

Darwinian Evolutionary Ethics: *Between Patriotism and Sympathy*

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Summary

Darwin believed that his theory of evolution would stand or fall on its ability to account for human behavior. No species could be an exception to his theory without imperiling the whole edifice. One of the most striking features of human behavior is our very elaborate social life involving cooperation with large numbers of other people. The evolution of the ethical sensibilities and institutions of humans was thus one of his central concerns. Darwin made four main arguments regarding human morality: (1) that it is a product of group selection; (2) that an immense difference existed between human moral systems and those of other animals; (3) that the human social instincts were “primeval” and essentially the same in all modern humans; and (4) that moral progress was possible based on using the instinct of sympathy as the basis for inventing and favoring the spread of improved social institutions. Modern studies of cultural evolution suggest that Darwin’s arguments about the evolution of morality are largely correct in their essentials.

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Introduction

Darwin believed that his theory of evolution by natural and sexual selection would stand or fall on its ability to account for human behavior. No species could be an exception to his theory without imperiling the whole edifice (Gruber 1974: Chapter 10). He thus eventually devoted the *Descent of Man* to developing an evolutionary account of human origins based on selection, but also on the inheritance of acquired variation.

What Darwin called the “moral faculties” were a major part of his account of humans. One of the most striking features of human behavior is our very elaborate social life involving cooperation with large numbers of other people. As the philosopher-historian Robert Richards (1987) shows in elegant detail, the *Descent* was a sophisticated piece of work that even today repays close study, not least for its theory of the evolution of morality. Darwin made four main arguments regarding human morality: (1) that it is a product of group selection; (2) that an immense difference existed between human moral systems and those of other animals; (3) that the human social instincts were “primeval” and essentially the same in all modern humans; and (4) that moral progress was possible based on using the instinct of sympathy as the basis for inventing and favoring the spread of improved social institutions. Modern studies of cultural evolution suggest that Darwin’s arguments about the evolution of morality are largely correct in their essentials.

Darwin’s Ethical System

Humans from the beginning

Darwin's early M and N notebooks on Man, Mind and Materialism make clear the important place that the human species played in the formation of his ideas on evolution (Gruber 1974). In August 1838, a few weeks *before* his first clear statement of the principle of natural selection was recorded in his notebook on *The Transmutation of Species*, Darwin wrote in his M notebook

Origin of man now proved.—Metaphysics must flourish.—He who understand baboon would do more toward metaphysics than Locke (Barrett, in Gruber 1974: 281)

In October 1838, just after he formulated his first clear idea of natural selection, he confided to his N notebook

To study Metaphysics as they have always been studied appears to me to be like puzzling at astronomy without mechanics.—Experience shows that the problem of the mind cannot be solved without attacking the citadel itself.—the mind a function of the body.—we must bring some stable foundation to argue from.— (Barrett, in Gruber, 1974: 331)

These words were written in the heat of Darwin's most creative period. These passages are an expression of hopeful enthusiasm rather than triumph. He was actively pursuing a purely materialistic theory of organic evolution, and was already committed to the idea that humans would belong under the theory. Given the scope of the theory, it could hardly be otherwise. On the one hand, evolutionary theory, if correct, should provide powerful tools to understand human behavior. On the other, if humans are not understandable in evolutionary terms, then critics would properly suspect deep, general problems with the theory.

When Darwin published *Origin of Species*, he included the famous teaser “light would be thrown on the origin of man and his history.” When none of his allies rose to the occasion, he eventually took on the task of writing the *Descent of Man and Selection in Relation to Sex*

(1871,1874). In the Introduction, he wrote of his fear that publication of his views on the subject would inflame prejudices against his theory. This fear was not unfounded. As the *Quarterly Review*'s commentator, probably the long hostile and devoutly Catholic St. George Mivart, gloated, the *Descent* "offers a good opportunity for reviewing his whole position" (and rejecting it, Anonymous 1871).

Darwin differed from many of his contemporaries in not believing progress, including moral progress of humans, a necessary or intrinsic part of evolution. Natural selection's subtractive rather than creative property makes it a implausible force for progress. As Darwin expressed the matter in his N notebook in November 1838

Man's intellect is not become superior to that of the Greeks (which seems opposed to progressive development) on account of the dark ages.—Look at Spain now.—Man's intellect might well deteriorate.—((effects of *external* circumstances)) ((In my theory there is no absolute tendency to progression, excepting from favorable circumstances!)) (Barrett, in Gruber, 1974: 339)

Why were Darwin's contemporaries so keen on progressive theories of evolution? The original nub of the matter was that almost all Victorians understood and feared the impact that a thoroughly Darwinian theory of human origins would have upon morals. As the *Edinburgh Review's* anonymous (1871) commentator on the *Descent* remarked:

If our humanity be merely the natural product of the modified faculties of brutes, most earnest-minded men will be compelled to give up those motives by which they have attempted to live noble and virtuous lives, as founded on a mistake....

According to Burrow (1966), a significant segment of Victorian opinion was skeptical about conventional religion and was often enthusiastic about evolution. However, they did believe that human morality required the support of natural laws. If God's Law were to be dismissed by the scientific minded as superstition, then all that much more important to find a substitute in natural laws that scientists were elucidating. Darwin's evolutionary theory of morality does have a progressive element, despite his general suspicions about evolutionary progress. However, human moral progress is by no means guaranteed by a natural law; his theory is much more contingent than that.

Darwin's four-part argument

Group selection

His theory of the origins of human morality is sketched in Chapter 5 of the *Descent*, "On the Development of the Intellectual and Moral Faculties During Primeval and Civilized Time." He proposed that natural selection *on groups* operated in primeval times to produce human moral capacities (172-180):

It must not be forgotten that although a high standard of morality gives but a slight or no advantage to each individual man and his children over other men of the same tribe, yet that an increase in the number of well-endowed men and an advancement in the standard of morality will certainly give an immense advantage to one tribe over another. A tribe including many members who, from possessing in a high degree the spirit of patriotism, fidelity, obedience, courage, and sympathy, were always ready to aid one another, and to

sacrifice themselves for the common good, would be victorious over most other tribes; and this would be natural selection (178-179).

Note especially the terms *patriotism* and *sympathy* for future reference.

