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Chapter 4

Progress and Evolution

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Like *progress* the word *evolution* refers to an historical process of cumulative change. Nevertheless, how these two concepts are related to one another, if at all, is a complex and controversial issue, primarily but not solely because of ambiguity about what would constitute a progressive trend, as opposed to retrogression or an absence of direction, in the context of the modification of life forms over generations.

In this essay, we address two distinct aspects of the relationship between progress and evolution. First, we consider whether the evolution of life on earth over geological time has entailed progress in any of several related senses. We suggest that it has, despite some arguments to the contrary. Secondly, we consider whether the proposition that the human animal is a product of Darwinian processes has any implications with respect to social progress in historical time. We suggest that it does, and that those implications provide some grounds for cautious optimism as regards the prospects for continuing gains in equality, justice, and human well-being.

Progress in the Evolutionary History of Life on Earth

For biologists, "evolution" refers to change in any attribute of a population, spe-

cies, or higher taxon over generations: form or function, anatomy or biochemistry, central tendency or distribution. It is customary to distinguish at least four forces that affect the direction and tempo of evolution, namely

> (1) selection: systematic differences in the reproduction and proliferation of types within a population as a result of their different properties;
> (2) drift: consequential differences in the reproduction of types within a population as a result of "chance," i.e., *not* as a result of their different properties;
> (3) mutation: random errors in the replication of genetic elements; and
> (4) migration into and out of the population.

In the absence of the first force, selection, each of the other three tends to destroy order and to increase entropy or noise. Only selection is potentially progressive in the sense that it causes adaptive complexity to increase, as small improvements are selectively retained and build on one another.

Charles Darwin (1859), the first to appreciate that selection could explain complex adaptation in nature, was intimately acquainted with the practices of farmers and hobbyists who pursued specific goals like increased milk production or showier flowers by selective breeding of domesticated plants and animals, and he coined the term "natural selection" by explicit analogy with this "artificial" selection.[1] Of course, Darwin was well aware that "nature" is not an intentional agent and *has* no goals, and he painstakingly explained why intention is inessential for the emergence of functional "design." Basically, each small improvement that spreads to "fixation" (universality) in a population sets the stage for further improvements, so over many generations, the cumulative products of this automatic process of differential success can be attributes of increasing intricacy, such as the vertebrate eye and visual system, whose immediate functions (image analysis, in this case) subserve more distal functions of survival and, ultimately, reproduction.[2]

A major misconception in lay understandings of evolutionary biology is the notion that there is a unidimensional progression—the *scala naturae*—proceeding from earlier, simpler, "lower" animals to *Homo sapiens* at its summit. Evolutionists are essentially unanimous—and often very exercised—in their insistence that this popular view rests on a profound incomprehension of the evolutionary process. For one thing, the human animal is certainly *not* the most recent product of that process: yes, the hominid lineage has undergone some relatively rapid evolution in the last couple of million years, but so have other, unrelated lineages, and other groups have speciated in the millennia since anatomically modern humans first appeared. Moreover, and even more importantly, there is no satisfactory criterion for ranking species as "higher" or "lower." Most attempts to do so are transparently anthropocentric: corollaries of the premise that "we're number one" and that the rest of creation is relatively "advanced" to the degree that it resembles us. But even if one finds the intuitive grounds for placing human be-

ings atop the *scala naturae* compelling, how could one then decide the relative positions of an orchid and a clam? Only arbitrarily.

Contemporary monkeys, fishes, algae, or bacteria are not our ancestors. They are our contemporaries, and they are every bit as much the current culmination of billions of years of evolution as is *Homo sapiens sapiens*. A much better model than the *scala naturae* is therefore that of a shrub whose terminal buds correspond to contemporary species. The shrub is constantly being pruned by extinctions, and its surface is constantly being reestablished and rearranged by fresh branchings.

That said, however, the inadequacy of the pre-Darwinian notion of a *scala naturae* provides no reason to conclude that the history of life on earth is devoid of tendencies that might reasonably be called "progressive." Life presumably began, after all, with some relatively simple process of chemical replication, and attained such milestones as cell walls, messenger RNA, specialized organs, and everything else that impresses us about the complexity of life, only as the cumulative consequences of the selective retention of superior mutants, those relatively rare accidental variants, proved to be better at survival and reproduction than their "normal" predecessors. Thus, if one defines "progress" as *change in the direction of greater complexity*, which is probably the most popular meaning when one speaks of possible progress in evolution, there is abundant evidence that the Darwinian process has engendered it, albeit inconsistently as discussed below.

