Our "nature" does not set us apart from the ants and termites, nor do similarities between humans and insects link all of us, hand in claw, in a miserable, determinist chain gang, plodding through life only to survive and reproduce as best we can.

If human society is closely related to that of the ants and bees, this doesn't mean human beings are restricted to a rigid set of biologically-imposed rules, as we believe insects are – it means we need to start re-evaluating how rigid those rules are for the *insects*.

Darwin vs. the Ant

The Altruism of Bugs and Humans

by
Erin Wiegand
illustration by
Erin E. Hunter

It is an extraordinary comment on the state of the social sciences in the 1960s that the rehabilitation of human nature should have been a task originally undertaken by entomologists.

—Andrew Brown, *The Darwin Wars*

They are less than a millionth the size of a human, but taken in total, their mass on Earth would weigh about as much as all human beings. There are approximately 11,880 known species, making them the most common animal in the world. They contribute to the health of ecosystems with their symbiotic relationships with other species, by disposing of dead plant and animal material, and by moving soil and seeds. In Central and South America, one species actively cultivates fungi on fresh leaves carried into their underground chambers. Some protect "herds" of aphids or caterpillars in order to harvest their honeydew (a sweet liquid secretion), sometimes even taking them along when migrating to a new area. And the jaws of another snap shut at 8.5 meters a second—the fastest recorded movement of any anatomical structure.

The ant is a marvelous creature, by anyone's terms. But she is also responsible for provoking one of the greatest evolutionary debates of our time: How can animals evolve the capacity for altruism, self-sacrificial behavior to support another?

For Charles Darwin, the survival and evolution of a species depended on the "fitness" of each of its members; that is, how well each individual was able to survive in its environment and successfully reproduce. Altruism, then, seems quite peculiar if one accepts Darwin's contention that success in passing on one's own genetic lineage to a new generation—at the expense of others, if necessary—is evolution's highest principle.

The ant was a particularly heavy puzzle for Darwin because of its stratified colonies, in which entire castes of worker ants are born without the ability to reproduce, foregoing their own chance at breeding in order to better support the queen and her offspring. How, Darwin wondered, could sterility be a trait passed through generations of ants if those that carry the gene do not themselves reproduce? How could a species be so successful, in evolutionary terms, when so many of its individual members sacrifice their own reproductive capacity? The question posed such a challenge, in fact, that he referred to it in 1859 as the "one special difficulty, which at first appeared to me insuperable, and actually fatal to my whole theory."

Though you wouldn't know it from contemporary "Darwin vs. God" debates, the theory of evolution does not begin and end with Charles Darwin—he was not the first to propose that species changed over time, and that animals (including humans) of today have ancestors that may have looked quite different. At the time Darwin developed his theories of "descent with modification" (his preferred term for evolution), it was already well-accepted that characteristics from a particular organism were passed down to their offspring—although the theories of the day favored the notion that such characteristics were developed in species based on how much they were "used," much like the way muscles become stronger the more they are worked. Darwin's contribution, then, was his explanation of a process he called "natural selection." Particular traits—length of legs, body shape, cell structure—arise randomly in individuals within a species, and are then *selected* for in the process of evolution; that is, characteristics that are not conducive to an organism's "success" in a particular environment

will eventually be weeded out because those that carry them will not survive long enough to reproduce and thus further the descent of those traits into the next generation.

Darwin's theory was not met with instant approval by his peers, and many of his colleagues argued that the notion of natural selection as the only agent of evolution was preposterous. Darwin, however, did not intend to suggest that natural selection was the *only* explanation for evolution—it was simply the most primary. As he wrote in the sixth edition of *Origin of Species,* in 1872, "My conclusions have lately been much misrepresented, and… I may be permitted to remark that in the first edition of this work, and subsequently, I placed in a most conspicuous position—namely, at the close of the Introduction—the following words: 'I am convinced that natural selection has been the main but not the exclusive means of modification.'" Evolutionary theorists since Darwin have suggested a number of other "means of modification," including mutation, abrupt environmental changes or disasters, and genetic drift (random changes in the frequency of genes within a population).

