

Sociobiology and the Nature/Nurture Debates

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Introduction

For ages, people have debated the essence of human nature, often posing the issue in the classic form of determinism vs. free will, asking whether given circumstances preordain all that we are and do or if we are a clean slate upon which we can write what we choose. With the advent of modern biology and the social sciences, the debate took on a new form: heredity vs. environment. Each was deemed to be a concrete scientific factor worthy of study, not just a philosophical concept to be argued. The controversy over nature and nurture raged once more, and the debaters almost invariably took up the torch for the primacy of one side over the other.

A quarter century before the turn of the millennium, Edward O. Wilson published *Sociobiology: The New Synthesis*. In arguing for the genetic basis of social behavior, this new discipline became the first widely discussed framework in which to deal explicitly with both nature and nurture. The field's central theoretical problem was how altruism, which by definition reduces personal fitness, could possibly evolve by natural selection (Wilson, 1975a: 3). It was now accounted for by two new hypotheses. Kin selection suggests that individuals act altruistically toward those with whom they share a significant number of genes, while reciprocal altruism poses that individuals may act altruistically toward those to whom they are unrelated with the expectation that the beneficiary may one day return the favor, a sort of biological golden rule. Encompassing all was the new inclusive fitness theory, which involved a refocusing of Darwinian fitness to the gene level as opposed to the individual. Maximizing inclusive fitness came to entail doing what is best for the gene to be perpetuated and not necessarily what is best for the organism.

In his *New York Times Magazine* article, "Human Decency is Animal," published later in

the same year as his original text, Wilson paved the way for genetic explanations of human altruism by providing several examples of how these new concepts played themselves out in the non-human world. The best known example may be that of the bee which stings an intruder. The stinger remains embedded, pulling out much of the bee's innards as it moves away, causing it to die. Not only is this act generous in that it can deter the intruder from further invasion, but the chemicals released by the now-exposed venom gland incite other bees to flee. Thus, the suicidal attack is more effective than if the bee had withdrawn its stinger and survived. But such altruistic acts are not limited to insects. Some small birds warn others of the approach of a hawk, endangering themselves by betraying their own location. Dolphins may gather around an injured cohort to lift it to the surface where it may find easier breathing. Coming even closer genetically to humans, chimpanzees have been observed to tear off pieces of meat from a recent kill and drop them into the outstretched hands of others, an act of generosity which Wilson says is unknown in other monkeys and apes (Wilson, 1975b: 39).

In the end, the goal was to apply sociobiology fully to humans, achieving a modern synthesis of biology with the social sciences and the humanities. But the proposed synthesis was not received with unanimous acclaim. Sociobiology was accused of methodological problems, unjustified biological determinism and, most significantly, supporting reactionary politics. Critics suggested that evolutionary homology with animals may not be justified when similar phenomena could arise through different methods, genetic for animals and cultural for humans, thus yielding only an analogy (Sociobiology Study Group, 1976 / 1978: 284). In the older terms of the debate, critics were taking the free will side. With nurture acting on a *tabula rasa*, there would be no insurmountable constraints on human potential. In contrast, Wilson was labeled a fatalist.

While critics made a point of providing as many scientific arguments as they could, the debate is so significant precisely because it went beyond science. Science, often impelled by a desire to understand us and our world and to improve our lot, wound its way through biological arcana to propose direct insights into human nature. With supposedly dramatic social and political implications, sociobiology could not remain behind the closed doors of academia. In attempting to integrate seemingly opposing forces, Wilson brought the nature/nurture debate, variously characterized as heredity/environment, biological/social, genetic/cultural, to the fore once again. Indeed, sociobiology made the cover of *Time* (1977), as much for the controversy it had raised as for the innovative potential it held, in both science and politics.

Did sociobiology fulfill its stated goal as a grand synthesis, or did it prove to be a “synthesis” (Silverberg, 1980: 35) to be abandoned? Through the early 1980s, articles filled both academic and lay periodicals and entire volumes were published on the subject. Yet while the prodigious amount of material seemed to contain all possible arguments from both sides, the issue was never resolved. With the appearance of articles like “E.O. Wilson After Twenty Years: Is Human Sociobiology Possible?” in 1994 (Flew, 1994), it is clear that the debate continues. And when *Scientific American* includes the larger nature/nurture controversy as one of the great questions remaining in science at the end of the millennium (deWaal, 1999), it seems the end is nowhere in sight despite cries for reconciliation. Publications in the last months of the 1990s provide an interesting, if not completely fair, juxtaposition. *Scientific American* reminds us that, among other criticisms, Wilson once got cold water poured on his head at a symposium on sociobiology (deWaal, 1999: 97). Meanwhile, Stephen Jay Gould, one of the key figures on the other side of the debate, simultaneously received the cover story of *Natural History* (1999) in an

article celebrating 25 of years “America’s evolutionist laureate” writing for the magazine. Where do things stand at the turn of the millennium?

Reviewing the arguments on both sides of the sociobiology debate reveals that it is not the diabolical theory its detractors propose, and further that they misrepresented Wilson and his theory in the service of their politics. Sociobiology actually provided many successful scientific findings and deserves a great deal of credit for helping move the nature/nurture debate toward a new phase. However, as originally conceived, sociobiology never proved to be the Holy Grail capable of synthesizing biology with the social sciences. That this new phase of the nature/nurture debate was never actually reached, though, has at least as much to do with the terms of the debate as with the specifics of sociobiological research. A closer look at the nature/nurture issue itself, then, suggests that only its own reconception may yield a quantum leap forward in the study of human nature. By looking at two related forms of the issue — heredity vs. environment and man vs. nature — it will become clear that not only are both incarnations falsely dichotomized but that there are actually more than two factors involved in each case. Reintroducing the physical environment brings the situation into clearer focus and helps point the way toward an integration not only of the nature/nurture issues themselves but of coevolutionary and ecological perspectives, both of which hold genuine potential for synthesis.

