. We're also told by Gerald Hüther in his book *The Compassionate Brain* that the capacity for empathy sets the human brain apart from all other nervous systems, despite scientific evidence that this just isn't so.

In the end, the truth is simply that a dog has rich emotional and cognitive experiences of the *dog kind*. Ethological studies and research in social neuroscience show that humans aren't the sole occupants of the emotional arena. Dogs and many other animals can be happy, sad, and get pissed off. They let their tails do the talking. Animals talk to us using a myriad of behavior patterns — postures, gestures, and gaits — along with their mouths, tails, eyes, ears, and noses.

ANIMALS AND HUMANS:
Sharing Emotions, Sharing Lives

Animal emotions are a matter of importance in their own right, but the very presence of animals — with their free-flowing emotions and empathy — is also critical to human well-being. Animal emotions should be important to us because we need animals in our lives; they help us. It's because animals have emotions that we're so drawn to them; lacking a shared language, emotions are perhaps our most effective means of cross-species communication. We can share our emotions, we can understand the language of feelings, and that's why we form deep and enduring social bonds with many other beings. Emotions are the glue that binds. They catalyze and regulate social interactions in animals and in humans.

Veterinarian Marty Becker's book *The Healing Power of Pets* showed how pets can keep people healthy and happy — they help to heal lonely people in nursing homes, hospitals, and schools. In *Kindred Spirits*, holistic veterinarian Allen Schoen points to fourteen concrete ways in which a relationship between animal companions and humans has been shown to reduce stress. These include reducing blood pressure, increasing self-esteem in children and adolescents, increasing the survival rate of heart attack victims, improving the life of senior citizens, aiding in the development of humane attitudes in children, providing a sense of emotional stability for foster children, reducing the demand for physician's services

for nonserious problems among Medicare enrollees, and reducing loneliness in preadolescents. And Michelle Rivera, in her book *Hospice Hounds*, tells numerous stories of how dogs and cats can help people who are near death.

A recent study showed that a visit from a friendly pup might be good medicine for an ailing heart. In a randomized study of seventy-six hospitalized heart-failure patients, UCLA researchers found that anxiety scores dropped an average of 24 percent among patients who interacted with canines, regardless of the breed. The dogs would lie on the patients' beds for twelve minutes while patients simply patted and scratched their ears. "This study demonstrates that even a short-term exposure to dogs has beneficial physiological and psychosocial effects on patients who want it," said Kathie Cole, a clinical nurse at the UCLA Medical Center.

Similarly, in my home state, inmates at the Colorado Women's Correctional Facility get to care for and live with dogs who would have been put to sleep at the local animal shelter. The experience of walking the dogs, grooming them, and cleaning up after them is incredibly rewarding and beneficial to everyone — the inmates, the dogs, and the prison staff.

Stories of wild animal and human encounters — and other cross-species relationships — echo the conclusions of these studies. Lions are magnificent carnivores and powerful predators, yet they also show compassion, sympathy, and empathy in very unpredictable ways. For example, three lions in Ethiopia rescued a twelve-year-old girl from a gang who had kidnapped her. Said Sergeant Wondimu Wedajo: "They stood guard until we found her and then they just left her like a gift and went back into the forest." Stuart Williams, a wildlife expert with the country's rural development ministry, said that it was likely that the young girl was saved because she was crying from the trauma of her attack. Williams said, "A young girl whimpering could be mistaken for the mewing sound from a lion cub, which in turn could explain why [the lions] didn't eat

her. Otherwise they probably would have done so." Eventually, three of the four kidnappers were caught.

In but one of many stories of dolphins helping humans at sea, in New Zealand, a pod of dolphins circled protectively around a group of swimmers to fend off an attack by a great white shark. "They started to herd us up. They pushed all four of us together by doing tight circles around us," said Rob Howes, one of the swimmers. In these stories, we see that the empathetic presence of animals can have a direct and immediate impact on our well-being and even survival.

