

Good Natured-The Origins of Right and Wrong in Humans and Other Animals, 1996

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In addition to being human, we pride ourselves on being humane. What a brilliant way of establishing morality as the hallmark of human nature-by adopting our species name for charitable tendencies! Animals obviously cannot be human; could they ever be humane? If this seems an almost-rhetorical question, consider the dilemma for biologists-or anyone else adopting an evolutionary perspective. They would argue that there must at some level be continuity between the behavior of humans and that of other primates. No domain, not even our celebrated morality, can be excluded from this assumption.

Not that biologists have an easy time explaining morality. Actually, there are so many problems with it that many would not go near the subject, and I may be considered foolish for stepping into this morass. For one thing, inasmuch as moral rule represents the power of the community over the individual, it poses a profound challenge to evolutionary theory. Darwinism tells us that traits evolve because their bearers are better off with them than without them. Why then, are collective interests and self-sacrifice valued so highly in our moral systems?


Debate of this issue dates back a hundred years, to 1893 when Thomas Henry Huxley gave a lecture on "Evolution and Ethics" to a packed auditorium in Oxford, England. Viewing nature as nasty and indifferent, he depicted morality as the sword forged by Homo sapiens to slay the dragon of its animal past. Even if the laws of the physical world-the cosmic process-are unalterable, their impact on human existence can be softened and modified. "The ethical progress of society depends, not on imitating the cosmic process, still less in running away from it, but in combating it."1


By viewing morality as the antithesis of human nature, Huxley deftly pushed the question of its origin outside the biological realm. After all, if moral conduct is a human invention-a veneer beneath which we have remained as amoral or immoral as any other form of life-there is little need for an evolutionary account. That this position is still very much with us is illustrated by the startling statement of George Williams, a contemporary evolutionary biologist: "I account for morality as an accidental capability produced, in its boundless stupidity, by a biological process that is normally opposed to the expression of such a capability."2

In this view, human kindness is not really part of the larger scheme of nature: it is either a cultural counterforce or a dumb mistake of Mother Nature. Needless to say, this view is extraordinarily pessimistic, enough to give goose bumps to anyone with faith in the depth of our moral sense. It also leaves unexplained where the human species can possibly find the strength and ingenuity to battle an enemy as formidable as its own nature.


Several years after Huxley's lecture, the American philosopher John Dewey wrote a little-known critical rejoinder. Huxley had compared the relation between ethics and human

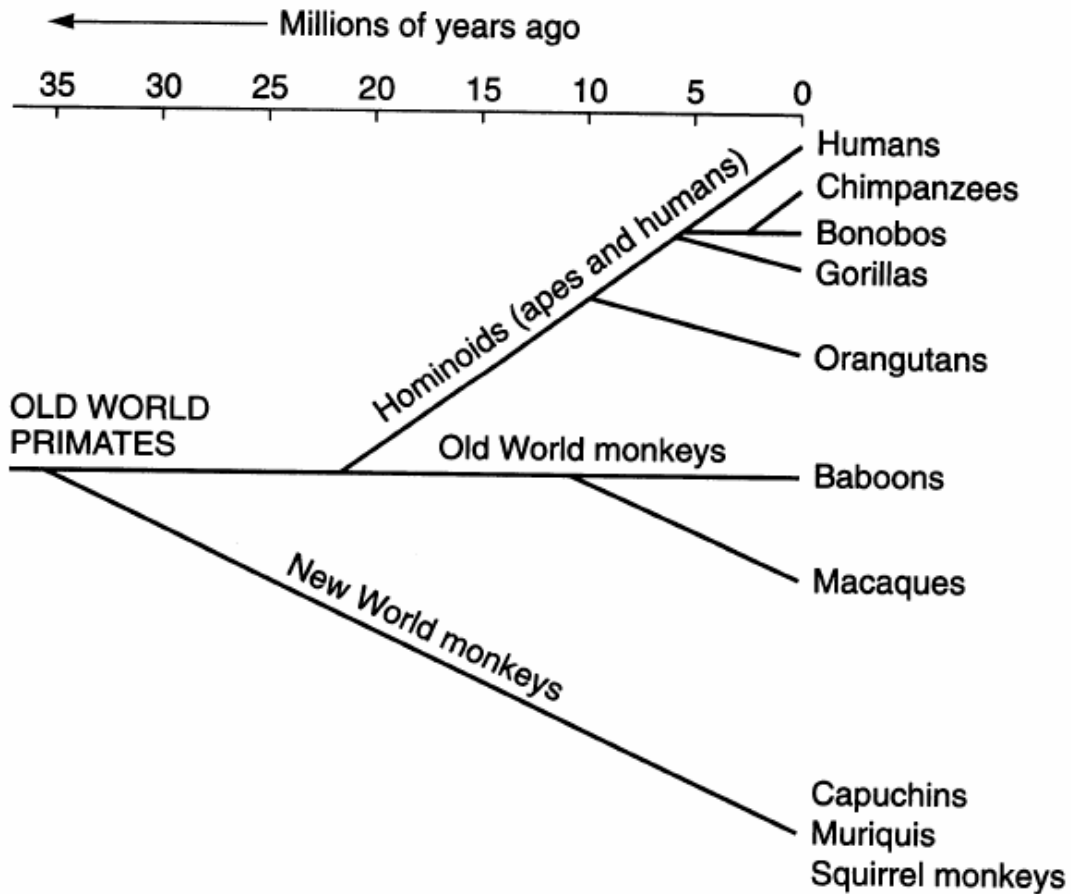
nature to that between gardener and garden, where the gardener struggles continuously to keep things in order. Dewey turned the metaphor around, saying that gardeners work as much with nature as against it. Whereas Huxley's gardener seeks to be in control and root out whatever he dislikes, Dewey's is what we would today call an organic grower. The successful gardener, Dewey pointed out, creates conditions and introduces plant species that may not be normal for this particular plot of land "but fall within the wont and use of nature as a whole."³

 I come down firmly on Dewey's side. Given the universality of moral systems, the tendency to develop and enforce them must be an integral part of human nature. A society lacking notions of right and wrong is about the worst thing we can imagine - if we can imagine it at all. Since we are moral beings to the core, any theory of human behavior that does not take morality 100 percent seriously is bound to fall by the wayside. Unwilling to accept this fate for evolutionary theory, I have set myself the task of seeing if some of the building blocks of morality are recognizable in other animals.