The Sociobiology Debate

The first negative words about Wilson’s sociobiology appear to come from Paul A. Samuelson’s *Newsweek* piece entitled “Social Darwinism,” appearing shortly after publication of Wilson’s original text. More a warning about the ends to which some may put the new discipline

than a critique per se, he cautioned that “the sociobiologist had best tread softly in the zone of race and sex” (Samuelson, 1975: 55).

The opposition kicked off its campaign in earnest in November 1975 with a letter to the editor of the *New York Review of Books*, co-signed by 16 concerned scientists including the eminent evolutionists Stephen Jay Gould and Richard Lewontin. The letter suggests that Wilson himself justifies by the present social order by claiming that “what exists is adaptive, what is adaptive is good, therefore what exists is good” (Allen et al, 1975 / 1978: 261). Providing a number of arguments, they were convinced that they had left Wilson with a theory that has no scientific support (Allen et al, 1975 / 1978: 264). With a somewhat different list of co-signers, the group, now dubbing themselves the Sociobiology Study Group of *Science for the People*, a leftist publication, published a longer piece in *BioScience* in March 1976, reiterating their various criticisms (Sociobiology Study Group, 1976 / 1978: 280). In both of these pieces and elsewhere, their arguments centered around a few main themes: the adaptationist program in general of which sociobiology appeared to be a part, biological determinism, lack of evidence and, most importantly, conservative politics.

The adaptationist program, simply stated, assumes that what exists is the result of natural selection promoting adaptive features and weeding out maladaptive ones. While Darwin considered natural selection to be the main factor in evolutionary change, he never thought of it as acting alone. Eventually, additional factors like genetic drift, fixation of neutral mutations and allometry were indeed shown to influence evolution (Gould, 1980: 258). If natural selection is not omnipotent, then adaptationist explanations may not be sufficient for any phenomena, physiological, behavioral or otherwise.

Ludwig von Bertalanffy warned that exclusive use of such explanations would explain too much through unprovable hypotheses which have only their plausibility to show for themselves (Gould, 1980: 257). Gould refers to these using Kipling's term "just-so stories" (Gould, 1980: 258), noting that Christian fundamentalist arguments used to frustrate him until he realized that they fall into this same category and are therefore bankrupt of any real explanatory value (Gould, 1980: 257). Gould and Lewontin accused the adaptationist program of operating within the Panglossian paradigm (Gould & Lewontin, 1979), named for Dr. Pangloss, from Voltaire's *Candide*, who felt that we must live in the best possible world by the simple virtue of its existence (Gould, 1978 / 1980: 284). The main problem is that an existent trait is not automatically adaptive. Anatomic/physiological traits and learned behaviors can be adaptive, nonadaptive or maladaptive (Silverberg, 1980: 44). Thus, "Perhaps it is scientifically responsible to regard adaptiveness not as an a priori assumption but as an empirical question." (Silverberg, 1980: 46).

With its stated focus on the genetic basis of behavior and its support for inclusive fitness theory, sociobiology was seen as a manifestation of the adaptationist program, subject to all the flaws therein such that it "so vulgarizes natural selection and the theory of adaptation that it does not have a claim to be a serious form of scientific investigation" (Lewontin, 1979: 6). In other words, "The trouble with the whole system is that nothing is explained because everything is explained" (Sociobiology Study Group, 1976 / 1978: 288). Sociobiologists get kudos for expanding their range of selective stories with notions of inclusive fitness and kin selection to explain altruism, which Gould believes may often be correct, but nevertheless remain in the rut of just-so storytelling (Gould, 1980: 260). The stories are not necessarily incorrect, but they have not been sufficiently confirmed nor do they lend themselves to experimental testing (Lewontin,

1979: 12).

Just as an existent trait is not necessarily adaptive, an adaptive trait is not necessarily genetic. Behavioral traits, adaptive or not, can have evolved genetically or culturally, since culture is a true system of inheritance, parallel to but separate from genetics. Thus, a biological explanation will not always be sufficient. Regarding cultural change vs. biological, Gould says, “Of course, some aspects of the two phenomena must be similar, for all processes of genealogically constrained historical change must share some features in common” (Gould, 1996: 219), but he warns against the excessive reductionism of adaptationism. Arguments of biological determinism fail when they attempt to find a biological basis for a purely cultural trait. As Gould says in *The Mismeasure of Man*:

In short, the *biological basis* of human uniqueness leads us to reject biological determinism. Our large brain is the biological foundation of intelligence; intelligence is the ground of culture; and cultural transmission builds a new mode of evolution more effective than Darwinian processes in its limited realm — the ‘inheritance’ and modification of learned behavior... Yet, if human biology engenders culture, it is also true that culture, once developed, evolved with little or no reference to genetic *variation* among human groups. (Gould, 1981: 325; see also Gould, 1976 / 1978: 348-9)

In contrast, critics appeared primarily to line themselves up with theories of social determinism, following other left-leaning thinkers such as Durkheim, Comte and Marx, all of whom suggested that social groups can only be understood in social terms (Fedoseev, 1976 / 1982: 326; Silverberg, 1980: 37; Degler, 1991: 318). Sociologist John H. Kunkel literally turns the tables on Wilson, proposing “biosociology” as a new field, stressing that biological factors may set the stage “but that culture and history provide the script for social life” (Kunkel, 1977 / 1982: 283), showing a clear bias toward culture yet not completely denying a role for biology.