If it seems strange that animals would go out of their way to care for us, that's not even half the story. Some of the relationships that animals form are unbelievably improbable — for instance, in the Samburu Reserve in northern Kenya, a lioness adopted a baby oryx, usually a lion's favored meal, on five different occasions. And at Tokyo's Mutsugoro Okoku Zoo, a rat snake named Aochan befriended a dwarf hamster named Gohan. The hamster was originally offered as a meal; Aochan had refused to eat frozen mice, and zookeepers figured that the hamster would be more appetizing. However, Aochan refused to eat the animal and seemed to prefer sharing a cage with her; now Gohan even naps on Aochan's back. Even though Aochan has begun eating frozen rodents, he still shows no interest in eating his friend. Kazuya Yamamoto, a keeper at the zoo, said, "Aochan seems to enjoy Gohan's company very much."

And what do we make of the following fish story? Mary and Dan Heath claim that their adult golden retriever, Chino, is best friends with a fifteen-inch koi named Falstaff. For the past six years, the pair meets regularly at the edge of the pond where Falstaff lives. Each day, when Chino arrives, Falstaff swims to the surface and greets him and nibbles on Chino's paws. As Falstaff does this, Chino stares down with a curious and puzzled look on her face. Their close friendship is extraordinary and charming — as well as a powerful demonstration of just how important contact with other beings really is.

I have many personal stories that illustrate this as well, and I'll share two that involve my longtime canine companion, Jethro. One day, when Jethro was about two years old, after playing in the yard, he ran to the front door and waited to be let in. As he sat there, I noticed a small furry object in his mouth. My first reaction was, "Oh no, he killed a bird." But when I opened the door, Jethro dropped a very young, very alive bunny at my feet — drenched in his saliva. I couldn't see any injuries, but I decided to keep the bunny until I was sure it would be able to survive on its own. I named her Bunny, and I guessed that Bunny's mother had disappeared, probably eaten by a coyote, red fox, or mountain lion. Jethro looked up at me, wide-eyed, clearly seeking praise for being such a good friend to the bunny. This I gave him with a pat on his head and a rub of his tummy.

As I gathered a box, blanket, and food for Bunny, Jethro got very agitated. He tried to snatch her from my hands, and he whined and followed me around, watching my every move. When I had to leave the box, I called Jethro to come, but he wouldn't leave. I thought he'd try to snatch Bunny or the food, but he never did; he just stood watching for hours on end, fascinated by this little ball of fur slowly trying to get oriented in her new home. Jethro even slept next to Bunny, and during the two weeks I nursed her back to health, Jethro didn't harm her once. Indeed, Jethro had adopted Bunny, and all his attention was focused on making sure no one harmed her. Even when the day came to return Bunny to the outdoors, so she could begin life as a full-fledged rabbit, Jethro simply watched as she cautiously sniffed around, then slowly hopped away.

Nine years after this, Jethro again came running up to me with a wet animal in his mouth. Hmm, I wondered, another bunny? This time the wet ball was a young bird who was stunned from flying into a window. I held it in my hands for a few minutes till it regained its senses, and Jethro, true to form, watched every move. When I thought it was ready to fly, I placed the bird on the porch railing. Jethro approached it, sniffed, stepped back, and watched it fly away.

Jethro loved other animals, and he saved two from death. He could easily have eaten each with little effort. But you don't do that to friends.

When animals express their feelings they pour out like water from a spout. Animals' emotions are raw, unfiltered, and uncontrolled. Their joy is the purest and most contagious of joys and their grief the deepest and most devastating. Their passions bring us to our knees in delight and sorrow. If animals didn't show their feelings, it's unlikely that people would bond with them. We form close relationships with our pets not only because of our own emotional needs but also because of our recognition of theirs. As a resident of the Rocky Mountain foothills, I love rocky landscapes and rivers and streams, but I don't feel as close to them as I do to animal beings. I believe this is because landscapes and bodies of water don't have feelings or a point of view — they're not sentient.

Shared emotions and their gluelike power to attract and bind are responsible for this country's billion-dollar pet industry. More than 60 percent of U.S. households have a least one companion animal, and more than 55 percent have a dog or a cat. But the variety of animals kept as pets, particularly worldwide, is astonishing; it includes rodents, birds, fish, amphibians, reptiles, insects, spiders, invertebrates, and many more. About 20 percent of U.S. households have a bird, and more than 600 million pet fish are sold each year. In the both the United States and Britain, the numbers of pets are growing.

