There are all sorts of things that would be comforting. I expect an injection of morphine would be comforting. . . But to say that something is comforting is not to say that it's true.

Richard Dawkins

The current debate between evolutionary psychology and human behavioral ecology is just the latest version of the tired old nature/nurture debate. Evolutionary biology and psychology have been used, often inaccurately, as support for a reactionary argument that since much human conduct is hardwired, ideologies that hope to "engineer" human nature towards more altruistic and communitarian behavior are doomed to failure. Human behavioral ecology, on the other hand, is the latest response to that discourse: it proposes that very little, if any, of human nature is hard-wired, because we have constantly evolved and adapted to an unstable and dynamic environment. Both positions take too much for granted, and selectively ignore evidence and (sometimes) common sense. For us anarchists, this is not just an academic exercise. The survival and continuing relevance of anarchism depends on a proper and scientifically grounded analysis of what it means to be human.

This article is intended in part as a followup to my piece about four years ago in Social Anarchism issue 37, "Anarchism and Human Nature." In that essay I discussed neo-Darwinism, its attack on sociobiology and the latter's successor theories, and explored cognitive science as a possible way out of the difficulties. In the present article I would like to pursue some more recent aspects of the controversy, in particular the claims of human behavioral ecology, a relatively new discipline that attempts to update and refine sociobiology and to explore the complex interrelationships between the human mind and the world "out there." It has come in for some heavy criticism from the academic and political left, on the grounds that it is just another semi-disguised attempt to justify inequality, sexism and a host of other evils as innate (and therefore incurable) genetic legacy from our primitive ancestors. This is nonsense - though the behavioral ecologist do have a habit of handing ammunition to their enemies. The ongoing debate is of interest to anarchists, because we, like all the other leftist or anti-authoritarian movements that arose in the nineteenth century, have based our view of human nature on the "blank slate" model proposed by Locke and further developed by John Stuart Mill and the pioneers of the social sciences and modern psychology. The entire socialist project of the last century and a half would not have been possible without an assumption that human beings are born "empty" enough to be filled with the right sort of social conscience.

But we are not born empty. The left can no longer ignore the overwhelming scientific evidence, and we cannot evade the issue by ad hominem attacks on those who disagree with our worldview. Fortunately, the new science does not really render hopeless our hopes for a better future. It does, however, require us to melt down and re-cast our basic assumptions. Among these are:

- dichotomization: we all know by now that the nature/nurture debate is a false dichotomy, a red herring; let's get over it. Many if not most of the cherished dichotomies of western civilization are false: innate and learned, individual and society, organic and inorganic, myth and history, brain and mind, God and Satan... it's a very long list. We in the West have been dichotomizing the
world ever since Aristotle invented formal logic. One of the best things evolutionary psychology has going for it is its unequivocal rejection of the nature/nurture dichotomy.

human nature: yes, there is such a thing, and at least some of it is hard-wired or innate. We need not go as far as Steven Pinker, who writes that "All the potential for thinking, learning and feeling that distinguishes humans from other animals lies in the information contained in the DNA of the fertilized ovum."1 We are flexible enough to build a free and democratic society, a world without arbitrary authority and oppression, an ecologically sustainable world community. But it will take a lot of hard work, because there are deeply rooted human attributes that run counter to those goals, and we will not eradicate them. We will have to work around them. And we should probably find a better term than human nature. As William Cronon wrote a dozen years ago, it "compresses such diverse and complex phenomena into such a flat, colorless cartoon that it erases most of the things scholars wish to understand."2

individualism: one of the most noble ideas anyone ever thought of - if we define "individual" correctly. The establishment of a rigid boundary between "me" and "the other" is no doubt related to the boundary-madness of Western civilization. The earliest farmers bounded their fields; they drew a line between "mine" and "thine" and by extension, between "us" and "them." The drawing of boundaries is addictive and self-perpetuating. But the ego boundary is "a recent and parochial invention of human culture."

