

Ecoethics: Now Central to All Ethics

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Abstract A few years ago, I wrote on the need for expansion of the environmental areas of bioethics, and covered some of the topics touched on here. Sadly, although it is possible to find some notable exceptions, bioethics does not provide much of an ethical base for considering human-nature relationships. Here I'm not going to deal with these philosophical issues or others about the nature of ethical decision-making. The rapid worsening of the human predicament means that applied ethical issues with a significant environmental connection (what I call "ecoethics"), must be dealt with without waiting for the more interesting theoretical issues to be resolved. I define ecoethics very broadly to deal with dilemmas over a vast range of scales, and believe they now should penetrate virtually all areas of human activities. Ecoethics must struggle with issues of intra-generational (and interperson/group/nation) equity and the dilemmas of discounting by distance (valuing distant persons/events/costs/benefits less than those closer to the observer in physical or mental distance). Ecoethics also deals with the difficult

dilemma of inter-generational equity—of discounting the future. That is especially troublesome when actions today can have significant environmental consequences 50 or more generations from now. Here I would like to highlight the ubiquity of those questions and the importance of seeking answers.

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A few years ago, I wrote on the need for expansion of the environmental areas of bioethics (Ehrlich 2003) and covered some of the topics touched on here. Sadly, in the intervening period there has been no significant expansion of public discussion of environmental-ethical issues, let alone signs of changed behavior. Although it is possible to find some notable exceptions (e.g., Potter 1999; Potter and Whitehouse 1998; Whitehouse 1999), bioethics does not provide much of an ethical base for considering human-nature relationships. Meanwhile, we are faced with unprecedented problems. The monumental task before us is to resolve the human predicament—the interrelated crises of overpopulation, wasteful consumption, rapidly deteriorating life-support systems, growing economic inequity and human-rights abuses, increasing hunger, toxification of the planet, declining resources, an increasing threat of resource wars (especially over oil, gas, and fresh water), a worsening epidemiological environment that enlarges the probability of unprecedented pandemics, and persis-

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tent racial, gender, and religious prejudices that make environmental problems more difficult to solve.

Bioethics today is a major area of academic ethical thought (Bryant et al. 2002) and the center of considerable controversy because it so often deals with highly personal decisions and the nature of medical and pharmaceutical establishments (Turner 2009). There also is a long ethical tradition of considering human responsibility for the preservation of nature (for a fine and comprehensive overview, see Rolston 1988), and a rich philosophical literature on ecological ethics, much of it very theoretical and technical (e.g., Brulle 2002; Eckersley 1992; Habermas 1984), dealing especially with whether the basis of ethics should be ecocentric. That literature asks the difficult question of whether ethics of the environment should be holistic, as in Leopold's "land ethic" (Leopold 1949) or "deep ecology" (Naess 1973)—focused on entire systems and often derived in some way from ecosystem ecology—or focused on the situations of individual organisms and how nature serves human instrumental needs. A fundamental issue is the degree to which humanity should take responsibility for nature, and much of that depends on the degree to which people consider nature as a means to human health and welfare, and how much as an end in itself.

I'm not going to deal here with these philosophical issues or others about the nature of ethical decision-making (e.g., Toulmin 1958). The rapid worsening of the human predicament means that applied ethical issues with a significant environmental connection (what I call "ecoethics") must be dealt with without waiting for the more interesting theoretical issues to be resolved (if they ever will be). These applied issues that look primarily at nature as a means unhappily are so pressing as to require immediate consideration. This personal opinion may sound extreme at first, but I do not believe it is—the practical ethics of decisions on, say, whether or not to go to war have profound environmental consequences. Furthermore, all human relations, including those of international disputes, seem bound to be stressed by the escalating environmental changes civilization is facing. That implies that *most* of applied (or practical) ethics—agreed-upon values that involve notions of whether actual behaviors are right or wrong (Jamieson 2008; Singer 1993)—will need to evolve. Rapid cultural evolution is required if the organization of our small-group

animal (one genetically and culturally accustomed to dealing with ~150 other individuals) is to transition successfully from a gigantic society teetering on global collapse (Homer-Dixon 2006) to one that is sustainable and provides everyone with a reasonable quality of life (Ehrlich and Ehrlich 2008).

I define ecoethics very broadly to deal with dilemmas over a vast range of scales, and believe they now should penetrate virtually all areas of human activities; for example, sustainable health care (e.g., Jameton and Pierce 2001) and nuclear war (Toon et al. 2007). This goes beyond what has been typically covered under the already broad rubric "environmental ethics" (Rolston 1988). Ecoethics must struggle with issues of *intra*-generational (and inter-person/group/nation) equity and the dilemmas of discounting by distance (valuing distant persons/events/costs/benefits less than those closer to the observer in physical or mental distance). But ecoethics also deals with the difficult dilemma of *inter*-generational equity—of discounting the future. That is especially troublesome when actions today can have significant environmental consequences 50 or more generations from now (e.g., Solomon et al. 2009). I hope that the ubiquity and extreme seriousness of ecoethical problems will attract to them some of the bioethicists who have put so much effort into the important but much less critical questions of medical ethics.