 Although I share the curiosity of evolutionary biologists about how morality might have evolved, the chief question that will occupy us here is whence it came.... Do animals show behavior that parallels the benevolence as well as the rules and regulations of human moral conduct? If so, what motivates them to act this way? And do they realize how their behavior affects others? With questions such as these, the book carries the stamp of the growing field of cognitive ethology: It looks at animals as knowing, wanting, and calculating beings....

Biologicizing Morality

 Social inclusion is absolutely central to human morality, commonly cast in terms of how we should or should not behave in order to be valued as members of society. Immoral conduct makes us outcasts, either here and now or-in the beliefs of some people-when we are turned away from the gates of heaven. Universally, human communities are moral communities; a morally neutral existence is as impossible for us as a completely solitary existence. As summed up by Mary Midgley, a philosopher, "Getting right outside morality would be rather like getting outside the atmosphere."⁴ Human morality may indeed be an extension of general primate patterns of social integration, and of the adjustment required of each member in order to fit in. If so, the broadest definition of this book's theme would be as an investigation into how the social environment shapes and constrains individual behavior.



Evolutionary tree showing the main branches of the primate order: the New World monkeys, the Old World monkeys, and the hominoid lineage that produced our own species. This diagram reflects recent advances in DNA analysis that place the African apes (gorillas, chimpanzees, and bonobos) much closer to humans than previously thought.

No doubt some philosophers regard morality as entirely theirs. The claim may be justifiable with regard to the "high end" of morality: abstract moral rules can be studied and debated like mathematics, almost divorced from their application in the real world.

According to child psychologists, however, moral reasoning is constructed upon much simpler foundations, such as fear of punishment and a desire to conform. In general, human moral development moves from the social to the personal, from a concern about one's standing in the group to an autonomous conscience. While the early stages hardly seem out of reach of nonhuman animals, it is impossible to determine how close they get to the more rational, Kantian levels. Reliable nonverbal signs of thought in humans do not exist, and the indicators that we sometimes do use (staring into the distance, scratching the head, resting the chin on a fist) are commonly observed in anthropoids. Would an extraterrestrial observer ever be able to discern that humans ponder moral dilemmas, and if so, what would keep that observer from arriving at the same conclusion for apes?

Biologists take the back door to the same building that social scientists and philosophers, with their fondness for high-flung notions, enter through the front door. When the Harvard sociobiologist E. O. Wilson twenty years ago proclaimed that "the time has come for ethics to be removed temporarily from the hands of the philosophers and biologized,"⁵ he formulated the same idea a bit more provocatively. My own feeling is that instead of complete reliance on biology, the best way to generate fresh air is simultaneously to open both front and back doors. Biologists look at things in a rather functional light; we always wonder about the utility of a trait, on the assumption that it would not be there if it did not serve some purpose. Successful traits contribute to "fitness," a term that expresses how well adapted (fitted) an individual is to its environment. Still, emphasis on fitness has its limitations. These are easily recognized when paleontologists hold up the fossil remains of an ancestor who could barely walk, declaring it a defining moment in human prehistory when the unfit began to survive.

To understand the depth of these limitations, one need only *realize* the influence of Thomas Malthus' essay on population growth that appeared at the beginning of the nineteenth century. His thesis was that populations tend to outgrow their food supply and are cut back automatically by increased mortality. The idea of competition within the same species over the same resources had immediate appeal to Charles Darwin, who read Malthus; it helped bring his Struggle for Existence principle into focus.

Sadly, with these valuable insights came the burden of Malthus' political views. Any help one gives the poor permits them to survive and propagate, hence negates the natural process according to which these unfortunates are supposed to die off. Malthus went so far as to claim that if there is one right that man clearly does not possess, it is the right to subsistence that he himself is unable to purchase with his labor.⁶

Although Darwin appears to have struggled more with the moral implications of these ideas than most of his contemporaries, he could not prevent his theory from being incorporated into a closed system of thought in which there was little room for compassion. It was taken to its extreme by Herbert Spencer in a grand synthesis of sociology, political economy, and biology, according to which the pursuit of self-interest, the lifeblood of society, creates progress for the strong at the expense of the inferior. This convenient justification of disproportionate wealth in the hands of a happy few was successfully exported to the New World, where it led John D. Rockefeller to portray the expansion of a large business as "merely the working-out of a law of nature and a law of God."⁷

Given the popular use and abuse of evolutionary theory (comparing Wall Street to a Darwinian jungle, for example), it is not surprising that in the minds of many people natural selection has become synonymous with open, unrestricted competition. How could such a harsh principle ever explain the concern for others and the benevolence encountered in our species? That a reason for such behavior does not follow readily from Darwin's theory should not be held against it. In the same way that birds and airplanes appear to defy the law of gravity yet are fully subjected to it, moral decency may appear

to fly in the face of natural selection yet still be one of its many products.

- Altruism is not limited to our species. Indeed, its presence in other species, and the theoretical challenge this represents, is what gave rise to sociobiology—the contemporary study of animal (including human) behavior from an evolutionary perspective. Aiding others at a cost or risk to oneself is widespread in the animal world. The warning calls of birds allow other birds to escape a predator's talons, but attract attention to the caller. Sterile castes in social insects do little else than serve food to the larvae of their queen or sacrifice themselves in defense of their colony. Assistance by relatives enables a breeding pair of jays to fill more hungry mouths and thus raise more offspring than otherwise possible. Dolphins support injured companions close to the surface in order to keep them from drowning. And so on.

Should not a tendency to endanger one's life for someone else be quickly weeded out by natural selection? It was only in the 1960s and 1970s that satisfactory explanations were proposed. According to one theory, known as kin selection, a helping tendency may spread if the help results in increased survival and reproduction of kin. From a genetic perspective it does not really matter whether genes are multiplied through the helper's own reproduction or that of relatives. The second explanation is known as reciprocal altruism; that is, helpful acts that are costly in the short run may produce long-term benefits if recipients return the favor. If I rescue a friend who almost drowns, and he rescues me under similar circumstances, both of us are better off than without mutual aid.