utopianism: not all anarchists are infected, but many are; see for example Zerzan’s primitivism. This is not just an error, it’s a device of the enemy, and one that even Marx fell for. A central objective of mechanistic Western civilization is the constructing of an earthly paradise, a rebuilt Eden. Nature as presently constituted does not fit the bill, because most of it is outside our control and domination. This will have to be a paradise without all the unpleasant bodily functions so feared by us, including sex and even death. It must be a pure and sterile machine. "Destruction is its prelude," says Paul Shepard. "The orgies of spoiling, the messianic and apocalyptic atmosphere, the hatred of history and tradition" all typify this suicidal goal. What anarchism needs to strive for, in contrast, is a future in which we recognize that healing one’s self and healing society are the same thing.

reification: the very bad habit of seeing processes as discrete "things." Remember, you can’t step into the same river twice. You are a process, and so is your brain. Much of the misunderstanding between evolutionary psychology and behavioral ecology (not to mention many other philosophical and scientific debates) would evaporate if we understood that whatever we call our mental functions - modules, gestalts, holons - are processes, not permanent or isolated entities.

Before delving into the current debate, we need to define some terms. One central source of the dispute is a failure to understand that evolutionary psychology and behavioral ecology or genetics are not in competition; they have different priorities, and if we focus on the commonalities rather than the disagreements, we see that they are complementary. “Evolutionary psychology and behavior genetics,” say Cosmides and Tooby, are animated by two radically different questions:
What is the universal, evolved architecture that we all share by virtue of being humans? (evolutionary psychology)

Given a large population of people in a specific environment, to what extent can differences between these people be accounted for by differences in their genes? (behavior genetics)

In other words, evolutionary psychology looks for universals, and behavior genetics or behavioral ecology looks for particulars. These are not two different questions, but two sides of the same question. The answers will not be contradictory. We need both if we are to come anywhere close to an accurate understanding of human nature. It makes no sense to argue, on the one hand, that all humans share the same genetic makeup, and on the other, that there is no universal human nature. Genome studies have by now made it abundantly clear that traditional categories such as race and ethnicity, and even to a degree gender, mean very little: we are all virtually identical when we look at our DNA. At the same time, one can take any two people at random and see - very easily - that we are not all alike. Obvious to the point of cliche, perhaps, but not trivial. The error of racism, as so many thinkers have pointed out (without much impact), is the error of judging individuals on the basis of traits, real or imagined, of groups to which they are perceived to belong.

Evolutionary psychology has an impressive pedigree. Darwin predicted something like it in the last chapter of the Origin of Species, and William James wrote in his Principles of Psychology that nearly all of our behavior is what he called "instinctive" rather than the product of reasoning. "Instinct" is not a word we would want to use today, but James had a point. It is a widely held belief that while all other animals act on instinct, humans primarily use reason. Leda Cosmides and John Tooby point out that this is mere semantics: "reason" is the name that we give to our instincts. (These two are co-directors of the Center for Evolutionary Psychology at UC Santa Barbara, and their lucid online primer is a major source for this article).

The "blank slate" model has a very long history, and it has been associated at least since the seventeenth century with left-of-center political thought. (It is an example of what logic calls the moralistic fallacy: because something is obviously morally wrong, it cannot be a product of innate human nature. Humans are good; if they do bad things, it's because they learn to do them.)

The development of psychology, philosophy, sociology and biology in universities rather than "on the street" strengthened the bond, due to the generally Uberai atmosphere at those institutions, and the genuine desire of academics to make the world a better place. The connection runs so deep that many of us on the left believe it subconsciously, and react in knee-jerk fashion when it is criticized. This is an association that we must break.

Aristotle proposed the tabula rasa in His De anima, and it was transmitted by Avicenna to the medieval scholastic philosophers. In its modern form it was systematized by John Locke in his Essay concerning human understanding (1690). Not only is the human mind "empty" at birth, says Locke, it is even devoid of rules or mechanisms for processing information. British empiricism, which has informed so much of Western liberal thought, arose from Locke's analysis. Undeniably good results followed: individualism; the basic human right to be and shape oneself; Mill's simple axiom that society has no right to control me beyond preventing me from doing harm to others. Then Darwin came along, and disproved the tabula rasa. And bad results
followed: Social Darwinism, eugenics, the Übermensch, gas chambers to cleanse the gene pool. It is not surprising that a century which saw Nazi racism made even mainstream philosophy and science suspicious of any innate human nature. We would all rather believe that our minds are flexible enough to be educated out of our nasty habits. Unfortunately this can boil down to rejecting Darwin, something we also try to avoid so as not to be classed with the Bible-thumpers.