All human activities involve the use of energy, and thus all have environmental consequences (e.g., Ehrlich 1994), even the simple act of breathing. Since one can hardly have a mental (or actual) debate over the ecoethics of every single action taken by an individual or a collective, one must search for basic principles that if widely enough applied will increase the chances that we can avoid a collapse that might well be entrained by climate change alone, leading to mass starvation and perhaps nuclear war (Ehrlich et al. 1983; Ehrlich and Ehrlich 2008; Toon et al. 2007; Sterman 2008). Ecoethics ranges from common "small-scale" personal ethical decisions to the ethics of power wielded by large institutions that try (and sometimes succeed) to control huge aspects of our global civilization. Those institutions include governments, religious institutions, transnational corporations, and the like. To ignore these power relations is, in essence, to ignore the most important issues in ecoethics,—which at that large scale constitutes an extremely difficult area that virtually demands global discussion.

Broader consideration of ecoethics could build a basis for an ongoing dialogue on this difficult topic.

We even need to examine some basic issues that confront all ethical and political theories.¹ Since almost every policy we choose has both winners and losers, how do we fairly aggregate the costs and benefits? How do we deal with persistent disagreements about values, and about policies that best reflect those values? More specifically, can a globalized world sustain itself if broad ecoethical differences persist; if, for instance, people or nations opt out of agreements others consider necessary for civilization's survival? What sorts of actions would be justified against those who broke international agreements (or refused to agree to decisions) on, say, limiting greenhouse gas emissions?

Not surprisingly, in this paper I cannot give solid answers to the key questions in ecoethics, although in some cases I think I can point toward them. But I would like to highlight the ubiquity of those questions and the importance of seeking answers. I've tried to summarize an ecoethical laundry list, organized on the basis of a rough estimate of the scale at which the problem occurs, and to focus on the levels at which it ordinarily will be resolved. These are, roughly: personal decision making; actions by regional and national institutions, often governmental; and those of global significance, possibly requiring new human norms or international agreements and institutions. Regardless of how we sort the laundry, my goal is to emphasize how badly we need to start the washing machine and to make some personal suggestions of how to do that.

Small-Scale Ecoethics

In modern Western bioethics, the discourse has tended to privilege the individual and autonomy, to focus on ends rather than means. Let's start with the small but extremely common sort of personal ecoethical dilemmas faced by ecologists and other environmental scientists as individuals. My wife, Anne, and I—like many of our colleagues—are faced with a continuous stream of such problems. Should we eat shrimp in a

restaurant when we can't determine its provenance? Should we become more vegetarian? Is it legitimate to fly around the world in jet aircraft to try and persuade people to change a lifestyle that includes flying around the world in jet aircraft? How should we think about all the trees cut down to produce the books and articles we've written? These sorts of decisions are poignantly discussed by Giovanni Bearzi (Bearzi 2009), who calls for conservation biologists to think more carefully about their individual decisions and set a better example where possible by restraining their more biodiversity-threatening activities.

Interestingly though, Bearzi does not discuss decisions about child-bearing, even though, especially in rich countries, these are often the most environmentally significant ethical decisions an individual makes (Murtaugh and Schlax 2009). But small-scale ecoethics are tough because they relate to personal preferences, and because society has not come to grips with the most basic of issues—those surrounding reproduction and consumption—and provides little ethical guidance (or legal structures) to regulate their joint impacts on a global civilization.

Sometimes equally difficult and environmentally relevant are personal health decisions, such as when to use antibiotics, as I have discussed earlier (Ehrlich 2003). The epidemiological environment (Daily and Ehrlich 1996) appears to be deteriorating further, as population growth, globalization, and lack of preparation—and general failure to make the connections that tie individual human health to the health of the biosphere—make the chances of vast epidemics greater. Careful consideration of when it is ethical to employ antibiotics personally or on loved ones is one place where individual action could make a collective ecoethical difference, helping to retard the evolution of antibiotic resistance. This can also be an issue of education—is it ethical for our school systems and mass media not to assure that virtually all of us as citizens are aware of the potential costs of using antibiotics (personal and collective) as well as of the benefits? And thus, of course, one might consider it an ethical imperative that every schoolchild be made aware of how evolution works.

It is important to note that almost all small-scale ecoethics interfaces with the classic collective (medium-to-large-scale) problems of dealing with various kinds of common property resources and the perils created by

¹ While ignoring many others, such as the long and intertwined relativist/absolutist and consequentialist/deontologist debates in ethics, which are relatively unimportant to the subject at hand.