Gould characterizes the debate over sociobiology as biological determinism to be one of the breadth of the range of potential behavior allowed by genes. Sociobiologists, he says, claim

ranges narrow enough to code for a specific behavior while critics argue that genetically programmed ranges are so wide that they allow for various behaviors, none of which can be traced to a specific gene. Gould claims that these are not simply “different positions on a smooth continuum [but] two qualitatively different theories about the biological nature of human behavior.” Sociobiologists look for specific traits in genes, while critics seek generating rules in the genes with specific behaviors being environmentally inspired epiphenomena of the rules (Gould, 1981: 329). Elsewhere, he refers to this as a question of biological determinism vs. biological potentiality, not biological nature vs. nonbiological nature, since both theories are biological (Gould, 1976 / 1978: 344; Gould, 1981: 330). Others also stress the need to distinguish a genetic predisposition to learn, i.e., to have culture, from a genetic predisposition to learn something specific, the learning process from a particular learned behavior (Silverberg, 1980: 43-4).

As an example of sociobiology’s mistaken approach on this count, Gould cites Wilson’s claim that peaceable tribes once were and again will be aggressive, commenting, “But if some peoples are peaceable now, then aggression itself cannot be coded in our genes, only the potential for it. If innate only means possible, or even likely in certain environments, then everything we do is innate and the word has no meaning” (Gould, 1978 / 1980: 290; Gould, 1981: 330).

Objectionable as both the adaptationist program and biological determinism seem, critics acknowledge that they could be justified if there were more genetic evidence with respect to human behavior (Lewontin, 1979: 9; Gould, 1980: 262). Almost every critical publication, however, claims that there is no direct evidence for a genetic basis for any human behavior. Sociobiologists are accused of positing the existence of genes even when there is no evidence

simply because their theory requires it (Harris, 1979 / 1980: 320; Lewontin, 1979: 10). Evidence, however, is almost impossible to obtain due to the logistical problem of our long generation time and the ethical problems related to breeding experiments (Gould, 1980: 262). Further, we would need evidence of genetic variation in the past in order to explain the present. Evidence of present variation would not really tell us anything (Lewontin, 1979: 10).

The debate became most polarized when politics was brought into the fray, with all scientific arguments neatly supporting the critics' leftist views. Critics decried that adaptationism and biological determinism could be used to justify a conservative/reactionary political position, affirming the status quo and denying the need, or even possibility, of social change. But the argument is against more than Spencerian Social Darwinism and its affirmation of the status quo. Sociobiology's critics are equally against eugenics, an attempt to modify the status quo which was based on faulty premises, i.e., that genetics held the key to all change. Nazi Germany proved just how problematic and undesirable such a program could be. The critics were thus against all applications of biological determinism, which they believed to have been effectively discredited by their scientific arguments.

According to philosopher Charles Frankel, "Wilson, in their eyes, has opened a dangerous door" (Frankel, 1979 / 1982: 49). In some of their writings, though, they go so far as to claim that Wilson himself has walked through the door, actually espousing conservatism.

Anthropologist Marshall Sahlins created the term "genetic capitalism" to refer to the perversion of Darwinism toward conservative political ends (Sahlins, 1976: chap. 3). Gould said he has no interest in suppressing truth for fear of its political consequences but was instead worried about the spread of unsupported speculations that happen to carry a great deal of political clout (Gould,

1980: 262-3).

Wilson's stance was best described by Nicholas Wade: "The Wilson-Lewontin debate has every outward appearance of an illuminating battle between titans. Unfortunately the main issue is never joined, because Wilson denies that he says what the Sociobiology Study Group claims he says," as they constantly misrepresent and distort his work (Wade, 1976 / 1978: 327). Indeed, Wilson's original works, prior to the onset of the debate, made clear that he agreed with his critics on many scientific points and understood the potential for their misuse.

Regarding the adaptationist program, Wilson agreed with the stance against, granting that there will be some cases that are not testable (Wilson, 1975b: 41). Later, he and others would note that cultural change can often diverge from genetic fitness since it acts so much faster and does not always have the time to optimally track environmental changes (Wilson, 1977 / 1982: 37; Durham, 1979 / 1982: 79, 83; Barkow, 1980 / 1982: 63, 67). Sociologist Pierre L. van den Berghe supported this, suggesting that culture "has become by far our most important way of adapting, but culture does not wipe the biological slate clean. We remain the kind of animal that our entire phylogeny has made us: a highly, but not infinitely, adaptable one" (van den Berghe, 1978 / 1982: 26).

The idea of individual responsibility within the new field became crucial to interpreting the criticisms of adaptationism: "... that some sociobiologists refuse to let their theory be falsified does not mean that the theory itself is essentially any less falsifiable than any other" (Ruse, 1978: 366). Nevertheless, one can, to a degree, defend merely plausible stories. Darwin's own theory of natural selection was, at the time he proposed it, little more than a just-so story since he lacked a mechanism for the production of variation (Young, 1985, chap. 4). It wasn't until the

acceptance of Mendelian inheritance that the neo-Darwinian synthesis could occur, providing an explanation to support the theory. A plausible story, then, is better than an unplausible story and, while it may not be the whole story, can point the way to future research to support or deny its validity.

Wilson also clearly had no leanings toward biological determinism. At the beginning of his original text, he writes:

Sociobiology is defined as the systematic study of the biological basis of all social behavior. For the present it focuses on animal societies, their population structure, castes, and communication, together with all of the physiology underlying the social adaptations. But the discipline is also concerned with the social behavior of early man and the adaptive features of organization in the more primitive contemporary human societies. (Wilson, 1975a: 4)

He does not assume that biology is the sole basis of all social behavior, instead merely posing all social behavior as ripe for analysis, whether or not a biological basis may be found. Further, he is clear in directing sociobiological study of humans only toward early man and ostensibly similar contemporary societies. There is no mention of applying sociobiology to the study of a modern, complex society, much less the notion of justifying its present state.

