21st Century Vindications of Darwin

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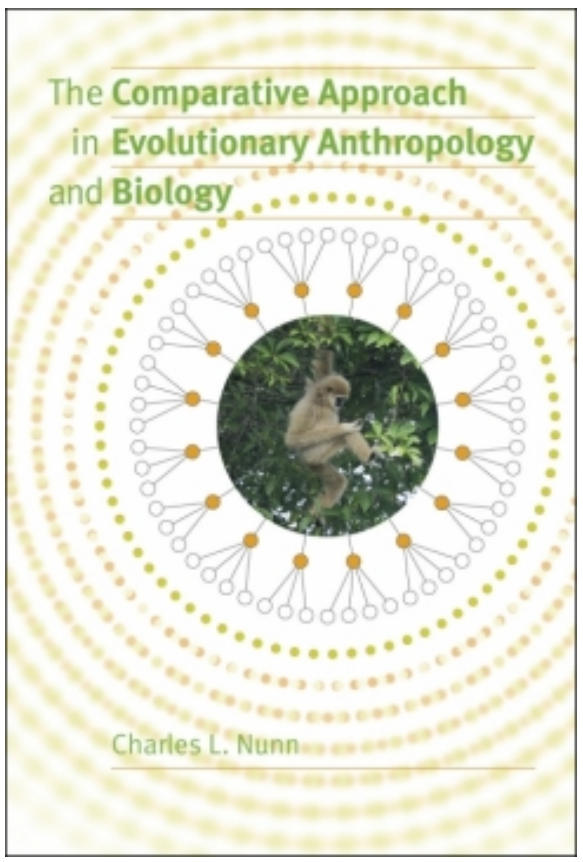
JULY 31, 2012



NEAR THE END of *The Origin of the Species*, Charles Darwin boldly predicts: "Much light will be thrown on the origin of Man and his history." That prediction was prescient but premature. Half-baked extrapolations of his theories were almost immediately used to shore up pernicious imperial enterprises, to buttress Marx's tendentious view of history, and to justify racism and anti-Semitism. In short, *The Origin* initially fostered a dark age of misappropriations, rather than enlightenment.

None of these abuses were Darwin's fault, any more than the Thirty Years War was the fault of Copernicus. Indeed, Darwin's actual writings on human origins — *The Expression of the Emotions in Man and Animals* and *The Descent of Man* — were

characteristically meticulous applications of his scientific models. And, in addition, he was far more concerned with assembling evidence for our origins as a *unified* species and for our consequent *universal* characteristics than he was with differences among groups of humans, let alone human competition among groups or races or classes or nations.

The fact that 'Darwinism' (the supposedly deterministic struggle for existence) was used to justify many of the nineteenth and twentieth centuries' atrocities created a chilling effect: by the late twentieth century, the social sciences were extremely leery of fraternizing with anything smacking of so-called Darwinism. Even so, new applications of evolutionary science were emerging in ever more compelling ways. By the end of the millennium, it was next-to-impossible to avoid conversations that linked biology to human behavior.

Two years after the bicentennial of Darwin's birth and the sesquicentennial of *The Origin of Species*, a steady stream of new books marks his influence in twenty-first century scholarship. As several of them demonstrate, Darwin's new descendants have returned to the ancestral method. Based on carefully developed models and tested with real evidence, they demonstrate that the work of applying Darwin to the social sciences is just getting started. Evolution is ever more thoroughly ensconced in the realm of what science historian Thomas Kuhn famously called "normal science," tackling new individual problems but within a familiar paradigm, instead of throwing out the paradigm and building a new one. Darwin's theory is being applied as a matter of course not just to biology but to psychology, anthropology, sociology, economics, linguistics, political science, even history. This is not to say that it is cannibalizing those fields. Nor is it taking the place of these fields' standard theories and methods. Rather, it expands and informs them by taking into account our growing

knowledge of human beings as animals who, to borrow the last words of *The Origin*, "have been, and are being, evolved."

