

“[N]atural selection acts only by taking advantage of slight successive variations; she can never take a great and sudden leap, but must advance by short and sure, through slow steps.”

—Charles Darwin

INTRODUCTION

Darwin believed that the castes of sterile female ants, such as soldiers and nursery workers, evolved for the benefit of the colony. (Darwin 1952a, pp. 132-34). Darwin also believed that in human ancestors, the instincts of “patriotism, fidelity, obedience, courage, and sympathy,” along with tribal defense, evolved for the good of the tribe. (Darwin 1952b, pp. 321-22). So does just about everyone today—everyone, that is, except sociobiologists.

Darwin believed that traits evolve if they are slightly advantageous in aiding survival and reproduction. They can “never take a great and sudden leap”. (Darwin 1952, p. 92). Just about everyone today believes the same—everyone, that is, except sociobiologists.

According to sociobiology, group traits cannot exist. All organisms are selfish. All life is selfish, down to the gene. G.C. Williams, one of the architects of sociobiology, once said: “a biologist seeing one animal doing something to benefit another assumes either that it is manipulated by the other individual or that it is being subtly selfish.” (Williams, quoted in Dennett 1995, p. 251).

In neo-Darwinism, group traits cannot exist because Hamilton’s Rule (kin selection) forbids them; it does not permit fidelity, courage, or sympathy—collectively, “altruism”—to a colony, tribe, or any other kind of society. (Dawkins 1989, p. 94). Since patriotism is a group concept, it rejects it altogether.

Hamilton’s rule *does* permit altruism *between individuals*, but by degree of relatedness, and only in very extreme circumstances that demand startling leaps of benefits to costs: 2 to 1 (siblings), 4 to 1 (aunts, uncles, nephews, nieces), 8 to 1 (cousins), 32 to 1 (second cousins); *ad infinitum*.¹ Even for parental altruism towards offspring—i.e., basic parental care—kin selection requires 2-to-1 leaps of benefits. With

¹ Hamilton’s rule is mathematically simple: $rB > C$, where B is the reproductive benefit to the beneficiary, C is the reproductive cost to the altruist, and r is the Mendelian coefficient of relatedness. Offspring receive only 1/2 of a parent’s genes, so they are related by 1/2; siblings each receive 1/2 of a parent’s genes, and so are related by 1/2. Cousins share 1/8 of their genes from a common ancestor (a grandparent), and thus are related by 1/8. And so forth. See Hamilton 1964.

Hamilton's rule, each individual organism is viewed as selfishly maximizing its "inclusive fitness"—the number of its own genes (by common descent)—even when it helps another.

Thus, under kin selection, altruism cannot occur at the level of the group. It cannot even occur at the level of the group when the group consists of family (kin) or a kin-based tribe. That is not where an individual draws boundaries. Instead, each individual draws boundaries around itself—or, rather, a series of concentric rings based on the different degrees of Mendelian relatedness it has to those around it. In a tribe, defense against an attack would depend on the degree of relatedness to the individuals who might be saved. If a man could save more than two full sisters by sacrificing his life, he ought to do so. (Dawkins 1989, p. 93). But if the lives of two half-sisters are at stake, he should flee. If he could save seven cousins, he should also flee. Heroism isn't worthwhile unless at least eight cousins are saved, or thirty-two second cousins.

In an ant colony with a single queen, the sterile workers are related to their mother queen by $1/2$, their virgin queen sisters by $3/4$, and their brothers by $1/4$. In a colony with several queens (usually mothers, daughters, and granddaughters), the degrees of relatedness are even more varied—and much lower. When, as is common, queens mate with more than one male, the within-colony relationships become exceedingly complex. Nevertheless, according to kin selection, workers must discriminate among all these varied relationships because Hamilton's rule operates on these individual relationships: altruism in workers can evolve *only if* a specific altruistic trait systematically hurdles the leaps of benefits to costs of the specific individuals it helps.

Does anything like this actually happen in nature? Of course not. In ant colonies, "workers are able to discriminate between nestmates and intruders, but they also tend to treat all nestmates as colony members, regardless of the degree of relatedness." (Holldobler and Wilson 1990, p. 197). Hundreds of field studies document the same in bees, wasps, cooperatively breeding birds, African wild dogs, marmots, Black-tailed prairie dogs, ground squirrels, lion prides, mole rats, bats, langurs, and the rest of the social species.²

In short, animals discriminate between "us" and "them," their society and all others—but this is a group distinction, not degree of kinship. According to Dawkins,

² See, eg., Malcom and Marten 1982, p. 11 (in African wild dogs, in which pack members babysit and regurgitate food to pups, "there is little or no correlation between an individual's contribution and its degree of relatedness"); Hoogland 1995, pp. 142-43 ("Prairie dogs also do not discriminate between close and distant kin in behavioral interactions (chap. 10), in fissions of large coterie (chap. 6), when giving antipredator calls (chap. 8), or during communal nursing (chap. 9)"). The studies documenting this in other species are detailed in Section 2.