An Immense Gap

In the chapters of the *Descent* on the “Comparison of the Mental Powers of Man and the Lower Animals,” Darwin summarizes the issue:

We have seen in the last two chapters that man bears in his bodily structure clear traces of his descent from some lower form; but it may be urged that, as man differs so greatly in his mental power from all other animals, there must be some error in this conclusion. No doubt the difference in this respect is enormous The difference would, no doubt, still remain immense, even if one of the higher apes had been improved and civilized as much as a dog has been in comparison with its parent form, the wolf or jackal. (94)

The moral sense perhaps affords the best and highest distinction between man and the lower animals (171).

In these chapters he struggles with the challenge that the great gap between humans and other animals poses for his theory of the gradual, step by small step, emergence of humans from their ape ancestors. How much easier his task would have been if he seen fit to people the gap with the living human races, as so many of his contemporaries did! Gaps are an embarrassment to his theory of evolution by gradual changes. As it is, to minimize the extent of the immense gap he tends to raise non-human animals up rather than cast the lower races down:

there is no fundamental difference between man and the higher mammals in their mental faculties. . . . With respect to animals very low in the scale, I shall give some additional facts under Sexual Selection, showing that their mental powers are much higher than might have been expected (95).

Considering the case as a whole, the evidence was clear enough in Darwin’s time. Even the simplest human societies are larger than any other primate society. No human society is without ethical rules that make peaceful interactions between non-relatives routine. These attributes, along with our technological prowess, made us, even as “savages,” a widespread and successful species while the other apes remain confined to the tropical forests of our common ancestor.

Social Instincts Primeval

Darwin pointedly credits “savages” with a loyalty to their tribes sufficient to motivate self-sacrifice to the point of death and with the “instinct” of sympathy, with the objective of making sure that the reader understands that these moral sentiments are of primeval age, shared by the living savage and the civilized alike. Darwin’s theory of moral evolution in the *Descent* is in many respects one more typical of the last half of the 20th Century than of the Victorian 19th. Just as he did not make progress the centerpiece of his story, he did not rank humans, as regards their minds or their moral intuitions, on a primitive-advanced progressive scale.

Darwin’s first published views on humans in the *Journal of Researches (Voyage of the Beagle)* were made several years after formulating his early ideas on natural selection, but more than a decade before their publication and 25 years before the *Descent*. His descriptions of the Fuegians in the *Journal* are often quoted to demonstrate that his views of the hierarchy of races were stereotypically Victorian. He did use the most purple Victorian prose to describe the

wretched and lowly state of the Fuegians, whom he had observed first-hand on the *Beagle* voyage (Darwin 1845, pp. 242-7):

These poor wretches were stunted in their growth, their hideous faces bedaubed with white paint, their skins filthy and greasy, their hair entangled, their voices discordant, and their gestures violent. Viewing such men, one can hardly make one's self believe that they are fellow-creatures, and inhabitants of the same world (243).

They cannot know the feeling of having a home, and still less that of domestic affection; for the husband is to the wife a brutal master to a laborious slave. Was a more horrible deed ever perpetrated than that witnessed on the west coast by Byron, who saw a wretched mother pick up her bleeding dying infant-boy, whom her husband had mercilessly dashed on the stones for dropping a basket of sea-eggs! (246).

He goes on at some length in this fashion, but this is the bait rather than the hook of the argument. The passage on the Fuegians begins with a description of the rigors of the environment of Tierra del Fuego and ends by attributing the low nature of the people to the poor quality of the environment rather than as representing inherently primitive people:

We were detained here for several days by the bad weather. The climate is certainly wretched: the summer solstice was now past [passage is dated December 25] yet every day snow fell on the hills, and in the valleys there was rain. The thermometer generally stood at 45° but in the nights fell to 38° or 40° (242).

While beholding these savages, one asks, whence could they have come? What could have tempted, or what change compelled a tribe of men, to leave the fine regions of the North, to travel down the Cordillera or backbone of America . . . and then to enter on one of the most inhospitable countries within the limits of the globe? . . . [W]e must suppose that they enjoy a sufficient share of happiness, of whatever kind it may be, to render life worth living. Nature by making habit omnipotent, and its effects hereditary, has fitted the Fuegians to the climate and the productions of this miserable country (246-247).

The argument is quite in keeping with his idea that progress under his theory could only come from favorable circumstances. In effect he is saying that any humans—Englishmen, say—forced to live under such conditions with such limited technology would rapidly come to behave similarly. Note the reference to hereditary habits; this concept figures large in his mature ideas on human evolution.

Darwin was also well aware of the evidence that the pioneering ethnographers and archaeologists of his time were producing on the history and prehistory of our species. He reviews this in the *Descent* under the heading *On the Evidence that all Civilized Nations were once Barbarous* (193-195):

The evidence that all civilized nations are the descendants of barbarians, consists, on the one side, of clear traces of their former low condition in still-existing customs, beliefs, language, etc.; and, on the other side, of proofs that savages are independently able to raise themselves a few steps on the scale of civilization, and have actually thus risen (193).

In Darwin's day no absolute time scale could be put on the rise of civilization, and he makes no attempt to even guess about the matter. However, the evidence he adduces for the "few steps" comes from ethnographic observations, so the time scale for the rise of civilizations must be relatively short.

The climax of Darwin's argument in the *Descent* is Chapter 7, "On the Races of Man." He considers two hypotheses: that the races are sufficiently distinct to count as different species, and that they are alike in all important organic respects. He first spends several pages outlining all the evidence in favor of the different species hypothesis (Darwin, 1874: 224-231). Darwin's dispassionate tone in these pages makes it easy for careless readers to believe that this is the alternative Darwin favors. However, he then goes immediately on to demolish the separate species argument in favor of the trivial differences alternative (231-240).

Although the existing races differ in many respects, as in color, hair, shape of the skull, proportions of the body, etc., yet, if their whole structure be taken into consideration, they are found to resemble each other closely on a multitude of points. Many of these are so unimportant or of so singular a nature that it is extremely improbable that they should have been independently acquired by aboriginally distinct species or races. The same remark holds good with equal or greater force with respect to the numerous points of mental similarity between the most distinct races of man. The American aborigines, Negroes, and Europeans are as different from each other in mind as any three races that can be named; yet I was constantly struck, while living with the Fuegians on board the "Beagle," with the many little traits of character showing how similar their minds were to ours; and so it was with a full-blooded Negro with whom I happened once to be intimate (237).