The "mind as computer" analogy is just the latest of a long series of metaphors for the blank slate, but it is an exceptionally pernicious one. A computer starts out with nothing but an operating system; it is devoid of all substantive content. First, programs are added to manage certain types of data (word processing, spreadsheets, games) and then we superadd information to those programs, which are used to move it around or recombine it. Ingenious models have been devised to explain the human brain in the same manner. But brains are not computers: first of all, they are organic, not mechanistic; and second, they are self-organizing: they do not require an outside operator.

This pernicious metaphor requires a few more examples. Here are some quotations from Cosmides and Tooby, in which the choice of words is perhaps more significant than the content.

"Principle 1. The brain is a physical system. It functions as a computer. Its circuits are designed to generate behavior that is appropriate to your environmental circumstances." And in the next sentence they contradict themselves: "The brain is a physical system whose operation is governed solely by the laws of chemistry and physics." The latter statement is of course true, but computers are designed and built, while brains evolve through natural selection. The use of the words "designed to" here expose a weakness in their reasoning: designed by whom? It reminds one of "intelligent design," and of the argument from ignorance: "because I cannot understand how this entity could have come into being without someone designing it, therefore someone (or something) did design it." The ubiquitous computer has become the template of our times, used and misused as a metaphor for nearly every process or structure one cares to name. The fact that "he has a mind like a computer" is a compliment is rather scary.

The authors go on to toss around such terms as "neural circuits" and "information-processing programs" and "micro-machines" and this rather scary sentence: "Adaptations are problem-solving machines, and can be identified using the same standards of evidence that one would use to recognize a human-made machine: design evidence."

Partly because of the baneful effects of Darwinism (effects which Darwin himself saw coming, and was horrified by) the blank slate hypothesis continued to dominate the social sciences. Freud, while not denying heredity altogether, postulated that environment and experience shape most of our psychological landscape. Psychology has been dominated by that view ever since, though it is beginning to take genetic influences more seriously. We are coming to see that genes and environment are so thoroughly entangled that it makes no sense to try to draw a fine between them: in other words, there is an ecology of mind. Here the deep ecology idea of Self-realization (with a capital S) is useful: we do not understand ourselves or the world until we realize that there is no boundary between the two. The resistance we see among so many anarchists and socialists to evolutionary psychology is an infelicitous relic of a nature/nurture battle that has been pretty much laid to rest. The factors that make us what we are cannot be fully counted or
measured. Twin studies or tinkering with IQ tests can barely dent this problem. Worse yet, nearly all testing of hypotheses - on both sides of the question - is warped by modern scientific method, which tries to understand complex phenomena by breaking them down into simpler pieces, putting them into isolated boxes and looking at them under the real or metaphorical microscope. And still worse, research is often pushed in certain directions by political pressures or the exigencies of grant-seeking.

"Everything is connected to everything else," and "meddling with the part affects the whole" - these insights are among the oldest human intuitions we know of. Much of Murray Bookchins work over five decades was aimed at discovering how, when and why western civilization lost sight of that intuition. Parmenides and Heraclitus understood it; their pupils Plato and Aristotle did not, and we have been dealing with the consequences ever since.

A relatively new field of study, sometimes called "gene-environment interaction," shows promise. It is now understood that the expression of some genes - that is, how they are switched "off" and "on" - can be affected by environmental input. For example, phenylketonuria is an autosomal recessive genetic disorder in which a lack of the neurotransmitter tyrosine can cause retardation and seizures. But a diet low in phenylalanine (found in artificial sweeteners, for instance) can help suppress the disease, "turning off the culprit genes. Perhaps more to the point, countless experiments (mostly on animals) have shown that behaviors once thought instinctive need to be switched on by experience: for instance, newly hatched ducklings no doubt have a genetic propensity to fixate on their mothers quacking; but if the eggs are taken away from the mother and incubated in silence, the ducklings do not exhibit that imprinting at birth. This is a long ways from demonstrating that the genes responsible for higher-order brain functions like reasoning can be manipulated by environment, but it's a good start. If nothing else, it proves that our DNA is not locked in a box that the outside world cannot penetrate. While gene expression studies will no doubt support behavioral ecology, they will not invalidate evolutionary biology or psychology: the genes themselves are not going away. Still, Pinker may not be quite right when he writes disparagingly that culture "is not some miasma that seeps into people through their skin."5

