NEW BIOLOGICAL BOOKS

The aim of this section is to give brief indications of the character, content, and cost of new books in the various fields of biology. More books are received by The Quarterly than can be reviewed critically. All submitted books, however, are carefully considered for originality, timeliness, and reader interest, and we make every effort to find a competent and conscientious reviewer for each book selected for review.

Of those books that are selected for consideration, some are merely listed, others are given brief notice, most receive critical reviews, and a few are featured in lead reviews. Listings, without comments, are mainly to inform the reader that the books have appeared; examples are books whose titles are self-explanatory, such as dictionaries and taxonomic revisions, or that are reprints of earlier publications, or are new editions of well-established works. Unsigned brief notices, written by one of the editors, may be given to such works as anthologies or symposium volumes that are organized in a fashion that makes it possible to comment meaningfully on them. Regular reviews are more extensive evaluations and are signed by the reviewers. The longer lead reviews consider books of special significance. Each volume reviewed becomes the property of the reviewer. Most books not reviewed are donated to libraries at Stony Brook University or other appropriate recipients.

The price in each case represents the publisher’s suggested list price at the time the book is received for review, and is for purchase directly from the publisher.

Authors and publishers of biological books should bear in mind that The Quarterly can consider for notice only those books that are sent to The Editors, The Quarterly Review of Biology, C-2615 Frank Melville, Jr. Memorial Library, Stony Brook University, Stony Brook, NY 11794-3349 USA. We welcome prepublication copies as an aid to early preparation of reviews.

THE BIOLOGY OF CULTURAL EVOLUTION

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A review of


When one thinks of theories of culture, the humanities come to mind, as well as such disciplines as sociology and anthropology for which cultural structural dynamics are central. Mark Pagel is, however, a population biologist who has developed new and creative directions in estimating phylogenetic trees from highly spotty data, Bayesian Markov processes, and related methods. What scientific strengths, we might ask, does such a researcher have to justify writing a book on human culture?

In fact, biologists have developed models of cultural evolution that are superior in most respects to those generated by sociologists and anthropologists. The social sciences in general would improve their explanatory value by simply importing whole cloth the body of research generated by population biologists and animal behavior theorists over the past four decades.

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There are two conceptual foundations for the biological approach to culture. The first is that culture, like genes, are forms of information passed from one generation to the next. Indeed, both genes and culture evolve by very similar mechanisms: replication, mutation, and selection. Pagel conveys this message in a manner accessible even to readers with no background in biology.

The second foundational insight is that genes and culture mutually interact, giving rise to what is known as gene-culture coevolution, operative over the two-million-year history of the evolution of hominins and their recent transformation into *Homo sapiens* (Cavalli-Sforza and Feldman 1981; Lumsden and Wilson 1981; Boyd and Richerson 1985; Gintis 2011). This term expresses the fact that once culture becomes an important part of hominin life, through toolmaking and other forms of technology, as well as through initiating new forms of social interaction, culture determines who gets to reproduce and who does not. Thus, in the long run, culture produces genes and genes produce new cultural forms. Moreover, both the genes and the culture are constantly subject to evolutionary pressure: a cultural form persists in the long run, just as a gene persists in the long run only if it enhances the fitness of the individuals in which it resides. Indeed, the very title of the book *Wired for Culture* is a poetic way to express this deep insight.

I have one objection to Pagel’s argument: his assertion that cooperation in human societies can be explained in terms of what Robert Trivers (1971) calls reciprocal altruism, in which individuals offer aid to others in need with the expectation that the favor will be repaid at some point in the future. Individuals, according to this view, act prosocially only to gain a reputation for helpfulness that will further their personal interests in the long run.

There is no cogent evidence for this belief. It is, of course, quite true that repeated interaction and reputation formation are very important parts of human social behavior and contribute strongly to our success as cooperators. The problem with reciprocal altruism as a general model of cooperation among unrelated humans is that people often behave prosocially even when no one is watching. Moreover, there is no evidence that human society could have evolved without ubiquitous prosocial behavior. It surely could not exist in anything resembling its current form without prosocial behavior unrelated to reputation formation.

The experimental literature supporting innate human prosociality is extensive. For a recent summary, see Bowles and Gintis (2011). But human prosociality is equally evident in everyday life. If people only cared about reputations, they would rob, rape, and steal as long as they were assured that no one is looking. If Pagel’s explanation of human cooperation were correct, for instance, we would never help or be helped by strangers whom we will never see again. More critically, in considering voting in elections for office, the reputation-minded individual will not participate because the costs of voting are positive and significant, but the probability that one vote will alter the outcome of the election is vanishingly small. In this case, there is no reputation effect, as voting behavior is not public information. Thus, the personal gain from voting is also vanishingly small.