Further, Wilson explicitly agrees with Gould's support of biological potential over biological determinism, stating that "The hypothesis to consider, then, is that genes promoting flexibility in social behavior are strongly selected at the individual level" (Wilson, 1975a: 549). He grants that "the intensity and form of altruistic acts are to a large extent culturally determined" (Wilson, 1975b: 41) and that genes can only prescribe a capacity to develop certain behaviors rather than any specific behaviors (Wilson, 1975b: 46-7). Later, Wilson would argue that sociobiology's "validity in no way depends on a demonstration that human social behavior has a genetic basis. And contrary to an impression still widespread among social scientists, sociobiology is not the theory that human behavior has a genetic basis," allowing fully for the

possibility that genes merely prescribe the capacity for culture (Wilson, 1980: 296). Moreover, he fully acknowledged polygenic inheritance acting over a range of possible phenotypes (Wilson, 1977 / 1982: 35).

The potential for political abuse was also not lost on Wilson who, in the *New York Times Magazine* article published before the first main salvo by his opposition, pointed out the “dangerous trap... of the naturalistic fallacy of ethics, which uncritically concludes that what is, should be” (Wilson, 1975b: 50). He amplified this sentiment shortly thereafter in his first actual response to his critics, noting the fallacy of the political consequent, the idea that political belief systems can be directly mapped onto biological or psychological generalizations (Wilson, 1976 / 1978: 302). Indeed, these fallacies bring a piece of Darwinism into the social realm, the notion that no specific end is sought by evolution (Frankel, 1979 / 1982: 50). His critics accused him of both fallacies, but he maintained his innocence.

Even if sociobiology was deterministic, it could only attempt to account for the present in terms of the past, explaining what is with no power to prescribe what ought to be in the future with respect to social, political or economic arrangements (Wilson, 1976 / 1978: 296-7; Caplan, 1980: 99). Indeed, the only thing it may say about conservative politics is why it is good for conservatives. Supporting this more concretely, Wilson said he does not know of any evidence for aggression as an innate drive searching for an outlet (Wilson, 1975b: 45) and that evidence from comparative studies of animal behavior cannot justify human aggression (Wilson, 1975b: 46).

Anticipating the reaction that a suggestion of genetic determinism will lead to a

justification of the political status quo, Wilson points out that extreme environmentalism can lead to support for authoritarian mind control (Wilson, 1975b: 46), a notion supported by philosopher Mary Midgley (Midgley, 1979 / 1980). Indeed, Brave New World and A Clockwork Orange are at least as nightmarish as Gattaca. Political scientist Roger Masters supports this, noting that sociological theories that look to whole systems to explain behavior in social terms, such as those of Durkheim or Parsons, can espouse conservatism (Degler, 1991: 319).

In actually responding to his critics, Wilson used his opportunities for rebuttal mostly to reiterate his original statements in their proper context rather than to argue the opposite side of his critics' case his views were basically not contrary to theirs. In addition, new defenses were developed for sociobiology by Wilson and others.

It was noted that there was no such thing as biological determinism, since any theory of human behavior must incorporate environmental variables (Masters, 1981: 139; Wilson, 1977 / 1982: 41). On the other hand, determinism was justified in some senses, since some sort of determinism is usually presumed to be true at the beginning of any scientific inquiry (Caplan, 1980: 99). It is "simply a general assumption that causes work, not a decision to back one set of them against another" (Midgley, 1979 / 1980: 22). That a particular sociobiological explanation may mistakenly overlook a particular selective pressure cannot falsify the sociobiological approach in general, since it is an approach that deals with selective pressures, "and the existence of such pressures is not contradicted by their lack of genotypic-phenotypic manifestation" (Barkow, 1980 / 1982: 61). Culture merely provides an added selective factor in human evolution. Cultures certainly evolve, and in so doing they complicate the application of sociobiology to humans (Barkow, 1980 / 1982: 63), but complication is a world apart from

prohibition.

As for the evidentiary issue, philosopher of science Michael Ruse pointed out that the critics themselves acknowledge evidence that schizophrenia is genetically controlled (Ruse, 1978: 364). With at least one example of genes as the basis of behavior, more would likely follow, destined to further weaken the critics' case.

That there are so many discrepancies in the scientific criticisms of sociobiology points to ulterior motives. Responding to Allen et al in his own letter to the *New York Review of Books* and to the Sociobiology Study Group is his own *BioScience* piece, Wilson says they pieced together bits of his work to make it appear that he espoused conservative politics (Wilson, 1975 / 1978: 265). This would certainly explain why Wilson's science was not at all what they made it out to be. He suggests that they have did so merely to have "a conspicuous straw man against which their view can be favorably pitted" (Wilson, 1976 / 1978: 293). Turning Gould and Lewontin on their head, biologist David C. Queller coined the term "So-Just Stories" to describe those in which "the storyteller justifies his own views by denigration of an alternative said to derive from tainted cultural roots or to promote undesirable social ends," and his favorite is that of the Marxist scientists who told of "how the sociobiologist got his spots" (Queller, 1995: 488).

Able neither to confirm nor deny conservative politics, sociobiology simply provides "a theoretical framework that may help us understand why an organism behaves the way it does" (Emlen, 1980: 127). Others including Wilson himself agreed that it is a discipline rather than a particular theory (Wilson, 1980: 296), and that some scientists will find useful while other do not (Barkow, 1980 / 1982: 72). Sociologist Marvin Bressler argued that sociobiologists should not be condemned for the flaws of their Social Darwinist predecessors simply because their pursuits

have something in common: “We do not rebuke astronomers because astrologers also presume to scan the heavens” (Bressler, 1981: 183).

Beyond simply denying support for conservative politics, Wilson actually described himself as a liberal. Indeed, altruism is stated as the central theoretical problem of sociobiology. The gene may be selfish, but the individual is not. Wilson is out to justify selflessness as natural, to move past mere arguments about individual survival which, when misapplied, led to Social Darwinism. Supporting the idea that sociobiology can, in fact, be consistent with liberal politics, Masters argued that impersonal social systems are intrinsically dangerous because they make the practice of altruism difficult and thus cause social instability (Masters, 1981: 158). Indeed, the French, Russians and radicals such as Herbert Marcuse and Noam Chomsky (Masters, 1982: 286; Degler, 1991: 319) have taken up sociobiological explanations to justify leftist politics.