The controversy between evolutionary psychology and behavioral ecology has unfortunately narrowed down to a handful of issues that appeal to the - shall we say - more prurient appetites of the general reading public. These issues involve, of course, sex and violence. A Natural History of Rape: Biological Bases of Sexual Coercion, by Randy Thornhill and Craig Palmer, set off an academic rumble when it was published in 2000. The authors (a biologist and an anthropologist) propose that rape, along with other disagreeable behaviors like the neglect or murder of stepchildren and cheating on spouses, is an evolutionary adaptation aimed at propagating one's own genes at the expense of other peoples. This is of course an aspect of Richard Dawkins "selfish gene," an idea6 condemned with evangelic fervor by pretty much everyone on die left, and by many respectable scientists (like Stephen Jay Gould) as well. Newsweek took notice of the controversy in the summer of 2009, telling us "Don't Blame the Cavemen." Since the publication of the rape study, opponents of evolutionary psychology have conducted a host of new studies seemingly disproving many of its contentions, and in 2005 David Buller of Northern Illinois University published a general condemnation, Adapting Minds (a title obviously selected to challenge the 1992 evolutionary psychology classic text The
Adapted Mind). The controversy has been exaggerated in the popular media, but academia is not blameless, either. Buller does not condemn evolutionary psychology, in fact he endorses it enthusiastically. But he then goes on to single out particular aspects of the theory, attacking them as if they were an altogether separate hypothesis. More on this later.

Recent studies suggest that the "rape scenario" is full of holes. Rapists do not in fact enjoy an adaptive advantage; they are likely to be shunned, incarcerated or killed, and the chances of a rape producing a viable pregnancy and a child who grows to adulthood are smaller than if the sex was consensual. We might add that rape is in no sense a normal behavior; it is an aberration, and cannot reasonably be used as a general argument in favor of (or against) any theory of psychology. The issue is complicated by a changing definition of rape: most of us would now say that rape is "sexual intercourse as a result of force or the threat offeree," while most people through most of history would have left out the words I put in italics. There might also be disagreement over whether "rape" includes same-sex incidents; whether it is possible for a female to rape a male; whether consensual sex involving an adult and a minor is rape; or whether the definition must be limited to vaginal penetration. The same goes for the other behaviors examined by this segment of the evolutionary psychologists. Is there a particular female body contour favored by males? A famous study in 1993 by psychologist Devendra Singh "proved" that men prefer a 0.7 waist-to-hip ratio, the classic "hourglass figure." But his subjects were American college students, and subsequent studies have shown that in some cultures, such a figure is considered sickly and probably infertile. (And what about those grossly obese Venus figures from prehistoric Europe and the Middle East?) Are men predisposed to kill or neglect stepchildren and favor their own biological offspring? Probably yes, in some cases, and no in others; many factors come into play, and no generalization is worth a damn, including this one. No doubt we are all hard-wired to maximize our reproductive chances, as evolutionary psychology claims; and no doubt the way in which we express that innate drive varies greatly according to cultural and environmental influences, as behavioral ecology insists.

It seems self-evident, even without the proofs offered by the neo-Darwinists, that all living creatures have evolved to pursue their own self-interest. If that were not the case no species could last very long. The philosophical view that to be rational is to maximize self-interest goes back at least to Epicurus. It received a tremendous boost from Darwinism (if not from Darwin himself) and the utilitarians, and is a staple of evolutionary psychology. The problem with "self-interest" is that no one really knows what it is. As cognitive science demonstrates, most of our decision-making is unconscious and metaphorical. At the risk of gross oversimplification, this is what Freud was all about: my conscious definition of "what is best for me" may be at odds with my subconscious (and much more powerful) definition of the same thing.