Because Pagel believes humans are inherently selfish and cooperate only because it is worthwhile having a good reputation, he also subscribes to the so-called Machiavellian hypothesis (Byrne and Whiten 1988), which purports to explain the large, highly costly brains that we have by the fact that smart people can outwit dumb people, so there was an “arms race” among early hominids where the weapon was the conniving, scheming social brain. The author is quite persuasive in claiming that humans are excellent deceivers, excellent sleuths at uncovering deception, and smart people can do it better than stupid people. However, this is an implausible explanation of the evolution of human intelligence if one posits, and Pagel does, that humans evolved because they are first-rate cooperators. If intelligence were adaptive mainly because it allows one to dupe one’s neighbor or avoid being duped by him rather offering some prosocial benefits, human hypercognition would not be fitness enhancing for human groups. We now know that there were large numbers of early hominin species in competition for the same ecological niche (hunter/scavengers of large mammals), so a species that dissipated its energy on deceiving and preventing being deceived would likely be replaced by a hominin species that avoided this unproductive arms
race. Thus, hominid species with small brains would have had an evolutionary advantage over humans because the small-brained hominin has dramatically lower fitness costs of brain maintenance. Note that it is the large human brain that required humans to be born long before they are mature (neoteny), which caused a reorganization of the female pelvis and led to very long periods of infant dependence. The notion that this can be explained in terms of Machiavellianism is not plausible.

The alternative to the reputation theory is that humans evolved substantive morality in the course of our evolution as a species, and developed a cultural system that was extremely inhospitable to sociopaths, who are nice only when others are looking, and are depraved maniacs otherwise. Of course, sociopaths are still among us, but they are a small minority. For recent contributions to this line of research, see my book with Samuel Bowles, A Cooperative Species (2011), Christopher Boehm’s Moral Origins: The Evolution of Virtue, Altruism, and Shame (2012), and Richerson and Boyd’s Not By Genes Alone (2005).

Pagel’s venture into paleoanthropology is one of the stronger points of this volume. A few general points are worth noting in this regard, especially concerning the role of tools and weapons in our evolution. Our primate ancestors evolved a complex sociopolitical order based on a social dominance hierarchy in multimale/multifemale groups. In these societies, the alpha male had no positive role in contributing to the group, but rather was a despot relying on physical strength and careful coalition-building to corner the largest possible part of the group’s efforts, both in nourishment and reproduction. The emergence of bipedalism in the hominid line, together with environmental developments that made a diet of megafauna fitness enhancing under conditions of rapid climate change, created a niche for hominids in which there was a high return to coordinated, cooperative, and competitive scavenging. This in turn led to the use of stones and spears as lethal weapons, and thence to the reorganization of the upper torso, shoulders, arms, and hands to maximize the effectiveness of these weapons, as well as the growth of new neural circuitry allowing the rapid sequencing of bodily movements required for accurate weapon deployment.

The availability of lethal weapons in early hominin society undermined the standard social dominance hierarchy, thus threatening social dissolution, as the hominid niche required sophisticated coordination of hunting activities and procedures for the peaceful sharing of meat. Two successful sociopolitical structures arose to prevent this dissolution and to enhance the flexibility and efficiency of social cooperation in hominins. The first was the reverse dominance hierarchy, which replaced pure power and Machiavellian coalition formation with a political system in which success depended on the ability to persuade and motivate. The second was cooperative mothering, which provided a strong impetus toward prosocial psychological propensities. This system persisted until cultural changes in the Holocene fostered new patterns of economic activity, in which it became possible again, as it did with our primate ancestors, to sustain a social dominance hierarchy, this time in the form of a predatory state.

This scenario has important implications for political theory and social policy for it suggests that humans are predisposed to seek dominance when this is not excessively costly, but also is predisposed to form coalitions to depose and dispose of pretenders to power. Moreover, humans are much more capable of forming powerful and sustainable coalitions than other primates due to our enhanced cooperative psychological propensities. This, of course, is a defense of liberal democracy, although it is based not on political philosophy, but rather on the facts of our evolution.

I am not asserting the inevitable triumph of liberal democratic over despotic politics. The open society will always be threatened by the forces of despotism, and a technology could easily arise that irredeemably places democracy on the defensive. The future of politics in our species could well be something akin to George Orwell’s 1984, or Aldous Huxley’s Brave New World.

I am certain Pagel can defend himself ably against my critique (I have heard him do so, although I am certainly not convinced—I believe he would do better to learn a little standard sociology and social psychology), but it
would have been useful for readers to get the whole picture as it stands today and not simply a highly valuable statement of a possibly superannuated theory.

REFERENCES