Wilson's *Sociobiology: The New Synthesis* summarized the new developments. It is an influential and impressive book predicting that all other behavioral sciences will one day see the light and convert to the creed of sociobiology. Confidence in this future was depicted in an amoebic drawing with pseudopods reaching out to devour other disciplines. Understandably, nonbiologists were piqued by what they saw as an arrogant attempt at annexation; but also within biology, Wilson's book provoked battles. Should Harvard be allowed to lay claim to an entire field? Some scientists preferred to be known as behavioral ecologists rather than sociobiologists, even though their theories were essentially the same. Moreover, like children ashamed of their old folks, sociobiologists were quick to categorize earlier studies of animal behavior as "classical ethology." That way everyone could be sure that ethology was dead and that we were onto something totally new.

Sociobiology represents a giant stride forward; it has forever changed the way biologists think about animal behavior. Precisely because of their power and elegance, however, the new theories have lured some scientists into a gross simplification of genetic effects. Behavior that at first sight does not conform to the framework is regarded as an oddity, even a mistake. This is best illustrated by a single branch of sociobiology, which has gotten so caught up in the Malthusian dog-eat-dog view of the world that it sees no room for moral behavior. Following Huxley, it regards morality as a counter-force, a rebellion against our brutish makeup, rather than as an integrated part of human nature .8

Calvinist Sociobiology

At the Yerkes Regional Primate Research Center, one chimpanzee has been named Atlanta and another Georgia. It is impossible for me to forget where I am, as I see both individuals on a daily basis. I moved to the Star of the South, as the city likes to call itself, to resume my study of the species that surpasses every other when it comes to similarity to our own. My tower office has a large window that overlooks the outdoor enclosure of twenty chimpanzees. The group is as close-knit as any family can be; they are together day and night, and several of the adults were born into the colony. One of these is Georgia, the rascal of the group. Robert Yerkes, a founder of primatology, once declared it "a securely established fact that the chimpanzee is not necessarily utterly selfish."⁹ From everything I know about Georgia, she is not the sort of character Yerkes had in mind when he made that declaration six decades ago.

When we provision the colony with freshly cut branches and leaves from the forest around the field station, Georgia is often the first to grab one of the large bundles, and one of the last to share it with anybody else. Even her daughter, Kate, and younger sister, Rita, have trouble getting food. They may roll over the ground, screaming in a pitiful tantrum, but to no avail.

No, Yerkes must have thought of individuals such as Mai, an older high-ranking female, who shares quite readily not only with her children but also with nonrelatives, young and old. Or he may have thought of adult male chimpanzees, most of whom are remarkably generous when it comes to food distribution.

While a distinction between sharing and keeping means a lot in human society, it is sometimes lost in the language of a particular brand of sociobiology that takes the gene as absolute king. Gene-centric sociobiology has managed to reach a wide audience with its message that humans and other animals are entirely selfish. From this standpoint, the only difference between Mai and Georgia is in the way they pursue self-interest; whereas Georgia is just plain greedy, Mai shares food so as to make friends or receive return favors in the future. Both think only of themselves. In human terms, this interpretation amounts to the claim that Mother Teresa follows the same basic instinct as any inside trader or thief. A more cynical outlook is hard to come by.

Gene-centric sociobiology looks at survival and reproduction from the point of view of the gene, not the individual. A gene for bringing home food for one's children, for example, will ensure the survival of individuals likely to carry the same gene.¹⁰ As a result, that gene will spread. Taken to its logical extreme, genes favor their own replication; a gene is successful if it produces a trait that in turn promotes the gene (sometimes summed up as "a chicken is an egg's way of making other eggs"). To describe such genetic self-promotion, Richard Dawkins introduced a psychological term in the title of his book, *The Selfish Gene*. Accordingly, what may be a generous act in common language, such as bringing home food, may be selfish from the gene's perspective. With time, the important addition "from the gene's perspective" was often forgotten and was eventually left out. All behavior was selfish, period.

Since genes have neither a self nor the emotions to make them selfish, one would think this phrase is just a metaphor. True, but when repeated often enough, metaphors tend to assume an aura of literal truth. Even though Dawkins cautioned against his own anthropomorphism of the gene, with the passage of time, carriers of selfish genes became selfish by association. Statements such as "we are born selfish" show how some sociobiologists have made the nonexistent emotions of genes into the archetype of true emotional nature. A critical article by Mary Midgley compared the sociobiologists' warnings against their own metaphor to the paternosters of the Mafiosi.

Pushed into a corner by a witty philosopher, Dawkins defended his metaphor by arguing that it was not a metaphor. He really meant that genes are selfish, and claimed the right to define selfishness any way he wanted. Still, he borrowed a term from one domain, redefined it in a very narrow sense, then applied it in another domain to which it is completely alien. Such a procedure would be acceptable if the two meanings were kept separate at all times; unfortunately, they merge to the extent that some authors of this genre now imply that if people occasionally think of themselves as unselfish, the poor souls must be deceiving themselves.

It is important to clear up this confusion, and to emphasize once and for all that the selfish gene metaphor says nothing, either directly or indirectly, about motivation, emotion, or intention. Elliott Sober, another philosopher interested in the semantic trappings of sociobiology, proposes a distinction between vernacular egoism, our everyday usage of the term, and evolutionary egoism, which deals exclusively with genetic self-promotion. A plant, for example, is able to further its genetic interests yet cannot possibly be selfish in the vernacular sense. A chimpanzee or person who shares food with others acts altruistically in the vernacular sense, yet we assume that the behavior came into existence because it served survival and reproduction, hence that it is self-serving in an evolutionary sense.¹¹

There is almost no point in discussing the evolution of morality if we let the vernacular sense of our terminology be overshadowed by the evolutionary sense. Human moral judgment always looks for the intention behind behavior. Ill lean out of a window on the fifth floor and unknowingly nudge a flowerpot, thereby killing a pedestrian on the sidewalk below, I might be judged awkward or irresponsible, but not murderous. The latter accusation would surely be heard, however, had someone watched me grab the pot and throw it at the person. The effect is the same, but the motives are absolutely crucial. Jury and judge would want to know which emotions I showed, the degree of planning involved, my relationship with the target, and so on. In short, they would want to fathom the psychology behind the act.