“[t]he kin altruism gene does not program individuals to take intelligent action on its behalf; it specifies a simple behavioral rule of thumb such as ‘feed squawking gapes in the nest in which you live.’ It is this unconscious rule that will become universal when the gene becomes universal.” (Dawkins 1979, p. 192).

That *is* how it works in nature. Bird helpers *do* feed squawking gapes in the nest, they groom all the squawking gapes, and they defend the entire nest. And they do so whether they are full siblings, half-siblings, nieces, or nephews. (*See, eg.*, Rabenold 1990, pp. 172-73) (in Bi-colored Wrens and Stripe-backed Wrens, “no tendency exists for full-sibling helpers to contribute more than helpers of lesser relatedness”). They do these things even though there are vastly different leaps of benefits to costs (2 to 1 for full sibs, 4 to 1 for half-sibs, nieces, and nephews). In ant colonies with numerous queens, workers nurture larvae and defend the entire nest even though it is full of great-aunts, great-nieces, and second cousins twice removed.

Animal altruism isn’t calculated by degree of relatedness. Nor are there separate calculations for each kind of altruism. But this contradicts kin selection’s central claim, that altruism evolves according to a precise mathematical formula, in which all organisms are selfishly maximizing their own genes by common descent. The whole theory hinges on this. There is no room for the kind of gross group sloppiness of “feed squawking gapes in the nest in which you live,” even if they are all kin—not if kin have varying degrees of relatedness with vastly different leaps of benefits to costs.

Field biologists used to puzzle over the lack of discrimination in animal societies. (*See, eg.* Hoogland 1995, p. 142-43 (lack of discrimination is “perplexing”)). They used to express skepticism: “Perhaps the most important implication of the absence of nepotism within genetically heterogeneous colonies is that the amount of actual, as opposed to potential, conflict within insect societies may be substantially less than was originally envisioned with the advent of ‘selfish-gene’ thinking.” (Carlin et. al. 1993, p. 394).

Not anymore. The contradiction is now masked with bland statements that kin selection means kin favor kin, or that altruism can evolve between close relatives. (*See, eg.*, Gadagkar 1997, ch. 6; Freeman 2011, p. 1032). It *is* true that cooperative animal societies are comprised of relatives. This is because they are formed and replenished through natal philopatry: the young remain in their natal nests or territories after they mature. It is also true that *by human standards*, animal societies typically consist of close relatives: parents, siblings, half-siblings, aunts, nieces, nephews, and cousins. And in multiple queen insect societies with overlapping generations, these relatives might stretch to second cousins, third cousins, and the like.

Using Hamilton’s rule, however, altruism between even close relatives requires vastly different and extremely large leaps of benefits to costs in order to evolve. This

doesn't happen. No one has even tried to make the case that it is plausible. No one has tried to marshal evidence for it. There is none.

Modern neo-Darwinians have lived with this contradiction for decades. If so, why does it matter? It matters because to perpetuate a theory with a central prediction that doesn't fit the key facts it is supposed to explain is just not good science.

It matters because it perpetuates the falsehood that every bit of life must be viewed through the lense of selfishness. The constant drumbeat of selfishness skews our perspective of the animal world; instead of seeing the coordinated harmony of an insect colony or a wolf pack, we see selfish conflict everywhere—an ugly, relentless war of all against all. Selfishness creeps into our consciousness so that the plainest patterns of nature escape us. A basic biology textbook can teach that “[n]o instance of purely self-sacrificing behavior—where the individual received no fitness benefit in return—has ever been recorded in nature.” (Freeman 2011, p. 431). And no one blinks an eye.

It matters, too, because it's really about us. We're animals. Our ancestors evolved through natural selection. Their animal instincts remain in the DNA of modern humans. The promise of sociobiology was ultimately not about the social behaviors of other species; it was to link the understanding of humans to our evolutionary roots.

Here is what sociobiology says about us: “[W]e are born selfish.” (Dawkins 1989, p. 3). The “light which guides the human sociobiologist” instructs that even when we see what looks like cooperation among humans, it's an illusion: “[U]ltimately the benefits have to return to the individual.” (Ruse 1989, p. 163). If “no instance of purely self-sacrificing behavior” occurs in nature, maybe it doesn't occur in the human world either: “[I]t remains an open question whether there is such a thing as genuinely altruistic relation to one's fellow man, in which the gratification of one's own instinct plays no part at all.” (Gadagkar 1997, p. 84). If, as G.C. Williams says, the rest of nature is “grossly immoral” (Pinker 2002, p. 163), perhaps so are we.

