ETHICS, EVOLUTION, AND THE POPULATION-ENVIRONMENT CRISIS

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It is now widely recognized that the ever-increasing scale of the human enterprise is destroying the life-support systems upon which all of our lives depend. The main causes are overpopulation and continuing growth in human numbers, overconsumption and persistent economic growth among the rich, and the widespread use of environmentally malign technologies. Secondary causes are inefficient, inequitable, and often iniquitous social, political, and economic arrangements. These forces are already denying a billion or more people a decent life and inexorably depleting the natural capital that sustains civilization – creating what has become known as the “human predicament.” That predicament has been amply covered in a diverse literature. Despite the many fine attributes evolution has given Homo sapiens, one thing is clear to me and to many of my colleagues who spend their time examining the human environment at a pace that prevents biological evolution from making changes that could adapt us genetically to the new conditions. Furthermore, the rate of cultural evolution in the area of technology, increasing human abilities to do things, has far outstripped cultural evolution in the areas of values, ethics, and social organization – areas that increase our ability to understand the impact of our activities on the ecological systems that support civilization.

The ultimate cause of the predicament can be summarized in another way. Cultural evolution has altered the human environment at a pace that prevents biological evolution from making changes that could adapt us genetically to the new conditions. Furthermore, the rate of cultural evolution in the area of technology, increasing human abilities to do things, has far outstripped cultural evolution in the areas of values, ethics, and social organization – areas that increase our ability to understand the impact of our activities on the ecological systems that support civilization.

The issues that are at the very center of the human predicament are ones of values and ethics -- of how we behave towards one another and our environments. Values and ethics first evolved during our past when human beings were a small-group animal, living in hunter-gatherer bands, and they continue to evolve today. Understanding that continuing evolution of ethics can provide an important background for our thinking about environmental issues in the next century. Values and ethics first appeared in situations where every individual knew every other member of the group and her or his relationship to each. The family was almost certainly the basic social and economic unit, and families were probably loosely associated in bands. With those levels of intimacy made complex kinds of social and political organization and codification of behavior were unnecessary. For instance, the difference between the herbal healer who almost always made someone sicker and the herbal healer who often healed was well known to all, and the “market” solved the problem of quality control in the healing profession. There was no need for “healer ethics” committees in the Pleistocene as there are for medical ethics committees today.

The origin of ethics has been a matter of dispute for millennia, and the debate has usually centered on whether they are intrinsic, an evolving product of the human mind, or extrinsic, having a separate existence “out there,” separate from the existence of humanity. That is, are ethics just functions of a material brain that gradually evolved within groups of highly social primates? That widely held view can be traced back at least to Denis Diderot and his materialist contemporaries in the 18th century French enlightenment. Or are ethics (as Kant thought and many religions claim) part of a supernatural or moral universe? Are they, in short, handed down by gods or simply systems devised culturally in support of certain social goals.

Since religions themselves are human inventions, and I see little to support a dualistic, mind vs. matter, view of existence, the intrinsic hypothesis seems more likely to me. There is no sign that the postulate that ethics are transcendental, that they exist without empirical explanation, beyond explanation by human history or human minds -- is valid or useful. So my answer is “yes” to the question of whether ethics are functions of our material brains. We can explain the existence of ethics, morals, and norms without invoking a separate moral universe. Human nature is clearly the result of biological and cultural evolution, and in some sense the ethical feelings and behaviors that are part of that nature must have arisen through these same processes. Under the assumption that ethics are intrinsic, perhaps the most controversial claim made about them is that they (along with morals and norms) can be explained on the basis of biological evolution. If they can, then humanity’s age-old struggles with issues of ethics may have been largely an exercise in futility. Evolution had the answers all along.

But can the choice of the ethics, morals, and norms to which we ought to adhere be derived from understanding biological evolution? I think not. I see the capacity of human brains to develop ethics as a product of that evolution. That capacity involves an ability to anticipate the consequences of one’s actions, a capacity for empathy, a capacity to make value judgments, and “free will” -- a capacity to make choices. There may even be a sensitive period during which a child has a special capacity to absorb the norms of its culture.
I see no sign, however, that the particular ethical systems developed in societies trace many, if any, of their features to biological evolution. In general, trying to judge an ethical ought from a natural is deserves its old title, “the naturalistic fallacy.” The “oughts” seem to me largely products of cultural evolution, with a great deal of chance factoring into the evolutionary process. When we know the evolutionary origins of attitudes or behaviors, that knowledge carries no message about the ethical status of those attitudes or behaviors. If something is “natural,” it is not necessarily good, and what is good is not necessarily natural. That there is either a transcendental system of ethics or a set of ethical values that are biologically evolved seems especially unlikely because what is ethical varies greatly within and between societies and over time. For instance, slavery, once widely considered not unethical, no longer is an acceptable practice. Hitler and Pol Pot thought genocide was ethical; most of human society had decided it wasn’t. And, to me most telling of all, how much and what kind of human alteration of the environment is ethically appropriate was not widely considered an issue until three decades ago, but it now is one, and will almost certainly be a more important one in the decades to come.