An alternative definition of evolutionary progress might be *growth of intelligence or understanding*, and there is plenty of evidence for that, as well. The earliest life forms must necessarily have detected few aspects of the primordial soup in which they lived and shown little flexibility in their responses thereto. The origin of the cell, more than two billion years ago, entailed large gains in the capacity of living things to process information about environmental variables like pH, temperature, and light levels, and to respond contingently. So, of course, did the subsequent innovations of multicellularity and specialized organs at the organism/environment interface, and so, even more clearly, did the further innovations of nerve cells and networks whose basic functions are information processing and transmission. Finally, with respect to the narrower question of progress in the human lineage, the amount of brain tissue, especially the neocortex, clearly increased with some sustained directionality (albeit for reasons that are still the subject of speculation and controversy) over the course of hominid evolution, and there is no reason to doubt that cognitive capacity was increasing too.[3]

Another conception of progress, rather different from mere growth in either complexity or intelligence, has stronger moral overtones. This is the idea that progressive change is that which entails *expanding spheres of common cause and cooperative action*. This may sound like the sort of trend that could only be discerned in human history, but such tendencies are again apparent in organic evolution too. The several innovations in the evolution of multicellular organisms with specialized organ systems, for example, entailed new levels of shared fate. Au-

tonomous single-celled organisms find themselves in a more or less purely competitive, zero-sum contest for shares of the ancestry of future populations, such that one's gain is another's loss, but the individual cells of an organism such as a person or an oak tree are in a very different situation: they are all in the same boat because they can advance their own prospects for Darwinian fitness (genetic posterity) only by advancing the fitness prospects of their neighbors.

Heart cells, liver cells, bone cells, etc., all work together for the common good—that is, the survival and reproduction of the whole organism of which they are parts—because this is how the genetic instructions underlying their development can be transmitted and hence preserved. Moreover, it now seems clear that the eukaryotic cell itself originated as a coalition (perhaps initially exploitative, but eventually cooperative) of previously autonomous organelles, and that chromosomes and nuclear genomes are likewise coalitions of previously independent replicators whose fates have become linked and whose actions have therefore evolved to be complementary.[4] The evolutionary elaboration of common cause and cooperative action is not bounded even by the limits of the individual organism, for although it is indeed true at one level that the individuals who comprise a population or species (or at least those individuals of a given sex) are engaged in a zero-sum contest over shares of future populations' ancestry, it is also true that various considerations, especially kinship, can have the effect of engendering a positive correlation between the expected fitnesses of two or more individuals, thus creating conditions conducive to the evolution of cooperation and other-regarding sentiments such as parental, fraternal, and romantic love.[5]

Change in the physical environment is aimless, and sometimes exhibits repeated reversals, such as the recurrent advance and retreat of polar ice caps over millennia. Insofar as evolution is a process of adaptation to such change, it is unlikely to exhibit any sort of sustained directionality. Other changes in the physical environment, such as that in the composition of the atmosphere as a result of life processes,[6] are more consistent in their direction over long periods of time, but even this consistency is not enough to impart a cumulative character to evolution of the sort that we might deem progressive. Rather, the principle considerations that afford the possibility of progressive trends in evolution do not depend on changes in the physical environment at all. They are, first, the "bootstrapping" effect implied by the fact that in the absence of foresight, adaptive designs arise only as minor improvements on last year's model, and second, the fact that evolution entails "arms races" as a result of the fact that the selective milieu does not consist solely of the physical environment but of a co-evolving biotic environment as well.