These distinctions are largely irrelevant within a sociobiology exclusively interested in the effects of behavior. In such a framework, no different values are attached to intended versus unintended results, self-serving versus other-serving behavior, what we say versus what we mean, or an honest versus a dishonest mistake. Having thus denied themselves the single most important handle on ethical issues, some sociobiologists have given up on

explaining morality....

Whereas de Mandeville provided a mere satire, the idea of public blessings derived from the pursuit of self-interest gained respectability when the father of economics, Adam Smith, pronounced self-interest society's guiding principle. In a passage from the *Wealth of Nations*, first published in 1776, Smith saw each individual as being "led by an invisible hand to promote an end which was no part of his intention. Nor is it always the worse for society that it was no part of it. By pursuing his own interest he frequently promotes that of the society more effectually than when he really intends to promote it."¹²

The crux of Smith's famous invisible hand metaphor is that of a gap between intention and consequence; our actions may mean something entirely different in the bigger scheme of things than they do to us individually. Thus, life in the city depends on the professional services of bakers, mechanics, and storekeepers, whereas these people are only carving out a living for themselves and unknowingly are driven to serve the larger whole. To this day, the metaphor is popular with economists: a recent New Yorker cartoon showed a gathering of economists kneeling in the grass, hoping for a huge invisible hand to appear in the sky.

Smith's views were complex, however. As a moral philosopher, he knew full well that it would be hard to hold a society together purely on the basis of egoism. Like Huxley, Smith mellowed with age; he consecrated the final years of his life to a revision of *A Theory of Moral Sentiments*, expanding on his earlier belief in unselfish motives. Throughout this work Smith rejected the self-love thesis of de Mandeville, observing in the very first sentence that man possesses capacities "which interest him in the fortune of others, and render their happiness necessary to him, though he derives nothing from it, except the pleasure of seeing it."¹³ This passage still stands as one of the most succinct and elegant definitions of human sympathy, a tendency Smith believed present in even the staunchest ruffian.

What makes the invisible hand metaphor so powerful is the idea of simultaneous micro and macro realities: the reality in the mind of each individual is not the same as the reality that emerges when many individuals interact. At one level we do A for reason B, while at another level A serves purpose C. Biologists are familiar with such multilevel thinking. For example, sex serves reproduction, yet animals engage in it without the slightest notion of its function; they are not driven by any desire to reproduce, only by sexual urges (as are humans most of the time). Similarly, members of a species do not need to have the benefits of mutual aid in mind when they help one another; these benefits may be so indirect and delayed in time that they matter only on an evolutionary timescale.

Imagine that you and I are sitting in individual boats adrift in the large swimming pool of an immense cruise ship. The ship has a slow and steady course to the north, but we care only about the direction of our little boats and cannot see beyond the body of water within which we are maneuvering. Even though I decide to head west and you to head

south, to the outside observer both of us wind up going north. Since our experiences do not match our eventual destination, we live in separate proximate and ultimate realities.¹⁴

Intention and consequence need not be independent, however, particularly in our species. Often we have a reasonable understanding of the effects of our actions, especially when these effects are immediately obvious. Thus, it cannot escape us that one function of cooperative behavior is what appears to be its antipode: competition. Is not cooperative competition what team sport and party politics are all about?

In the primate order, the most widespread and best-developed collaboration is alliance formation, defined as two or more individuals banding together to defeat a third. For example, two male chimpanzees team up in order to overthrow the established ruler. The two challengers will swagger shoulder to shoulder in an intimidating manner, with their hair on end, often embracing or mounting each other directly in front of their rival, and of course supporting each other if it comes to an actual confrontation. By doing so for weeks or months on end, they wage a veritable war of nerves that may force the other male out of power. This is one of the most committed forms of animal cooperation that I know, one in which lives are literally at stake. Alpha males rarely go down without a fight.

Idealists such as Kropotkin tend to focus entirely on the agreeable side of cooperation, such as loyalty, trust, and camaraderie, while ignoring the competitive side. Although the Russian naturalist did refer to the role of a common enemy in fostering mutual aid, he conveniently ignored the possibility that the enemy might belong to one's own species. In *The Biology of Moral Systems* the biologist Richard Alexander presents our violent history of group against group and nation against nation as the ultimate reason why we attach so much value to the common good and to ethical conduct.

Alexander points out, however, that conflict between groups cannot be the whole explanation. Ants, for example, engage in terrible warfare on a massive scale, yet no one would argue that they have anything resembling a moral system. Thousands of them may be locked in deadly combat carried out in broad daylight on the sidewalks of our cities, while thousands more are recruited to join the massacre. Within each colony, however, harmony reigns. Ants form colonies of millions of individuals produced by and reproducing through a single female, the queen. With such overlapping reproductive interests, why should they compete with their own colony mates? And without conflicts of interest to be settled, what good would a moral system do?

The second condition for the evolution of morality, then, is conflict *within* the group. Moral systems are produced by tension between individual and collective interests, particularly when entire collectivities compete against one another.

If the need to get along and treat each other decently is indeed rooted in the need to stick together in the face of external threats, it would explain why one of Christianity's most heralded moral principles, the sanctity of life, is interpreted so flexibly, depending on which group, race, or nation the life belongs to. As recently as 1991, a war was declared "clean" and said to have been conducted with "clinical precision" despite the loss of more

than a hundred thousand lives! Because the overwhelming majority of the dead in the Gulf War had fallen on the other side, Western media and politicians saw no need to burden our consciences.

Human history furnishes ample evidence that moral principles are oriented to one's own group, and only reluctantly (and never evenhandedly) applied to the outside world. Standing on the medieval walls of a European city, we can readily imagine how tightly life within the walls was regulated and organized, whereas outsiders were only important enough to be doused with boiling oil. There is of course great irony in Alexander's suggestion that the moral underpinnings of the community, on the one hand, and warfare and ethnic strife, on the other, are two sides of the very same coin. In modern times we highly value the first, yet feel embarrassed by the stubborn persistence of the second.

Both conditions for the evolution of morality apply to monkeys and apes. First, many species engage in intergroup conflict, mostly at low intensity but sometimes with extreme brutality. Wild male chimpanzees, for example, may take over a neighboring territory by systematically killing off the males of the other community. Second, while there is no lack of strife and competition within groups, we also know that primates have ways of resolving conflict nonaggressively... .