The contrast between Darwin and others like Ernst Haeckel who really did think that "natural men (e.g. Indian Vedas or Australian Negroes) are closer to the higher vertebrates (e.g. apes and dogs) than to highly civilized Europeans" could hardly be more stark (Richards 1987: 596).

The extent to which Darwin subscribed to what we now call the doctrine of psychic unity is widely misunderstood. Even otherwise knowledgeable scholars believe that Darwin shared the widespread Victorian belief that the living races could be ranked on a primitive-advanced scale (e.g. Ingold 1986: 53). Bowler (1993: 70) remarks "The *Descent of Man* takes racial hierarchy for granted and cites the conventional view that whites have a larger cranial capacity than other races" (in constructing the argument he proceeds to demolish, we note!). Alexander Alland (1985: 4-5) approvingly quotes Stephen Jay Gould to the effect that Darwin shared the typical Victorian idea that the dark races are lower in the progressive evolutionary sense. As Geoffrey Hodgson (MS) and earlier Robert Bannister (1979) have shown, Social "Darwinists" of the type imagined by Hofstadter (1945) hardly existed at all and Darwin and his closest followers were not among them! We find it quite odd that contemporary social scientists, operating in a liberal to radical political milieu, fail to recognize that Darwin's general political views, while not often worn on his sleeve to the extent that his views on slavery were, were far to the left for his day, and not so different from those of the modern non-doctrinaire academic left (Sulloway 1996:Chapter 10; Desmond 1989: Afterword; Richards 1987: 597).

Moral progress via sympathy and other prosocial dispositions

For further advances, Darwin puts great weight on customs acquired by imitation (174). He spends several pages reviewing the tendency of advancing civilization, if anything, to weaken natural selection (180-193). He summarizes the argument:

I have already said enough, while treating of the lower races, on the causes which lead to the advance of morality, namely the approbations of our fellow-men—the strengthening of our sympathies by habit—example and imitation—reason—experience, and even self-interest—instruction during youth, and religious feelings (185-186).

And, in current circumstances:

With highly civilized nations, continued progress depends in a subordinate degree on natural selection. . . . The more efficient causes of progress seem to consist of a good education during youth while the brain is impressible, and of a high standard of excellence, inculcated by the ablest and best men, embodied in the laws, customs, and traditions of the nation, and enforced by public opinion (192).

Note that the means of moral progress that apply in his mind to the lower races is virtually identical to those that apply to the highest. *Primeval* evolution endowed living savages with the same social instincts as civilized people, and hence they are susceptible to the same improvement from “good education” and the rest. The lower races have the same moral instincts as the higher; the higher have just had the advantage of a favorable environment to push moral progress a little further.

Since people from different places do differ substantially in behavior, Darwin, of course, needed an account of human diversity. In Chapter 7 of the *Descent* he makes something like the modern distinction between organic differences and customs:

He who will read Mr. Tylor’s and Sir J. Lubbock’s interesting works can hardly fail to be deeply impressed with the close similarity between the men of all races in tastes, dispositions and habits (238).

Darwin’s favorable citations of Tylor, the founder of cultural anthropology and one of the important 19th Century defenders of the Enlightenment doctrine of the psychic unity of all humans, is surely significant and quite in keeping with his sympathy for savages and slaves. Tylor’s (1871: 7) postulate of organic similarity but customary difference is clear:

For the present purpose it appears both possible and desirable to treat mankind as homogeneous in nature, though placed in different grades of civilization.

Darwin sometimes uses the exactly same distinction:

As it is improbable that the numerous and unimportant points of resemblance between the several races of man in bodily structure and mental faculties (I do not here refer to similar customs) should all have been independently acquired (239)

For Darwin the explanation for differences between races has to do with customs, not organic differences. The story is complicated for us to understand because of Darwin’s frequent use of the concept of inherited habits, as in the quote about the Fuegians above. In the preface to the second edition of the *Descent*, Darwin reiterated his commitment to the inheritance of acquired variation:

I may take this opportunity of remarking that my critics frequently assume that I attribute all changes of corporeal structure and mental power exclusively to natural selection of such variation as are often called spontaneous; whereas, even in the first edition of the “Origin of Species,” I distinctly stated that great weight must be attributed to the inherited effects of use and disuse, with respect both to the body and the mind (3-4).

One of the most important forms of the inherited effects of use and disuse in Darwin’s mind is “inherited habits.” Custom, good education, imitation, example of the best men, and other manifestations of culture would tend to become hereditary in Darwin’s scheme. Lacking the 20th Century concept of a gene isolated from direct environmental modification, a rigid distinction between inheritance by imitation and inheritance by organic structures was foreign to his thinking. He does seem to divide traits into more and less conservative poles. On the conservative side are basic anatomy and basic features of the mind, little influenced by the inheritance of acquired variation but mainly by selection over long spans of time. More labile traits are much more sensitive to environmental and cultural influences, though they also come to be inherited. Inheritance notwithstanding, the more labile traits are susceptible to being rapidly remodeled again by inherited habit if the environment changes. In this feature of his theory was erroneous and archaic; still the conservative-labile distinction does the same work for Darwin that the genetic-cultural one does for us.

Moral progress in Darwin’s theory is clearly not automatic. He is quite alive to the moral deficiencies of the advanced civilizations. He forthrightly condemns Argentinean General Rosa’s war against the natives of Patagonia in the *Journal* (Darwin, 1845: 36-37; 121-125; 561-563) and expresses sympathy and admiration for the Indian resistance. For example, he ends the recounting of a story of an Indian’s daring escape with his small son from a genocidal attack Argentineans:

What a fine picture one can form in one’s mind—the naked, bronze-like figure of the old man with his little boy, riding like a Mazeppa on a white horse, thus leaving far behind him the host of his pursuers! (124)

His anguished paean against slavery begins (561-563):

On the 19th of August, we finally left the shores of Brazil. I thank God I shall never again visit a slave country. To this day, if I hear a distant scream, it recalls with vivid painfulness my feelings when, passing a house near Pernambuco I heard the most pitiable moans, and could not but suspect that some poor slave was being tortured, yet knew that I was as powerless as a child even to remonstrate.