The bootstrapping effect is most dramatically illustrated by the ways in which major innovations in the history of life have repeatedly opened the way to an explosion of further invention. Dawkins (1989) argued that such events have repeatedly changed aspects of what the evolutionary process can do next and how, a history of expanding possibilities that he refers to as the "evolution of

evolvability."[7] In a similar vein, Maynard Smith and Szathmáry (1995) identify and discuss a succession of "major evolutionary transitions" in the form or function of replicating entities, each of which changed the landscape of further possibility: the origins of metabolism, self-replication, a nucleic acid based genetic code, cell walls, cell nuclei, sexual reproduction, multicellular organisms, nervous systems, animal societies, and human language.[8]

As for what evolutionists call "arms races," a crucial consideration is that the environment of evolving species includes *other* evolving species with contrary interests. An improvement in the speed, agility, or immune system of one species constitutes a deterioration of the environment for other species that prey upon or parasitize it, and intensifies selective pressures on these predators and parasites to overcome the new defenses. In some cases, such as when alternative host genotypes are differentially vulnerable to a corresponding set of parasite genotypes, cyclical change in their respective frequencies over generations may result and the evolutionary arms race goes nowhere. Van Valen (1973) dubbed these "Red Queen" processes, after the Wonderland character who told Alice that "it takes all the running *you* can do, to stay in the same place," and this term has sometimes been applied to co-evolution generally.[9] However, co-evolutionary arms races that produce a true Red Queen cyclical stasis appear to be relatively rare. More typically, arms races engender some degree of sustained directional change, such as an increase in size or fleetness or complexity of information processing over many generations.

It is not just your predators, prey, and parasites that are potentially co-evolving antagonists. Competitors co-evolve, too, as do any interactants whose commonality of purpose is less than total. Thus, co-evolutionary arms races can occur not only between two interacting species, but within a single species as well. Partners in sexual reproduction constitute a prime example. Because a man and woman each supply half of a given child's genes, that child is equally a potential contributor to the fitness of both parents, and we might therefore expect that selection should have favored concordant ambitions in the couple. However, the fact that a particular male is keen to sire a female's children does not guarantee that he is the best choice from her perspective, and even after a deal has been struck and a child conceived, either party could still gain fitness at the other's expense by shirking. The upshot is that heterosexual transactions have evolved to be complex and nuanced, with each party concerned to advertise its own virtues, to verify the truth of the other's claims, and to enforce cooperative agreements. Mate choice is a powerful evolutionary force, as Darwin (1871) was the first to realize.[10] Indeed, a good case can be made that mate choice has been the principal architect of much of what we value in human nature, including artistic expression and our appreciation thereof.[11]

Despite these considerations, the notion of progress in evolution is anathema to at least a few biologists. Several complementary arguments against the idea have been advanced, especially by Gould (1989, 1996).[12] One fact that has been

invoked as evidence against progressive trends in evolution is that many lineages neither exhibit sustained complexification over geological time nor are supplanted by those that do. Bacteria are apparently no more complex than they were when multi-cellular organisms first appeared on the scene, for example, and they still outnumber (perhaps even out*weigh*!) these latecomers. Well, in fact, we don't actually know whether modern bacteria are more complex than their ancient ancestors, but that's a mere quibble. The more serious flaw in this argument is in its logic, which could just as readily be used to prove that there has been no progress in evolutionary biology since Darwin's time, since those who are completely ignorant of the subject still outnumber the cognoscenti. The issue is not whether *everything* has been getting more complex, but whether there has been a sustained increase in *maximal* complexity, and at least on some time scales, there clearly has been. This consideration also undermines the force of another favorite argument against progress in evolution, namely that selection sometimes favors the *loss* of complex structures, as in the evolution of blind cave-dwelling animals and many internal parasites. Finally, Gould (1989) has made much of the role of happenstance ("contingency") in the extinction of species and higher taxa, arguing that if the small human population that existed 50 or 100,000 years ago had been unlucky enough to encounter any of various disasters, nothing exactly like ourselves would exist now or ever in the future.[13] This is uncontroversial (except perhaps among those who believe that this particular upright ape is the image of divinity and the point of the creation), but it has no obvious bearing, one way or the other, on the question of whether there is something about the processes by which species and biotic communities evolve that tends to engender increasing levels of complexity, or intelligence, or cooperation, or any other abstract "good."[14]