Natural selection has been widely interpreted as "the survival of the fittest," a term not actually used by Darwin, but coined by the philosopher Herbert Spencer. Thomas Henry Huxley—known to many as Darwin's "bulldog" for his staunch advocacy of natural selection theory—wrote that "from the point of view of the moralist the animal world is about on a level of a gladiator's show. The creatures are fairly well treated, and set to fight—whereby the strongest, the swiftest, and the cunningest live to fight another day." And then, of course, there's the poet Alfred Lord Tennyson's famous description of nature as "red in tooth and claw," which has been invoked time and again to explain the process of natural selection—despite the fact that he wrote those lines in 1850, nine years before the first publication of *Origin*.

For those who refuse to accept the more cutthroat and self-centered institutions of human civilization as logical extensions of "human nature," the theory of natural selection has often inspired nothing so much as disgust. After all, if the law of nature is simply to favor those who are best able to compete and win, why should the rules be any different for humans than they are for bottle-nosed dolphins or prairie dogs?

But the notion that nature demands such selfish competition—and the way that notion has been used to justify capitalism, eugenics, and a host of other philosophies—stems from misunderstandings and willful ignorance of the actual conditions of nature as well as the actual meaning of "natural selection." Natural selection does not suggest that organisms duke it out in bloody battle to see who survives to propagate their lineage; rather, it means that those creatures best able to adapt to their particular environment (which could mean cooperation just as easily as competition) are the most likely to reproduce. Darwin himself (not to mention many scientists at the time and since) saw evidence of cooperation and mutual aid not only among members of the same species, but among different species. And as far as altruistic behavior, one need look no further than the social insects for particularly dramatic displays of self-sacrifice for the good of the community.

As any amateur naturalist, weekend camper, or child with a large stick and a propensity for acts of destruction can tell you, ants, bees, and wasps all readily give up their lives to defend the nest against intruders: The honeybee's stinger attaches itself to an enemy's skin with fishhook-like barbs—and in order to sting, the bee essentially eviscerates itself. One species of African termite attacks via a secretion that congeals upon contact with air and entangles both termite and enemy (sometimes, these termites will work their muscles so strongly that they explode, spraying their secretion out in all directions). Fire ants, during times of flood or in order to cross a river, will form gigantic balls out of their own bodies—with the queen at the center—to ride the water in a "living raft," a suicidal act for those unfortunate enough to form its outer surface. And then there are those worker ants that troubled Darwin: enormous numbers born without the ability to reproduce, who instead assist the queen in rearing her offspring—an act of extreme altruism, in evolutionary terms.

The use of the term "altruism" to describe certain animal acts is, of course, not without its problems. Isn't altruism something unique to human beings, to a human consciousness and moral sense? But "altruism"—like "queen" or "worker," for that matter—is used within biology not to draw anthropomorphic connections between ant and human societies, but because it is the closest (and easiest) descriptor to something we can recognize in our own societies and social relations.

Still, there are those that argue that there is, in fact, no difference between insect altruism and human altruism, or, rather, that what passes for a noble, specifically human behavior is actually no different than the altruism at work in the ant colony or beehive. This was the belief of the Russian geographer and anarchist Peter Kropotkin, who sought to prove that cooperation was "natural" to humanity by demonstrating the same behavior in various animal species.

Kropotkin's theory, outlined most famously in his 1902 work *Mutual Aid*, was that those species which are "fittest" are actually those that cooperate, not those that compete:

> If we resort to an indirect test, and ask Nature: "Who are the fittest: those who are continually at war with each other, or those who support one another?" we at once see that those animals which acquire habits of mutual aid are undoubtedly the fittest. They have more chances to survive, and they attain, in their respective classes, the highest development of intelligence and bodily organization.

Kropotkin's observations, while focused on cooperation rather than altruism (cooperation does not necessarily involve the element of self-sacrifice found in altruism), contain the basis of the theory of *group selection*—that natural selection can operate at the level of the group as well as the level of the individual. Over a hundred years later, group selection remains one of the most controversial of several theories developed to explain altruism in evolutionary terms.

That special explanation eluded many group selectionists up through the 1960s, at which point the theory was widely rejected by the scientific community. "At the time," says Wilson, "group selection was rejected because it was theoretically impossible, there wasn't good empirical evidence, and there were better theories to explain it," he says. "[It] just didn't seem to work very well. And because people had been making 'for the good of the group' arguments, sloppy arguments, it seemed like a reasonable position."