Enough of that, let's get to the serious criticisms. As mentioned above, currently the most highly regarded riposte to evolutionary psychology is David Buller's Adapting Minds, a book not surprisingly praised on the left and disparaged on the right. Neither perspective is fair to the author. True, he makes some absurd statements, but he does a good job of delineating the issues. Any reader should also look at the excellent 2006 review essay on the book, by Edouard Machery and H. Clark Barrett of the University of Pittsburgh. Buller goes so far as to reject the very existence of "human nature" as well as the idea - accepted by pretty much everyone who believes in evolution - that human psychology is shaped at least to some extent by evolutionary
adaptation. The question, of course, is: to what extent? As Machery and Barrett point out, if there is no inherited human nature - or even if that nature is secondary or peripheral - then there is not much point in the existence of a discipline at the intersection of evolution, biology and psychology. We are left with only an idiographic situation, forced to abandon all search for general principles.

As conditions for early humans were constantly changing - and certainly, their fives were insecure enough that even small environmental changes could endanger survival - evolution would have selected for psychological flexibility over fixed or hard-wired behaviors. Buller tellingly uses the term "evolutionary arms race" - an interesting choice of words; he assumes without question a prehistoric past that was poor, nasty, brutish and short. Clearly he is no Hobbesian reactionary; he seeks to prove that human nature is highly malleable, a position taken by nearly everyone on the left, this writer included. But in so doing he paints himself into some familiar corners. If we define human nature (as in fact Buller does) as consisting only of those attributes peculiar to homo sapiens, then were are not left with much to talk about. Or perhaps nothing at all. Can you name any characteristic that some species does not share with us? Even language and reasoning can be discerned, in some form, in other primates and in cetaceans. An octopus can figure out how to open a twist-top jar, and bees "talk" with complex threedimensional dances.

Buller argues that we do not have sufficient information to infer what adaptations were made (or failed to be made) to environmental hazards and opportunities. True, we do not fully understand the motives and priorities even of our most recent ancestors: why did they build Stonehenge, for example, or were they generally matricentric or not? But a lack of full knowledge does not preclude making and testing hypotheses. If it did, all science would be poindess. Each faction criticizes the others research methodology, a rather pointless exercise: all science progresses by trying and discarding various methods. We can safely assume that the avoidance of hungry lions would be an adaptive behavior, while a tendency to try to pet them would result in that particular Cro-Magnon not passing on his genes to the next generation.

The "modularity" idea, another staple of evolutionary psychology, has come under fire. The brain, according to this idea, is a collection of "modules" with specific functions, rather than a holistic information-processing device. Experimental evidence can be interpreted to support both views. We know, for example, that the power of speech is localized in Brocas area. We also know that damage to one area of the brain can be compensated for by that area's functions 'migrating' to other areas (usually more than one). Modularity was first suggested in 1983 by Jerry Fodor, and since then his overeager supporters have latched onto his modules to the exclusion of his general theory. He says that although innate or hard-wired modules do exist, primarily for essential perceptual tasks like face recognition and hearing, they are "peripheral," and that the higher functions of die brain like abstraction and decision-making are not modular but involve large regions of the brain. These functions are in a sense unmoored from the brain's hard wiring. True, some of the leading evolutionary psychologists like Leda Cosmides and John Tooby have endorsed a "massive modularity" model in which most or all of the brain operates as modules. "In this view," says their website, "the mind is a set of information-processing machines that were designed by natural selection to solve adaptive problems faced by our huntergatherer ancestors." Their use of the word machine is revealing, and should warn all anti-
authoritarians - or indeed anyone who believes that the organic is preferable to the mechanistic as a way of describing the world - that their theories must be looked at critically. This is not to say they must be dismissed wholesale. For example, Tooby and Cosmides have admitted that certain functions which most of us would consider rather important, such as the subtle cues that lubricate (or hinder) social interaction, may not be modular. This implies, for example, that our habit of automatically classifying everyone we meet according to 'race' - useful in prehistoric times, when our ancestors had to recognize outsiders quickly, but not so helpful now - is a learned behavior, and can be unlearned. A recent study of the different ways westerners and Asians interpret facial expressions supports this view. The idea that social behavior is more learned than innate is best set forth by Richard Lewontin, Steven Rose and Leon Kamin in their 1984 book Not in Our Genes. Needless to say it has been bashed without mercy by evolutionary psychologists for the last three decades: for example Steven Pinker, who opines that "the deeper mistake, as they see it, lies in trying to analyze behavior as an interaction between human nature and the human environment (including society) in the first place."8 Pinker fails to see that there is a false dichotomy here. Predictably, that book drew the attention of the popular press mainly because it suggested that IQ test result differences among the (so-called) races are almost entirely due to environmental factors.