What, then, can be said about the evolution of ethics? Human beings have developed the most ingenious of all ways to deal with social interactions. They have taken consciousness further than any other animal and have combined it with an extraordinary awareness of their own being – of self. They use that understanding of self to interpret and respond to the behavior of others. As philosopher Mary Midgley put it, they developed ethical capacities that are “just what could be expected to evolve when a highly social creature becomes intelligent enough to become aware of profound conflicts among its motives.” That is, people use introspection as a route to dealing with the most important parts of their environments, the other members of their own group.

There appears to be a sense of self in chimpanzees and bonobos, which along with orangutans are the only other animals known to treat their mirror images as something except another member of the same species. They understand that they are looking at themselves, so they will use the mirror to examine portions of their bodies not normally visible – like the tops of their ears. It seems clear that evolution of at least a strong consciousness, including a sense of self, is a necessary prerequisite for being able to impute mental states to other individuals. Intense consciousness, self-awareness, empathy, and social attribution (the capacity to project mental states onto other individuals) are hallmarks of humanity, although some experimental evidence that suggests chimpanzees also have these characteristics to a degree. Evolutionary traces may also be imputed from the patterns of development of these hallmarks seen in human children, in whom they appear gradually.

Being able to reflect on one’s own mental states provides the basis for interpreting those of others, and acting on those interpretations. And the evolution of those capacities provides the basis for empathy and the ability to attribute feelings to other individuals. That appears to be possible for chimpanzees. Chimpanzee’s minds probably provide a fair model for the sort of mind that our common ancestor possessed, since there is little reason to believe that their mental attributes have changed dramatically (as ours clearly have) over the past five million years.

Empathy, in turn, provides the underpinnings of ethical systems. But the origin of ethics – culturally shared values that involve notions of right and wrong – cannot be traced to our chimpanzee-like ancestors. Chimps have no way to share values; ethics had to await at least the evolution of language, of an efficient method of sharing the ideas that were presumably generated by notions of empathy. There appears to be an unbridgeable ethical gap between human beings and chimpanzees. If you don’t believe it, try to imagine a chimp risking harm to prevent an individual in her group from harming a member of another group. There were no peacenicks among the Kasakela chimps when that band was exterminating its rivals in the Kahama group.

But how did natural selection allow ethical systems to develop in the hominid line? Darwin and myriad analysts since his day have recognized a basic problem. If the unalloyed reproductive selfishness of natural selection is the basic engine of evolution, including human evolution, why did concerns for others arise? Why should a hungry person share a morsel of food with a starving brother, or the starving child of a stranger, when a person’s primary goal is to maximize his or her own reproduction? Many biologists thought the answer to altruism toward a brother had been found in the discovery of inclusive fitness – more copies of one’s genes could sometimes be passed on to the next generation by helping relatives to have children than in reproducing oneself. But that couldn’t explain altruism towards non-relatives. Altruism towards strangers could be explained, however, by the expectation of improved reproductive prospects through reciprocity – especially if the altruistic acts exacted small costs on the donor and conferred great benefits on the recipient (as may often be the case).

Unhappily, these solutions are partial ones at best. Virtually nothing is known about any genes that altruistic human beings might promote by helping relatives, and even less is known about the possible reproductive differentials involved. And empathy and altruism often exist where the chances for any return to the altruist are nil. Indeed, careful psychological experiments suggest that much of human helping behavior is divorced from any real prospect of reproductive or other rewards. Apparently, helping behavior can have as its ultimate goal only the improvement of the welfare of others without any physical, social, or psychological benefit whatsoever to the helper, including the benefit.
of pleasure in being altruistic. That is, there can be behavior that is truly altruistic, and as far as we know, that behavior is unique to human beings.

Many of our empathic feelings clearly are unrelated to personal advantage. Empathy comes from a combination of attribution and experience. Evolution of the capacity for empathy, which is so helpful in dealing with other members of our group, appears to have brought with it a value of caring for them. We apparently often see improvement of their welfare as a reward in itself, not just a contribution to the goal of improving our own welfare. But if there is hard wiring for basic empathy, there is almost certainly some genetic tendency to place limits on how we act upon our empathy. As philosopher Mary Midgley put it: “Some degree of partiality is...built into our social nature. It shows itself, not just in favouring kin, but more widely in the way we form attachments or fail to form them, with all of the people who are of importance to us.” In addition to any hard wiring, there is clearly huge culturally evolved variation in how empathy is deployed.

Exactly how large the universe of caring should be has evolved through time and still is a matter of substantial dispute within western culture and is an ever more serious topic of debate as humanity struggles to come to grips with the worsening human predicament. How much should be done by Englishmen to alleviate hunger in poor African countries? Should American troops be risked to save the lives of Moslems threatened with genocide in the Balkans? How much should we care about conserving resources or maintaining environmental quality for the next generation?