A Special Relationship: Children and Animals

I work with children as part of Jane Goodall's Roots & Shoots program, whose purpose it is to stimulate children to develop respect for animals, people, and the environment. This isn't difficult: children are curious naturalists who easily bond with all sorts of creatures. Children also provide some of the best examples of the powerful effect of animal emotions and empathy on human lives. More than 75 percent of children in the United States live with pets, and children are more likely to grow up

with a pet than with both parents. American boys are more likely to care for pets than for older relatives or younger siblings. A vast majority of children refer to their pets as "family" or "special friends" and confidants, and more than 80 percent refer to themselves as their pet's mother or father. If stranded on a desert island, more than half of children would prefer the company of their pet rather than of family members. Children also worry about homeless pets.

A study of 394 U.S. university students showed that those who had lived with dogs or cats as children were more self-confident than those who did not. In a study conducted in Croatia, children who lived with dogs were more empathic and pro-socially oriented than children who did not live with dogs, and children with a greater attachment to their pets rated their family climate significantly better than children who were less attached. Interactions with pets also help children learn that their pets have needs different from their own and foster the development of a children's theory of mind (their pets have their own beliefs and view of the world).

Pets can be social catalysts and help to draw out autistic and socially withdrawn children (an increase in pro-social behaviors). The term "pet therapy" was coined by Boris Levinson more than four decades ago, and it is still in use today. An American child psychologist, Levinson found that many children who were withdrawn and uncommunicative would come out and interact positively if his dog, Jingles, joined them in therapy sessions.

Pets also help victims of abuse by teaching them about unconditional love and buffering and overcoming trauma. In one study, pets were rated as more supportive than humans for sexually abused children. Pets provide support for children who have to overcome divorce or the illness or loss of a family member or close friend.

The value of animals to humans cannot be overstated. And it's their emotions that draw us to them. And yet, while we need animals, many animals would surely do much better without us.

A PARADIGM SHIFT:

Rethinking Our Assumptions and Revising Our Stereotypes

Questions about animal emotions and why they matter can generate a lot of heat. Our relationship with animals is complex, and how we treat animals often changes dramatically depending on the context. Many people can show tremendous love and devotion to animals who are their pets, but then, with little forethought, concern, or regret, they may go on to abuse animals in different settings in egregious ways. This is particularly true of scientists and the animals they keep at home and in the lab. My response to scientists (and others) who say they love animals and then, directly or indirectly, subject them to intentional pain and suffering is to say that I'm glad they don't love me! Unfortunately for animals, the relationship with humans has been, and remains, strongly asymmetrical. Human interests almost always trump animal interests.

A few years ago while reading the prestigious journal *Science*, I came across the following sentence: "More than any other species, we are the beneficiaries and victims of a wealth of emotional experience." The scientist who wrote this, Professor R. J. Dolan, cannot possibly know that this is true. Indeed, other animals might actually experience more vivid emotions than we do, both positive and negative. This sort of "humanocentrism" is what plagues the study of animal emotions, and it's also a large reason why animals are treated by such varying standards. Why are we so special? Why are we such deeply feeling animals, whereas other animals aren't? Looking at the state of the world today, I find it difficult to accept that we should be the standard against which other animals should be compared.

It's my hope that the study of human-animal interactions will put an end to useless dualisms such as "we" versus "them," the "laboratory" (where animals are often disposable objects) versus "the home" (where animals are highly valued friends), and "higher" animals versus "lower." These dualisms aren't accurate, and they surely do not foster

the development and maintenance of deep, respectful, and symmetrical interrelationships between humans and other animals.

What I hope to foster is a paradigm shift in how we think about animals, how we study animal emotions and animal sentience, and what we do with the information we already have, "scientific" and otherwise. This paradigm shift involves revising our stereotypes about what the emotional lives of animals of different species are "supposed" to be like. Rather than presuming that fish feel less than mice and that mice feel less than chimpanzees, or that rats aren't as emotional as dogs or wolves, or in general that animals feel less (and know less and suffer less) than humans, let's assume that numerous animals *do* experience rich emotions and *do* suffer all sorts of pain, perhaps even to a greater degree than humans.