The evolutionary anthropologist Don Symons has said that in order to understand an argument, you have to know who is being argued *against*, and it is no secret who it is that opponents of the notion of progress in evolution have been most concerned to refute: "social Darwinists." This label refers to the adherents of a fringe political philosophy, a century ago, who maintained that because "survival of the fittest" is the engine of evolutionary improvement, it should be encouraged. Like Calvinists who justified inequity by arguing that advantage accrues to the deserving, social Darwinists maintained that the wealthy and privileged are superior and deserve their advantages. This doctrine found little if any support among evolutionary biologists and had little if any influence on them. Indeed, it never had a large following *anywhere*, but it did appeal (little wonder) to some rich men, such as the American industrialist J. P. Morgan. The fact that its advocates included a few such powerful men probably explains why social Darwinism has been the object of far more discussion than ever was warranted on the strength of its arguments or the size of its following. One modern consequence of this intellectual history is that distaste for the notion of progress in evolution continues to be fuelled by moral sentiment: if the evolution of life forms is given its direction by competition and weeding out the "unfit," then the whole process seems anti-

thetical to progress in the sense of growth of the dominion of good and diminution of the dominion of evil. Moreover, many people, even highly educated ones, still imagine that Darwinism itself is a reactionary ideology rather than what it actually is: the foundation of modern biology.

Ironically, one must concede that there *is* a sort of logic to the revulsion that some people feel toward the blind, creative, Darwinian process. Evolution's arrow (if such a thing exists) does not point toward the abolition of pain and suffering. Evolution by selection *invented* pain and suffering as motivational devices that encourage fitness-promoting behavior. Neither does the evolutionary process tend to produce an ever-increasing stock of human happiness (other than as a byproduct of an ever-increasing stock of humans). Like suffering, pleasure is regulated and is *fleeting by design*, because chronic satisfaction would be counterproductive for an organism whose prospects for increasing its expected future fitness must ever entail striving after goals as yet unattained. Selection does not even favor mercy, or at least it does not do so routinely. Killing quickly and cleanly can evolve where predators who behave otherwise risk injury to themselves, but in the absence of such risks, many predators and parasites blithely devour their prey alive.

Every complex organism embodies a cornucopia of niches for parasites and pathogens, whose life processes degrade that complexity and often make the complex organism suffer as they do so. It was once popular to imagine that selection favors evolutionary trends away from exploitative and destructive parasitism and towards a more benign mutualism. Unfortunately, this soothing notion has little theoretical or empirical basis. The microbes that are favored by selection, for example, are simply those whose attributes are most effective at infecting their hosts, at replicating within their hosts, and above all, at getting themselves or their progeny transmitted to other suitable hosts before the present host is destroyed. At least one eminent evolutionary biologist, George Williams (1988), has seriously argued that we should look upon the blind, oblivious process of evolution by selection as not merely amoral, but evil.[15] In its defense, however, one can reply that as selection has built more complex life forms, it created the situation in which human values and the possibility (however slim) of trends that satisfy them came into existence, and that the Darwinian process entails within its own dynamics the seeds of cooperative and other-regarding sentiments, including empathy and love.

Implications of the Proposition That Human Nature Evolved under Selection

The evolutionary process has equipped organisms like ourselves with a highly complex suite of functional machinery: teeth and bones, hearts and livers, brains and immune systems, and much, much more. These distinct but functionally inte-

grated components are dedicated to specific tasks, solving problems that our ancestors encountered regularly: mastication and digestion, nourishing tissues and removing their wastes, detecting and interpreting threats, distinguishing invading micro-organisms from self, and so on and on.

The biomedical view of human nature assumes the complex functionality of our anatomy, physiology, and biochemistry, and progress in biomedical science consists primarily of producing an ever-more elaborate description of our evolved human nature. Curiously, however, the social sciences have seldom seen their mission in the same terms, and the very notion that the human animal possesses a multifaceted psychological and social nature, which we might usefully strive to describe, is often attacked as reactionary. The supposed alternative to a "nativism" that attributes the structure and organization of our minds to human evolution is philosophical "empiricism," which Dennett (1995) defines as "the view that we furnish our minds with details that all come from the outside world, via experience" within each individual's lifespan.[16]