One environmental area in which the size of the universe of caring has been an issue is foreign aid related to birth control. The ethical issues involve consideration of the long-term results of steps taken by rich countries to lower death rates in poor nations by supplying disease and hunger-fighting technologies, without simultaneously taking steps designed to lower birth rates. It is just a recent round of an old ethical debate about what are the ethical obligations of the rich toward the poor. Would assistance in lowering death rates without parallel assistance to lower birth rates be immoral, since population growth will, sooner or later, lead to enormous suffering? Furthermore, by sending aid to overpopulated areas, might not one damp out the signals that tell people in those areas that they have exceeded the carrying capacity of their homelands? Ecologist Garrett Hardin has thought long and hard about that ethical issue and others related to population growth, environmental deterioration, international migration, foreign aid, within-generation equity and intergenerational equity. Hardin tries to consider the long-term consequences, especially environmental consequences, of human activities, and in the process generally has come down on the side of what one might call “ecological tough love.” A characteristic passage from his work on “Lifeboat Ethics” expresses this:

“We are all descendents of thieves, and the world’s resources are inequitably distributed, but we must begin the journey to tomorrow from the point where we are today. We cannot remake the past. We cannot, without violent disorder and suffering, give land and resources back to the “original” owners – who are dead anyway.

“We cannot safely divide the wealth equitably among all present peoples, so long as people reproduce at different rates, because to do so would guarantee that our grandchildren – everyone’s grandchildren – would have only a ruined world to inhabit.”

At the opposite ethical extreme is philosopher Peter Singer, who believes Englishmen should care as much about starving Bengalis as about destitute Britons. He asserts that “if it is in our power to prevent something bad from happening, without thereby sacrificing anything of comparable moral importance, we ought morally to do it. By ‘without sacrificing anything of comparable moral importance’ I mean without causing anything else comparably bad to happen, or doing something that is wrong in itself, or failing to promote some moral good, comparable in significance to the bad thing that we can prevent.”

The universe of concern can also be expanded in non-geographic directions. Intergenerational equity is an obvious example; so are the debates over animal rights and the rights of nature. How much should we care about the well-being of future generations of human beings, of pets, of domestic animals, of wild animals, of natural systems? It is not my purpose here to enter into the fascinating discussion of the limits to obligation, but merely to point out that there is ongoing cultural evolution in this area, as might be expected as we have been transformed from hunter-gatherers to the dominant species on Earth whose “metabolism” (economy) has altered not just our own environment but that of virtually every other living organism as well as our distant descendents.

It is nearly impossible to come up with a standard traceable to genetic evolution in humanity as a whole that would provide a touchstone for making many sorts of ethical decisions. What should environmentalists or animal rights activists do about traditional native American whaling? What is the ethical position to take if your child has a sore throat and high fever, and your physician suggests starting a course of antibiotics while lab tests are done to see whether the infection is bacterial or viral? Antibiotics are useless against viruses. Choosing to use the antibiotics could provide a great benefit to your child, but add a small increment to the loss of efficacy of the antibiotic through the evolution of resistance – a tiny risk for your child perhaps, but also a contribution toward a possible deadly consequence for one of your grandchildren when the same antibiotic proves useless from overuse.
Natural selection can’t operate at a sufficiently fine-grained scale to promote connections that will interact with environments to solve all such dilemmas. And cultural evolution cannot provide universal touchstones either. It produces different answers to the ethical problems confronting different generations, different groups, and even different individuals within groups. Environmental ethics is an example: a relatively new area, one that has only been evolving, indeed exploding, for a few decades. It is an area where ecologists such as Charles Birch and Garrett Hardin have been major contributors. Discussion in this complex area of cultural evolution is involving classically separate disciplines ranging from economics and ecology to political science and philosophy. For historical and economic reasons, it has been largely confined to western culture. The rise of environmental ethics shows clearly how cultures evolve in response to newly perceived ethical needs. That cultural evolution in action can be observed in this can be considered a powerful argument against a basically transcendental basis for ethics.

In the mid-1800s George Perkins Marsh expressed concern over the impact that human beings were having on the planet, but his discussions were not based on a need for a great change in societal norms. In the mid-1900s Aldo Leopold did call for a change in basic cultural attitudes towards the environment when he introduced his “land ethic.” With the upsurge of the environmental movement soon thereafter brand new ethical issues became hot topics of debate. Should non-human animals have legal rights? Indeed the entire issue of the ethical position of Homo sapiens vis-a-vis the rest of nature was (and still is being) discussed extensively, especially in a context of what has become known as “deep ecology.” The overall impact of humanity on its life-support systems has increased some 20-fold in the past 150 years, threatening the integrity of the life-support systems of civilization. As a result, in the last half-century it has become evident there is a population problem – that, population growth was a major driver in causing that impact. In the West a few decades ago, the number of children that it was ethical for a couple to produce was seen as purely an issue of their ability to rear them. There was no ethical issue of the effects of satisfying parents’ desires to have a family of more than two children on those children or the future of all people. There was also no ethical issue of how much one should consume, except to the degree that conspicuous consumption in proximity to severe deprivation was considered by some unethical. Neither reproduction nor consumption was tied to the state of Earth’s life-support systems.