And ends:

It makes one’s blood boil, yet heart tremble, to think that Englishmen and our American descendants with their boastful cry of liberty, have been and are so guilty: but it is a consolation to reflect that we have made a greater sacrifice than ever made by any nation to expiate our sin. [Britain freed the slaves in all her colonies in 1838.]

Gruber (1974: 65-68) notes that Darwin’s deep antipathy to slavery was shared with his extended family circle, though not nearly so widely shared by his contemporaries, leading for example, to a furious argument with Captain Fitzroy on the *Beagle* voyage.

Darwin does not develop a detailed account of what makes for moral progress and regression. He certainly thought that moral progress was possible, and clearly thought that Europeans had achieved some notable advances relative to savages. Things like the rule of law and the having of just laws supported by enlightened public opinion, such as the ending of slavery in the British Empire, he counted as progress. Most of us would agree. What about regressions like slavery and colonial genocide? He seems to suggest that patriotism will tend to conflict with and limit the scope of sympathy. Sympathy on its own easily extends to everyone, but patriotism demands allegiance to country, caste, class or tribe and limits sympathy toward outgroups. Slaveowners, through solidarity with others of the slave-owning caste, could develop racist theories and institutions of ruthless subordination that limited the effects of empathy toward slaves. Darwin seems to be arguing that moral progress beyond what natural selection can achieve is accomplished by increasing the scope of empathy at the expense of narrow patriotism.

A spiritual foundation?

Darwin's own religious apostasy is well known. In his student years, he had much enjoyed Paley's *Natural Theology*. During the time of the voyage of the *Beagle* (1831-1836) and immediately afterward he read Charles Lyell on geology and adopted a turn of mind that mandated, as the proper scientific approach, a highly mechanistic account of natural processes. His theory of natural selection was an explicitly materialistic explanation for the origins of organic form in which no influence of natural theology remained (Gruber 1974: 125-127). Nevertheless, Darwin sometimes writes so lyrically about the natural world that one is tempted to take him as a sort of nature mystic. The most famous passage of this sort is the last paragraph of the *Origin of Species*

It is interesting to contemplate an entangled bank, clothed with many plants of many kinds, with birds singing on the bushes, with various insects flitting about, and with worms crawling through the damp earth, and to reflect that these elaborately constructed forms, so different from each other in so complex a manner, have all been produced by laws acting around us. . . . There is grandeur in this view of life, with its several powers, having originally breathed into a few forms or into one; and that, whilst this planet has gone on cycling on according to the fixed law of gravity, from so simple a beginning endless forms most beautiful and most wonderful have been, and are being, evolved.

Many a scientific naturalist seems to derive a religious experience from the close study of nature. In the modern case, field biologists' devotion to the preservation of nature suggests that such appreciations lead to a powerful ethical impulse as well. By some accounts, Saint Francis was a nature mystic (Armstrong 1973). One wonders if scientists don't often experience the awe of nature but simply don't use a theistic vocabulary to describe the experience (Kiestler 1996/1997).

A Modernization of Darwin's Argument

In the light of modern evolutionary theory, Darwin's theory for the evolution of morality and moral progress had two main weaknesses. First, Darwin was quite confused about the nature of inheritance as we have seen. In his mind, inherited habits connected customs—culture in our terms—directly to the process of organic inheritance. Geneticists long ago showed that the genetic system generally lacks the inheritance of acquired variation. Second Darwin's theory is heavily reliant on group selection. Most evolutionary biologists believe that individually costly group-beneficial behavior can only arise as a side effect of individual fitness maximization.

Many, but by no means all, students of evolution and human behavior have followed the argument against group selection forcefully articulated by George Williams (1966). Several prominent modern Darwinians—W.D. Hamilton (1975), E.O. Wilson (Wilson 1975: 561-562), R.D. Alexander (Alexander 1987: 169), and I. Eibl-Eibesfeld (Eibl-Eibesfeld 1982)—have given serious consideration to group selection as a force *in the special case* of human ultra-sociality. However, most theorists do not believe that genetic systems will maintain enough variation between groups for group selection to be a strong force, except in small groups of close genetic relatives (see Sober and Wilson, (1998) for a contrary view). We believe that *cultural* variation is more plausibly susceptible to group selection than is genetic variation.

This argument is developed below using the idea that Darwinian tools are as useful for understanding cultural evolution as for genetic evolution. The basic idea is this: Learning from someone else by imitation or teaching is similar to acquiring genes from parents. A potentially important determinant of behavior is transmitted from one individual to another in both cases. As individuals acquire genes or culture, they draw their genetic parents and cultural models from a large population of potential parents and cultural models. Then, evolutionary processes operate on individuals, discriminating in favor of some cultural and genetic variants and against others. The population that exists for the next generation to sample typically differs subtly from the previous one. As many generations pass, changes accumulate and evolution occurs. This analogy between genetic and cultural evolution is undoubtedly what led Darwin to so thoroughly confuse the two. Both are population-level, historical processes that frequently result in the adaptive diversification of behavior. Luigi Cavalli-Sforza and Marcus Feldman (1981) and their followers have developed a considerable body of theory about cultural evolution by modifying standard evolutionary theory to fit the case of culture.

The evolution of human morality

A good deal of our own work and that of our students has been devoted to understanding the evolution of human sociality. Step by step, we have been led to what amounts to a modernization of Darwin's theory of the evolution of human morality. We outline this modernization under the same headings that we used to describe Darwin's original theory: (1) that group selection is the basic mechanism explaining human moral impulses; (2) that an immense gap exists between the moral faculties of humans and other animals; (3) that the moral faculties evolved in the common ancestors of all living humans; and (4) that moral progress arises when humans create social institutions that enlarge sympathy and control patriotism.