“free riding” (e.g., Dasgupta 2007; Ostrom 1990). Does one more airline flight, dumping CO₂ into the common-property atmospheric sink, really make a difference? After all, the plane would have gone even if I hadn’t been on board.

Mid-Scale Ethics

Mid-scale ecoethical problems are those that are primarily of concern to limited local or regional groups—not individual dilemmas and not ones dealing with potential global consequences. Some of these difficult ethical problems were brought home again to Anne and me on a 2008 field trip to southern Africa, and some detail on the relationships there between wild elephants and human beings can illustrate the dilemmas involved. Among other goals, we went to see what was happening to the vaunted ecotourism industry there, a subset of the tourist industry, which is a hotbed of difficult ethical issues (e.g., Smith and Duffy 2003), as is ecological management in general (Minteer and Collins 2005). Is ecotourism an answer to saving Earth’s biodiversity? Our first impressions on that trip led to a clear “yes”; we went to a series of well-run, “ecologically conscious” camps and enjoyed a rich panoply of wildlife, which showed no sign of being disturbed by game-viewing from open vehicles. A well-organized regional tourist industry clearly gave relatively poor nations in the area a strong incentive to preserve their living natural capital.

Elephants were common during our visit to the Okavango Delta, reminding us of the heated debate in much of Africa over whether or not it is ethical to cull the herds that are growing in response to recent steps to stem the ivory trade (<http://news.bbc.co.uk/2/hi/africa/7262951.stm>). On one hand, the giant beasts can be serious agricultural pests and at high densities can radically alter natural landscapes; on the other, animal rights activists and many other nature lovers are offended by the killing of these charismatic and intelligent animals. Like many of today’s ecoethical dilemmas, this one is not easy to resolve.² There are

ways to attain needed population reductions other than culling, including relocation and contraception. But suitable areas into which to introduce elephants are growing scarce, and using contraceptives is difficult except in small parks and is more complicated and expensive than shooting. Animal rights groups are, in my view, properly concerned about cruelty to elephants, and the plight of young elephants orphaned when their mothers are killed is especially heart-rending. With some notable exceptions (e.g., Bryant et al. 2002), the rights of non-human animals tend to be given relatively short shrift in bioethical discourse, and even when considered tend to take a back seat to questions about the ethical treatment of people. But overpopulation of elephants can lead both to problems of sustainability for them and to collisions with another overpopulated species that has the capability of destroying them.

The Zimbabwean “Campfire” (Communal Areas Management Programme for Indigenous Resources) program, partially funded by USAID, was the center of a great elephant controversy in the 1990s (Frost and Bond 2008). The funding was for building the capacity of local populations to manage natural resources (<http://digital.library.unt.edu/govdocs/crs/permalink/meta-crs-388:1>). The situation can be briefly summarized: Elephant herds outside of parks and reserves were capable of decimating a family’s livelihood in an hour by destroying its garden plot. That led to defensive killing of raiding elephants by local people. Rogue elephants were also responsible for hundreds of human deaths each year (http://findarticles.com/p/articles/mi_m1594/is_n4_v9/ai_20942049/pg_1). All that was accelerating a decline in elephant herds, which at that time was primarily due to poaching.

Campfire supported the return of elephant herds to the control of local communities and the issuing of some 100–150 elephant hunting licenses per year for community lands. The licenses were sold to sport hunters for \$12,000–15,000. The money was given to Rural District Councils, which got to determine how the money was spent. Herds grew dramatically in the hunting areas because poaching was suppressed by the elephants’ new “owners,” local people, who got more money and suffered less damage, and it seemed to many it was a win-win situation. But the Humane Society of the U.S. (HSUS) objected, saying that the intelligent and charismatic elephants should never be

² I do not wish to get into this debate here. For intelligent discussion of these issues, see Midgley (1983) and Jamieson (1999). Although I sometimes disagree with Singer’s conclusions (often emotionally), I always find him a clear thinker.

killed by hunters, and animal rights groups lobbied to get funding stopped. The whole issue was further clouded by arguments over how much of Campfire's motivation was centered on reopening the ivory trade (partly sanctioned by CITES) and its impact on elephants outside of Zimbabwe, and on whether a switch to entirely photographic safaris (a trend then well under way) would not be equally effective in protecting herds (but perhaps less effective in protecting local people and garden plots).

More recently, despite the shocks of a cessation of international funding and the political-economic implosion of the Zimbabwean state, the conservation benefits of Campfire remained remarkably robust (Balint and Mashinya 2008), although their present status is in doubt. The situation underlines the need to keep the ecoethics of the "big picture" always in mind, such as the impact of political disputes on biodiversity, and to pay attention to factors such as "political endemism" (Ceballos and Ehrlich 2002)—the disparate capabilities of different nations to protect wildlife—when determining where to allocate conservation funds.