Since the 1960s, Wilson says, all three points have been reconciled. And a growing group of evolutionary theorists (including Edward O. Wilson, the notable entomologist and founder of sociobiology) are now promoting a return to group selection as a framework with which to view altruistic behavior. "The broader scientific community thinks that group selection has been rejected," D.S. Wilson says. "but a little bubble [of scientists] is comfortable with it, and it's been growing and growing."

However, group selection is still widely disputed as an explanatory model for altruism, despite its seemingly straightforward and uncomplicated nature. The controversy is largely based on the argument that every example of group selection can also be explained by another model focused even more on the individual—or more accurately, on that individual's *genes*.

Kin Selection

Modern genetics studies began in the 1860s, but the "Modern Synthesis" of natural selection theory and genetics was not complete until some 80 years later. (The term was coined by Julian Huxley—grandson of Darwin's "bulldog"—in 1942.) This new generation of evolutionary theorists proposed that the unit of selection was not the individual organism, but the gene. Natural selection, they argued, is not a simple matter of organisms trying to thrust as many of their own offspring as possible into the world—it's a matter of maximizing the reproduction of our own genes into future generations. And for that, we don't necessarily need the offspring to be our own.

This is the heart of the theory of "kin selection," which argues that animals are more inclined to help those that are closely related to them, because it ensures the survival of their own genetic material. And in situations where the best overall chance for genetic survival means the self-sacrifice of some members of the family (whether by their death or simply by their "choice" not to reproduce themselves), altruism emerges. (Darwin's explanation for altruistic behavior held some of the foundations of kin selection, as he suggested that

The honeybee's stinger attaches itself to an enemy's skin with fishhook-like barbs—and in order to sting, the bee essentially eviscerates itself. One species of African termite attacks via a secretion that congeals upon contact with air and entangles both termite and enemy.

Fire ants, during times of flood or in order to cross a river, will form gigantic balls out of their own bodies—with the queen at the center—to ride the water in a "living raft," a suicidal act for those unfortunate enough to form its outer surface.

Group Selection

The British ecologist V. C. Wynne-Edwards suggested in 1962 that individuals might sacrifice themselves or reduce their own fertility when their immediate group faced food scarcity, in order to contribute to the overall health of the species. Such behavior might seem to be a trait natural selection would weed out, because any individual who undertakes an altruistic act is at an immediate disadvantage; within its group, it has a lower fitness than they do. But Wynne-Edwards argued that because it supported the fitness of the larger group (and therefore furthered the species when it otherwise might die out), natural selection would indeed favor such a trait.

Darwin had already conceded this point when it came to the social insects and particularly to humankind, observing that while altruists are more vulnerable to non-altruists on an individual level, *groups* of altruists are much better equipped to survive over groups of non-altruists. And when individual altruists interact primarily with each other rather than with non-altruists, they're better off than their non-altruistic neighbors. He muses in *The Descent of Man* that "although a high standard of morality [e.g., willingness to behave altruistically] gives but a slight or no advantage to each individual man and his children over the other men of the same tribe…[it] will certainly give an immense advantage to one tribe over another."

Evolutionary biologist David Sloan Wilson refers to a type of "naïve group selectionism" that did not account for within-group and between-group altruism. "Darwin saw the problem that altruism is vulnerable to selfish [individuals within a group], and that the evolution of altruism required a special explanation."

if sterile ants contribute to the overall welfare of their fertile kin, they succeed in promoting a shared genetic heritage.)

The real development of the theory of kin selection, popular legend has it, stems from an offhand remark by the English biologist J.B.S. Haldane, a rather dramatic character known for his enthusiastic participation in dangerous experiments such as drinking hydrochloric acid or breathing chlorine. While discussing natural selection in a pub, he is said to have scribbled some calculations on the back of an envelope and said, "I will lay down my life for two brothers or eight cousins." Because, of course, in evolutionary terms, it's just as worthwhile for his two brothers to live to reproduce—each of them carry half his genes, and each cousin a quarter of that. The story has been contested by the slightly less colorful evolutionary theorist W.D. Hamilton, who claims he came up with the original idea, and went on to publish the first mathematical formulas based on the concept.