What is the phenomenon to be explained? In most animal societies, the animals that cooperate are close kin, as in the colonies of social insects based upon a single reproducing queen. Cooperation in such systems is well explained by W.D. Hamilton's (Hamilton 1964) famous inclusive fitness theory, proposing that individuals can be altruistic toward others to the degree that they share genes "identical by common descent." While human familial altruism fits neatly into this pattern, human societies always include supra-familial institutions. Some complex of innate predispositions and culturally transmitted dispositions leads human societies to have customary systems of tacit and formal rules that mold family units into a larger social system. Even at their simplest, these social systems differ from those of our close ape relatives in having larger amounts of cooperation between un- or distantly related individuals and in linking together people who do not reside in the same group (Rodseth et al. 1991). To judge from contemporary simple societies, three more or less hierarchical levels of social organization

characterized our ancestral Upper Paleolithic societies: the family, the coresidential band, and a collection of bands that routinely intermarry, speak a common language, and have a common set of myths and rituals. Families were similar to modern families and bands were rather fluid units. Members of the largest unit, often called a tribe, generally maintain relatively peaceable relations with each other, and routinely cooperate in subsistence, defense, and other activities. It often spoke a distinctive language or dialect and consisted of a few hundred to a few thousand people.

Compared to many agriculturally based societies of the last 10,000 years, the sophistication of political organization of hunting and gathering societies is slight. Often such units had no formal political leadership at all and yet such units were able to maintain long-term alliances with other tribes. Often highly egalitarian (although often quite sexist, as Darwin observed), these societies functioned as if every male adult were a member of an informal parliament informally led by the able and respected. Sometimes band headmen were formally recognized and sometimes their consultations were formal enough to warrant calling them a tribal council. Intertribal institutions were not uncommon. In addition to alliances, intertribal religious organizations were not rare. Inter-band affairs were probably regulated by *ad hoc* negotiations dominated but not controlled by the headmen.

The important point is that even such simple societies are a moral community, governed by a common set of widely respected rules that vary from tribe to tribe. For example, in many such societies, a rich and delicately balanced set of institutions exist which both quietly honor successful hunters (skill in this regard is quite variable) and prevent them from becoming petty tyrants (Boehm 1999). The role of religion in simple human societies has been much debated (BELIEVE 2003). Suffice it to say here that supernatural beliefs, legends and stories, and collective ritual must have been common if not universal features of our ancestors' societies.

Cultural Group Selection

What if we imagine that cultural rather than genetic variation is the subject of group selection? Several common properties of cultural inheritance make it a much more plausible candidate for group selection than genes.

First, if only a few influential teachers exist in each group, much variation between them is likely to be created (Cavalli-Sforza and Feldman, 1981: 204, 338-9). In the case of moral systems, the instant establishment of a major cultural variant by the charismatic founders of new religions and political ideologies is well known (Stark 1997; Abanes 2002). The formation of micro-cults and micro-parties is a rather common phenomenon, and only a handful of these become even modest successes. Clearly a selection process winnows the variants on offer, and we have some idea of how the process works (Stark and Bainbridge 1996). Very rarely, great ethical teachers like Moses, Christ, Confucius, and Mohammed are able to put their stamp on a whole series of civilizations.

Second, the conformist "When in Rome" imitation rule has a strong tendency to minimize the effects of migration on the variation between groups (Boyd and Richerson 1985, Chap. 7, Henrich and Boyd 1998). Even if migrants are fairly common, so long as they do not approach half the population of a group, resident culture will have an advantage over that of minority migrants; it will be over-represented due to the conformity of old-stock individuals and second-generation migrants alike to the commoner norms. The very considerable assimilation of many immigrants to the USA to British-American culture is testimony to the power of this effect.

Third, the symbolic aspects of culture are a potent source of variation between groups (Boyd and Richerson 1985: Chapter 8). Symbolic differences can also arise in isolated groups through a kind of runaway process that perhaps explains the extreme exaggeration we observe in fads and fashions, and in the colorful excesses with regard to ordinary utility in many ritual systems. Ritual, religious belief, and language isolate groups, potentiating group selection. Symbolic systems act to protect groups from the effects of migration, much as in the case of conformity, because people ordinarily tend to admire, respect, and imitate individuals displaying familiar symbolic traits. Cultural chauvinism is distressingly common and contributes to sharp, too-often violent, competition between groups. Directly important aspects of culture, such as the ethical norms that are the basis for patterns of altruism and for the basic form of social organization, are often embedded in richly symbolic belief systems.

Selection on cultural groups can often be fairly rapid because cultural death and reproduction do not necessarily depend upon the physical death and reproduction of people. Defeated groups often are incorporated into the victorious society, or by friendly groups not involved in the conflict. In simpler societies, defeat in war typically results in more captives and refugees than dead. Thus, war generates migration, which is much more hostile to genetic than cultural group selection. We have attempted to measure the rate of cultural group selection in simple societies, using data on local group extinctions in Highland New Guinea in pre-contact time (Soltis, Boyd, and Richerson 1995). These rates are fairly substantial, and might result in the replacement of less favorable with more group-favorable traits in a large population of societies in something like 1,000 years. This seems about right to account for the relatively slow, halting evolution of more complex and more powerful polities over the 10,000 years since crop cultivation made complex societies ecologically feasible.

Other modes of cultural group selection exist besides the one tested by Soltis. Successful societies also attract imitators, so that a culture could expand without any overt conflict at all (Boyd and Richerson 2002). This form of cultural group selection is potentially very rapid. Much of the spread of European culture in the last 500 years was due to the displacement and/or replacement of indigenous peoples, as in the case of the Indians and European settlers in North America. Currently, however, Europeanization (“modernization” and “globalization”) depends much more upon the voluntary adoption of party systems, parliaments, Marxism, Christianity, university education, factory organization of work, and so forth than it does on displacement or forced conversion. Most likely, both the slow Soltis mode of group selection and the faster inter-group imitation processes are important. Group imitation can only transfer variation that is relatively easily observed. At least the nuances of social organization are often difficult to appreciate from afar and are often difficult to establish piecemeal in a host society. Douglass North (1973) among others—Karl Marx comes to mind; see Bettinger and Baumhoff (1982) for the case of simple societies—argues that innovations in social institutions have been the rate limiting step in the evolution of more sophisticated social systems. Social organizations probably have elements that evolve on the Soltis time scale. A parliamentary form of government is easy to adopt, but the dispositions, skills, and ancillary institutions necessary to make such a government work like the Western model are not so easily transferred. In this regard, religious conversion is potentially a potent vehicle for the cross-cultural transfer of social institutions because proselytizing religions like Christianity and Islam have well-developed means of making conversion easy. Still, syncretism with local beliefs and practices is also commonplace. The general role of religious conversion in the diffusion of social institutions would repay study.

