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Evolution and Our Inner Conflict

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Are human beings intrinsically good but corruptible by the forces of evil, or the reverse, innately sinful yet redeemable by the forces of good? Are we built to pledge our lives to a group, even to the risk of death, or the opposite, built to place ourselves and our families above all else? Scientific evidence, a good part of it accumulated during the past 20 years, suggests that we are all of these things simultaneously. Each of us is inherently complicated. We are all genetic chimeras, at once saints and sinners — not because humanity has failed to reach some foreordained religious or ideological ideal — but because of the way our species originated across millions of years of biological evolution.

Don't get me wrong. I am not implying that we are driven by instinct in the manner of animals. Yet in order to understand the human condition, it is necessary to accept that we do have instincts, and will be wise to take into account our very distant ancestors, as far back and in as fine a detail as possible. History is not enough to reach this level of understanding. It stops at the dawn of literacy, where it turns the rest of the story over to the detective work of archaeology; in still deeper time the quest becomes paleontology. For the real human story, history makes no sense without prehistory, and prehistory makes no sense without biology.

Within biology itself, the key to the mystery is the force that lifted pre-human social behavior to the human level. The leading candidate in my judgment is multilevel selection by which hereditary social behavior improves the competitive ability not of just individuals within groups but among groups as a whole. Its consequences can be plainly seen in the caste systems of ants, termites and other social insects. Between-group selection as a force operating in addition to between-individual selection simultaneously is not a new idea in biology. Charles Darwin correctly deduced its role, first in the insects and then in human beings — respectively in "On the Origin of Species" and "The Descent of Man."

Even so, the reader should be warned that the revival of multilevel selection as the principal force of social evolution remains a hotly contested idea. Its opponents believe the principal force to be kin selection: when individuals favor kin (other than offspring), the evolution of altruistic behavior is favored. The loss suffered by the genes of the altruist are compensated by genes in the recipient made identical by common descent of the altruist and recipient. If the altruism thus created is strong enough it can lead to advanced social behavior. This seems plausible, but in 2010 two mathematical biologists, Martin Nowak and Corina Tarnita, and I demonstrated that the mathematical foundations of the kin selection theory are unsound, and that examples from nature thought to support kin selection theory are better explained as products of multilevel selection.

A strong reaction from supporters of kin selection not surprisingly ensued, and soon afterward more than 130 of them famously signed on to protest our replacement of kin selection by

multilevel selection, and most emphatically the key role given to group selection. But at no time have our mathematical and empirical arguments been refuted or even seriously challenged. Since that protest, the number of supporters of the multilevel selection approach has grown, to the extent that a similarly long list of signatories could be obtained. But such exercises are futile: science is not advanced by polling. If it were, we would still be releasing phlogiston to burn logs and navigating the sky with geocentric maps.

I am convinced after years of research on the subject that multilevel selection, with a powerful role of group-to-group competition, has forged advanced social behavior — including that of humans, as I documented in my recent book "The Social Conquest of Earth." In fact, it seems clear that so deeply ingrained are the evolutionary products of group selected behaviors, so completely a part of the human condition, that we are prone to regard them as fixtures of nature, like air and water. They are instead idiosyncratic traits of our species. Among them is the intense, obsessive interest of people in other people, which begins in the first days of life as infants learn particular scents and sounds of the adults around them. Research psychologists have found that all normal humans are geniuses at reading the intentions of others, whereby they evaluate, gossip, proselytize, bond, cooperate and control. Each person, working his way back and forth through his social network, almost continuously reviews past experiences while imagining the consequences of future scenarios.

A second diagnostic hereditary peculiarity of human behavior is the overpowering instinctual urge to belong to groups in the first place. To be kept in solitude is to be kept in pain, and put on the road to madness. A person's membership in his group — his tribe — is a large part of his identity. It also confers upon him to some degree or other a sense of superiority. When psychologists selected teams at random from a population of volunteers to compete in simple games, members of each team soon came to think of members of other teams as less able and trustworthy, even when the participants knew they had been selected at random.

All things being equal (fortunately things are seldom equal, not exactly), people prefer to be with others who look like them, speak the same dialect, and hold the same beliefs An amplification of this evidently inborn predisposition leads with frightening ease to racism and religious bigotry.

It might be supposed that the human condition is so distinctive and came so late in the history of life on Earth as to suggest the hand of a divine creator. Yet in a critical sense the human achievement was not unique at all. Biologists have identified about two dozen evolutionary lines in the modern world fauna that attained advanced social life based on some degree of altruistic division of labor. Most arose in the insects. Several were independent origins, in marine shrimp, and three appeared among the mammals, that is, in two African mole rats, and us. All reached this level through the same narrow gateway: solitary individuals, or mated pairs, or small groups of individuals built nests and foraged from the nest for food with which they progressively raised their offspring to maturity.

Until about three million years ago the ancestors of *Homo sapiens* were mostly vegetarians, and they most likely wandered in groups from site to site where fruit, tubers, and other vegetable food could be harvested. Their brains were only slightly larger than those of modern chimpanzees. By no later than half a million years ago, however, groups of the ancestral species *Homo erectus* were maintaining campsites with controlled fire — the equivalent of nests —

from which they foraged and returned with food, including a substantial portion of meat. Their brain size had increased to midsize, between that of chimpanzees and modern *Homo sapiens*. The trend appears to have begun one to two million years previously, when the earlier prehuman ancestor *Homo habilis* turned increasingly to meat in its diet. With groups crowded together at a single site, and an advantage added by cooperative nest building and hunting, social intelligence grew, along with the centers of memory and reasoning in the prefrontal cortex.

Probably at this point, during the habiline period, a conflict ensued between individual-level selection, with individuals competing with other individuals in the same group, versus group-level selection, with competition among groups. The latter force promoted altruism and cooperation among all the group members. It led to group-wide morality and a sense of conscience and honor. The competitor between the two forces can be succinctly expressed as follows: within groups selfish individuals beat altruistic individuals, but groups of altruists beat groups of selfish individuals. Or, risking oversimplification, individual selection promoted sin, while group selection promoted virtue.

So it appeared that humans are forever conflicted by their prehistory of multilevel selection. They are suspended in unstable and constantly changing locations between the two extreme forces that created us. We are unlikely to yield completely to either force as an ideal solution to our social and political turmoil. To yield completely to the instinctual urgings born from individual selection would dissolve society. To surrender to the urgings from group selection would turn us into angelic robots — students of insects call them ants.

The eternal conflict is not God's test of humanity. It is not a machination of Satan. It is just the way things worked out. It might be the only way in the entire universe that human-level intelligence and social organization can evolve. We will find a way eventually to live with our inborn turmoil, and perhaps find pleasure in viewing it as a primary source of our creativity.

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