In the mid-twentieth century, an extreme version of empiricism called "behaviorism" was prominent in psychological science. With the admirable goal of ridding psychology of pseudo-explanatory *post hoc* mental constructs and "innate abilities," behaviorists aspired to explain the richness of human and nonhuman behavior in terms of a few simple "laws of learning," or even one. This ambition slowly collapsed under the weight of two broad classes of discoveries. One is that the human brain contains hundreds (perhaps thousands) of distinct anatomical structures and chemical subsystems, where different sorts of information are processed and different sets of genes are active, and which exhibit demonstrable continuity ("homology") with the structure and function of components of nonhuman brains. The other nail in the coffin of extreme versions of behaviorism was provided by a series of demonstrations showing that individual experience is not sufficiently informative to train an unstructured all-purpose learning device to do the many expert things that we do effortlessly, such as seeing and speaking and deciding that something novel is or is not potential food. As behaviorism came under attack in the 1960s and 1970s, the alternative view that people and other animals possess evolved mental mechanisms that direct their attention and their development was initially portrayed, even by critics of behaviorism, as a matter of "constraints" on learning ability. Selective readiness to associate nausea with tastes but not with sounds, to take one familiar example, sounds like a narrowing of what an "unconstrained" capacity for associative learning might achieve. However, increasing recognition of the limited capabilities of an unstructured brain has turned this conception on its head: the evolution of complex, domain-specific mental mechanisms is now considered *enabling*, not constraining.[17]

One might infer from this brief summary that the battle between nativism and empiricism is over, and nativism has won. A better conclusion, however, is that such nature-nurture disputes were grounded in a false opposition. "Environmentally induced" is not the antithesis of "evolved." Any complex evolved at-

tribute of a multicellular organism develops in each individual with susceptibility to environmental variations, and much of that susceptibility is adaptive conditional response "designed" by selection to exploit the information value of those environmental variations. This is not to deny, however, that debates that are ostensibly about nature *versus* nurture sometimes concern issues of scientific substance. There is current controversy, for example, about whether certain aspects of probabilistic inference, linguistic competence, kin recognition, and the evaluation of potential mates are performed by mental devices that evolved for those specific tasks or should be understood as the products of more general problem-solving machinery, and although quarreling persists even about what counts as evidence, there are some tractable scientific questions here. It is in debates such as these that scientists may still be described as proponents of relatively empiricist or nativist positions.

Our reason for dwelling on this dimension is, of course, that it is widely presumed to be relevant to opinions about the possibility or likelihood of progress in human affairs. Empiricist views of human nature are commonly considered optimistic and politically progressive, while relatively nativist views are seen as pessimistic and reactionary, since empiricists since Locke supposedly believe that the world can be changed for the better, while nativists, with their Hobbesian, misanthropic belief in a "fixed" human nature, do not.

Despite the widespread acceptance of this view of the political implications of empiricism and nativism, there are good reasons to reject it. On the one hand, the history of biomedical science puts the lie to the idea that relatively nativistic views of human nature imply a doctrine of despair: progress in medical knowledge and practice has shown again and again that an increasingly rich description of our evolved physiological nature is essential for the design of increasingly effective and humane interventions. Why, then, should the pursuit of a more detailed description of our complex evolved *psychological* nature impede or discourage the discovery or implementation of better social policies? And on the other hand, the presumption that relatively empiricist views of human nature have a natural affinity with political and social progress is easily challenged. As many writers have noted, the arch-empiricist's view of human nature as a "blank slate" was a totalitarian's dream. A blank slate devoid of any sort of complex, evolved self-interest is anybody's manipulandum, and fair game to boot: you cannot violate people's interests by manipulating them to serve new, externally imposed objectives if their prior objectives were no more their own than the new ones. Thus, coercive "reprogramming" of dissidents is morally unproblematic under extreme empiricist worldviews, which have been embraced by some of the worst tyrants of recent history. At the very least, one must conclude that while anti-nativists may be "optimistic" as regards the malleability of human nature, the programmatic manifestations of that optimism are not unequivocally "progressive."

The proposition that human nature evolved under the influence of natural selection suggests that an extreme version of empiricism cannot be true. Fitness

is relative, and selection favors those attributes, including attributes of the mind, that reproduce more successfully than rivals. This competitive aspect of selection implies that the social malleability of an evolved psyche cannot be limitless, because limitless malleability would mean limitless vulnerability to manipulation and exploitation. Conflicting interests are endemic in any sexually reproducing species, and this fact has assured that the human psyche has evolved defenses against being deceived and exploited, even while profiting from social life and information sharing.