It is simply unimaginable that fish would come to the rescue of an unlucky pond mate who is jerked out of the water, that they would bite the angler's line, or butt their heads against his boat in protest. We also do not expect them to miss their mate, search around, stop eating, and waste away. Fish are, well, cold to each other. They neither groom one another like primates, nor do they mutually lick, nibble, preen, or chat. I say this without any antifish bias. As a lifelong aquarium enthusiast, I can watch these animals for hours, yet I would never recommend them to someone in need of affection.

How different from the warm-blooded animals that took to the sea eighty million years ago!

Warm Blood in Cold Waters

Reports of leviathan care and assistance go back to the ancient Greeks. Dolphins are said to save companions by biting through harpoon lines or by hauling them out of nets in which they have gotten entangled. Whales may interpose themselves between a hunter's boat and an injured conspecific or capsize the boat. In fact, their tendency to come to the defense of victims is so predictable that whalers take advantage of it. Once a pod of sperm whales is sighted, the gunner need only strike one among them. When other pod members encircle the ship, splashing the water with their flukes, or surround the injured whale in a flowerlike formation known as the marguerite, the gunner has no trouble picking them off one by one. Such "sympathy entrapment" would be effective with few other animals.

But am I justified in using the term "sympathy," which after all is a venerated human concept with very special connotations? Let us for the moment simply speak of *succorant behavior*, defined as helping, caregiving, or providing relief to distressed or endangered individuals other than progeny. Thus, the dog staying protectively close to a crying child shows succorance, whereas the same dog responding to the yelps of her puppies shows nurturance. In reviewing the succorant behavior of animals we will pay special attention to characteristics it might share with human sympathy, the most important being empathy—that is, the ability to be vicariously affected by someone else's feelings and situation. Psychologists and philosophers consider this capacity so central that "empathy" has gradually replaced "sympathy," "compassion," "sorrow," and "pity" in much of their writings (I have even seen the famous Stones' song in paraphrased as "Empathy for the Devil").

This blurring is unfortunate, for it ignores the distinction between the ability to recognize someone else's pain and the impulse to do something about it. Administering electrical shocks to someone else's genitals or pouring bleach in open wounds, as done by the torturers of our fine race, involves the very same ability of knowing what makes others suffer, yet it is quite the opposite of sympathy. What sets sympathy apart from cruelty, sadism, or plain indifference is that sensitivity to the other's situation goes together with *concern* about him or her. As neatly summed up by the psychologist Lauren Wispe: "The object of empathy is understanding. The object of sympathy is the other person's well-being."¹⁵

Whether based on empathy or not, animal succorance is the functional equivalent of human sympathy, expected only in species that know strong attachment. I am not speaking here of anonymous aggregations of fish or butterflies, but the individualized bonding, affection, and fellowship of many mammals and birds.

There certainly is no shortage of attachment among whales and dolphins, which may beach themselves collectively because of their reluctance to abandon a distressed group mate, inducing a disoriented one. Whereas this action is often fatal to an entire herd, James Porter, an American oceanographer, describes a fascinating exception. When in 1976 thirty pseudorcas (false killer whales) had stranded on an island off the coast of Florida, they remained together in shallow water for three entire days until the largest one had died. The twenty-nine healthy whales would have been unable to return to the ocean (hence would have perished with their apparent leader) under normal tidal conditions. But the tidal range happened to be minimal, so that most of the time the whales did have the option of leaving. "Stranding" is the wrong word, therefore; the whales stayed close to shore of their own accord.

With blood exuding from his right ear, the sick male was flanked and protected by fourteen or fifteen whales in a wedge-shaped configuration. The group was noisy, producing an incredible variety of chirps and squeaks. "With some trepidation, but no common sense," as he commented afterward, Porter entered the water to snorkel toward the group. The outermost individual responded by breaking loose and heading menacingly toward him. Instead of attacking, however, the whale lowered its head and

slid underneath the scientist, lifting him out of the water and carrying him to the beach. This procedure was repeated three times, after which Porter tried his luck on the other side. There, too, the outermost whale carried him back to land several times. Porter noted that the whales lost interest in him as soon as he took off his snorkel, suggesting that they were showing a rescue response to sounds that perhaps resembled those of a clogged blow-hole.¹⁶

The U.S. Coast Guard was unable to break up the formation or push the pseudorca offshore: "If separated from the pack a whale would become highly agitated, and no amount of human effort could restrain its returning to the group. As soon as the whales touched each other, however, they became docile and could easily be nudged into deeper water." ⁷ (The calming effect of body contact extended to humans who, in a typical act of cross-species sympathy, applied suntan oil to whale backs exposed to sun and air.)

Once the large male had died, the formation around him loosened. Breaking ranks, the whales headed for deeper water while uttering high-pitched descending whistles. Autopsy revealed that the male, 6 meters long, had a massive worm infection in his ear. It is possible that parasitic worms impair a whale's echolocation system, hence its feeding efficiency: the victim's stomach proved empty.

While this account by no means solves the mystery of whale strandings, it gives an idea of how extraordinarily attached to each other these creatures are. If attachment and bonding are at the root of succorant behavior, parental care must be its ultimate evolutionary source. As explained by Irenaus Eibl-Eibesfeldt, with the evolution of parental care in birds and mammals came feeding, warming, cleaning, alleviation of distress, and grooming of the young, which in turn led to the development of infantile appeals to trigger these activities. Once tender exchanges between parent and offspring had evolved—with the one asking for and the other providing care—they could be extended to all sorts of other relationships, including those among unrelated adults. Thus, in many birds, the female begs for food from her mate with the same gaping mouth and wing shaking as that of a hungry fledgling, while the male demonstrates his caretaking abilities by providing her with a nice tidbit.

Absorption of parental care into adult human relationships is evident from the widespread use of infantile names (such as "baby") for mates and lovers, and the special high-pitched voice that we reserve for both young children and intimate partners. In this context, Eibl-Eibesfeldt mentions the kiss, which probably derives from mouth-to-mouth feeding of masticated food. Kissing without any transfer of food is an almost universal human expression of love and affection, which, according to the ethologist, resembles kiss-feeding "with one partner playing the accepting part by opening the mouth in a babyish fashion and the other partner performing tongue movements as if to pass food."¹⁸ Significantly, chimpanzees both kiss-feed their young and kiss between adults. A close relative of the chimpanzee, the bonobo, even tongue-kisses... .