Such an assumption increasingly reflects the evidence. At the Rio conference I mention earlier, world-renowned scientist Ian Duncan pronounced with no hesitation that based on his and his students' research (along with that of other scientists), fish experience pain and fear. They're also cunning, deceitful, and display cultural traditions. Further, Donald Broom, a professor at Cambridge University in England, suggested the possibility that animals with more complex brains might deal more effectively with pain than animals with less complex brains because the former have more varied responses, more flexible behavior, to cope with aversive situations. Broom's intriguing hypothesis is that perhaps fish cannot deal with pain as effectively as animals with more complex brains, and because of this fish actually suffer more. When deciding what and how much animals feel, it's best to keep an open mind.

As I've said, when it comes to the sometimes unconscious double standard that people frequently have in the treatment of animals, I find the question "Would you do it to your dog?" to be a great leveler. If you wouldn't do something to your dog, why would you do it to any other being?

This paradigm shift would also change how we do science — it

would create revisions in methods and changes of heart. The burden of proof would permanently shift to the side of the skeptics, who would have to "prove" their claims that animals don't experience emotions and don't really feel pain. It would no longer be acceptable to say that "since we really don't know what animals feel, let's assume whatever they feel, if anything, doesn't matter." This would change how scientists conduct experiments and tests, creating a more humane environment for everyone. Respecting, protecting, and loving animals wouldn't compromise science, nor would it mean we'd respect, protect, and love humans less. Does feeding your dog mean starving your children? No, with a little consideration and forethought, everyone can be cared for.

Most important, assuming that animals do experience rich emotions will never cause any harm. A lovely, unidentified quotation captures this well: "If I assume that animals have subjective feelings of pain, fear, hunger, and the like, and if I am mistaken in doing so, no harm will have been done; but if I assume the contrary, when in fact animals do have such feelings, then I open the way to unlimited cruelties. . . . Animals must have the benefit of the doubt, if indeed there be any doubt."

WHAT WE DO WITH WHAT WE KNOW

As a scientist, I'm often criticized for being antiscience because of my strongly pro-animal views. I'm not antiscience. It is in the best traditions of science to ask questions about ethics; it is not antiscience to question what we do when we interact with other animals. Ethics can enrich our views of other animals, as they are in their own worlds and as we relate to them in ours; they help us to see that their lives are worthy of respect, admiration, and appreciation. Indeed, it is out of respect, admiration, and appreciation that many humans seek out the company of whales, dolphins, polar bears, and birds.

We need animals in our lives just as we need air to breathe. We live in a wounded world in which many of us are alienated from animals and

all sorts of nature. Animals are our consummate companions who help us each and every day. Without close and reciprocal relationships with other animal beings, we're alienated from the rich, diverse, and magnificent world in which we live. That's why we seek out animals for emotional support. Our old Paleolithic brains pull us back to what's natural but missing in our fast-moving world: close interrelationships with other beings that help us figure out who we are in the grand scheme of things. Animals comfort us and put us in touch with what really matters — other sentient beings. A sentient animal is one for whom feelings matter, as my colleague John Webster puts it.

If we can learn to live consistently from this perspective, it would change for the better a great many ways in which animals are used and abused by human society. In fact, we owe it to them to help them however, whenever, and wherever we can. We can begin by examining our own lives and making the best and most ethical choices possible. Through the clothes we wear and the food we eat, are we supporting humane industries and practices? If we see people we know making hurtful choices, can we help alert or educate them to change? Are there ways we can better educate ourselves and pursue more stringent animal protection legislation? Far too many animals are harmed each and every day worldwide. If we can change minds and hearts and especially current practices, we will make progress and there is hope.

In my own field, I know that solid science can easily be done with ethics and compassion. There's nothing wrong with compassionate or sentimental science or scientists. Studies of animal thought, emotions, and self-awareness, as well as behavioral ecology and conservation biology, can all be compassionate as well as scientifically rigorous. Science and the ethical treatment of animals aren't incompatible. We can do solid science with an open mind and a big heart.

I encourage everyone to go where their hearts take them, with love, not fear. If we all travel this road, the world will be a better place for all beings. Kinder and more humane choices will be made when we let our

hearts lead the way. Compassion begets compassion and caring for and loving animals spills over into compassion and caring for humans. The umbrella of compassion is very important to share freely and widely.