Bad science leads to bad philosophy. In his notebook, Darwin made this audacious comment: “Origin of man now proved.—Metaphysic must flourish.—He who understands baboon would do more towards metaphysics than Locke.” (Desmond and Moore 1991, p. 260). Darwin understood the metaphysics of man's moral conscience as this: “In order that primeval men...should have become social, they must have acquired the same instinctive feelings, which impel other animals to live in a body.... [T]hey would have felt some degree of love; they would have warned each other of danger; and have given mutual aid in attack or defence. All this implies some degree of sympathy, fidelity, and courage.” (Darwin 1952, p. 320).

Instead, in the name of his theory, *neo*-Darwinism preaches an ideology of selfish individualism. Even the fundamental character of the basic biological element—the

gene—is “ruthless selfishness” (Dawkins 1989, p.2); selfish genes infect every organism they inhabit, including us, so that we are just “lumbering robots” being manipulated by them to do their selfish bidding. (Dawkins 1989, p. 19). Selfishness is *natural*.

Sociobiologists toss out occasional bromides about how we must rise above our selfish nature (*see, eg.*, Pinker 2002, p. 163) or “teach generosity”. (Dawkins 1989, p. 3). They may be sincere, but the repetition of the triumph of utter selfishness sets the tone. So do the book titles: *The Selfish Gene* (Dawkins 1989); *The Folly of Fools: The Logic of Deceit and Self-Deception in Human Life* (Trivers 2011); *Genes in Conflict: The Biology of Selfish Genetic Elements* (Burt and Trivers 2008); *Natural Selections: Selfish Altruists, Honest Liars and Other Realities of Evolution* (Barash 2007).

And they never explain how we are supposed to rise above selfishness. If every instinct in us is selfish, we would never think to be unselfish or to teach unselfishness to others. We would be born sociopaths. We would remain that way for the rest of our lives.

The human world *is* often ruthless. We are predators. Survival is a first principle of human existence. *We are* selfish. Modern capitalism thrives on it; the strongest enterprises survive, the weakest fail. Imperialism is a recurrent theme in history; it is often nasty, brutish, and bloody.

But selfish individualism is not the whole story. The long rows of headstones in war memorials vividly remind us that people do die for causes greater than themselves. People do sacrifice for what they perceive to be the good of their societies. The benefits of cooperation often do not return to the individuals who make the sacrifice.

Bravery in battle is particularly dramatic evidence of group loyalty, but the same sort of thing occurs every day in numerous, less dramatic ways. Humans are also capable of kindness, compassion, and mercy. It is not an illusion. The social safety net and charity for the poor are often given grudgingly, but we pool our resources and do it. We may only infrequently love our neighbors as ourselves. In practice, we may not always achieve “all for one, one for all” or *e pluribus unum*. But the fact that we even aspire to such a moral code says something profound about human psychology.

The problem with sociobiology’s fixation on selfish individualism is not that it is philosophically odious. The problem is that it is scientifically inaccurate. It is based on a theory of altruism that is wrong. We pledge allegiance to our society—to the group.

A theory of the evolution of altruism should explain the evolutionary roots of human psychology—both selfishness and unselfishness, including loyalty and patriotism. It should do so honestly, without artifice, without contradiction. It should be able to explain why social animals draw the cooperative boundaries at the level of their own

societies. It should not have to explain that a soldier ant defending its colony is really selfishly propagating its own genes—even when colony members are related by some implausibly remote degree. It should not have to explain that altruism requires leaps in order to evolve.

But as science philosopher Thomas Kuhn observed, once a scientific theory has achieved paradigm status, it does not die because of the accumulation of facts which contradict it; it dies only when an alternative theory takes its place. (Kuhn 1970, p. 77).

Thus, the ultimate purpose of this book: to set forth a theory that explains adaptations at the level of the colony, pack, and tribe; explains how traits that benefit animal societies but are self-sacrificing at the level of the individual have evolved; and explains how they evolve if they are just slightly advantageous. It is called “dynastic theory,” after the way in which animal societies (other than humans) are structured—because societies are formed and maintained through natal philopatry (offspring and further descendants remaining with their parent(s)), each is a family dynasty. Dynastic theory, which has nothing in common with the theory of group selection advocated by D.S. Wilson and, more recently by E.O. Wilson, except the recognition that group altruism exists, is set forth in Section Two. Its implications for the origins of human group adaptations, for the theory of natural selection, and for a theory of human cultural evolution, are set forth in Implications, which concludes this book.

To clear the way, however, it will first be necessary to thoroughly lay bare the fallacies of kin selection’s logic and predictions. This is Section One.