Finally, theoretical models suggest that group selection is especially potent on systems of punishment (Boyd et al. 2003; Henrich and Boyd 2001). The reason the models work the way they do is easy to appreciate. Helping acts are costly every time one engages in them. As altruists become common, the number of hands to help increases, but so do those in need of help. Helping remains costly. Also, as altruists become more common, they will tend to run the risk of “moral hazard.” Knowing that helpful individuals are common, individuals will be motivated to take risks, be lazy, or be otherwise feckless, knowing that plentiful helpful souls will likely aid them. Worse yet, pure altruists may attract con artists who will victimize them. Cooperative communities of many altruists will tend to produce surpluses that attract predators. On the other hand, the costs of being a punisher of those who break moral rules reliably drops as punishers become more common. When punishers are vanishingly rare, each punisher will have a large load of work to do. In an evolutionary sense, punishment is hard to get started. But if punishers ever become common, they will have many hands to share the work of punishment and fewer individuals will be in need of punishment. In the limit when everyone is a punisher, punishers have absolutely no work to do! In Boyd and company’s models, the evolutionary dynamics tend to become complicated since the strategy of being altruistic but not punishing tends to invade a system that is rich in punishers because non-punisher altruists are both protected by punishers and evade the cost of punishment. So long as any work remains for punishers to do, altruist non-punishers will increase at their expense. But as the number of non-punisher altruists rises, the opportunity for non-punisher, non-altruist rascals to invade the system increases. Nevertheless, models suggest that relatively weak group selection can keep the frequency of punishers high in such a system.

The empirical literature suggests that punishment institutions are a ubiquitous feature of human societies. For example, Elinor Ostrom (1990), one of the leading students of small-scale commons management, details a number of quite sophisticated punishment and monitoring systems and could find no successful commons management schemes without such institutions. The typical systems are elaborately graded and begin with light warnings and only progress to harsh penalties for repeated substantial transgressors. So too with other sorts of transgressions. The rule of law in modern societies is similarly graded, but eventually appealing to long prison sentences and even death for sufficiently persistent or egregious misbehavior. The pacifist Amish ultimately rigorously shun those who stubbornly disdain gentler attempts to enforce the congregation’s rules (Hostetler 1993).

Thus, human-scale societies may have evolved because the peculiar properties of the cultural inheritance system lend themselves to group selection. Originally, processes like conformity may merely have functioned to reduce the risk of adopting foreign traits that are less likely to be useful than home-grown ones in an environment that varies from place to place. Group selection, and resulting indiscriminate altruism from the genetic point of view, may at first have been merely a by-product of adaptation to spatially varying environments (Henrich and Boyd 1998). A number of ingenious hypotheses besides group selection have been proposed to explain human cooperation in recent years (Hammerstein 2003), but we believe that the best evidence supports a major role for *cultural* group selection (Richerson, Boyd, and Henrich 2003).

Why can’t selection on genes successfully favor innate changes that compensate for any deviations from inclusive fitness optimizing? As Rappaport (1979: 100) puts it in the context of cultural rules that prevent over-exploitation of the environment, “to drape nature in supernatural

veils may be to provide her with some protection against human folly and extravagance.” Combined with punishment of malefactors, culture encases individuals in a web of institutions that make deviation difficult and dangerous. *Innate* human nature will have been bent by the late Pleistocene by the impact of being selected to live on a tribal scale in a culturally group-selected world. This is an example of culture playing a leading role in the process of gene-culture coevolution.

Nevertheless, the gene-culture coevolutionary system makes the perfection of human altruistic tendencies exceedingly difficult. The problem is that our genetic reproductive system has no analog of the suppression of reproduction among workers. As Donald Campbell (1983) perceptively noted, humans are characterized by reproductive competition between the cooperators, quite unlike the social insects. Those who act *entirely* on behalf of the group are likely to be counter-selected at the individual level. Selection on genes to increase our inclusive fitness no doubt goes on side by side with cultural group selection. Conflicts between narrower loyalties to self-interest and kin and larger loyalties to groups generate considerable psychic pain, as if genetic and culture rules still struggle for mastery of our behavior (Campbell 1975; Richerson and Boyd 1998; Richerson and Boyd 1999). This phenomenon, we suggest, accounts for many of the moral conflicts that are endemic to human life.

An Immense Gap

As Darwin supposed, apes and other animals can do everything we do to some approximation. Primatologists like Christophe Boesch (personal communication) and Frans de Waal (2000) stress how similar chimpanzees are to humans. Social learning turns out to be quite common in animals, yet not even the most sophisticated animal social learners seem to have a system approaching the human level of complexity (Heyes and Galef 1996). Chimpanzees in the wild seem to have a considerable amount cultural variation (Whiten et al. 1999). For example, the chimpanzees in some populations use stones to crack nuts on a simple anvil. On the other hand, when Andrew Whiten and Michael Tomasello compared the skills of human children and adult, lab-reared chimpanzees on the same imitation tasks, they found that children as young as 3 years were more proficient imitators than the chimpanzees (Tomasello 1996; Whiten and Cusance 1996).

The long-term evolutionary consequences of the enlarged capacity of humans to imitate and teach differentiate us very markedly from our ape ancestors and relatives. The critical feature is that human imitation is accurate enough and fast enough that we can progressively improve artifacts and social institutions to generate adaptations that rival the famous chestnuts of organic evolution like the vertebrate eye (Boyd and Richerson 1996). The Inuit kayak, for example, is a marvel of traditional engineering. Light, fast, and seaworthy, it was constructed from the very limited inventory of raw materials available in the High Arctic using stone-age tools. Chimpanzees, by contrast, use unmodified stones to crack nuts and twigs just stripped of their leaves to fish for termites.