Either way, the story—and the theory—would go on to help support the idea that selection operates at a purely genetic level, thus explaining altruistic behavior in cases where altruism supports the "kin" of the organism in question, which theoretically would share their genes. What kin selection postulates is that certain genes wired for altruistic behavior compel certain animals to act in ways that may endanger themselves, or diminish their own chance at reproducing, if (and only if) those acts help their close kin to reproduce, thus ensuring their own genetic "survival." As Richard Dawkins wrote in *The Extended Phenotype* (1982), rather than expecting to see animals always acting in what we perceive to be their best interest, we should realize that animals act "to maximize the survival of genes 'for' that behavior, whether or not those genes happen to be in the body of the particular animal performing it."

It may sound like a pretty strange explanation for altruistic behavior as humans understand it—especially considering the vast numbers of human beings that have given their lives for an abstract cause, throughout history—but when it comes to explaining behavior in other species, and particularly in the social insects, the theory of kin selection has had staggering success. Today, kin selection is widely accepted by scientists as the "answer" to Darwin's special difficulty.

But while some scientists believe the debate has been long been put to rest (with kin selection emerging as the "victor"), others see it as far from settled.

According to David Sloan Wilson, W.D. Hamilton argued as early as 1975 that there exists a group selection dynamic within kin selection; or, that kin selection could, in fact, be seen as a kind of group selection. There are plenty of examples of extremely close kin—to the point where they might be called clones—that fail to develop the kinds of advanced social networks (or the altruism) seen in ants and other social insects. "It is neither necessary nor sufficient to have genetic relatedness," says Wilson. "It is important, but it is just one piece of a larger puzzle."

How is kin selection distinguished from group selection? It isn't always so clear-cut—especially because groups of individuals living together or very closely together tend to be genetically related to each other. It's further muddied by cases that can be easily interpreted in multiple ways, such as the behavior of Acromyrmex versicolor, a desert ant. Unrelated queens will form a group, but only one will forage for food, bringing back sustenance for the entire group. Her altruistic behavior—exposing herself to predators as well as doing the grunt work while her comrades rest—was evidence, many thought, of a situation where group selection could explain altruism where kin selection could not: while lowering her own individual "fitness" relative to others in her group, she increases the fitness of her group relative to other groups. But other researchers argued that because the other queens will not replace a forager who refuses to work—thus destroying the entire group, and the forager among them—it is really in the forager's individual genetic interest to forage, making the behavior explainable under kin selection.

"Mathematically, they're not different models," says Hudson Kern Reeve, Associate Professor of Neurobiology at Cornell University. "They give you the same predictions about the conditions under which cooperation and altruism will evolve. They are just alternative pictures. The controversy now," he claims, "is over whether group selection is [a more] useful [theory than kin selection]."

Reciprocal Altruism

A third model is the theory of *reciprocal altruism*, which predicts that animals behave altruistically in situations where they can expect to be "compensated" for their actions, either immediately or in the future. But wouldn't natural selection favor those who were best able to exploit such altruism—to cheat? As it turns out, certain conditions are needed for reciprocity to work: Individuals need to have repeated interactions with each other, and there needs to be a system of retaliation against cheaters.

"The conditions that are needed for reciprocity to work are relatively uncommon in nature," says Hudson Kern Reeve. "Acts that seem to be reciprocity could very easily be simple mistakes of identification—animals that think the others are kin. A lot of people have argued that [true acts of reciprocity] are infrequent in nature, and we're biased because we're humans and it does apply to us."

But what does this distinction say about human behavior? Does our uniqueness require a separate theory to explain human morality—is our "altruism" somehow special, is it "real" where the altruism of insects is merely instinctual?

The Birth of Sociobiology

These questions, particularly regarding altruism (and particularly in the wake of the development of kin selection theory) laid the groundwork for the development of sociobiology in the late 1970s, a theory that suggested that the social behavior biologists had been observing in animals was not only the result of natural selection (altruism, for example, as a means of propagating one's own genetic line), but that such behavior could be studied in humans in much the same way.

Sociobiologists were certainly not the first to apply evolutionary theory to the social realm—and Darwin himself was heavily influenced by social philosophies in constructing his theories in the first place. As he wrote in his 1876 autobiography, it was Thomas Malthus' essay on population (suggesting that an ever-increasing population would eventually surpass food supply and lead to increasing struggle for scare resources) that provided the real spark for his theory.