Nature/Nurture — Two Debates in Search of a Reconciler

A balanced view of sociobiology appears most clearly in the views of those who chose not to take sides in the debate. Bressler suggests that “Sociobiology can be claimed as an ally by partisans of competing ideologies” (Bressler, 1981: 185), and quotes sociologist Robert K. Merton to explain the implication: “... the fact that functional analysis can be seen by some as inherently conservative and by others as inherently radical suggests that it may be *inherently* neither one nor the other” (Bressler, 1981: 187).

James Silverberg, speaking from an anthropologist’s perspective, claims that it is important to understand levels of analysis. Biology and culture are different levels, and while analysis at one level cannot contradict analysis at another level, consistency does not imply

causation from one level to the next. There is nothing wrong with sociobiology's attempt to synthesize, yet anthropologists do not see reductionism as a form of synthesis (Silverberg, 1980: 37-8). Similarly, social anthropologist Jerome H. Barkow suggests that human social behavior can be explained in terms of evolution, physiology, individual experience and psychology, and cultural organization, and that all of these factors must be compatible with one another. However, none will be likely to be predictable from another (Barkow, 1980: 181).

The status of sociobiology is best summed up by Midgley. On one hand, she turns the tables on the evidence issue, suggesting that the burden of proof always lies on the more extreme theory — in this case, the extreme environmentalism that attempts to entirely exclude innate causes (Midgley, 1979 / 1980: 21). Nevertheless, she does not stand with Wilson, claiming that biology cannot be a favored cause simply because it is prior, otherwise “the original big bang would be the only true explanation of everything, and we all ought to be doing astro-physics” (Midgley, 1979 / 1980: 25). In the end, sociobiology is “neither a heresy to be hunted down, nor a revealed doctrine necessary to academic salvation. It is instead the usual kind of mixed picnic hamper” (Midgley, 1979 / 1980: 17).

Writing on his own after the peak of the debate, even Gould came to express a more moderate view. With respect to adaptationism, Gould acknowledged that not all of sociobiology proceeds with this method and that the more rigorous cases are worthwhile (Gould, 1980: 262). Sociobiology has been very fruitful when applied to non-humans and is questionable only with humans because of the cultural element. Even then, he loosened culture's omnipotent grip, saying that “even when an adaptive behavior is nongenetic, biological analogy may be useful in interpreting its meaning. Adaptive constraints are often strong, and some functions may have to

proceed in a certain way whether their underlying impetus be learning or genetic programming” (Gould, 1981: 327).

Gould and his cohorts are often characterized as disputing sociobiology for imposing limits on human potential, but Gould acknowledges that human behavior may not be infinitely malleable. In his book *Full House*, which is primarily about how limits affect evolution, he suggests that practitioners of the performing arts, including musicians and athletes, likely “stand close to right walls of human limitation” (Gould, 1996: 225), and that those involved in the creative arts, such as writers and composers, may even have reached the limit. Gould believes that we are not likely to produce a writer greater than Shakespeare or a composer superior to Mozart (Gould, 1996: 228-9).

Given that the truth, as is so often the case, would likely reside somewhere in the moderate view, between the two extremes of heredity and environment, it seems that the very opposition of the two factors may be at the heart of the problem. Indeed, at the AAAS symposium on sociobiology in 1978, Silverberg suggested that the nature/nurture dichotomy is false, yet that scientists perpetuate it by favoring biological or cultural explanations, despite that fact that all reasonable scientists say they believe in epigenesis, or interaction between the two systems (Silverberg, 1980: 38-9). This appears to be exactly what happened in the sociobiology debate.

According to van den Berghe, social scientists in general tend to be plagued with dualistic thinking. Indeed, thinking in terms of binary oppositions may be genetically hardwired in the human mind. Among other things, this has led social scientists to view nature/nurture as an opposition rather than an integration. Modern scientific thinking, on the other hand, is essentially

monistic (van den Berghe, 1978 / 1982: 15). The dichotomy of nature and nurture, when pulled into modern science, became a full-fledged either/or debate, with monistic theories about nature fighting monistic theories about nurture. Under the guise of scientific pursuit, the debate rages on rather than being reconciled. Indeed, if the underlying reality is integrated, favoring one factor over the other causes the mere spinning of wheels, with monism pointed in the wrong directions, missing the forest for the trees. With nature/nurture dovetailing so greatly between hard science and the inherently dualistic social sciences, the tendency against union is only enhanced.

Philosopher of science Arthur L. Caplan notes that care must be taken in labeling scientific explanations of behavior, e.g., genetic, compared to the set of factors that can act as causes in such an explanation, e.g., hereditary, developmental or environmental. Consistent with arguments on both sides of the sociobiology debate, Caplan says that “it is simply wrong to assume that ‘cultural’ explanations of behavior allow no room for biological factors, or that ‘genetic’ explanations exclude any type of environmental factors” (Caplan, 1980: 100). Further, heredity/environment is not the same as sexual transmission/social transmission, yet these concepts have been fused by the problematic shorthand of “nature/nurture” (Silverberg, 1980: 41).

Progress appeared to have taken place in the debates with the either/or question being replaced by an inquiry into how much of each was relevant in any given circumstance (Livingstone, 1980: 307), but as Gould says, “We cannot factor a complex social situation into so much biology on one side, and so much culture on the other” (Gould, 1984: 32). Elsewhere, he calls the dichotomy nonsensical (Gould, 1976 / 1978: 343).