Whether the brain is primarily or only peripherally modular is, however, less important than the means by which it processes routines are shaped. Evolutionary psychologists contend that these routines are shaped by natural selection over long stretches of time (and some, not all, would add that they have not changed much since prehistory). Behavioral ecologist disagree: our mental processing systems, whatever form they take, are more the result of experience and environmental influences over an individual's lifetime. In this view the only real adaptation is malleability or plasticity. Let me say at the outset that this debate is spurious: these two views are not incompatible. That their proponents cannot see eye to eye is evidence that their worldviews are still stuck in a very old but false dichotomy: the delusion that "mind" and "brain" are two different things. There can be no doubt that the human brain is the product (let us hope, not the end product!) of a long evolution. Equally, we cannot deny that the perceived interaction between ourselves and the world "out there" (another false dichotomy, but that's a different question) changes us, every day of our lives.

The incontrovertible fact that the brain has evolved in "layers" - the brainstem (essential functions like breathing) overlaid by the limbic system (emotions, longterm memory) overlaid by the neocortex (reasoning, language) - leaves no doubt that evolution is the overriding agency of mental functioning. We also know that neural connections proliferate into vastly complicated networks in the first few years of life, and that those networks constantly change as we mature some grow (as one learns to play the piano, for example) while others are pruned back or diverted to other uses. Behavioral ecology explains this by saying that, since individuals do not evolve (species do), these constant physical changes can only be the result of extreme plasticity. Evolutionary psychology counters that these changes (whether they take place holistically or within pre-existing modules) are epiphenomenal or peripheral to the brain's real business, which is survival and reproduction. In fact those higher functions, when understood correctly, are fundamentally aimed at supporting that business. But this difference of
opinion will evaporate - indeed, is already doing so - as we come to understand how our genes switch on and off in response to stimuli.

Another highly controversial axiom of evolutionary psychology, already alluded to above, is the claim that modern humans possess brains that evolved to their present condition a hundred thousand or more years ago, and haven't changed much since. As evidence it points to several undeniable facts. Human evolution is slow, because it takes each new generation a couple of decades on average to reproduce. Mitochondrial DNA and the Y chromosome have changed very little for half a million years, and can be used to trace prehistoric human migrations. No doubt we do look and think much like the 'cavemen' who painted the walls of the cave at Lascaux. We retain some of their eating habits: we love fatty foods and sugar, an advantage when food is scarce and must be scavenged from the environment, a disadvantage today, when it makes us obese and diabetic. Odier instincts have been adapted to new uses, such as the "fight or flight" response. Still others are now decidedly dangerous to society - this is where the rape controversy discussed above comes in. But the fact that we retain some stone-age behaviors does not mean that we retain them all, or even most of them. Moreover, it does not mean that those we do retain always cause us to act like (to use a hackneyed simile) Neanderthals. Sometimes, of course, we do; just attend a football game or watch prime-time TV to see what I mean. Our malleability allows us to sublimate or even negate some of those behaviors: I can resolve not to eat sugar, and stick to it; if that is the case, why can I not also decide to ignore my innate selfishness for the greater good of society and of the planet?

