

# Does evolution explain human nature?



Lynn Margulis

## Quite well.

Ever since Bishop Wilberforce asked, in a debate with Thomas Huxley, whether it was from his grandmother or grandfather that he claimed descent from a monkey, the sufficiency of evolutionary theory to explain

humanity's spiritual and moral qualities has been in question. Then, as now, the evolution of humans was a touchy subject, and after the publication of *On the Origin of Species*, Darwin devoted a separate work, *The Descent of Man*, to untangling how evolutionary understanding could be applied to humans and their special traits.

Since his account of "descent with modification" leaned heavily on natural selection of the *individual*, Darwin wondered how moral behaviors—which focus on others—evolved. When lying, cheating, manipulation, greed, and other less than admirable qualities seemed to benefit those individuals who practiced them, how could their opposites evolve? Pointing out that he "who was ready to sacrifice his life . . . would often leave no offspring to inherit his noble nature," Darwin pondered how members of a tribe became endowed with moral attributes.

His simple answers still apply. One who aids his fellows commonly receives aid in return. Darwin called this a "low motive" because it is self-regarding. So-called reciprocal altruism—I'll carry your baby if you take my son on the hunt tomorrow at dawn—is operative in species whose members are capable of recognizing each others' faces. More important is the praise we love and the blame we dread, instincts that help bind tribe members who work together. Reciprocal acts of kindness and aid underlie families, tribes, and religious groups; they ensure survival and reproduction as "naturally selected" perpetuating, living entities.

Our human sort of mutual care, along with the strong feeling of life we have in the presence of

sexual partners, family, friends, colleagues, classmates, and fellow citizens (in short, in the company of meaningful others), necessitates frequent communication: symbols, language, music, teaching, learning, etc. Do these activities fundamentally distinguish us from the non-human life forms with whom we share the planet and upon whom we depend for our survival? I doubt it.

This may sound inadequate to true believers in human uniqueness, especially on religious grounds. But religion serves an obvious evolutionary function: it identifies, unifies, and preserves adherents. Admonitions to desist from the seven deadly sins inhibit behaviors that threaten group solidarity and survival. Greed, for example, privileges the individual in seasons of limited resources. Lust—the biblical coveting of the neighbor's wife (in its male-centered perspective)—interferes with ideals for the nurture of healthy children and effective warriors. Prohibiting sloth enhances productive work intrinsic to survival and reproduction of the social unit. Anger, perhaps useful in battle, destroys family and other social relationships. Envy and pride promote individual interests above those of the larger social unit. The survival value of prohibiting sin seems obvious.

By contrast, "love thy neighbor," interpreted from an evolutionary point of view, is an algorithm for social connectedness. The touted virtues of chastity, moderation, compassion, diligence, patience, moral commitment, and humility provide touchstones for effective group action. The intellectual historian Karen Armstrong, a former nun and the author of books on Christianity, Judaism, and Islam, argues that compassion is the crucial link among the major religions. The golden rule of Jesus, Confucius, and others is that we should not do to others what we would not want them to do to us. Is this not a clear precept for the evolutionary perpetuation of specific cohesive groups in familiar habitats?

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We differ from other species in that fewer rules of social behavior are communicated only by shout, groan, touch, and facial expression and more by verbal explication. But all tend to maintain and perpetuate unity of the pack, gaggle, or herd. We people share a linguistic version of the universal tendency toward socio-ecological wisdom measurable in life forms at every level. After my collaborative scientific work for over a half century to detail the genetics, microscopy, and biochemistry of cells that adhere in their lives together, I consider the neo-Darwinist overemphasis on competition among selfish individuals—who supposedly perpetuate their genes as if they were robots—to be a Victorian caricature. Disease microbes that kill all their victims perish themselves as a result of their aggression.

I disagree with neo-Darwinist zoologists who assert that the accumulation of random genetic mutations is the major source of evolutionary novelty. More important is symbiogenesis, the evolution of new species from the coming together of members of different species. Symbiogenesis is the behavioral, physiological, and genetic fusion of different kinds of being; it leads to the evolution of chimeric new ones. One example is of originally pathogenic bacteria that invaded and killed many amoebae in the University of Tennessee laboratory of Kwang Jeon in the 1970s. He selected survivors, and eventually different amoebae with new species characteristics appeared among them. These had retained 40,000 bacteria in each amoeba!

A new type of fruit fly evolved after it acquired an insect-loving bacterium that prevented it from successfully mating with its old partners. Indeed, the only documented cases of the “origin

of species” in real time involve not selfish genes but “selfless” mergers of different forms. Chemical and genetic evidence suggests that even mitochondria, bodies inside all of our cells that suffocate without oxygen, came from ancient mergers, truces between oxygen-respiring bacteria and the nearly poisoned cells of other kinds of microscopic beings. The mergers, naturally selected, survived to thrive and spread across the planet.

Gifted with large brains that permit us great neurological processing power, we humans plan further into the future. We recognize more of our own kind with whom, now via global communication, we establish relationships of identity and trust. But on a crowded planet, there has always been a premium on effective togetherness. Our moral nature reflects rather than conflicts with nature.

Free will may also be nature-deep. Large single-celled forams choose from brightly colored sand grains the correct ones with which to make shells. Aware of shape and color, they make choices and reproduce their kind. Awareness in some form has been naturally selected for at least 550 million years. For me, our spirituality and moral nature help perpetuate our living communities, just as similar attributes aided previous living communities whose evolution is chronicled in the fossil record.

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