The story is much the same regarding social institutions. The kin-based social organization of chimpanzees is not markedly more complex than that of many other social mammals. Primate troops very often number about the same size as hunting and gathering bands, but no other primate has permanent bonds of affiliation linking many troops into anything like a tribe. Robin Dunbar (1993), noting that a good correlation exists in other primates between brain size and group size, plotted humans on the regression line. The predicted group size of humans by this

method is about 150. Joseph Birdsell's (1953) well known estimate of 500 for the average size of Australian tribes is considerably larger than this figure, especially given that the average person would have live in a larger tribe than the average.

Human artifacts and institutions are not only sophisticated but highly variable and rapidly evolving. By the end of the last Ice Age humans had spread all over the world, adapting to life from the margins of the glaciers to the equator using mainly cultural means. Other apes, by contrast, remain restricted to the tropical forest environments of our common ancestor.

The Social Instincts Primeval

Substantial advances in our understanding of human origins have been made since Victorian times (Klein 1999). While the human lineage has been distinct from that of the other apes for some five million years, the final modernization of humans occurred in the late Pleistocene. Richard Klein believes that fully modern humans emerged in Africa rather suddenly about 70,000 years ago. McBrearty and Brooks (2000) argue that a sequence of gradual changes in Africa, stretching back some 300,000 years, led gradually the level of technical and stylistic sophistication characteristic of modern people. In any case, about 50,000 years ago modern people spread out of Africa to the rest of the Old World, replacing more archaic humans like the Neanderthals of Western Eurasia. Analysis of mitochondrial DNA from Neanderthals suggests a rather deep split between these forms and modern humans, dating to about 600,000 years ago (Rightmire 1997). The human genome has quite low genetic variability compared to that of chimpanzees, and all modern humans seem to have shared a quite recent African ancestor (Kaessmann and Paabo 2002; Rogers and Jorde 1995). One of the important genes involved in language production probably originated in its modern form within the last 100,000 years (Enard et al. 2002). Thus, the paleoanthropological and genetic data concur in suggesting that all modern humans are very closely related.

Although the social instincts leave no direct fossil evidence, we can be fairly certain that our common late African ancestors were quite modern in this regard. The best indirect evidence comes from the sophistication of stone tools. The people who left Africa 50,000 years ago left with a toolkit of modern sophistication. We know from an inadvertent natural experiment that humans need to maintain a rather large social network to resist the loss of toolkit sophistication. When the Bass Strait flooded with rising sea levels after the last glacial, it isolated about 4,000 Australians on Tasmania. Over the ensuing 10 millennia, their toolkit became gradually less sophisticated until by the time of contact with Europeans they had the simplest toolkit ever collected. According to the analysis of Joseph Henrich (submitted), most attempts to teach or imitate the making of a complex artifact lead to slight imperfections. In a small group, these imperfection will accumulate. In a larger group, the occasional gifted artisan will correct the accumulated errors and have the effect of maintaining complex cultural adaptations against this erosion. Humans have to maintain a surprisingly large cultural orbit, far larger than the tribe, to maintain a complex toolkit. Modern humans have tribal alliances, trade networks, intermarriage, and other means of connecting themselves culturally on a much larger scale than the tribal social unit. Neanderthals had as large a brain as Moderns, but a much less sophisticated toolkit. Most likely, their social instincts were rather less sophisticated than ours, but all of us late Pleistocene African hunter-gatherers maintained quite complex toolkits wherever we spread, with the exception of the unfortunately long-isolated Tasmanians.

Moral Progress Via Sympathy

The last ten millennia, and especially the last five millennia, have witnessed dramatic moral progress in the sense that humans have come to be able to cooperate in ever larger groups. Archaeologists and historians have filled in many of the details of the evolution of civilized moral communities since Darwin's day. Even more than in the Victorian era, we have learned from the horrors of the 20th Century to view the moral claims of the "civilized" societies with a skeptical eye. While larger scale societies do not solve all old moral problems and often create new ones, the provision of justice, defense, and social welfare services, however crude, solves problems that tribes cannot. The scope of patriotism was enlarged from the tribe of a few thousand to the scale of nations that today have as many as a billion inhabitants living in the same moral community. Such societies can, for example, manage highly productive economies with a much greater division of labor than is possible in simpler societies.

The cultural evolution of large-scale institutions was, we believe, the product of *work-arounds* (Richerson and Boyd 2001, 1999). The tribal social instincts evolved to underpin only relatively small social systems, but these resources are enough to provide real scope for the evolution of moral progress. We shall concentrate on a specific work-around here for illustrative purposes: the enlargement of the symbolic sphere. Tribal social systems, recall, tended to have a common language, common rituals, common beliefs about the supernatural, common stylistic artifacts, and the like. Those who differed in these regards belong to other tribes. Thus, our innate psychology seems to be adapted to count those with whom we share such symbols as those to whom sympathy is due.

As state-level systems welded formerly independent tribes into an integrated society, they made lavish use of symbolic systems. Monumental architecture is one of the most common markers of emerging state-level systems. The monuments served as an excuse to mobilize masses of laborers in a common project and as the centerpiece of mass rituals afterwards. They symbolized a common religion and usually a common political system. The symbolic unity of the early state—as for many later empires—may often have been as much the unity of the elite as the unity of society as a whole. Elites often have little sympathy for the lesser classes, and often the sentiment is reciprocated. Complex societies always encapsulate tribal scale units that maintain varying degrees of autonomy and resistance against the hegemony of elite institutions. Nevertheless, common religion and common nation often count for a lot. The humble are more or less reconciled to their lot, elites are more or less paternalistic, and society lurches along despite having a far less than perfect moral system. Often, independent societies are knitted together by international institutions of some real force. The ancient Greeks fought zealously to maintain the independence of their poleis, but they had enough common institutions to collectively resist a Persian invasion and later to follow Alexander on his conquests. The great world religions likewise support institutions that incorporate people from diverse societies into a related set of moral communities.

At the same time, symbolic systems evolve rather quickly and easily. New dialects grow up on social fault lines (Labov 2001). Religious heresies are often a tool of the oppressed and are never entirely suppressed, even by such institutions as the Catholic Inquisitions or modern secret police. The recent rise of the current world's many varieties of fundamentalism is a case in point (Marty and Appleby 1991). Rodney Stark, the prominent iconoclastic sociologist of religion, has mounted an impressive empirical defense of both the functionality and dysfunctionality of

fundamentalist style religious communities (Stark 2003, 1997; Finke and Stark 1992; Stark and Bainbridge 1996).