The Campfire controversy highlights the ethical conflict between those who believe the key conservation issue is maintaining healthy wildlife populations and those concerned primarily over the rights of individual animals or who decry the "utilization" or "commodification" of nature—or, as it's sometimes called, "wise use" or "multiple use." This is a difference in values that is likely to persist. Yet in the face of values disagreement, we still have to make choices. Much as I hate to see elephants hunted by people who simply get a feeling of accomplishment from killing these magnificent animals (if they wanted "sport," they should stalk bull elephants on foot with spears), on the whole I come down on the side of the Campfire program. It seems more ethical to give local people a beneficial stake in maintaining the herds instead of permitting their extermination than it does to avoid the "unethical" killing of non-human animals by rich hunting enthusiasts—especially when and where entire elephant populations may be doomed in the absence of hunting revenues. It would also show local people that not all conservation programs operate against their perceived interest. In addition, I think it is ethical to consider the non-charismatic animals and plants that, as I have seen in the field, can be laid waste by elephant overpopulation even while

some other organisms can be dependent on normal elephant activities (Pringle 2008). So in a world in which ideal solutions are rarely available, I'd vote to continue controlled hunting for the moment, since it seems that both more people and more animals would benefit from that course. This is primarily a consequentialist position, but I would become deontological if the sum of the benefits could be increased by culling some of the human population—to me people count for more than elephants.³

Apparently less complex are issues related to ecotourism fueled by birds but also by petroleum. For example, efforts are being made in Australia by the New South Wales government to restore habitat for the endangered (and spectacular) Regent Honeyeater in Australia's Capertee Valley. Three species of *Eucalyptus* providing vital resources for the bird are being replanted, as well as a variety of other plants designed to restore the habitat present when the first Europeans arrived. The Regent Honeyeater is now subject to a captive breeding program; releases have begun in Capertee and a site in Victoria (Ingwersen 2008). In Capertee, development of larger areas of suitable habitat will not only likely increase the chance of Regent Honeyeater population growth, but also provide more suitable release sites. Happily, birdwatcher interest in the Regent Honeyeater will be providing more habitat for many other Australian animals—something that is desperately needed over much of the ecologically ravaged continent (Lindenmayer 2007; Recher et al. 1986). But, of course, it would also likely lead to more Aussies driving to the New South Wales outback.

In this case it is possible to visualize a long-term national ecotourism industry, should Australia bring its headlong environmental destruction under control, and should its government recruit its fine solar scientists to develop and deploy a solar/wind energy economy. One can imagine driving hybrid or all electric-powered vehicles to the Capertee Valley to enjoy these stunning honeyeaters and more than another 200 avian species, including a fine variety of other honeyeaters that impressed me on a recent visit. And sustainable sea travel, perhaps based on leisurely computer-controlled sailing, could bring overseas visitors to enjoy Capertee and other Austra-

³ Although I maintain a short list of individuals who I believe are exceptions to this rule.

lian birding hotspots. So while the ethics of long-distance fossil-fueled travel for ecotourism in Capertee may be questionable today, a sustainable future *might* be possible.

Polynesia is another part of the world where ecotourism, especially focused on rich coral reefs, is an important part of an economy now heavily dependent for energy on petroleum. Here the ecoethical issues are somewhat different. How long can this dependence continue, and what is the ethical planning course for local governments? Like the general activities on the islands, ecotourism requires oil, for importing both tourists and supplies and for maintaining them. Virtually all the islands are threatened by sea-level rise; the atolls by inundation, and the high islands by flooding of infrastructure that is concentrated in low coastal areas. Furthermore, much activity in the area is subsidized by New Zealand and France, both of which are feeling economic pressures to lessen their support. What are those nations' ethical obligations to the Pacific islanders? What are ours?

More broadly, what ethical responsibilities do we have toward organisms anywhere that will lose their habitats because of anthropogenic climate change? These are just a subset of the ethical dilemmas posed by climate change. Who should help whom and how as climate change dramatically alters Earth's environments? That's an ecoethical issue that's likely to be with us for a very long time (Solomon et al. 2009).

As in the case of Capertee, these ethical issues would be much more easily resolved (at least in my mind) if there were much less uncertainty. If I could know just how positive or negative my impact on the Polynesians and the islands/reefs would be, a decision on whether to tour Polynesia on a dive boat would be much simpler. This story, as Shamik Dasgupta pointed out to me, highlights the difference between what philosophers call theoretical and practical reasoning. Lacking the required data, theoretical reasoning would lead us to conclude we should suspend belief. But practically, I must either go or stay home. This is one of the most common problems in the human predicament—deciding which actions to take in the face of uncertainty.