Perhaps the most difficult and novel ethical issue now facing humanity is the growing conflict between the need to feed a growing population and the destructiveness of the agricultural enterprise to biodiversity (and thus to the ecosystem services upon which that enterprise depends). A basic ethical question is the degree to which short-term gains in production are justified in the face of the potential for long-term deterioration of the agricultural system in view of the often negative impacts of agricultural intensification on soil fertility, natural pollination and pest-control services, and climate stability. These questions are made especially vexing because of the inequities of food distribution, which mean that much of the sacrifice of future environmental values appears to be in service of simply keeping food prices low for the already well-fed rich. Such issues of intergenerational equity demand reappraisal of economic issues related to such things as discount rates and the underlying assumptions involved in setting them (e.g., often that future generations will be richer than present generations).

Indeed, in the face of an apparently unstoppable trend of the spread of industrial agriculture, biologists are increasingly searching for ways to preserve biodiversity in the face of agricultural monopolization of the landscape. Gretchen Daily of Stanford University has been developing a new field called “countryside biogeography” with precisely that goal in mind.

The ecological crisis has also intensified old ethical debates. The need for broad cooperation in solving environmental problems means that humanity can ill afford racism, sexism, homophobia, religious prejudice and gross economic inequity. Ethical stances with regard to those ancient problems have been evolving, but not fast enough to generate a level of equity that is likely to persuade nearly everyone that they will be treated with equity if they work to create a sustainable society. The problems of dealing with some of these issues are exacerbated by a new urgency generated by discussion of who should have the right to reproduce, whether an unreasonable blame and burden is being placed on women by male population controllers, and the differential impact of environmental degradation on the poor and powerless.

As a background to all of these issues is a fundamental question with a strong ethical component: How much of a precautionary principle should society adopt in the face of various environmental threats? For example, if there is a ten percent chance that climate change will cause a global catastrophe, perhaps leading to the premature death of over a billion people, what sort of expenditure today (if any) would be ethically required to protect those people?

Some do find an answer to the morality of environmental disruption in evolutionary ethics. There is a school of thought that our ancestors were, because of genetic and/or cultural evolution, natural conservationists. The implication is that the current assault on biodiversity – the greatest extinction crisis in the past 65 million years -- would not be occurring if modern people had retained the ethics of their hunter-gatherer forebears. As we have seen, however, there is little reason to believe this of hunter gatherer groups. Instead, apparently, our hunter-gatherer ancestors did not
much restrain themselves in the exploitation of environmental resources. They changed their environments to the degree that they were able: helping to exterminate many species of large animals at the end of the Pleistocene, and in so doing, changing the biological communities of much of Earth. There have also been repeated assertions that European industrial societies should look to the behavior of tribal peoples to know how to be proper custodians of natural systems.

But the degree to which the interests of indigenous peoples today are congruent with effective conservation policies is a matter of debate.48 Human history suggests something quite different, a lesson of value to those seeking overall strategies for maintaining our life-support systems. The conservation record of peoples after the agricultural revolution is, at best, somewhat mixed. Until very recently, societies generally have not paid much attention to the long-term environmental effects of their behavior, but rather have focused on the satisfaction of their immediate needs. Control by forest dwellers, peasants, nomadic herders (“ecosystem people”)39 of the local resources they depend upon often leads to superior husbandry of those resources,30 in comparison of today’s citizens of rich countries (“biosphere people”)51 who are able to draw their resources from the entire biosphere. The latter have little or no feedback about the status of the resource stocks they are tapping, and little incentive to conserve them. They “discount by distance,”52 having less concern for possible depletion and degradation far away. Overall, history over the last 10,000 years has not been mainly a story of sustainable management of resources but rather one of the progressive intensification of activities to support larger populations, which in many cases led to ecological collapses.

If there is a lesson for today, it is that global human society, which now dominates the ecosphere, should be very cautious about further expanding its operations. Husbandry of the ecosystems that supply society with essential services must be conscious and active, lest we risk repeating the fate of the Easter Islanders on a global scale. Their society was destroyed when they destroyed their environment, a fate they shared with many other civilizations. We need to try to understand the circumstances under which cultural evolution could lead to population stabilization and resource conservation, as well as those that would lead to overpopulation and collapse. Few understandings would have more value in ending the population-resource-environment crisis.

Human history is largely one of continuous intensification of resource use, strongly controlled by immediate rather than long-term needs. Whether in subsistence or industrial economies people need to develop social constraints on resource use that make it sustainable. As the human population size shoots past the carrying capacity of Earth,53 the ethical foundations of both intergroup and intergenerational equity and the intimately connected ethics of treatment of our life-support systems and their living components, are now moving to the forefront.54 These will almost certainly be the great ethical issues of the future.