JASPER AND PABLO:

Two Among Many

> *Every man and living creature has the sacred right to the gladness of spring.* — LEO TOLSTOY

I've dedicated this book to Jasper and Pablo. Jasper is a moon bear who was formerly kept in a crush cage on a bear bile farm in China. Crush cages are used to compress a bear's body to maximize the amount of bile the animal produces (which is extracted by means of a catheter inserted in the gall bladder). Jasper was kept in a tiny cage — a "rusting prison of torture," according to Jill Robinson, the founder of Animals Asia — and tortured repeatedly over the course of many years for his bile, a chemical used in traditional Chinese medicine. "This poor bear had been pressed down by a 'crush' which had reduced the height of the cage by half and had flattened Jasper to the floor," Robinson wrote to me. "Unable to sit or stand or hardly move, it is beyond belief to comprehend that this wild, intelligent bear lay there in this state for fifteen years before being rescued. Jasper was the victim of catheter implantation and his physical and mental agony must have been intolerable. A mischievous, fun-loving bear today, Jasper is everybody's friend, bears and people alike. His beautiful, trusting eyes show the absolute forgiveness of his species, and reinforces our goal of rescuing as many individual bears as possible."

In 2004, John Capitanio, associate director at a major primate research center, was asked if animals had emotions, and he dismissively responded that animals are "a neutral palette on which we paint our needs, feelings, and view of the world." Jasper is anything but a neutral palette. He's a deeply feeling being, not a thing, who was tortured repeatedly, and of

Jasper in the crush cage in which he was imprisoned for fifteen years. (Photo courtesy of Annie Mather/Animals Asia.)

A rehabilitated Jasper today. (Photo courtesy of Annie Mather/Animals Asia.)

course he didn't like it. How can any human being treat another feeling being this way? I like to call Jasper the "spokes-bear for hope and freedom." Despite his torture, Jasper forgave.

Pablo was a captive and mistreated chimpanzee, who was known as CH-377 in the New York University lab where he was kept. Using numbers rather than names is one way researchers distance themselves from the animals they exploit. Pablo's sad story was told in *Discover* magazine: "According to his research dossier, Pablo…had been darted 220 times, once accidentally in the lip. He had been subjected to 28 liver, two bone marrow, and two lymph node biopsies. His body was injected four times with test vaccines, one of them known to be a hepatitis vaccine. In 1993 he was injected with 10,000 times the lethal dose of HIV. The barrel-chested chimp had shrugged off AIDS and kept hepatitis at bay only to die of an infection aggravated by years of darts, needles, and biopsies."

Gloria Grow, who was with Pablo when he died, let the other chimpanzees see Pablo and observed: "Alone or in pairs, they tug at his arms, open his eyes, groom him, rub his swollen belly.…Before long the chimps wander off hooting. The hoots blossom into screams, and soon the walls of the chimp house echo with the sound of knuckles pounding steel." That spring Jane Goodall took some of Pablo's ashes with her to Tanzania "to sprinkle in the forests of Gombe, where chimps dance to stop the rain."

There are many thousands of animals to whom this book could be dedicated. Jasper and Pablo are two among far too many animals — billions a year — who are abused. The ways in which they and others are treated are an insult not only to them but also to us, for we are certainly beings who know right from wrong.

What animals feel is more important than what they know. IQs don't matter. It's worth recalling the utilitarian philosopher Jeremy Bentham's well-known statement concerning animal suffering: "The question is not, Can they *reason*? nor, Can they *talk*? but, Can they *suffer*?" For Bentham, it really didn't much matter if animals could think or if they

were smart. Rather, Bentham was concerned with whether or not animals could suffer. Intelligence and suffering are not necessarily correlated, and clever animals don't suffer more than less clever individuals. Some skeptics argue that some animals might not have a well-developed sense of self. We'll see this isn't really the case, but even if animals don't know who they are, they can still suffer, they can still be aware of their feelings, and they can still clearly tell us and other animals what they want and what they don't want.

It's time to journey into the minds and hearts of animals and discover what they feel and why. When we deny that animals have feelings, it demeans both them and us. We can make their lives better with little effort other than accepting them for who they are and welcoming them into our world. We should do no less.

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