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Charles Nunn is an evolutionary anthropologist, but his new book ranges beyond that field. More than a technical handbook, it is also a marvelous summary of recent research on everything from how the "intermembral index" (arm length divided by leg length) has evolved among primates to how testicle size relates to mating systems — it tracks body size up to a point, but in those species where females mate with lots of males, the latters' best course has been to evolve outsize gonads that can produce more sperm.

The same comparative methods are being applied to the evolution of language and culture, as Nunn points out. For example, evolutionists like Ruth Mace, Mark Pagel, and others argue that the processes of cultural change resemble those of biological change. Languages, like species, are more numerous closer to the equator, probably for precisely the same reason: the richness of the tropics enables groups to thrive in smaller areas and then to separate for long enough that they can evolve separately and so diverge. On the other hand, in lands far from the equator, like Europe and Asia, ecology appears to have little impact on, say, the direction of exchange of wealth at marriage; common ancestry does, however, have a significant impact in another notably nongenetic arena: traditions. In short, quantitative approaches to history ("cliometrics") have arisen independently of Darwin, but these studies suggest a happy convergence.

Psychologist Alex Mesoudi's book, *Cultural Evolution: How Darwinian Theory Can Explain Human Culture and Synthesize the Human Sciences*, carries the study of cultural evolution further,

with a less technical and more wide-ranging discussion. In his search for analogies to biological evolution, he can sometimes, however, stretch speculation a bit far. For example, he hypothesizes that a future science, which he names "neuromimetics," might play a role in the theory of culture comparable to the role of genes in biological evolution. In other words, just as in biological evolution the gene is the unit of selection, and changes in gene frequency are of the essence of change, Messoudi would give a similar central role to the neuron or neural connection as the unit of cultural evolution. But the problem is that there is no unit of cultural transmission comparable to the gene in its discreteness, segregation, independent assortment and random mutability. Rather, units of cultural transmission have fuzzy boundaries, routinely change by directed evolution or by design, and they range from phonemes to abstract ideas like reincarnation or the Trinity. There is no simple way to map such variety on the brain.

On the plus side, Messoudi persuasively argues for a science of culture based on quantitative models and methods; he gives examples from the work of population geneticist Luigi Cavalli-Sforza and others who have indeed made important contributions. Cavalli-Sforza and Marcus Feldman put forward sophisticated mathematical models of the way culture comes down from one generation to the next or from one person to the next, through learning. This might cover anything from hula hoops to vampire stories to hatred of taxation. But there is the same flaw: These researchers have modeled the transmission of individual cultural elements, and avoided the larger question of cultural coherence — as meant by anthropologists when they speak of, for instance, "Samoan" or "Nuer" culture, terms still widely used despite their fuzzier postmodern boundaries. (Consider the difficulty of defining "Tea Party values" as opposed to "hatred of taxation" to get the

idea.) Messoudi, too, ignores this larger question of cultural coherence. Also, he bypasses the important issue of gene-culture co-evolution as advanced in William Durham's landmark 1991 book, *Coevolution: Genes, Culture, and Human Diversity*. (For example, religious fervor is partly inherited and it usually leads to large families, which favors both the cultural and the biological expansion of religions.) This is a striking omission given that the more we know about genes and human behavior, the more likely it seems that any model of lasting value will have to focus on the interplay of genes and culture.