The human animal has a deep-seated passion for social comparison and has not been selected to tolerate relative disadvantage gladly. Inequitable access to resources motivates people to change their situations by both individual and collective action, including violent action. Despotic tyranny seems to be inherently unstable in human history, while the rise of democratic power-sharing and impartial third-party justice in state-level societies has coincided with (and apparently caused) a decline in the private use of personal violence to levels previously unknown.[18] It is true, and frightening, that the evolved human mind readily divides others into a "we" that is worthy of moral consideration and compassion *versus* a "they" that is not,[19] but it is also true that this in-group psychology works for indefinitely large coalitions and that an historical trend toward greater inclusiveness of the "moral circle" is conspicuous and apparently still underway.[20] Alexander (1987) and others have argued persuasively that violent conflict between rival coalitions became a major selective force during hominid evolution, equipping us with cognitive and emotional capacities to form cooperative alliances unlimited by kinship or even personal acquaintanceship.[21] If this is true, then empathy and our capacity to extend its scope to an indefinitely large in-group are the ironic and hopeful consequences of a war-like past.

Despite the genocidal and other horrors of the twentieth century, recent generations have enjoyed longer life expectancies and a better chance of dying peacefully in bed than our ancestors ever had. There is obviously room for a good deal more progress in these matters, and importantly, there is also clamorous *demand* for such progress. The evolved human psyche does not accede to relative disadvantage uncomplainingly, and resorts to more dangerous tactics in its struggle to achieve equity, the more severe the disadvantage and the less there is to lose.[22] It is *because* the Darwinian process has consistently favored those individuals who looked out for their own interests and those of their relatives and allies, resisting theft and coercion, that the human animal so resents injustice. And it is in that resentment that we see hope for an unrelenting pressure for social progress.

Notes

1. C. Darwin, *On the Origin of Species by Means of Natural Selection* (London: Murray, 1859).

2. For a highly readable, book-length elaboration of the basic idea that Darwinian selection is the creative force in evolution, see R. Dawkins, *The Blind Watchmaker* (Harlow: Longman, 1986).

3. T. W. Deacon, *The Symbolic Species: the Co-evolution of Language and the Brain* (New York: Norton, 1997).

4. L. Margulis, *Symbiosis in Cell Evolution* (New York: Freeman, 1993).

5. See, for example, S. A. Frank, *Foundations of Social Evolution* (Princeton: Princeton University Press, 1998).

6. J. F. Kasting, "Earth's Early Atmosphere," *Science* 259 (February 1993): 920-26.

7. R. Dawkins, "The evolution of evolvability," in *Artificial Life*, ed. C. Langton (Santa Fe: Addison Wesley, 1989).

8. J. Maynard Smith and E. Szathmáry, *The Major Transitions in Evolution* (Oxford: Oxford University Press, 1995).

9. L. Van Valen, "A New Evolutionary Law," *Evolutionary Theory* 1 (1973): 1-30.

10. C. Darwin, *The Descent of Man and Selection in Relation to Sex* (London: Murray, 1871).

11. See G. F. Miller, *The Mating Mind: How Sexual Choice Shaped the Evolution of Human Nature* (New York: Doubleday, 2000).

12. S. J. Gould, *Wonderful Life: the Burgess Shale and the Nature of History* (New York: Norton, 1989); S. J. Gould, *Full House* (New York: Harmony Books, 1996).

13. Gould, *Wonderful Life.*

14. For more extensive discussion and refutation of these arguments against progress in evolution, see R. Wright, *Nonzero: the Logic of Human Destiny* (New York: Pantheon, 2000).

15. G. C. Williams, "Huxley's *Evolution and Ethics* in sociobiological perspective," *Zygon* 23 (1988): 383-407.

16. D. C. Dennett, *Darwin's Dangerous Idea: Evolution and the Meanings of Life* (New York: Touchstone, 1995).

17. For a fuller account of the history reviewed in this paragraph, see S. Pinker, *How the Mind Works* (New York: Norton, 1997).

18. M. Daly and M. Wilson, *Homicide* (Hawthorne, N.Y.: Aldine de Gruyter, 1988).

19. H. J. Tajfel, *Social Identity and Intergroup Relations* (Cambridge: Cambridge University Press, 1982).

20. P. Singer, *The Expanding Circle: Ethics and Sociobiology* (Oxford: Clarendon, 1981).

21. R. D. Alexander, *The Evolution of Moral Systems* (Hawthorne, N.Y.: Aldine de Gruyter, 1987).

22. M. Daly and M. Wilson, "Risk-taking, Intrasexual Competition, and Homicide," *Nebraska Symposium on Motivation* 48 (2000) : 1-35.