But while Darwin refused to speculate on the meaning of natural selection for social and political life, others were more than happy to use the theory to prop up their arguments for competitive individualism and laissez-faire capitalism. The 19th century political theorist Herbert Spencer proposed that civilization is the direct result of the same evolutionary processes Darwin saw elsewhere in nature. Spencer and the "social Darwinists" who came after him (some have suggested "social Spencerists" would be more fitting) appropriated the term "natural selection" to mean an individual's personal struggle to "succeed," conflating "survival" with "dominance." (Other theorists, too, have applied evolutionary theory to human behavior – Kropotkin's mutual aid, for example, was used to justify a "natural" inclination towards anarchism; Marx saw in Darwin's theory a rejection of god that suited his own arguments quite well.)

Now, jump forward a hundred years or so to 1975, when E.O. Wilson's *Sociobiology: The New Synthesis* first rolled off the press. This mammoth work sought to give an exhaustive overview to social behavior in animals—including *homo sapiens*. Wilson believed that humans should be treated no differently than other species when interpreting behavior as the work of evolutionary selection, and in the infamous final chapter of the book came to such conclusions as "The flattened sexual cycle and continuous female attractiveness cement the close marriage bonds that are basic to human social life…" and "The building block of nearly all human societies is the nuclear family…during the day the women and children remain in the residential area while the men forage for game or its symbolic equivalent in the form of barter and money."

But while Wilson may have been less than feminist in some of his specific assumptions about "natural" human reproduction, bonding, and the activities of men and women, it was his larger point—that the roots of culture and behavior are biological—that caused an enormous stir and launched sociobiology as a new scientific discipline. Just a few months after the publication of *Sociobiology,* sixteen scientists (several of them Wilson's own colleagues at Harvard) launched an organized assault on sociobiology through the formation of a "Sociobiology Study Group," arguing that the theory was both scientifically unsound and politically dangerous. In a letter from the group to the *New York Review of Books*, they wrote that "Historically, powerful countries or ruling groups within them have drawn support for the maintenance or extension of their power from these products of the scientific community," and drew connections between sociobiology and the early 20th century policies of sterilization and eugenics. And even several years after that, while Wilson lectured to the American Society for the Advancement of Science in Washington, a group of protestors rushed the stage and dumped a pitcher of water over his head, presumably outraged at what they perceived to be his attempt to legitimize a racist, sexist status quo.

The backlash against sociobiology was marked by misunderstandings on both sides. Many of those angered felt that sociobiology was nothing more than a new incarnation of what they saw as "social Darwinism," and that Wilson was trying to make justifications for human behavior they found repugnant. Richard Lewontin, Steven Rose and Leon J. Kamin wrote in their controversial 1984 book *Not in Our Genes* that sociobiology is a "reductionist, biological determinist explanation of human existence." They charged sociobiologists with the promotion of three dubious arguments: (1) that current (human) social relations are inevitable; (2) that such relations are the result of specific actions of genes; and (3) that these genes have been selected by evolutionary processes because the traits associated with them result in higher fitness for those that carry them.

Such arguments can indeed be found in quite a bit of sociobiological thinking, especially when related to differences between the sexes and races. But it should be acknowledged that the array of opinions on the matter of genes is quite diverse among

While Darwin refused to speculate on the meaning of natural selection for social and political life, others were more than happy to use the theory to prop up their arguments for competitive individualism and laissez-faire capitalism.

Spencer and the "social Darwinists" who came after him (some have suggested "social Spencerists" would be more fitting) appropriated the term "natural selection" to mean an individual's personal struggle to "succeed," conflating "survival" with "dominance."

sociobiologists and evolutionary psychologists (the field more commonly spoken of today that emerged from the sociobiology debate), and is far from settled. It's the non-scientific press that is largely to blame for the over-simplification of such ideas, and the propagation of such notions as "the free market is justified by natural selection" and "genes explain why we do what we do."

Still, the sociobiologists' critics were quite right in cautioning them in handling a thesis so eerily similar to the one put forth by the conservative right: that human nature is predetermined, and that sex or racial differences, familial structures, and putting our kin and ethnically related peers first are all parts of our heritage; that such behavior is not learned, but firmly ingrained in our genetic structure. This critique was dismissed by sociobiologists as an attempt to only engage in "politically correct" science—to limit their research to only what was uncontroversial and would not throw a wrench in their own political agendas.