It may not be too late for humanity to avert a vast ecological disaster and make the transition to a sustainable society, but the task will not be simple. The required actions are evident, and they all have serious ethical implications for the required shifts in the norms of societies. Population growth should be halted as soon as humanly possible and a slow decline begun to a population size that, in a century or so, is environmentally sustainable and less beset with social problems related to crowding, forced migration, and conflict over dwindling resources. A sustainable population would probably be less than 2 billion people, even after considerable improvement of today’s technological and social arrangements.55 Wasteful consumption in rich nations needs to be reduced in order to allow for needed increases in poor nations. Fortunately, a reduction of consumption while increasing the quality of life is technologically feasible. For instance, John Holdren’s scenarios offer a possible path toward an equitable and efficient pattern of energy use that could close the rich-poor consumption gap and constrain environmental damage.56 Those goals might be reached while temporarily supporting the substantially larger human population that is inevitable before growth can be halted. But technological feasibility is not enough. As work with my colleagues Anne Ehrlich and Gretchen Daily has indicated, our sociopolitical systems need to undergo dramatic revision in the direction of increasing equity at all levels if sustainability is to be achieved.57 One of the overriding reasons is that the needed cooperation to solve global environmental problems is unlikely to be achieved in a world divided into “haves” and “have nots.” This brings us back to those intergroup and intergenerational ethical issues.

Our history also suggests that humanity should be alert for problems with the differential rates of change in different parts of human culture. Science and its offspring, technology, may now comprise over half of humanity’s culture, its body of non-genetic information. And that portion is evolving extremely rapidly. Antibiotics and insecticides, for example, have been enormously effective at reducing human death rates. Adoption of these “death-control” technologies was almost instantaneous – they went with the biological and cultural grain. But new birth control technologies have been neither as effective nor as rapidly deployed, and the result has been an enormous increase in human numbers in the last half of the twentieth century – from 2.5 billion to 6 billion. The slowness in the development of contraceptive technologies and their adoption has been in no small part because they go against the genetic and cultural grain. Yet, perversely, science has also blessed us with an array of increasingly lethal armaments, culminating in weapons of mass destruction. But cultural evolution, which generated those weapons, has been sluggardly in generating modes of behavior that lessen the probability of their use – as the occurrence of dozens of wars at the end of the twentieth century attests.
Mismatches of rates of cultural evolution are common in space as well as in time. Research has shown the broad environmental basis of early differences between cultural trajectories in, for example, the eastern and western hemispheres. But environmental differences alone cannot explain the giant geographic differences in the cultural attitudes and technological capabilities of Homo sapiens, which fuel the “fragmentation within globalization” trend that I and others find so disturbing. While ethnic groups seek autonomy (and often resist the consumption-oriented life styles of western civilization), television, computerized financial systems, the world-wide web, fax machines, and cell phones, are tending to knit the world together ever-more tightly economically and socially into a global system dominated by western values.

Is there anything that can be done to counter these unhappy trends – to solve the human predicament. I believe that we badly need to harness that spiritual side of existence in the battle to solve the human predicament, say, by trying to get a quasi-religious conversion to valuing other organisms. In recent years, a variety of religious groups have entered the battle to save Earth’s other life forms, as part of the creation. Their efforts should be encouraged by people of other traditions and faiths. It seems also important to note that discussions of ethics are probably more concentrated in religious communities than anywhere else in modern societies, and thoughtful discussions on these matters should be welcomed by all.

A decade ago psychologist Robert Ornstein and I concluded that the design of the human perceptual system made it especially hard for people to recognize the most serious environmental problems. Our perceptual system attempts to hold the environmental backdrop constant so that people can more readily detect, and react to, short-term threats. But now the threats are both long term and posed to that backdrop itself. As a result, we need to develop “slow reflexes” to accompany our quick ones, to detect threats that materialize not in seconds but in decades or centuries – such as the threats inherent in mismatches of cultural evolutionary rates. “We need to replace our old minds with new ones.”

Biological evolution obviously is much too slow to allow a response to that backdrop change, and undirected cultural evolution is often too slow to respond and inappropriate. The mismatch between the ability to do and to understand is too persistent. The answer, if humanity can manage it, is to create a new cultural evolutionary process – one of conscious evolution – that will spread the recognition of the human predicament and speed the search for new attitudes and the new ethics and social processes required to solve it. In short, we need to concentrate human efforts deliberately on increasing the rate of cultural evolution in the area of understanding environmental change, while applying new criteria that would brake its headlong “success” in the area of causing it.