Perhaps the most vexing ethical questions in conservation concern conflicts between saving endangered organisms and traditional rights to hunt them—exemplified by complex aboriginal “subsistence” whaling issues (Reeves 2002). While commercial

whaling is largely responsible for the collapse of many stocks, aboriginal whaling may threaten some of the remnants. Does one then side with the whales or the people, to whom the hunts may be an important part of tradition? My view is, of course, that preserving the stocks by limiting aboriginal takes would usually be the ecoethical thing to do, since it preserves a chance for the traditional hunt to persist, which will not happen if the whales go extinct. Tradition is a tricky thing. In Appalachia and Wales many groups have traditionally been coal miners. Ecoethically, to maintain the integrity of our life-support systems, it is necessary to restrain some human resource use, and that occupation should end. But what is the best way to end it fairly and humanely? And do we have enough knowledge to be reasonably sure of the consequences?

Ecoethics in general faces huge issues of uncertainty in trying to judge how to allocate effort to resolving various elements of the human predicament. The overall problem of minimizing the aggregate opportunity costs involved is daunting to begin with. Issues of irreversibility require guesswork about future technologies (e.g., will genetic engineering allow reversal of some extinctions?), and many if not most systems involved are too complex and feature too many potential irreversibilities and nonlinearities to allow us to make predictions about them with a high degree of precision. This issue becomes especially difficult as one approaches large-scale ethics.

Large-Scale Ethics

Most conservation biologists view the gigantic global task of preserving biodiversity as fundamentally one of ethics (Ehrlich and Ehrlich 1981, chapter 3; McCord 2009). Nonetheless, long experience has shown that arguments based on a proposed ethical need to preserve natural objects (Stone 1974) on the grounds that the environment has an intrinsic and aesthetic value outside of its resource (means) worth (Brulle 1996) have largely fallen on deaf ears. Indeed, President Obama's science advisor has been the subject of enraged attacks in the blogosphere for his discussion of the Stone proposal decades ago. (For one of the more polite cases, see: <http://corner.nationalreview.com/post/?q=ZTVmYjE4ZTkzNDU1>)

NWZjZjA0M2RjM2UxYTEwMjI5MmQ=) Few seem to believe that our only known living relatives in the entire universe, the products of incredible evolutionary sequences billions of years in extent, have enormous intrinsic value and are willing to treat nature primarily as a collection of valuable ends. Most ecologists (e.g., Maguire and Justus 2008) have therefore switched to what may be risky instrumental arguments for conservation, treating nature primarily as a set of means, most recently focused on the preservation of ecosystem services (e.g., Daily and Matson 2008). There is then a large-scale ethical-tactical issue of what degree of conservation is required and what proportion of conservation effort should be put into promoting instrumental approaches that might backfire or be effective only in the short or middle term. One of the best arguments for emphasizing those instrumental approaches is that they can at least buy time for the necessarily slow cultural evolutionary process of changing the norms that favor attention to reproducible capital and property rights to the exclusion of natural capital. Of course, if the instrumental arguments were strong enough, there might be no need to convince people to share the underlying values. But so far they haven't proven strong enough, and would in any case change in potency with technological and environmental change.

How should one consider the ecoethics of some newspaper editors (17% in one survey) who, in the face of potential world-wide environmental calamity (e.g., Hansen et al. 2008), are *reducing* their coverage of environmental issues? Sadly, just 10% of the editors considered reporting on science and technology “very essential”. One can, of course, write such behavior off to ignorance, or point out that editors assign reporters to cover what the public is interested in. But this leaves the question of whether ignorance or going with what sells can be an excuse in this case any more than it would be for a developer to sell you a house in a floodplain, claiming he didn't know the possible consequences or that houses there were very popular. Although clearly legal, is it ethical for people who openly admit they fail to understand scientific issues (e.g., Tierney 1990) to pronounce upon them, or for an editor to give such people a soapbox (<http://tierneylab.blogs.nytimes.com/2008/12/23/science-advisors-unsustainable-bet-and-mine/>)? And who can judge who understands? What about those scholars

with no grasp of the scientific issues who write on the ethics of environmental scientists and mischaracterize their views (e.g., Balint 2003)? And finally, supposing one *is* faced with an array of unethical anti-environmental editors and pundits, is there any point at which the government could be ethically justified in intervening? This is no trivial issue, raising (among other things) obvious issues of “free speech”.

An especially difficult theoretical area of large-scale ethics is that of anti-environmental pronouncements from leaders of religious organizations. Putting aside the ethics of the power gained over other people's lives by the leaders and (on the other hand) the happiness and peace of mind that may be provided to believing individuals, there is an even more serious question of their contributions to encouraging a possible collapse of global civilization. The most obvious example is the idea in Christian eschatology of “the rapture”—a time when all believers will be swept away to a land of eternal bliss. No doubt such ideas are comforting to many people, but unhappily when such people gain political power they often assume or claim that the “end time” is near and something real, and thus that there is no reason to care about life-support systems that the believers will soon no longer need. This may well have shaped the anti-environmental decisions of James Watt, Ronald Reagan's corrupt “born again” Secretary of the Interior.⁴ Thanks in part to the anti-environmental policies of the Reagan administration, the global environment is deteriorating rapidly, while after nearly 30 years, no supernatural being has put in an appearance to save the situation.