In any case, some recent genetic studies suggest that human evolution may not be as slow as we thought it was. Basing an opinion on mitochondrial DNA or the Y chromosome is risky. Those genes do mutate more slowly than most, which is what makes them useful to anthropologists and genealogists. John Hawks, a University of Wisconsin anthropologist, claims that modern humans are genetically more unlike the Mesopotamians or Chinese of five thousand years ago than those people were from the Neanderthals.9 The invention of agriculture, bringing profound changes in diet as well as lifestyles, was probably the key factor. The complex and always-changing relationship between us and bacteria and viruses was almost as important. The sickle-cell gene, protecting many Africans from malaria, is relatively new. The vast majority of humans are lactose-intolerant, but northern Europeans - who once depended heavily on milk and cheese - are not. Hawks concludes that the rate of human DNA mutation in the past five thousand years has been no less than one hundred times faster than it was in all the hundreds of thousands of years that preceded the invention of agriculture. Such a trend could eventually lead to humans differentiating into new species - but it won't, given the rapid increase in migration and interbreeding in the last few hundred years. We don't yet know, of course, whether this rapid rate of mutation is changing anything really important, like gender-specific behaviors, but the research is still very new. But if evolution is holistic, as many scientists now think, even a specific mutation like the sickle cell could have - probably must have - systemic implications. "Evolution embodies information in every part of every organism," writes Daniel Dennett.10

DNA, though re-mixed in every generation, is passed down almost inviolate (there are occasional random mutations) through hundreds of human generations. How then is it possible that it can be affected by die life experiences of a single individual? The possibility smacks of Lamarckianism - one of the more potent swear-words in the vocabulary of modern biology. Still,
the possibility that genes are not, after all, the carriers of heredity is worth exploring. It could explain how a purely inherited chemical (DNA), in no sense pulled in from the environment, can nevertheless adapt itself to that environment on the level of individuals. Here we are down among the alchemists, on the borders of pseudoscience. But plate tectonics (to give just one example) was considered a pseudoscience not long ago. No long digression here, just a suggestion: the biologist Rupert Sheldrake claims that it is memory, not genes, that pass on heritable traits. His theory of "formative causation" is an updating of Waddington's chreode theory of the 1930s, which proposed that events carve out pathways in nature that deepen with use, just as running water wears a gully into the earth along the path of least resistance. The idea suffers from being unable to tell us into just what medium the chreodes are carved. Sheldrake drinks he has the answer: morphogenetic fields, so far undetectable by science but nevertheless as real as magnetic or gravitational fields (also still somewhat elusive). Genes, he argues, are too chemically simple to generate the immense complexity of life. They are part of the pattern, but not the "material" of which the pattern is made. An evolving fabric of morphogenetic fields (surviving through time by what Sheldrake calls morphic resonance) organizes all of life, in effect preserving patterns or chreodes which tell the various organic and inorganic substances what to do in order to construct a human being (or a poodle, or a mushroom). Because the fields permeate all of nature, they render meaningless the distinctions we make between individual and society, nature and nurture. Just as there are no immutable laws of nature (Sheldrake points out that the very idea of "laws" is anthropocentric), no immutable species, nothing at all that can be called constant, there is no impermeable boundary between "me" and the rest of the universe.

All of this, as one can imagine, is laughed at by mainstream science, not so much because it is unbelievable, but because it is largely untestable by accepted scientific method. Some of Sheldrake's claims indeed stretch credibility. Are morphic fields exempt from the laws (that word again) of time and space? Sheldrake argues that they connect members of the same species no matter how far apart they may be, a possible explanation for telepathy. All of this needs further exploration.

We must also say a few words about language. Even the most adamant evolutionary psychologists agree that it is not heritable: if it were, this author's French would be a lot better. The theoretical linguist Noam Chomsky, who is of course also an anarchist, attacked the prevailing empiricist or tabula rasa view beginning in the 1950s, and has since refined his "generative grammar" into what he now calls die Minimalist Program. In this view, all humans inherit a basic and unconscious framework on which all languages are built. No external influence, Chomsky argues, is sufficient to explain the complexity of language, much less the common features all languages share (this sounds rather like Sheldrake's view of genes). For instance, even a small child can utter a fully grammatical sentence that it has never heard anyone say, constructing it from words that have been learned but according to an innate unconscious set of rules. Grammars do of course vary enormously - there is not much to compare between die grammatical structure of English and Hopi - but they all agree that there is such a thing as "ungrammatical," and all seem to use recursion, which is the embedding of one sentence within another. Steven Pinker, one of die best-known proponents of evolutionary psychology, agrees but adds that the language capacity is a deep genetic instinct, not the byproduct of other adaptations as Chomsky suggests.
Chomsky claims that his universal heritable language instinct is an example -not the only one - of the deep characteristics all human share, overriding more superficial distinctions such as race. A profound capacity for creativity and flexibility - of which language is only one manifestation - obviously supports the anarchist project.