For the first time in human history, cultural evolution has brought us to a precipice beyond which is worldwide ecological collapse. Nothing less than the future of global civilization is at stake. My cynical side says that finding a solution to the human predicament will be nearly impossible. My pollyanna side says we have no sensible choice but to try. We are, in any case, unlikely to achieve a consensus and back away from the abyss without much more widespread, open-minded, and empathic consideration of human nature, its biological evolutionary roots, its cultural evolutionary history, and the complex interactions of genes and culture by both scholars and the general public. But we denizens of universities must approach this task, as ancient as it is difficult, with some humor and humility.

Science is necessary but not sufficient for understanding human natures. We need other ways of knowing – ways drawn from the humanities and from philosophy -- from the vast epiphenomenal world created by billions of brains generating and elaborating human cultures. We need more clear-thinking, clear-writing philosophers like Daniel Dennett, Peter Godfrey-Smith, James Griffin, Mary Midgley, John Rawls, and Richard Rorty, for whatever we may think of their views, they are exploring important issues largely inaccessible to science. Even the philosophers of postmodernism and deconstruction have messages of importance, or at least of interest (e.g., that scientists often embody their own world views in their writings, that there is value in a diversity of views and ways of knowing, that general theories of human societies are doomed to failure, but the abstruseness of their prose, which frequently borders on gibberish, often obscures those messages and makes one long for the clarity and common sense of a William James.

We university professors especially need to assess our attitudes carefully and approach the interdisciplinary problems we must solve with a mixture of breadth, insight, and the humility to see that other members of society must be fully engaged in a debate about the human future. As David Hume said long ago about academicians, “If any of the learned be inclined, from their natural temper, to haughtiness and obstinacy, a small tincture of pyrrhonism [radical skepticism] might abate their pride by showing them that the few advantages which they may have obtained over their fellows are but inconsiderable if compared with the universal perplexity and confusion which is inherent in human nature. In general, there is a degree of doubt and caution and modesty, which, in all kinds of scrutiny and decision, ought forever to accompany a just reasoner.”


Ehrlich, P. R., and A. H. Ehrlich. 1991. *Healing the Planet*. Addison-Wesley, Reading, MA.

1 An expanded version of much of this material will be found in my forthcoming book Human Natures (Island Press, 2000).
2 See Copleston (1964), pp. 1-58. Among the most prominent materialists were Diderot (1713-1784), who might be called a proto-evolutionist, realizing that the biblical story of creation was mythical; Julien de La Mettrie (1709-1751) and Paul d’Holbach (1723-1789). All were atheists (Diderot not until late in his development) who did not believe there was a supernatural source of moral guidance.

3 Kant’s philosophy was very complex, but assumed God had to exist as a basis for the realization of justice and morality. Remember that Kant viewed the cosmos as dualistic, split between a Platonic “noumenal” world, one of objects of awareness (like morals) that are not produced by sensory awareness, and a “phenomenal” world of space and time available to sense perception. For insight into the intricacy of Kant’s thought by a great philosopher not terribly sympathetic with Kant’s ideas, see Bertrand Russell (1945), pp. 704 ff. One of the books I most enjoyed as a teenager was Russell’s 1927 essay, “Why I Am Not a Christian” (Russell 1957, pp. 3-23). In that essay he said about Kant, “He was like many other people: in intellectual matters he was skeptical, but in moral matters he believed implicitly in maxims that he had imbibed at his mother’s knee.” Russell summarized Kant’s argument as saying that unless God existed there would be no right or wrong, and proceeded to demolish it (p. 12).

6 The monist view is that the mind and ethics can be explained eventually in terms of neurophysiology – that the mind and brain are the same thing. It’s where my instincts tend to lie. The dualist view posits a separate world of the mind; it is counterintuitive for many if not most scientists. For a stimulating recent discussion, which comes down on the somewhat out-of-fashion dualist side, see Stent (1998). Maybe he’s right.

7 E.g., Leach (1967).

8 Ethics are the principles by which behavior within a group is considered to be good or bad. Morals are virtually synonymous with ethics, but increasingly refer to standards of sexual behavior. Norms are standards of conduct, usually ethical or moral standards. “Normative,” in the philosophical sense, refers to something that deals with ethical or moral values (worthwhile qualities or principles), or defines standards of conduct to be complied with.

10 My view here is quite close to that of Ernst Mayr, whose essay gives a fine overview of evolutionists’ thoughts on the genesis of ethics (1988, chapter 5, pp. 75-89).

11 Besides Mayr, such views are widespread among biologists: e.g., Simpson (1969) and Ayala (1987).


13 Moore (1903); for an early opposing view from Ed Wilson (a view about which I obviously have my doubts), see Wilson (1978), e.g., pp. 4-5. For a later one, see Wilson (1998), pp. 248-251. Wilson himself seems, like the fine scientist he is, to have modified this view somewhat over time (Wilson 1984, in which on p. 119 he combines “emotion with the rational analysis of emotion” to develop a better conservation ethic). Nonetheless he remains more optimistic than I on the degree to which neurobiology can help us to understand ethical issues (Wilson 1998, chapter 11).

