



Genesis: The Deep Origin of Societies

Edward O. Wilson

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Asserting that religious creeds and philosophical questions can be reduced to purely genetic and evolutionary components, and that the human body and mind have a physical base obedient to the laws of physics and chemistry, *Genesis* demonstrates that the only way for us to fully understand human behavior is to study the evolutionary histories of nonhuman species. Of these, Wilson demonstrates that at least seventeen—among them the African naked mole rat and the sponge-dwelling shrimp—have been found to have advanced societies based on altruism and cooperation.

Whether writing about midges who “dance about like acrobats” or schools of anchovies who protectively huddle “to appear like a gigantic fish,” or proposing that human society owes a debt of gratitude to “postmenopausal grandmothers” and “childless homosexuals,” *Genesis* is a pithy yet path-breaking work of evolutionary theory, braiding twenty-first-century scientific theory with the lyrical biological and humanistic observations for which Wilson is known.

Genesis: The Deep Origin of Societies Details

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Author : Edward O. Wilson

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Peter O'Kelly says

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Ryan Boissonneault says

There exists within evolutionary theory a deep contradiction, one that Charles Darwin noticed back in the nineteenth century. The problem is this: how can evolution by natural selection account for altruistic behavior that benefits the group at the expense of the individual?

The standard view of natural selection, operating at the level of the gene, goes as follows: genetic mutation results in variation in form and function in the individual, which either confers an advantage or disadvantage (or is neutral) in relation to other individuals. If the mutation enhances survival and reproduction in a particular environment, then that individual will flourish and the frequency of those genes will increase within the population.

The problem is in explaining altruistic behavior that *decreases* individual fitness and yet persists, as when insects in a colony forgo reproduction in service of the few members that can reproduce. Standard explanations of natural selection would predict that this behavior would be quickly extinguished.

The answer to the paradox of altruism—one thought of by Darwin himself—is the concept of group selection (facilitated by cooperation among group members), which is the running theme throughout Edward O. Wilson's latest book, *Genesis*, used to explain the altruistic behavior found in both insect colonies and other social animals, including humans.

But isn't group selection a misleading and false way to think about evolution? Doesn't evolution happen at the level of the gene? And aren't bodies and groups simply vehicles for the transmission of genes? I used to think so, but after reading this book, along with David Sloan Wilson's book *This View of Life*, I now see the inescapable logic of group selection. Here's Wilson describing the concept:

“For group-level traits as for individuals, the unit of selection is the gene that prescribes the trait. The targets of natural selection, which determine whether genes do either well or poorly, are the traits prescribed by the genes. An individual in a group that competes with other members for food, mates, and status is engaged in natural selection at the individual level. Individuals that interact with other group members in ways that create superior organization through hierarchies, leadership, and cooperation, are engaged in natural selection at the group level. The greater the price extracted by altruism and the resulting loss to the individual's survival and reproduction, the larger must be the benefit to the group as a whole. The

evolutionary biologist David Sloan Wilson (no relation) has nicely expressed the rule for the two levels of selection as follows: within groups, selfish individuals win against altruists, but groups of altruists beat groups of selfish individuals.”

Let’s unpack this for a minute. Wilson is not denying that genes are the only true replicators; he’s simply pointing out the fact that selection can occur at multiple levels, each of which impact the transmission of genes.

Genes build bodies as vehicles, but it’s the interaction of the vehicle with the environment that is ultimately the target of selection. Individual bodies that have survival and reproductive advantages outcompete other individual bodies and increase the frequency of their genes within the population.

You can take this logic one step further by considering extended phenotypes. A phenotype is “the set of observable characteristics of an individual resulting from the interaction of its genotype with the environment.” The phenotype is simply the physical expression of a trait. An *extended* phenotype is the genetic expression of a trait outside the body, for example a spider’s web. Spiders that weave better webs have an evolutionary advantage and so the genes for the better webs increase their frequency within the population.

Now, just think of groups as a type of extended phenotype. Individuals with cooperative traits, if they allow the group (a kind of superorganism) to function better and beat out other groups, will transmit their cooperative genes by virtue of group survival (and that otherwise would have died out without the group, in the same way a spider will die out without its web).

There are several examples of this in nature, which Wilson recounts in the book. For example, the cells of our body carry out programmed cell death for the benefit of our bodies, and worker ants forgo their own reproduction to serve the reproduction of the queen, leading to a stronger colony that can outcompete other groups. The worker ants are analogous to the individual cells of our body when they sacrifice themselves for the greater good.

The bottom line is this: if trait X persists in a population but would not otherwise persist outside of the group, then trait X has been selected for at the group level, even though it’s still the genes prescribing the trait.

This adequately resolves the paradox of altruism, and explains altruistic behavior in all eusocial insects and mammals, including humans. Wilson further explains, in detail and throughout the book, how this came about in biological terms and the evidence for the genetic mutations that can result in the creation of eusocial or cooperative societies of altruists. It’s in these various real-world examples and experiments that the ideas really come to life—and are difficult to argue against.

My only complaint is that book ends rather abruptly. The final chapter on the human story could have been expanded, and the final paragraph ended as if the author ran out of time during a proctored exam. The book could have greatly benefited from a concluding chapter that brought all of the ideas together.

Nonetheless, if you’re looking for a quick read that synthesizes the best evidence for the origin of social, cooperative species, one devoid of myth and superstition and based on the best available scientific evidence, then you won’t be disappointed. I think you’ll also come to see the logic of group selection as the solution to the paradox of altruism, and, in fact, as the only **possible** solution.

Sarah Goss says

Wilson, succinct

A quite succinct version of Wilson, but didn't deliver philosophically as intended. The science was there, but the ending felt abrupt as he didn't conclusively close his beginning remarks.

Dennis Robbins says

The author is one of the most prominent thinkers of our time who also an engaging writer. This is a short-book essay on the author's thoughts about three eternal questions. He states in the beginning:

What are we?

What created us?

What do we ultimately wish to become?

Not wanting to leave these existential issues to political dogmas or religious superstitions he takes a naturalistic and evolutionary perspective. He assumes our minds and bodies evolved and are sufficiently understood by applying the known principles of chemistry and physics. His evolutionary analysis using "group selection," "phenotypic plasticity," and "controlled flexibility" as the key conceptions for explaining the origin of complex societies which besides human beings there are many, particularly in the insect world.

My favorite quote: "The spread of Homo sapiens out of Africa and around the habitable world was somewhat preordained. It was meant to establish our rule of the planet with the inalienable right to treat it as we please. That mistake, I suggest, is the true human condition (p. 33)."

Most of the book, however, is focused on insect social evolution while saving humanity's story for the last chapter. Only then does he begin answering those initial questions.

His earlier book "The Meaning of Human Existence" (2014) directly covered the dilemma of human society; cooperation allowed humanity survive but tribalism is leading to our extinction. I recommend that reading.