Having Broad Nails

For decades students of animal behavior considered it wrong and naive to speak of animals as wanting, intending, feeling, thinking, or expecting beings. Animals just behave; that is all we know, and all we will ever know about them.

Curiously, the key to behavior was sought not within but outside the individual. The individual was merely a passive instrument of the environment. Psychologists studied how responses to stimuli increase if rewarded, and biologists analyzed how behavior spreads if it promotes reproduction. The first is a learning process, the second natural selection; the timescales are of course vastly different, yet the role of the environment as final arbiter of the suitability of behavior was the same. With biologists and psychologists quibbling endlessly over whose discipline offered the better explanation, it is hard to believe that they shared so much common ground.

The critical insights of both disciplines steered attention away from the acting agents themselves. If the environment controls behavior, why do we need the individual? Psychologists came up with their infamous black box, which mediates between stimulus and response, yet remains inaccessible to science. Biologists described animals as survival machines and preprogrammed robots, another way of saying that we should not worry too much about what goes on in their heads. The final presentation of the late B. F. Skinner, who firmly kept the lid on the black box, therefore could hardly have been accidental. Addressing fellow psychologists, he compared cognitive psychologists to creationists, thus throwing together the enemies of behaviorism and Darwinism!⁹

When evaluating the succorant behavior of animals, we face already so many obstacles relative to the scarcity of data and the design of experiments that we do not need the additional burden of a narrow-minded rejection of the entire problem of cognition. Some biologists will point out that most of the accounts of caregiving discussed earlier—certainly the more striking ones—concern kin. Why not simply view these instances as investments of genetic relatives in one another, and leave them at that? While perfectly valid when it comes to evolutionary explanations, this point has absolutely no bearing on the question at hand. We are concerned here with motivations and intentions. Regardless of how care is being allotted, the caregiver must be sensitive to the situation of the other, feel an urge to assist, and determine which actions are most appropriate under the circumstances.

If Tallulah stuffs grass into the mouth of a dying herd member, if a chimpanzee goes to hug another who has just been beaten up, or if the top male of a monkey group fails to punish a brain-damaged infant for bothering him, we want to know what makes these animals react in this way. How do they perceive the distress or special circumstances of the other? Do they have any idea of how their behavior will affect the other? These questions remain exactly the same whether or not the other is a relative.

Times are changing. Interest in the mental life of animals is regaining respectability. Whereas some scientists propose a gradual shift in this direction, depending on evidence along the way, others are less patient. Believing it unfair to hold a new perspective hostage to the availability of final answers, they advocate a clean break with the


Cartesian view of animals as automatons.

This is not to say that all we need to do is "feel as one" with animals without some critical distance, without putting ideas to the test, and without choosing our words carefully. Discussions about animal behavior often boil down to discussions about language. The ethologist inevitably borrows concepts from common language, which is primarily designed for communication about people. Yet the familiarity of these concepts by no means absolves us from the obligation to be specific about what they mean when applied to animals. Anthropomorphism can never replace science.

Take "reconciliation" and "consolation," two blatantly anthropomorphic terms applied to primate behavior. They refer to circumscribed encounters and come with a set of predictions that, if contradicted, should spell the end of their use. For example, reconciliation is defined as a reunion between former opponents shortly after an aggressive conflict between them. If it were found that reconciliations thus defined do not occur, or do nothing to reduce renewed hostility, it would be time to rethink the label. The same argument applies to older, more widely accepted terms, such as "threat," "greeting," "courtship," and "dominance," which have already gone through a process of fine-tuning and critical evaluation, but can still be questioned at any moment²⁰

It is this use of anthropomorphism as a means to get at the truth, rather than as an end in itself, that sets its use in science apart from use by the layperson. The ultimate goal of the scientist is emphatically not to arrive at the most satisfactory projection of human feelings onto the animal, but rather at testable ideas and replicable observations. Thus, anthropomorphism serves the same exploratory function as that of intuition in all science, from mathematics to medicine. As advocated by Gordon Burghardt:

What I am calling for is a critical anthropomorphism, and predictive inference that encourages the use of data from many sources (prior experiments, anecdotes, publications, one's thoughts and feelings, neuroscience, imagining being the animal, naturalistic observations et cetera). But however eclectic in origin, the product must be an inference that can be tested or, failing that, can lead to predictions supportable by public data. ²¹

But what about the cherished principle of parsimony—the one great bulwark against all liberal thinking? The problem is that insofar as monkeys and apes are concerned, a  profound conflict exists between two kinds of parsimony. The first is the traditional canon that tells us not to invoke higher capacities if the phenomenon can be explained with lower ones. This favors simple explanations, such as learned adjustment, over more complex ones, such as cognitive empathy.

The second form of parsimony considers the shared evolutionary background of humans and other primates. It posits that if closely related species act the same, the underlying process probably is the same too. The alternative would be to assume the evolution of divergent processes for similar behavior; a highly uneconomic assumption for organisms with only a few million years of separate evolution. If we normally do not propose different causes for the same behavior in, say, tigers and lions, there is no good reason to

do so for humans and chimpanzees, which are genetically as close or closer.

In short, the principle of parsimony has two faces. At the same time that we are supposed to favor low-level over high-level cognitive explanations, we also should not create a double standard according to which shared human and ape behavior is explained differently. Such "evolutionary parsimony" is a factor especially when both humans and apes exhibit traits not seen in monkeys, and two explanations are proposed where one may do. If accounts of human behavior commonly invoke complex cognitive abilities—and they certainly do—we must carefully consider whether these abilities are perhaps also present in apes. We do not need to jump to conclusions, but the possibility should at least be allowed on the table.

Behind the debate about parsimony towers the much larger issue of humanity's place in nature. To this day, those who see our species as part of the animal kingdom continue to lock horns with those who see us as separate. Even authors with a distinctly evolutionary perspective often cannot resist searching for the one big difference, the one trait that sets us apart—whether it is opposable thumbs, toolmaking, cooperative hunting, humor, pure altruism, sexual orgasm, the incest taboo, language, or the anatomy of the larynx. Countless book titles reflect this search: *Man the Tool-Maker*, *Man the Hunter*, *The Ethical Animal*, *Uniquely Human*, and so on.