But there is a great diversity of Christian (and other religious) worldviews in relation to central issues of ecoethics (e.g., Van Houtan and Pimm 2006). In contrast to the Reagan-Watt approach, many religious leaders have been important positive spokespersons on environmental issues, often taking a (to me) welcome “ends” approach to conservation. For instance, protecting biodiversity (“the creation”) was endorsed by the Greek Orthodox, Protestant, and Catholic hierarchs of the Standing Conference of Canonical Orthodox Bishops in the Americas (SCOBA) at their meeting in New York City, on June

⁴ On January 2, 1996, he pled guilty to withholding information from a grand jury, and a whole series of other felony counts against him were dropped.

21, 2005, following approval of the statement by the SCOBA Social and Moral Issues Commission, and recommendation by the SCOBA Study and Planning Commission (To see their entire statement go to: <http://www.goarch.org/news/goa.news1393>). There has also been substantial convergence between the views of some evangelical Christian religious groups and those of environmental scientists (E.g., http://www.terraily.com/reports/Evangelicals_Embrace_Climate_Change_Science_To_Save_The_World_999.html). The reverend Richard Cizik has become an important crusader on environmental issues in the evangelical Christian community. Read his words:

The climate change crisis that we believe is occurring is not something we can wait 10 years, 5 years, even a year, to address. Climate change is real and human induced. It calls for action soon. And we are saying *action based upon a biblical view of the world as God's world*. And to deplete our resources, to harm our world by environmental degradation, is an offense against God. That's what the Scriptures say. Therefore, if we are to be obedient to the Scriptures, there is no time to wait, no time to stall, no time to deliberate [his emphasis] (<http://www.thegreatwarming.com/revrichardcizik.html>).

But there are deeper ethical questions in this area: Is it ever ethical to damage other people or the environment that supports humanity on the excuse that some supernatural entity mandated it long ago? In general, one would like to sort out the ethics of using individual belief as a guide to behavior and as a basis of state policies, but this is made more complex by belief-driven behaviors (such as having large families) that in the aggregate can create pressure for policy restraints (e.g., the one-child family policy in China). Children raise further ethical dilemmas. Is it a form of child abuse (Hitchens 2007, pp. 217ff) to train youngsters, before they are old enough to think for themselves, to ignore the human predicament on the basis of religious beliefs?

Is it ethical for the leadership of the Catholic, Mormon, Orthodox Jewish, or any other religion to espouse pro-natalist policies that exacerbate one of the major drivers of environmental deterioration that seriously threatens the wellbeing of present and future generations? This is a problem of elements of the Catholic hierarchy, which has a very long history of

telling people what their ethics ought to be (and burning alive those who disagreed). Many priests, however, have been opposed to the efforts of those elements to dictate how young women should lead their lives (Kavanaugh 1967). But the conservatives at the top of the hierarchy forbid the use of effective contraception and also of abortion. Typical of the conservative view is the journal *First Things*, which is dedicated to advancing “a religiously informed public philosophy for the ordering of society”. Recently it published Mary Eberstadt’s “The vindication of *Humanae Vitae*” (2008)—a defense of Pope Paul VI’s “teaching” banning the use of artificial contraception and containing other messages from above about sexual morality. I won’t comment on the “substance” of the article, since many millions of Catholics have already voted on that with their genitalia, as evidenced by the very low birthrates in Catholic nations such as Italy, Spain, France, and Poland. For me, Eberstadt’s behavior and that of the hierarchy is ethically reprehensible—not that some of the issues they discuss are not ethically important, but because they pay no attention to the underlying logic and appear determinedly ignorant of the environmental consequences of their dictates. Those dictates serve to increase the number of people, and thus the damage to everyone’s vital life-support systems, and reduce the chances of future generations to have decent lives, or even to exist.

In addition, while focusing on control of young women’s sexual activities, the hierarchy has paid much less heed to the numerous pedophiles that they release on societies, often protecting the predators and giving them more opportunities. This is especially sad, causing untold pain to the victims, because the society in which they commit their crimes (unlike some other societies) condemns all child sexuality, and their own narrow sexual rules deepen the pain for abused Catholic children. This aspect of the hierarchy’s behavior, of course, weakens their position to provide ethical guidance of any kind. And at this time in human history, I believe that any authority that is listened to at all has a very special responsibility to be both well-informed and to put major effort into moving society toward sustainability. That means, among other things, that ministers, rabbis, priests, imams, and other individuals looked up to by the religious have an ethical obligation to devote sufficient time to learning how the biophysical world

works to effectively move their co-religionists in that direction. But, of course, behind all of this discussion is the consequentialist/deontological tension where (without being able to resolve the issue) I clearly come down in the consequentialist camp.