Several chapters in the edited volume *Man is By Nature a Political Animal: Evolution, Biology, and Politics*, do adroitly address this interplay and serve as further examples of gene-culture coevolution. As the editors Peter K. Hatemi and Rose McDermott — both are political scientists, but Hatemi is also trained in genetic epidemiology — write in their concluding chapter, "It is only by creating models with an explicit recognition of the influence of *both* biology and environment that we can begin to develop more comprehensive models..." Social sciences access a deeper level of understanding when both biology and behavior are taken into account. But this does not mean that biology determines behavior; sometimes it happens the other way around. Thus, chapters on psychophysiology, hormones and politics, and the new science of neuroimaging, demonstrate how social behavior can cause biological change. To take one example, on the day that Barack Obama was elected, researchers monitored a sample of young men from early evening until CNN called his victory. It turned out that the normal nightly decline in testosterone was significantly smaller in Democrats than in Republicans, and was also correlated with strength of party commitment. Here the hormonal flux is being toyed with by electoral results — a cultural cause with biological results. Speaking of testosterone,

and on the other side of the ledger, it is no accident that young men throughout the world have always played a disproportionate role in political rebellions; their natural level of testosterone is likely one cause of this behavior. In the one case a CNN projection of Obama's win is the cause and testosterone flow the effect; in the other, the normal testosterone surges of youth are among the causes that may increase the likelihood of ground-up political change.

The editors of this volume rightly emphasize "theory" in evolutionary psychology, but the mounting evidence that ties biology to politics is striking. And it is not just human politics; a chapter by Darby Proctor and Sarah Brosnan summarizes the many small-scale parallels among various species of primates to human political power games. Another chapter, by Oleg Smirnov and Tim Johnson, introduces political scientists to formal evolutionary modeling, perhaps especially pertinent in game theory. But the most compelling part of this volume is a set of three chapters on gene-environment interaction, based largely on robust twin and family studies with parallel designs in the U.S. and Australia. These studies unequivocally demonstrate that both genes and environment play a role in behaviors like church attendance, conservatism, and strength of political commitment. Interestingly, genes do not influence conservative political attitudes before age 20, when parental influence dominates attitudes. But after that genes have a strong effect that lasts throughout life. Such studies vindicate Thomas Jefferson; influenced by the physician Benjamin Rush, Jefferson argued that "Whig" and "Tory" are enduring "types" that will always be with us. Neither will win the other over, so government had better operate to enable them to check each others' excesses. Conservatives tend to resist change, being skeptics of human nature and sometimes longing for the past; liberals tend to be optimistic about change because they believe that people are "good at heart" and that their ideas can

trump the dark side of human nature. These are fundamental differences in the character, temperament, and nature of people; the issues change but the tensions do not, because they are tensions between different sorts of people, and they are visible in arguments about everything from Obamacare to the Arab Spring.

Finally, a chapter by Jason D. Boardman argues that a proper analysis of gene-environment interaction is more illuminating than a simple partitioning of genetic and environmental effects. Some psychologists and other behavioral scientists say it is meaningless to claim, for example, that a child's ability to learn a first language is mainly genetic but the particular language she learns is mainly cultural — everything, they remind us, is an interaction. Somewhat paradoxically, however, modern behavior-genetic studies have contributed a great deal to the identification of which environmental influences matter most. For example, they generally show that aspects of the environment shared by siblings — say, parents' rules and rearing patterns — are less powerful than non-shared features like different peer groups. We parents knock ourselves out to treat our children the same way, yet it turns out that what makes them similar to each other is mostly the common genes we gave them, while the environment plays its main role in helping them become different, not similar.

Economist Robert H. Frank's *The Darwin Economy: Liberty, Competition, and the Common Good* is a readable account of an old and simple idea: self-interest favors the individual but can harm society and negate individual advantages in the long run. This is "the tragedy of the commons." A labor economist and champion of behavioral economics, Frank traces that tragedy in light of new theory. He invokes Darwin, who himself understood the social dangers of selfishness, just as Adam Smith did. But the book does not really live up to the promise

of the title; it begins with Darwin but most of the argument is developed without reference to evolution. Darwin and evolution could be removed from the book without changing it much; it is really a brief for liberal economics. Frank ends by advocating a libertarian welfare state, basically a welfare state in which limits are set on how much government may intrude. But what democratic state fails to recognize such limits? Liberals want universal health care, and up to a point want government to encourage healthy habits, but almost all of us would balk at mandating daily broccoli. I share Frank's agenda, even if it's hardly new. Still, this is a good book to hand a young person who thinks we should shrink government drastically, because it persuasively explains the good government can do.