14 I add “largely,” since some ethical “oughts,” such as incest taboos, may be related to genetic predispositions. Darwin (following Aristotle and others) supposed that human social sense and morals germinated in the long and close bond between parents and offspring: “The feeling of pleasure from society is probably an extension of the parental or filial affections, since the social instinct seems to be developed by the young remaining for a long time with their parents; and this extension may be attributed in part to habit, but chiefly to natural selection” (Darwin 1871, pp. 108). Morals then flowered in the need for cooperation as groups became ever larger and more complex (pp. 126ff). Chimps show close and enduring parent–offspring bonds and can cooperate, but show precious little moral sense by our standards, while upper-class Englishmen often fail to bond with their sons, who nonetheless generally grow up with the morals of upper-class Englishmen. I can’t help but feel that morals and ethics are primarily a product of complex cultural evolution not easily subject to a universal reductive explanation. For a contrary view, see Ruse and Wilson (1986).

15 There is a big, if frustrating, philosophical literature on the meanings of natural and good. For an introduction to these and related topics, see Honderich (1995).

16 Midgley (1994)


18 Hyatt and Hopkins (1994).

19 Lethmate and Dücker (1973); Miles (1994).

20 Gallup (1979, 1985). Interestingly, it has not been possible to demonstrate that gorillas recognize themselves in mirrors (Gallup Jr. 1983, Suarez and Gallup Jr. 1981), but see Patterson and Cohen (1994) Mirrors test self-recognition, rather than self-awareness, and it seems reasonable to suppose that some primates that cannot recognize themselves in a mirror nevertheless have a degree of self-awareness -- Povinelli (1987); Povinelli and Godfrey (1993).


22 A classic experiment that can be thus interpreted was that of Premack and Woodruff (1978). It is, however, open to other interpretations (Savage-Rumbaugh et al. 1978). For a useful discussion that makes clear that these issues remain

24 Trivers (1971). See also the model by Simon (1990), which depends on there being genetic variance for “docility” – being adept at learning from others (social learning).


26 Batson (1990). Buried in this problem is the one of “free will,” since one can hardly be ethical unless one can choose to do so without constraint. Determinism is the notion that all acts have predetermined causes – part of a fixed chain of causes and effects that extends both into the distant past to the origin of the universe and into the distant future, to its end. Within our own lives, it erases the possibility of “free will” -- we do what we have been fated to do by the original configuration of the universe. That view of a clockwork Newtonian universe led Laplace to state that a sufficiently intelligent being, once aware of the position and momentum of every particle in the universe, would know the entire past and future. The more statistical scientific view of the world that accompanied the development of quantum mechanics has not really solved this age-old philosophical problem. For a brief overview of this problem, see Roy C. Weatherford’s entry “determinism” and connected entries in Honderich (1995). Ruse (1986) has an interesting related discussion.


28 It is also a matter of dispute in the social science community. See for example the discussion of Richard Rorty’s concept of “ethnocentrism” in Festenstein (1997).


31 Singer (1972).

32 E.g., Singer (1975); Regan (1983).

33 E.g., Stone (1974); Ehrenfeld (1978); Devall and Sessions (1985).

34 For an overview of many relevant ethical issues see Rolston (1988).

35 One reason is a shortage of genes relative to the number of synapses that must be connected. This issue is discussed in detail in Human Natures (Island Press, 2000).


37 For a sampling of the developing literature of ecological ethics and related topics (including “deep ecology”) see Daly (1989); Dasgupta (1993); Dasgupta and Maler (1995); Devall (1980); Devall and Sessions (1985); Eckersley (1992); Fox (1984); Fox (1989); Leopold (1966); Murdoch (1980); (Naess 1973, 1989); Nash (1989); Pirages and Ehrlich (1974); Pirages (1977, 1996); Sessions (1981); SouleX’ and Lease (1995); Stone (1987); Tobias (1985); Zimmerman (1986).

38 E.g., Marsh (1874).

39 E.g., Leopold (1966).


41 For the start of it, see Naess (1973).


43 Daily (1997); Ehrlich (1990, 1991)

44 E.g., Daily (1997).

45 Daily et al. (2000).


47 E.g., chapter XX material on Inuit; Hames (1991); Alvard (1993a, 1993b); Kay (1994, 1995); Low (1996); Winterhalder and Lu (1997); Alvard (1998).

48 Tisdell (1989); Redford and Stearman (1993a); Alcorn (1993); Redford and Stearman (1993b); SouleX’ (1995); Spinage (1998); Atwell and Cotterill (2000).

49 E.g., Gadgil (1991); Bawa and Gadgil (1997).

50 E.g., Dasgupta (1993); Gadgil et al. (1993); Ehrlich et al. (1995).


53 At least in terms of current and foreseeable behaviors and technologies (Daily and Ehrlich 1992); (Ehrlich and Ehrlich 1990, pp. 67-70, 92)

54 E.g., Birch (1993a), pp. 107-110; Birch (1993b).

55 Daily et al. (1994). There are many possible definitions of “optimum;” the one used in this study considered preserving broad environmental and social options for individuals.