This tragic problem overlaps with another important ecoethical issue. Can we create an ecologically sustainable global society in which some groups of people are systematically discriminated against? Can we expect people to work together to solve pressing environmental problems if rampant racism, sexism, and religious prejudice persist? The last two are especially ecoethically intertwined. There are many indications that improving the status of women is an important route to the humane reduction of fertility rates (Abbott 1974; McDonald 2000), in itself a major ecoethical plus. But major religions—Islam, the Catholic Church, Evangelical Christians, the Mormons, and Orthodox Judaism among others—systematically discriminate against women. Basic ethical issues here include whether the rules putatively tracing to the wishes of supernatural males via the reports of men, still interpreted almost exclusively by men, should have any particular ethical standing simply because of their provenance. Indeed, I would claim that present-day death and suffering of women and the suffering of children on the basis of such rules makes them outstandingly *unethical*, without even considering the immense future suffering they contribute to by encouraging increased overpopulation. Can we afford to impede the ability of women to contribute to building sustainability, since in the critical areas of reproduction and nutrition their contributions are especially valuable?

Individual responsibility for institutional unethical behavior is more difficult to assay. Does the Pope actually believe that human life begins with the zygote, even though biologically a sperm is every bit as alive as he is? If so, then his position may be uninformed but not unethical. I suspect, however, he would claim that his division between life and non-life is not made on biological criteria. Do the apologists for the position of the Vatican hierarchy, who regularly post nonsense on their websites about population pressures and are ignorant of the ecological situation (e.g., Austin Ruse describing Malthus as a “scientist” and claiming that the planet is “remarkably empty,” see <http://www.usccb.org/prolife/programs/rlp/03ruse.shtml>)

rate as being unethical or just ignorant? What are the ethical responsibilities of an American officer leading troops attempting to make Iraq subservient to U.S. interests and assure a supply of oil that ecoethically should never be burned (Hansen et al. 2008)? I suspect the officer believes she is doing right—and can cite “authorities” to “prove” it. But, as with the editors mentioned above, should ignorance be an excuse?

These are not easy ethical issues. Am I being ethical in promoting the belief that population growth is a threat to global civilization just because that’s the consensus of the scientific community (National Academy of Sciences USA 1993; Union of Concerned Scientists 1993)? After all, it was once the consensus of the scientific community that some “races” were inferior to others and that eugenics was ethical. If ethics are simply agreed-upon values, how could one judge an SS officer or me to be unethical if the vast majority of our colleagues agreed with our values? Rudolf Höss, commandant of the Auschwitz death camp, felt the orders Himmler gave on behalf of Hitler were “sacred” and suppressed his natural empathic feelings to a higher moral cause: “I was not permitted to show the slightest compassion ... I had to carry on my task, to witness extermination and slaughter, to repress my feelings ...” (Mineau 1999, pp. 134–135). But here I’m straying again into the morass of theoretical ethics—*mea culpa*.

If we accept that it is ethical to hold responsible those who are wrecking humanity’s life-support systems, humanity must discuss and determine what sanctions should be applied. Some interesting suggestions have been made. For example, in the United States it would seem ethical (and equitable) to institute a high carbon tax in a “tax and 100-percent dividend” system (Le Page 2008). The revenues from the tax would be divided equally among the nation’s citizens so that everyone would receive money, and the guilty—drivers of gas-guzzlers, those of us who fly around to meetings, owners of dot-com palaces, and other big-time energy users—would be sanctioned by their increased costs far outstripping their dividends. But there are those who would fight such a trend because their own financial positions would be damaged—raising the question of private versus community interests: whether it’s ethical for individuals to protect their own interests and those of their families when it increases social costs.

Such difficulties underline the need for wide-ranging debates of such ethical issues and discussion of ways to solve dilemmas as equitably as possible. A world-wide *Millennium Assessment of Human Behavior* (MAHB) (Ehrlich and Kennedy 2005) is starting to be established to, among other things, facilitate debate and discussion on the key ecoethical question of “what are people for?” (<http://mahb.stanford.edu>). I would hope that such a public education effort, generated with wide and persistently promoted public discussion and the institution of some preliminary sanctions, would eventually lead people to adopt new norms in key areas. For example, it could make people more aware that taxes buy services from a government that could not otherwise be supplied, and gradually instituted Pigovian taxes might encourage a change of norms (as did initial laws mandating recycling). Fairly administered, taxes could promote many social goods—such as the supremely ecoethical task of ending humanity’s addiction to fossil fuels. If the MAHB and other deliberative efforts (Spash 2007) actually generated an appropriate change in norms away from the idea that taxes are automatically “bad”, a tax-dividend system could be instituted in most nations, each increasing the rate regularly. Carbon tariffs and boycotts could be used to encourage nations not to cheat.