An entirely different approach is taken by Samuel Bowles and Herbert Gintis, also both economists, in *A Cooperative Species: Human Reciprocity and Its Evolution*. While all the books discussed here have value, this one is in a class by itself in terms of ambition, theoretical power and groundbreaking synthesis. Far from seeing cooperation as Frank does — a kind of glorious tilting at windmills — Bowles and Gintis argue that we evolved in conditions that made cooperative behavior highly rational, and that it still is rational today. In this view, natural selection has always favored cooperation and altruism by favoring human groups where those were more common, while pure selfishness turned out to be an evolutionary dead end for some of our nonhuman competitors. For many years, these two scholars have been at the forefront of experimental tests of game theory (especially as applied cross-culturally), and of the formal modeling of human social evolution. In this state-of-the-art book, they combine these approaches. For example, what happens if people in Group A are more cooperative and altruistic than people in Group B? The altruists in A may lose out against the selfish members of their

own group, yet A may beat B in the long haul because A has more self-sacrificing individuals. The balances can be viewed as a game, given mathematical values, and manipulated through models.

After reviewing the basics of game theory and neodarwinian models, they apply them especially to altruism, illuminating human evolution and human life, including in particular such paradoxes as "altruistic punishment" (punishing others for breaking social norms to the detriment of yourself) and "parochial altruism" (sacrificing yourself for the benefit of your own group over another). Explaining the evolution of both types of punishment, they assume a long human past during which hunter-gatherer groups could exterminate each other in wars, thus enabling groups with more parochial altruists to pass on their genes. To be sure, this could be said to constitute a rather pessimistic or cynical model of altruism.

But Bowles and Gintis can themselves seem naïve. They write that cooperation has been sustained "by motives that led some people to bear costs on behalf of others, contributing to common projects, punishing transgressors, and excluding outsiders." Yes, people are, alas, at their cooperative best when excluding, punishing, and even slaughtering outsiders. This is hardly comforting, and it does not enable us to grandly conclude that humans are in the last analysis "a cooperative species," especially when the cooperation we need most is ahead of us and must not be parochial. In a hopeful gesture, the book is dedicated to James Chaney, Andrew Goodman, and Michael Schwerner, all civil rights martyrs who transcended group boundaries to make the ultimate sacrifice. Need we say that such people remain exceptions in our species? The question of whether, in the future, cooperation and altruism can prevail at the species level, in the absence of a feared and hated out-group, is our greatest unknown.

To return to Darwin's early optimistic claim — "much light will be thrown on the origin of Man and his history" — these books represent a fulfillment and a vindication. They also comprise a collective triumph over the dark age of false "Darwinian" social science that characterized the late nineteenth and early twentieth centuries. I do not mean to say there are no further dangers of misinterpretation, nor that politically egregious uses will not be made of this kind of work. As a lifelong liberal myself, I think I understand the dangers. But I see no choice other than to go on with it, and I feel hopeful about the varied practitioners and approaches represented here. For the most part they are intelligent, rigorous, creative, and certainly well intentioned. This does not guarantee their success or completely protect their work against abuses. But that is true of all science, and in the end I think these new trends in evolutionary social science will do us much less harm than good. Certainly, obscuring the truth about human nature and experience cannot be the path forward, and the truth entails, among other things, inviting Darwin to walk with us along the way.

RECOMMENDED READS:

- *"PARADIGMS REGAINED": IAN HACKING ON THE STRUCTURE OF SCIENTIFIC REVOLUTIONS: 50TH ANNIVERSARY EDITION BY THOMAS S. KUHN*
- *"GENGHIS KHAN'S DNA": INGRID NORTON ON THE BETTER ANGELS OF OUR NATURE: WHY VIOLENCE HAS DECLINED BY STEVEN PINKER*
- *THE SCIENCE PAGE*