Even the Marxist approach may permit a reconciliation. Scientist Piotr Fedoseev affirms

the Marxist stress on the social but says that “we are also against the oversimplified notion that man is completely separated from nature. Man is a social as well as a biological creature, for he is part of nature” (Fedoseev, 1976 / 1982: 326). He defends the Marxist thesis that “human nature is a product of history” inasmuch as both biological and cultural evolution are affected by an environment changing over time (Fedoseev, 1976 / 1982: 328). Social groups can only be understood in social terms, but individuals can be understood from an interaction of social and biological factors (Fedoseev, 1976 / 1982: 326).

Wilson didn't mean for sociobiology to be the straw-man that the Sociobiology Study Group made it out to be. He intended it as a fully formed discipline to be accepted. But, political rhetoric aside, it became a straw man simply by virtue of its being the first earnest attempt to deal simultaneously with both nature and nurture, the biological sciences and the social sciences. That it was not the final solution cannot be held against Wilson, who deserves credit for reopening the question of how biology and culture may be related (Lieberman, 1989: 677). An attempt to deal with both, even if it seemed weighted toward one, i.e., genetics, helped point the way toward an acknowledgment of interaction: “It has led to increased communication among biological and social scientists, and the ensuing debate should lead to a more rigorous definition of the issues and surely some advanced in our understanding of human behavior” (Livingstone, 1980: 307).

Barkow says that “Sociobiology ‘ has come to mean not the all-devouring synthesis for which Wilson originally intended it but simply the application of modern evolutionary biology to all species, our self included” (Barkow, 1980 / 1982: 72). To reject it in this form truly pushes the envelope of monistic cultural reductionism. But to accept it is no solution either. Neither sociobiology nor the hurlyburly surrounding it could truly move the nature/nurture debate forward

precisely because, for practical purposes, the debate bought into the opposition of the factors.

According to sociologists Janice I. Baldwin and John D. Baldwin, “a central criterion for an adequate theory [of human study] is that it not be biased toward either nature or nurture” (Baldwin & Baldwin, 1980 / 1982: 311). They propose a balanced biosocial theory which recognizes both factors as crucial and complimentary in human development. Anthropologists Peter Richerson and Robert Boyd conclude that only a model of coupled cultural and genetic control can explain the results of ethnographic studies (Wilson, 1977 / 1982: 37).

Moving these ideas forward, anthropologist William Durham proposes a coevolutionary synthesis, arguing that models for the evolution of human social behaviors should “explicitly integrate both the genetic and the cultural inheritance mechanisms” to better deal with behaviors which may stem from either one (Durham, 1979 / 1982: 88). Such an approach avoids false dichotomies simply by acknowledging that there are multiple factors involved and refusing to play an either/or game. As for sociobiology, Durham maintains that the burden of proof falls on its proponents to demonstrate a genetic basis for any behavior but does not at all deny the possibility.

A coevolutionary approach helps clarify how some traits identified as genetic universals may simply be cultural universals — cultural traits that have pervaded every human culture — or, perhaps more importantly, false cultural universals — cultural traits have pervaded almost every human culture. Either way, but especially in the second case, there is all the more reason to distinguish the two, and the possibility arises of appeasing both sides of the sociobiology debate. Additional work in this realm has been pursued by people in widely different fields, including anthropologists Alan R. Rogers (Rogers, 1988) and Alexander Alland, Jr., political scientists John Langton, Thomas Landon Thorson and Roger Masters, sociologists Marion Blute and Joseph

Lopreato, and economists Richard Nelson and Sidney Winter (Degler, 1991: chap. 13). The interdisciplinarity is perhaps not coincidentally evocative of the integration coevolution seeks.

Just as Gould eventually drifted toward more moderate views, Wilson himself came on board with coevolutionism, fully acknowledging the interaction between biology and culture (Degler, 1991: 310) and agreeing that the nature/nurture dichotomy must be replaced (Wilson, 1980: 302). Sociobiology seemed itself to evolve toward coevolution when Wilson and his and co-author Charles Lumsden proposed their Gene-Culture Theory of Evolution (Gould & Gould, 1983: 66). While models of cultural evolution may not prove to be Darwinian in the strictest sense, they could certainly be Darwinesque, incorporating positive selection based on cultural criteria (Durham, 1979 / 1982: 78). Indeed, the negative selection of Darwinism was inspired as an analogy to the positive selection of artificial breeding.

In all the discussion about the heredity vs. environment issue of human nature and development, though, it is almost shocking that nobody seems to have pointed out that one of its tangential issues is really a second manifestation of the same issue, itself a volatile and age-old debate: the relationship between man and nature. Niles Eldredge recognizes that these two issues are related in complex ways (Eldredge, 1997: 18). Nature/nurture is about the dynamic of organismic development — what factors cause an organism to become what it becomes, heredity or environment? Man/nature is about the static relationship between humanity and everything that is considered to be in the realm of nature, inquiring about humanity's position with respect to nature — are we an integrated part or somehow uniquely separate? Like its counterpart, the man/nature issue is usually phrased as an opposition with the obligatory “versus” as the link which suggests that there is, in fact, no link. Just as organisms were thought to develop because of

either nature or nurture, man is posed as something outside of nature.

The nature/nurture debate, of course, occasionally touches explicitly upon the man/nature. The controversy over sociobiology brought this out extremely clearly when its detractors were occasionally accused of their own secular form of Creationism, as when they were compared to Bishop Wilberforce, who spoke so strongly against Darwin (Midgley, 1979 / 1980: 34; Caplan, 1980: 100). However, it never seems to be acknowledged how crucial this second version of the debate is to the first. If nurture wins in nature/nurture then man wins in man/nature — man is independent of nature, free to evolve outside its constraints. But all other outcomes — nature dominant or integrated — bring man back into the fold, equated with all other organisms. Gould, Lewontin, et al thus end up strange bedfellows with Creationism in a fundamental way overlooked by those who point merely to their antagonism toward genetic explanations. This is particularly ironic given that Gould equated the just-so stories of sociobiology with those of Biblical literalism.