57 Daily and Ehrlich (1996b); Ehrlich et al. (1995).

58 Diamond (1997).

A recent example is the successful effort of His All Holiness The Ecumenical Patriarch Bartholomew I (Eastern Orthodox Church) to bring various groups together in aid of preserving biodiversity (Hobson and Lubchenco 1997). For a thoughtful discussion of religion and ecology see, Haught (1995), chapter 9.

Yes, I know: who is to judge what is thoughtful? I don’t think it’s that difficult. Many thoughtful people are opposed to a woman’s right to an abortion; many other thoughtful people support that right. (For the record, I support it in most circumstances). Thoughtful people can be either for or against affirmative action (I favor it in many circumstances). The issues in such cases are too complex for thoughtful people not to disagree at times. But those who recommend killing doctors to stop abortions or favor rigid minority quotas, are not, in my view, “thoughtful.”


An extremely slippery concept, related to post-industrial, in that it suggests a break with the past “modern” era. It is believed by some, for example, that humanity has entered an entirely new “information age” or is undergoing a “knowledge revolution” (e.g., Chichilnisky 1997) – both somewhat questionable assertions (Ehrlich et al. 1999). Postmodernists are suspicious and critical of virtually everything, generalized rebels, but also too often utterly Incoherent and without ideas that might help human beings to cope with the problems of living. One interpretation of postmodernist distress is that they are representatives of a segment of the intellectual class, a new class with a “will to power” (Gouldner 1979. Pp. 16-18). That segment is “elitist and self seeking and uses its special knowledge to advance its own interests and power, and to control its own work situation.” (Gouldner 1979, p. 7). The postmodernists may be distressed by their general irrelevance (Gouldner 1979, p. 58) – their triumphs being the intellectual destruction of some university departments that themselves were hardly shaping society. Other segments of the intellectual class, molecular biologists, ecologists, engineers, etc., are less distressed because they’re not so irrelevant and are able to tap into public and corporate funds.

I have substantial sympathy with this point (e.g., Ehrlich 1980, pp. 64-65), but not to the “all ways are equal” extreme to which many postmodernists take it.

Called “grand narratives” (Lyotard 1984 (1979), p. 31ff); an example is Marx’s view that the essential factor in social evolution was class conflict.

For a sample of the Hegelian prose, I recommend an essay “What is postmodernism” by one of its exponents, Jean-François Lyotard (1924-1993), pp. 71-82. Consider: “The Salons and the Académies, at the time when the bourgeoisie was establishing itself in history, were able to function as purgation and to grant awards for good plastic and literary conduct under the cover of realism. But capitalism inherently possess the power to derealize familiar objects, social roles, and institutions to such a degree that the so-called realistic representations can no longer evoke reality except as nostalgia or mockery, as an occasion for suffering rather than for satisfaction” (pp. 73-74). This is some of the clearer exposition of this wave of philosophizing. Philosopher Richard Rorty points out that twentieth century deconstructionists, descendents of nineteenth century idealism, want to make literature the central discipline and “treat both science and philosophy as, at best, literary genres” (Rorty 1982, p. 141). He goes on to point out (p. 142) that literature, in opposition to science, encompasses “areas of culture which, quite self-consciously, forego agreement on an encompassing critical vocabulary, and thus forego argumentation.” In the course of creating their literature, the deconstructionists often have “ornamented the writing with uncomprehending and certainly incomprehensible passages of bewitching scientific jargon” (Miller 1999, p. 1626). This led to one of the most hilarious spoofs of all time – a lampoon by physicist Alan Sokal entitled “Transgressing boundaries: toward a transformative hermeneutics of quantum gravity” (Sokal 1996), which was actually published in a postmodernist journal. The article is reprinted in Sokal and Bricmont (1998). For interesting comments on this affair from a Humean perspective, see Miller (1999). A philosophically balanced recent overview of the postmodernist attack on science can be found in Hacking (1999).

A key figure in this controversial area of philosophy is Jaques Derrida (1930- ). Unhappily, many deconstructionists, with their intellectual base in literary criticism, throw the scientific baby out with the bathwater. Although their influence in the “hard” sciences has been minimal, that cannot be said of the social sciences where, for example, various departments of anthropology have been intellectually destroyed by Derrida’s notion that “there is nothing outside the text” (Derrida 1976, p. 158). Derrida’s followers are intellectual descendents of early philosophers who argued that nothing exists but ideas (see discussion in Rorty 1982, chapter 8).

Named after Pyrrho of Elis (ca. 360 BC – ca. 272 BC), the ultimate skeptic, who tried to behave as if there was nothing “out there” (since good arguments can be made for and against the existence of anything) and had to be protected by his friends from doing things like walking into fires or falling into holes.

Hume (1777 (1777)), p. 111 (I’ve removed a few commas for clarity).