Other complex and contentious problems impinge on the development of behavioral ecology; we can give them no more than a passing mention here. Consciousness, for example: what is it, and how does it emerge from the electrochemical processes in the brain? Do other species share it? Is it a holistic phenomenon or an accumulative one, resulting from the sum total of individual modular processes? Does it reach beyond our physical bodies - is there a Jungian collective consciousness, a morphic field of consciousness? Is consciousness somehow perhaps even the fundamental stuff the universe is made of, as some Hindu philosophies aver? There are scientists who take this seriously: it may be argued that, because we can imagine the universe as a whole, consciousness is even bigger - or meta-universal. "It is the ultimate superset," says Susan Greenfield; "no wonder it is so hard to define." And so on: how can general system theory help us better understand our minds and how they have evolved? What about gestalt theory, which has attracted so many anarchists? How much truth is there in the image of our prehistoric ancestors as peaceful, matricentric and nature-worshipping, and how much does it matter? Can our science learn anything by exploring Taoism, Buddhism, the shamanic religions of Africa and Siberia and America?

Some human behavior is indeed hard-wired, and in that sense there is a fundamental, unchanging human nature that cannot be altered by education or "social engineering." (Of course, nothing is absolutely unchanging; I mean that these behaviors do not evolve fast enough for us to observe.) At the same time, much or even most of human nature is malleable, and can be changed - within certain parameters - by conscious efforts. Even the most stubbornly immutable traits can be channeled in new directions. (Are we innately competitive? Fine - put down the gun and go buy a soccer ball.) Anarchists need to recognize that sociology is a branch of psychology, and psychology is in turn a branch of biology. In addition, we must learn this lesson: it's hazardous to transmute scientific theories to fit political or economic models. It can and should be done - how can we hope to understand social relationships if we do not understand the nature of the beings who conduct those relationships? - but it must be done with caution.

Sidebar

We are flexible enough to build a free and democratic society, a world without arbitrary authority and oppression, an ecologically sustainable world community. But it will take a lot of hard work, because there are deeply rooted human attributes that run counter to those goals, and we will not eradicate them.

Sidebar

Brains are not computers: first of they are organic, not mechanistic; and second, they are self-organizing: they do not require an outside

Sidebar
"Buller goes so far as to reject the very existence of "human nature" as well as the idea - accepted by pretty much everyone who believes in evolution - that human psychology is shaped at least to some extent by evolutionary adaptation."

**Sidebar**

There can be no doubt that the human brain is the product of a long evolution. Equally, we cannot deny that the perceived interaction between ourselves and the world "out there" changes us, every day of our lives.

**Sidebar**

A profound capacity for creativity and flexibility - of which language is only one manifestation - obviously supports the anarchist project.

**Footnote**

Endnotes


6 ibid.


8 Psychology might have taken a very different direction. The "hormic" psychology of William McDougall (1871-1938), based on the idea that mental activity is fundamentally goal-oriented and instinctual, briefly rivalled Freud in popularity. Immersed in evolutionary theory (he admired Lamarck) and in teleological philosophy, McDougall strongly opposed the mechanistic and Pavlovian approach that was beginning to develop into behaviorism. He made enemies by assaulting every other school of thought with acid rhetoric; his only lasting contribution was to save instinct from the mechanistic dustbin. Robert W. Lundin, Theories and Systems of Psychology, 3rd ed. (Lexington: D.C. Heath, 1985)

10 Pinker, Blank Slate, 60.

11 It is not always noticed that Dawkins undermines his own argument - or rather, opponents who do not read him carefully think he undermines it - by stating in the first pages of his book that "Our genes may instruct us to be selfish, but we are not necessarily compelled to obey them all our lives." Richard Dawkins, The Selfish Gene (Oxford: Oxford University Press, 1976/1989), 3.

12 Sharon Begley in Newsweek, June 29, 2009.


17 http://www.psych.ucsb.edu/research/cep/primer.html


20 Pinker, Blank Slate, 127.


23 Susan A. Greenfield, Journey to the Centers of the Mind: Toward a Science of Consciousness

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