Why does nature vs. nurture remain one of the great issues in science when all reasonable scientists espouse their interaction? It seems likely that, despite similar acknowledgments that man is likewise integrated with nature, the man/nature opposition is still generally adhered to, in practice if not in principle, making it the more fundamental issue, the one whose reconciliation could once and for all dispel the illusion of a nature/nurture debate.

Karl Peter and Nicholas Petryszak cite W.R. Bates as emphasizing that the prime goal of biology should be to clarify what qualities set humans apart from the rest of creation (Peter & Petryszak, 1980: 45). Again, a parallel appears between scientists and Creationists in espousing an anthropocentric view of man's place in nature, the doctrine of human exceptionalism. Indeed,

Carl Sagan points out that many of the central debates in the history of science are at least in part over whether humans are special, devoting an entire chapter of Pale Blue Dot to “The Great Demotions,” the various developments in science which moved humanity away from any favored status in the universe (Sagan, 1994: chap. 3). Sagan points also to the Anthropic Principle as having operated throughout the history of science, first in its weak form in which it is suggested that there would not be humans if the laws of nature were different, but in some cases in its strong form, stating that the laws of nature exist *so that* humans would eventually come to be. Ironically, like Gould and Lewontin, Sagan draws a parallel to Voltaire’s Dr. Pangloss (Sagan, 1994: 34).

Ecologist Garret Hardin cites some important elements to this doctrine noted by sociologists William Catton and Riley Dunlap. Among them are that people are fundamentally different from all other earthly creatures, over which they have dominion, and that people are masters of their destiny (Hardin, 1993: 161-2). This firmly establishes the connection between the two manifestations of the nature/nurture debate — the first is clearly man dominant over nature while the second echos the extreme environmentalist attitude with nurture beating nature. Challenges are increasingly being made to this doctrine because it is proving itself to be “patently unecological” (Hardin, 1993: 162) and also because similarities continue to be found between humans and non-humans, even if they may be the result of different inheritance systems. Looking at a great variety of behaviors and qualities expressed both by human and non-humans, Carl Sagan and Ann Druyan have argued in Shadows of Forgotten Ancestors that there is essentially nothing that is uniquely human (Sagan & Druyan, 1992). If one takes up the view of some critics of sociobiology, that similar behaviors can be the result of genetics in non-humans and culture in humans, one must still show culture to be uniquely human. Even this idea cannot be completely

defended (Ruse, 1978: 371; Eldredge, 1997, 21), since any learned behavior can be construed as culture.

Even Marxism, which found a way to reconcile nature and nurture, will forever be tied to human exceptionalism. The means of production may not belong to individuals, but societal ownership trumps that of the rest of non-human nature (Fedoseev, 1976 / 1982: 331). Biologists James L. Gould and Carol Grant Gould support this notion, saying, “As adamantly as the creationists they ironically despise, Marxists require our species to be unique” (Gould & Gould, 1983: 67). The Marxist claim that man is a part of nature ends up bankrupt.

Wilson himself intends for humans to be seen as part of a continuum of nature, evident from the first sentence of the controversial 27th chapter of *Sociobiology*: “Let us now consider man in the free spirit of natural history, as though we were zoologists from another planet completing a catalog of social species on Earth” (Wilson, 1975a: 547). But even in their kindest moments, when his critics suggest that sociobiology may be fruitful when applied to non-humans they must add the caveat that it is problematic for our own species. Biologically deterministic theories are said to have “the enormous potential for *demystifying* human behavior” (van den Berghe, 1978 / 1982: 17) and can even “demean and belittle humankind” (Caplan, 1980: 98). Sociobiology may be more difficult to apply to humans due to the cultural factor, but it is problematic per se only if one accepts human exceptionalism: “How do we claim that [evolutionary biology] is irrelevant to our own species... without camping out with the antievolutionary Creationists for whom man and beast must forever be separate by the latter’s lack of a soul?” (Barkow, 1980 / 1982: 61)

Beyond even all this, the two false dichotomies are further falsified in that more than two

factors are involved in each case. In the development issue of nature/nurture, nature refers to the genes while nurture refers to two things — culture is crucial but only a subset of the larger, complete environment. Indeed, non-humans who are claimed not to have culture nevertheless evolve with a nature/nurture interplay. Man/nature in the positional issue is even more misguided with multiple factors on both sides. Man, of course, deals with people as both genetic and cultural beings, while nature includes both the physical, supracultural environment as well as other individual, non-human organisms, themselves carrying unique genomes. Darwinian evolution always involved the two factors of heredity and environment, but in the 20th century debate both of these factors came to be subsumed in the nature part of the equation simply by virtue of the fact that they are both part of *biological* evolution, with culture becoming the only thing referred to as nurture. Indeed, the biology/culture debate is thus subtly yet crucially different from the nature/nurture debate.

On top of everything else is the fact that the entire enterprise occurs over time. This is crucial in understanding the idea of limitations. Some may argue that cultural progress is inherently unlimited, but, just as a trait's existence at a given moment does not mean it had to have been selected for in the past, a trait's existence now does not mean it cannot prove itself maladaptive in the future. Culture evolves quickly and may appear unlimited in the short-term, but long-term circumstances, most notably those related to the physical environment, may very well end up limiting cultural practices.

In the end, there are at least three key factors influencing an individual organism's evolution — its own genes, the complete non-cultural environment and, to the extent that it exists, the cultural environment of learned behaviors — and all operate over time. Interestingly,

the cultural factor resembles each of the other two factors: it is both an inheritance system and a set of given circumstances. None of this suggests any need to coin, e.g., ecobiocultural evolution or ecosociobiology but simply a need to recognize that the nature/nurture issue is a flawed concept in two ways. Not only do both manifestations of the conflict actually reconcile to integration and therefore no conflict at all, but both also squeeze at least three domains into two, therefore misrepresenting the entire dynamic.