What the sociobiologists also missed was the very legitimate concern that their interpretation of data and experiments was often (if not always) biased by culture and existing racist or sexist views. Indeed, it is quite hard to believe a study that describes a group of Chinese-American children as having "little intense emotional behavior" and "impassive facial expression[s]" (cited by E.O. Wilson in his book *On Human Nature*) to be unbiased. What is "impassive and unemotional" to one researcher might be just as easily read as "calm and serene," "happy and content," or even "bored" by another. This, of course, is not just the case in studies involving humans. As the Darwinian philosopher Helena Cronin points out in her book *The Ant and the Peacock*, when talking of sexual selection among animals, it has become standard practice to refer to "coy" females and "eager" males. "I can't resist wondering," she writes, "what words would be used if the sex-roles were reversed…. If males were choosy about mates, would they be 'coy'—or discriminating, judicious, responsible, prudent, discerning? (And…would females be 'eager'—or would they be wanton, frivolous, wayward, brazen?)"

A stellar example of competition.

Taking out the sociobiologists' extremes (arguments for differences in IQ being the result of race, for example) and the hostile accusations of their critics (of being no better than Nazi eugenicists, and the like), it seems that both parties actually share a lot of common ground. Both believe that the influence of natural selection in evolution is quite large, even if it isn't the only factor; environmental factors can shape evolution as well; biology does have some influence over our range of behaviors and activities (as Stephen Jay Gould points out, we wouldn't have developed agriculturally-based societies if we could photosynthesize); genes do not work on their own, but in interaction with other genes and their environment; and some features are selected, while others are "side effects."

And at least when it comes to altruism, the founder of sociobiology himself is the first to acknowledge the cultural foundations of its human expressions. "…The form and intensity of altruistic acts are to a large extent culturally determined," writes E.O. Wilson in 1978. "Human social evolution is obviously more cultural than genetic. The point is that the underlying emotion, powerfully manifested in virtually all human societies, is what is considered to evolve through genes."

In the debate over genetically vs. culturally produced behavior, it's also important to note that many prominent sociobiologists have taken pains to distinguish "is" from "ought"—that is, we cannot derive a code of ethics and morals from the simple facts that determine our existence. E. O. Wilson writes that "We are not compelled to believe in biological uniformity in order to affirm human freedom and dignity." Richard Dawkins insists in a 1996 interview that natural selection theory does not necessarily mean anything about how we should structure society or economics:

> In our political and social life we are entitled to throw out Darwinism…. We might say: Yes, Darwinism is true, natural selection is the true force that has given rise to life, but we, when we set up our political institutions…are going to base our society on explicitly anti-Darwinian principles…. The only message coming from evolutionary theory is what actually happens in nature. Now in nature it is true that, to some extent, the strong and the most selfish survive. But that is no message for what we should do. We have to get our 'shoulds' and our 'oughts' from some other source, not from Darwinism.

But, as Lewontin et al argue, "the effective political truth…is that 'is' abolishes 'ought.'" If biology alone compels us to perform certain behaviors, it's extremely difficult to launch ethical judgments against them. On the other hand, some sociobiologists argue that it is precisely because this is such a difficult task—overcoming one's genetic heritage to act in favor of a higher moral code—that it is so important to recognize it. Without fully accounting for what we're up against, we'll come up short every time.

Which leads us to the big question: What is that "genetic heritage," our "human nature?" Is it those traits that are found throughout various populations and cultures to be dominant? Does it leave any room for those that do not conform to the picture? Are there any elements that can be said to be universal? We all need to eat, but we do not all eat the same foods, nor can we all digest the same foods. Humans all reproduce sexually, but the raising of offspring can vary from the nuclear to extended family to adoption and artificial insemination—and not all humans that can reproduce choose to do so. All societies have a division of labor, but this varies widely both between cultures and within them; there are always those that go against the norm. Can those be said to be elements of human nature? Or are they strictly the dictates of human cultures?

Of course, the distinction between behavior and character has varied significantly throughout human history. Whether or not we perceive a person's eyes as "blue" doesn't change (much) over time or across cultures or depending on particular circumstances, but whether or not behavior is "altruistic" certainly does. In the debate over whether aggression or depression or homosexuality is wired in our genes or is the product of our environment, it's worth noting that many of these "character traits" have only been recognized in recent history. (Sex between two people of the same gender, for example, has only recently become an indicator of a homosexual identity; throughout most of human history, it was something a person did, not who they were.)