Claims of human uniqueness go back to the debate between Plato and Diogenes about the most succinct definition of the human species. Plato proposed that humans were the only creatures at once naked and walking on two legs. This definition proved flawed, however, when Diogenes brought a plucked fowl to the lecture room, setting it loose with the words, "Here is Plato's man." From then on the definition included "having broad nails."²²

In 1784 Johann Wolfgang von Goethe triumphantly announced that he had discovered the cornerstone of humanity: a tiny piece of bone in the human upper jaw known as the os intermaxillare. The bone, though present in other mammals including apes, had long been thought absent in us and had therefore been labeled a "primitive" trait by a Dutch anatomist, Petrus Camper. Goethe's bone, as it became known, confirmed our continuity with nature long before Darwin formulated his theory of evolution. It was a slap in the face—the first of many—to people postulating human uniqueness.

Do claims of uniqueness in any way advance science? Are they even scientifically motivated? Until now, all of these claims have either been forgotten, like Camper's, or required qualification, like Plato's. As a separate species, humans do possess distinct traits, yet the overwhelming majority of our anatomical, physiological, and psychological characteristics are part of an ancient heritage. Holding the magnifying glass over a few beauty spots (our distinct traits are invariably judged advanced and superior) is a much less exciting enterprise, it seems to me, than trying to get a good look at the human animal as a whole.

In this broader perspective, peculiarly human traits are juxtaposed with the obvious

continuity with the rest of nature. Included are both our most noble traits and the ones of which we are less proud, such as our genocidal and destructive tendencies. Even if we like to blame the latter on our progenitors (as soon as people hack each other to pieces they are said to be "acting like animals") and claim the former for ourselves, it is safe to assume that both run in our extended family.

There is no need to launch probes into space in order to compare ourselves with other intelligent life: there is plenty of intelligent life down here. It is infinitely more suitable to elucidate the working of our minds than those of whatever extraterrestrial forms might exist. In order to explore earthly intelligences, we need breathing room in the study of animal cognition: freedom from traditional constraints that tell us that nothing is there, or that if anything is there, we will never be able to catch even a glimpse.

Critics say there is no way to see what goes on inside an animal's head. That is, of course, not literally what cognitive ethologists are trying to do. Rather, they seek to reconstruct mental processes in much the way the nuclear physicist "looks inside" the atom by testing predictions based on a model of its structure. Admittedly, the use of anthropomorphism and anecdotal evidence, along with reservations about the principle of parsimony, have created uncertainty and confusion—as well as lively debate.³ Yet these are only the delivery pains of a much-needed change in the study of animal behavior....

Human ethics everywhere urge us to adopt someone else's perspective and look at the world through the eyes of others, as in the Golden Rule: do unto others as you would have them do unto you. Perhaps the evolution of role-taking, which is a very special capacity indeed, began with rather simple forms. For example, monkeys seem perfectly capable of identification with another monkey. If Azalea's sister interrupts hair plucking of her retarded sibling by another monkey, even though Azalea herself does nothing to draw attention, or if a mother monkey hurries over to stop an approach by her child toward an ill-tempered individual well before any-thing happens, these actions suggest great sensitivity to potential harm involving others.

It is not hard to see why monkeys would want to avoid harm to themselves, but why would harm to another bother them? Probably they see certain others as extensions of themselves, and the distress of those resonates within them. Known as emotional contagion,²⁴ this mechanism initially operates indiscriminately, yet becomes more selective with age. Monkeys learn to recognize subtle signs of distress, even situations in which distress is merely imminent. They follow closely what happens around them, especially if it involves friends and relatives.

Full-blown role-taking involves quite a bit more, however. The other is recognized not just as an extension of the self, but as a separate entity. Cognitive empathy is the ability to put oneself in the "shoes" of this other entity without losing the distinction between self and other. The American psychologist Martin Hoffman believes that this remarkable capacity grows out of emotional contagion. Being vicariously affected by others may make the child curious about their internal state, and stimulate him to search for cues about the others' feelings. Out of this challenge grows an increased awareness of the self

in relation to others.

The same challenge may have occurred in the course of evolution. Perhaps some species evolved social organizations in which it became particularly advantageous to appreciate how companions were doing-not just at an emotional level, but also by imagining their situation. Sharper awareness of the other entailed increased self-awareness. If the mirror test somehow taps into this ability, as Gallup suggests, higher levels of empathy may be limited to humans and apes.

One indication of a relation between the two is that the first signs of cognitive empathy in children appear at about the same time as mirror self-recognition.²⁵ Another sign is that consolation occurs in a self-recognizing species, the chimpanzee, but apparently not in macaques. Do macaques rarely reassure victims of aggression because they lack the required ability to trade places mentally with them? Signs of distress in others do affect them, but once the fight is over and these indications subside, macaques quickly lose interest ²⁶

As so often with regard to gradual processes, the tension between continuity and discontinuity cannot easily be resolved. Even if temperatures change steadily, there is an abrupt change in properties when water turns into ice or steam. Both the gradualist and the believer in fundamental distinctions have a point when considering the evolution of empathy and sympathy. Yes, apes do share our capability for self-recognition in a mirror, but no, this capability does not necessarily mean that humans and apes are the only animals conscious of themselves. And yes, apes do show remarkable empathy, but no, they are not the only animals sensitive to the needs of others. We only need think of the incredible assistance elephants, dolphins, and lemurs offer each other to realize how widespread and well developed these tendencies are. Caring responses go back much further in evolutionary history than the ape-human lineage.

Notes

1. Huxley, 1989 (1894), p. 83.
2. Williams, 1988, p. 438.
3. Dewey, 1993 (1898), p. 98. 4. Midgley, 1991, p. 8.
5. Wilson, 1975, p. 562.
6. According to Kenneth Lux, opposition to welfare assistance (the so-called Poor Laws) was most evident in the second edition of Malthus' *Essay on the Principle of Population* and was expunged from subsequent editions: "A man who is born into a world if he cannot get subsistence from his parents on whom he has a just demand and if the society does not want his labour, has no claim of right to the smallest portion of food, and, in fact, has no business to be where he is. At nature's mighty feast there is no vacant cover for him. She tells him to be gone, and will quickly execute her own orders, if he does not work upon the compassion of some of her guests. If these guests get up and make room for him, other intruders immediately appear demanding the same favour" (quoted in Lux, 1990, pp. 34-35).
7. Rockefeller quoted in Lux, 1990, p. 148.
8. History is not as simple as presented here. Charles Darwin, Alfred Russell Wallace,

Thomas Henry Huxley, and Herbert Spencer each took a different position with regard to the (im)possibility of an evolved morality. Well-documented accounts of this early debate may be found in Richards (1987) and Cronin (1991).