Conclusion: Toward a Resolution

In his *Scientific American* millennium piece, Franz deWaal mourns, “We remain as far removed as ever from a sophisticated understanding of the interplay between genes and environment... we still love to phrase everything in terms of one influence or the other, rather than both” (de Waal, 1999: 96). Later, though, he is hopeful that “the traditional either/or approach to learning and instinct will be replaced by a more integrated perspective” (deWaal, 1999: 99). But this kind of optimism has been expressed by scientists since at least as long ago as when Wilson first published *Sociobiology*.

As for sociobiology itself, as originally proposed it could not be the final synthesis of nature and nurture, since it was only concerned with the biological basis for behavior and not with other possible bases. That the field may evolve toward a more explicitly integrated pursuit cannot change this original goal. Should it do so, as Wilson himself appears to have done in heading toward coevolution, historians will need to acknowledge this, just as we now grant so much explanatory power to Darwinian natural selection even though it was not truly powerful until the neo-Darwinian synthesis.

On the other hand, sociobiology's critics were shown to have blown a great deal out of proportion in the name of political rhetoric. Further, in criticizing the extreme of biological determinism, they tended to swing themselves to the opposite extreme, that of cultural determinism. In overlooking the potential limitations to cultural progress that could come from the physical environment, they perpetuated not only the nature/nurture dichotomy but the more fundamental and more harmful opposition of man against nature.

Whether or not we continue to use the term sociobiology, a reconciliation is not only possible but necessary. Nature and nurture are complementary in human development. Further and more essentially, nature and humans are complementary ecologically. In each case, the factors are teammates, not opponents as they have traditionally been made out to be. Why does this not seem to be the case? Because, as Gould and Lewontin have repeatedly pointed out, adaptation is not the answer to everything. Certain traits can be maladaptive, or at least certain traits that once were adaptive can become maladaptive in different circumstances.

What, then, could the synthesizer be? If various fields of study are inherently related, then none can be said to be the glue that binds the fields together. That one particular field may start to see the connections sooner would bode well for integration but confers no truly special status on the field itself. If fields are interrelated, their integration will require people from all fields who are sensitive to and knowledgeable about areas other than their own. The function of integrated knowledge will follow the form of its pursuit, interdisciplinarity. The synthesizer, then, is more likely to be some kind of integrative approach rather than any particular field of research as such.

Historically, the positional issue of man/nature arose long after the interplay between biology and culture actually evolved modern humans, only once there could be such things as

cultural and social issues. It is difficult to know which of the man/nature or nature/nurture debates arose first. Nevertheless, the man/nature issue seems to have conceptual if not temporal primacy. Scientists and others may continue to argue over the superiority of heredity or environment in explaining human nature as long as the flawed opposition of man against nature lies underneath everything as one of the most basic assumptions of our global culture. Thus, the reconciliation of man and nature may provide a framework for synthesis. Alternately, it may be one of the many results of a nature/nurture reconciliation, heightening the need to strive in different ways for integration on the developmental issue.

With the nature/nurture debates reconciled, where would humanity be left on the issue of uniqueness? The key seems simply to lie in allowing for the uniqueness of human culture without placing it outside of nature. Van den Berghe states: “Sociobiologists are quite happy to recognize that the human species is unique in *some* important respects. So, for that matter, is every species; otherwise it would not be a species. Human beings are not unique in being unique” (van den Berghe, 1978 / 1982: 19). Out of the heat of battle, Gould echoes this sentiment: “We are inextricably part of nature, but human uniqueness is not negated thereby... It is not mere hubris to argue that *Homo sapiens* is special in some sense—for each species is unique in its own way” (Gould, 1981: 324). As Young argues, “the uniformity of nature was progressively assumed to apply to the history of life, including the life and mind of man” (Young, 1985: 120). Indeed, given a uniformitarian outlook, it would be absurd to think of anything about humanity as different in kind from everything else in the universe. Further, uniformitarianism not only allows for human uniqueness within nature but may itself provide a potentially integrative approach to the nature/nurture issues.

Wilson poses that every discipline has a complementary antidiscipline and indeed that each is itself an antidiscipline (Wilson, 1977 / 1982: 30), yet he suggests that ecology is an “orphan discipline” as a result of its focusing on the highest level of biological organization, the community (Wilson, 1977 / 1982: 32). Perhaps, with all other levels of analysis presupposed, ecology may be the one field that could itself be a synthesizer. At the very least, an ecological perspective, inherently holistic, may, by definition, provide integration.

Emlen recognizes that human societies must always face ecological constraints and that modern, industrialized societies, evolved culturally, may have broken the feedback systems which allow for ongoing ecological adaptation. This very scenario makes it difficult for sociobiology to make strong statements or predictions about the optimality of social structure (Emlen, 1976 / 1978: 340). Perhaps the diversity which is prized by ecology further indicates that it is pointless to look to nature for a comprehensive ethical system, not because biology doesn't have anything to tell us but because, as with coevolutionary theory and an integrated picture of both nature/nurture and man/nature, biology might not have everything. Indeed, since ecology covers all that lies beneath it, from genes to culture to the physical environment, a coevolutionary approach framework seems to harmonize nicely with the ecological perspective.

Hardin and Eldredge both suggest that human exceptionalism is at the heart of our global economic system and that we will simply not be able to ignore it for much longer. Its ecological effects are undisputed and can even be tied to many widespread social ills. Durham has suggested that the insights gained from a coevolutionary perspective should “prove useful as tools for contemporary social change” (Durham, 1979 / 1982: 92). Perhaps, then, a coevolutionary approach which takes care to incorporate all relevant ecological factors, including the physical

environment which was left far in the background of the sociobiology debate, may yield the integration required for resolving dichotomies, synthesizing fields of study and moving forward with social change. Should this occur, perhaps there may even be a reconciliation between those who supported sociobiology and those who opposed it.

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