As Darwin understood, moral progress is never guaranteed. Why not? First, human communities are still subject, as we have seen, to multi-level selection. Small-scale sub-communities are often very successful at socializing their offspring and just plain supporting “natural” increase. Anabaptists are a good example. Thus, the evolution of smaller-scale social units is always tending to undermine larger-scale ones. Second, humans appear have a strong innate need to be part of a functional small-scale community. If the larger-scale community fails to provide such attachments, smaller-scale organizations with narrower definitions of patriotism will evolve to fill such needs. “Nation” and “tribe” are always in competition for our loyalties (Garthwaite 1993). Sympathy tends to cause us to favor for more inclusive systems, but patriotisms tend to demand a narrower calculus of friend and foe.

The great moral problem of our time is how to grow larger-scale loyalties to fit the fact that the world is now so famously a global village, while at the same time creating tribal-scale units that reassure us that we belong to a social system with a human face. The existence of weapons of mass destruction and the need to manage important aspects of the environment as a global commons threaten catastrophe if we fail in this project. Persuasive humanistic and other universalistic perspectives in the spirit of Darwin are not far to seek (Coon 2000). The problem is that only a relatively small elite is so persuaded. Even in the most enlightened European countries, internationalism risks a nationalistic reaction. Stark and Bainbridge (1996) make the case that secularly and religiously liberal communities in the West are marked by a barely latent demand for tribal identities, manifest in relatively high rates of interest in cults in the most liberal regions. If our work-around analysis is correct, a liberalism that does not make ample provision for satisfying tribal-scale loyalties will fail. We have evolutionary debts to individual autonomy, family, and tribe that must be paid. Utopian schemes fail by ignoring these debts and evil empires flourish by exploiting them. The key is somehow a “federal” world system that encourages small-scale loyalties under a system of legitimate rule of law that enforces mutual tolerance of tribes and nations. On the positive side, tribes have brought families into such systems and nations have effectively bound tribes together. Anthropologist Christopher Boehm (1996) and sociologist Jonathan Turner (1995) note that both simple can complex societies have potent collective decision-making systems to apply to large-scale, deliberate cultural change (constitutional conventions are a good example). On the negative, universalists have clearly understood the basic problem of bringing nations under an international rule of law since the disaster of World War I, yet net progress continued to lag behind the growth of threats to the global village for the entire 20th Century. The failure of the first reigning superpower since Great Britain in the 19th Century so far to lead the establishment of a legitimate “New World Order” is a troubling disgrace. Universalists have an epoch-making piece of difficult work cut out for them—American universalists first among them.

The Parable of the Argentine Ant

We have presented a picture of human society as an evolutionary system that seems to have defied an evolutionary law of gravity. W.D. Hamilton’s theory of inclusive fitness says, in effect, that love, empathy, and altruism will be drastically undersupplied by evolutionary processes. Natural selection must discount aid to others by the coefficient of genetic relatedness. This vicious constraint on the potential for the evolution of morality exists despite the fact that in principle altruism could be favored any time its fitness benefits exceed its costs. Given that the

closest relationship most organisms have to one another is $\frac{1}{2}$, and that only a handful of other individuals typically have this level of relationship, a staggering number of altruistic deals in the world go begging according to this theory. And so, mainly, it seems to be.

As with real gravity, Hamilton's rule cannot be defied, only finessed. Flight is possible by counteracting gravity with other principles of physics. So too with the evolution of moral systems. A relative handful of species, such as ourselves and the social insects, have found various means to make extraordinary altruism fly (Genet 1997). The highest flying case of social evolution by some standards is a curious one, the Argentine ant (Holway, Suarez, and Case 1998). In its homeland, this species is an unremarkable species more or less obeying Hamilton's rule. Unrelated colonies fight ant wars in the familiar fashion. Argentine ants made their way, hitch-hiking on human commerce, to California, the Mediterranean, and Australia. In each case, the number of founding colonies was so small that genetic variation for colony-recognition odors is minimal. Hence, even colonies that are completely unrelated cannot recognize one another as distinct. Every Argentine ant is a perfect saint as far as other Argentine ants are concerned. The dividend for such inadvertent sainthood is about a two-fold increase in colony productivity, making Argentine ants the most successful ants in their adopted homelands. Our children have grown up without ever seeing an ant war around our California homes. Argentine ants have driven all other conspicuous species extinct in most urban habitats and are a major household pest.

Humans are not unlike Argentine ants. We are not so perfectly cooperative as they, but our genius at technology and social organization more than make up for our fractiousness. If God made us, perhaps he has reason to regret it! The explosive growth of our population and our technology has created dire threats to ourselves and the rest of the planet; we are a pest that threatens to put every other in the dark.

The Argentine ants will presumably gradually evolve colony-recognition odors and vanish into the background. No known mechanism can prolong their extraordinary defiance of Hamilton's rule or extend it beyond their own species. Humans are a different story. In the last ten millennia we have stumbled and staggered forward on our uncertain adventure of moral progress. We routinely, if unpredictably, unreliably, and sometimes foolishly, love dogs, cats, foreign friends, "man" as a whole, gods and nature. Moral progress is merely a matter of repeating the same tricks that we have used in the past to overcome slavery and similar evils. Universalists—Buddha, Christ, Confucius, Jefferson, Darwin and so many others—light the way. In an age of weapons of mass destruction, global climate change, and the mass extinction of other species, our collective minds should be well concentrated on the problem. Modern evolution tells a coherent scientific story that takes us back to the origins of the universe. Until the evolution of human sympathy and our species' unique potential to extend sympathy without limits by means of political and ethical action, nothing like our moral communities existed on the face of the earth. We are privileged to participate in the world's first true adventure. Awesome dangers lie on our path. We have not and will not escape all of them. But we are not helpless pawns in the evolutionary game as every species before us has been. Individual by individual, tribe by tribe, nation by nation we have the prospect of passing, by the exercise of a steadfast commitment to sympathy, to a better future by our own efforts. Mother Nature willing!

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