9. Yerkes and Yerkes, 1935, p. 1024.

10. Gene-centric sociobiologists often speak of "a gene for behavior x," regardless of what is known about the heritability of behavior x (usually, little or nothing). In reality, each gene acts in conjunction with hundreds of others. So every behavior is likely to depend on a wide range of genetic factors. Even if we grant gene-centric sociobiologists that their onegene-one-behavior scheme is not to be taken literally-that it is a mere shorthand for discussion-it is advisable to balance it with another generalization, one that is at least as close to the truth: "Every character of an organism is affected by all genes and every gene affects all characters" (Mayr, 1963, p. 164).

11. Apparently Dawkins is not convinced that we are born selfish, in the vernacular sense. In response to Midgley (1979) he admits that selfish-gene rhetoric may well be out of touch with actual human motives: "To the extent that I know about human psychology (a rather small extent), I doubt if our emotional nature is, as a matter of fact, fundamentally selfish" (Dawkins, 1981, p. 558).

This is a message to bear in mind, for it certainly is not evident in the author's writings. A general problem with pop sociobiology is that complex issues are compressed to such a degree that even if the author is fully aware of what is left out, the reader has no way of knowing. The simplifications are then perpetuated ad nauseam by less-informed writers until they haunt the field in general and must be countered as if they represented serious ideas (Kitcher, 1985).

In *The Ethical Primate*, Midgley (1994, p. 17) has reiterated her views on the pitfalls and illusions of reductionist science, giving scathing attention to sociobiology's forays into the psychological domain: "Darwinism is often seen-and indeed is often presented-not as a wide-ranging set of useful suggestions about our mysterious history, but as a slick, reductive ideology, requiring us, in fact, to dismiss as illusions matters which our experience shows to be real and serious."

12. Smith, 1982 (1776), bk. 3, p. 423.

13. Smith, 1937(1759), p. 9.

14. Ethologists distinguish sharply between proximate and ultimate causes. *Proximate causes* concern learning, experience, and the direct circumstances and motivations underlying behavior. *Ultimate causes* promoted a behavior in the course of evolution. If a behavior assists survival and reproduction, for example because it repels predators or attracts mates, this is the ultimate reason for its existence. Since evolution takes place on a timescale that escapes perception, only proximate causes exist in the minds of animals and most humans. Students of evolutionary biology are unique in that they care about ultimate causes.

Unfortunately, proximate and ultimate levels are frequently confused, particularly when the function of a behavior seems so obvious that it is hard to imagine that the actors are oblivious to it. Popular nature documentaries contribute to the mixup by describing animal behavior in ultimate terms. They will explain that two male walrus fight over

the right to impregnate the female, whereas these males neither know nor care about what happens in the female's womb after they have mated.

15. Wispe, 1991, p. 80.

16. On the basis of this incident, Porter (1977, p. 10) comments that he would not automatically discount the numerous reports of people who claim to have been saved by porpoises or some of the smaller whales. Accounts of Cetacea helping humans generally describe one of the following: (a) a drowning person is lifted to the surface; (b) a boat or ship is guided to safety (around submerged rocks, out of a storm); or (c) a swimmer is protected against sharks by a dolphin cordon. Reviews of both interspecific and intraspecific succorant behavior of Cetacea may be found in Caldwell and Caldwell (1966), Connor and Norris (1982), and Pilleri (1984).

17. Porter, 1977, pp. 10, 13.

18. Eibl-Eibesfeldt, 1990, p. 156.

19. Skinner (1990) saw both cognitive psychology and creationism as heavily influenced by religion. This element is obvious enough with regard to creationism, sometimes mislabeled creation science ("mislabeled" because creationists work with a single hypothesis, determined a priori to be true, whereas science tries to choose among alternative hypotheses). The effect of religion on cognitive psychology may be less evident-hidden as it is by centuries of sophisticated philosophizing, it is revealed in the persistent mind/body and human/animal dualisms. These dualisms lack a factual basis, and psychology would be much better off without them (Gibson, 1994).

20. Most readers would long ago have laid aside this book if I had limited myself to purely descriptive, technical language. There is a fine but important line between the use of anthropomorphism for communicatory purposes or as a heuristic device, and gratuitous anthropomorphism that projects human emotions and intentions onto animals without justification, explication, or critical investigation. Strong opinions about the use and abuse of anthropomorphism can be found in Kennedy (1992), Marshall Thomas (1993), Masson and McCarthy (1995), and in Mitchell, Thompson, and Miles (forthcoming).

21. Burghardt, 1985, p. 917.

22. Diogenes Laertius, quoted in Menzel, 1986, p. 167.

23. Promises and problems of the cognitive approach to animal behavior have been extensively debated among ethologists. See Kummer (1982), Kummer, Dasser, and Hoyningen-Huene (1990), de Waal (1982, 1991a), and Cheney and Seyfarth (1990).

24. Hatfield, Cacioppo, and Rapson (1993, p. 96) define emotional contagion as "the tendency to automatically mimic and synchronize expressions, vocalizations, postures, and movements with those of another person and, consequently, to converge emotionally."

25. This correlation was reported by Johnson (1982) and Bischof-Kohler (1988). According to the latter study, the link between mirror self-recognition and the emergence of cognitive empathy holds up even after correction for age.

26. The main alternative to a cognitive explanation of the absence of consolation in macaques is the so-called constraints hypothesis. It posits that macaques run serious risks in associating with an individual who has just been attacked. With their more tolerant and flexible relationships, chimpanzees may not be operating under the same constraints. We

plan to conduct experiments to eliminate the risk of approaching a victim of aggression. If macaques still fail to contact distressed group members under these circumstances, the social constraints hypothesis would be weakened (de Waal and Aureli, forthcoming).