Interestingly enough, the founder of sociobiology himself argues that, at least when it comes to altruism, our particularly human environments set us apart from other animals. E.O. Wilson writes in *On Human Nature*:

> Reciprocation among distantly related or unrelated individuals is the key to human society…The perfection of the social contract has broken the ancient vertebrate constraints imposed by rigid kin selection. Through the convention of reciprocation, combined with a flexible, endlessly productive language and a genius for verbal classification, human beings fashion long-remembered agreements upon which cultures and civilizations can be built.

According to Wilson, human altruism is *not* the same behavior that we find in the neuter ants and suicidal bees—through the "perfection of the social contract," humans are no longer subject to the same evolutionary laws as the rest of the animal kingdom. While "rigid" kin selection may explain the altruism of the social insects as a genetically-driven impulse, the altruism of humans is based on reciprocation and the creation of mutually-beneficial agreements.

Such an argument, though, is indicative of a troubling dualism that can be found within many theories of "human" and "animal" natures. As Stephen Jay Gould points out in his 1977 essay "So Cleverly Kind an Animal," such speculations usually involve attributing "negative" human qualities to some sort of brutish, animal past—such as aggression, selfishness, or infidelity—in an attempt to justify the existence of certain cultural attitudes that, most often, are under attack by those that find such ideas or institutions (patriarchy, racism, capitalism) unacceptable.

Altruism and kindness, on the other hand, are usually considered to be hallmarks of a particularly human moral order, those things that elevate the human animal above all other species. And such a belief

> …gains no justification from science [but] arises from such sources as the theology of the human soul and the 'dualism' of philosophers who sought separate realms for mind and body. It has roots in…our desire to view the history of life as progressive and to place ourselves on top of the heap (with all the prerogatives of domination). We seek a criterion for our uniqueness, settle (naturally) up on our minds, and define the noble results of human consciousness as something intrinsically apart from biology.

But as Hudson Kern Reeve notes, those "noble results" might not actually be that unique, nor the laws of nature all that brutish. "Humans…have underestimated the plasticity of other animals. My own work has shown that wasp societies appear to have evolved forms of cooperation that are highly flexible…. The harder we look at insect societies, the more it looks like a human society. There's been a massive movement away from looking at genetically hardwired behavior, not just in humans. In other words, anthropomorphism may be the appropriate stance."

If evolution were a predictable process, then it would be easy to see modern species as the mere product of natural selection, an inevitable outcome. But when you factor genetics into it, and base selection on the level of the gene—which is highly susceptible to mutation—you get *variation*, not *predictability*—as the rule. Between gene mutations (both random and the product of our environment or human interference through drugs or chemicals) and a constantly changing environment, it becomes clear that human—or animal—behavior cannot be thought of as static, even within a single culture or location. As E.O. Wilson writes, "a correct application of evolutionary theory also favors diversity in the gene pool as a cardinal value."

The essence of nature, then, is variety. Indeed, selection can only work if there are different organisms to choose from—and the "fittest" of a species in one environment might not be the "fittest" in another, or in the same environment but at a different period in history. In applying natural selection theory to human social behavior, it's wrong to assume that there is therefore an "innate" human nature. It is not the human that is fixed, but the *process* of selection.

Our "nature" does not necessarily set us apart from the ants and termites, nor do similarities between humans and insects link all of us, hand in claw, in a miserable, determinist chain gang, plodding through life only to survive and reproduce as best we can. If human society is, in fact, closely related to that of the ants and bees (and derived from the same evolutionary roots), this doesn't mean human beings are restricted to a rigid set of biologically-imposed rules, as we believe insects are—it might mean that we need to start re-evaluating how rigid those rules are for the *insects*. The selection of species does not compel us to "always compete" or "always cooperate," nor is one more "natural" than the other. Whether in the city or in the anthill, biological determinism is ultimately defeated by the astounding multiplicity of abilities and behaviors that are the reason, really, why we humans even bother theorizing about such matters in the first place. LiP

Things I'm Supposed to Care About

by Tim Kreider