One of the most dramatic ethical issues society faces today at the large scale are governmental: not issues of classic corruption, officials enriching themselves or their friends at public expense, but of ignoring issues crucial to the persistence of society, in particular ecological issues. In so doing they are not just robbing people today in the classic style, but threatening the wellbeing of future generations. Was it an ethical obligation of the Reagan or Bush II administrations to learn about the USA’s and the global society’s environmental peril and attempt to do something about it? It surely *was* unethical for the Reagan administration to strive to destroy every copy of the government’s Global 2000 Report (Barney 1980) as soon as that administration took office. Similarly, was it ecoethical for the Bush II administration deliberately to distort science in aid of their ideological ends (Mooney 2006)—something hardly restricted to that administration but reaching unprecedented heights during its tenure? More readily judged are those who successfully (and apparently deliberately) misled the public on the seriousness of

the climate crisis (for overviews, see Gelbspan 1997, 2005), something that the *Wall Street Journal* and the *Washington Post* pursue even today (Lomborg 2008; Will 2009). But what about the ecoethics of the Clinton-Gore administration, which knew more but still did not do anything significant on crucial issues such as population, consumption, or even climate disruption?

As Barack Obama took over the presidency of the United States, he was, knowingly or unknowingly, facing a gigantic ethical decision as he struggled with global economic problems. There is a crying need to help poor and out-of-work people find jobs and sustenance, and that is a major ethical challenge. But the ecoethical decision was whether to do that by firing up the same old growth machine, or to take on the second, much more difficult, task of revising the entire economic system. Further old-style growth of material wealth in the United States will certainly increase humanity’s ecological overshoot—its living on its natural capital rather than on income derived from it—and possibly produce more global inequity. Such growth, as envisioned by American politicians and many economists, would also likely add to the inequity that divides the world into “haves” and “have nots,” since the U.S., containing ~4.5% of humanity, already uses ~20% of its resource flows. The verdict is not yet in, but things do not look bright. I hope that Obama will take a leadership position and move the U.S. in an entirely new economic direction that will both reduce its footprint and help close the rich–poor gap (Ehrlich 2008; Ehrlich and Ehrlich 2005, 2008; Ehrlich and Goulder 2007; Butler 2008). He could get good advice from some of the top economists in the world, especially Sir Partha Dasgupta in England, who has focused on problems of equity and the economics of the natural environment (Dasgupta 1993a, b, 2001, 2007) and Nobel laureate Kenneth Arrow, who has lately turned his attention to issues of sustainability and consumption (Arrow et al. 2001; Arrow et al. 2004).

Why the vast majority of economists consulted by government and industry are largely ignorant of the big ecoethical and economic issues is partially a mystery and partially a result of their narrow disciplinary training (Colander and Klammer 1987). The same can be said of political scientists and sociologists (but again with prominent exceptions, e.g., Catton 1980; Pirages and DeGeest 2003). The

time is clearly here to dramatically revise what is taught in educational systems all the way up to the university level—with some special attention to departmental structures and graduate training in the social sciences, where their dismal state has long been recognized (e.g., Wallerstein et al. 1996).

Many of the ecoethical issues related to the neocon–neoliberal approach to U.S. foreign and economic policy are rather clear. For instance, the notion that unregulated markets produce equitable, ecologically sound results is nonsense, as dramatically demonstrated both outside and inside the United States (e.g., Klein 2007). For example, neocon policies have likely been partly responsible for more than 100,000 farmers committing suicide in India since 1993 (Thakurta 2008). Those policies included deregulating markets, placing globalized economic goals ahead of preserving our life-support systems or treating people equitably, and privatizing almost everything, combined with interventionist (imperial and neo-imperial) foreign adventures. The ecological aspects of such policies, which are often advanced by taking advantage of socio-political turmoil, tend to be negative. They have most recently been responsible for a financial catastrophe in the United States and other rich countries, one that has distracted attention from desperately needed environmental policy issues, such as reaching global agreement on control of greenhouse gas emissions. A plutocratic American government has tried desperately to insulate the rich perpetrators (e.g., Appel 2008) from the consequences of their acts. Sadly, most politicians drew no conclusions except the least ecoethical one—that it is necessary to again fire up the growth machine that is destroying human life-support systems by increasing environmentally destructive consumption.

Perhaps most daunting of all of the large-scale ecoethical tasks is getting broad agreement on ecoethical issues from diverse cultures. We, for example, don't even know what, if any, are the norms in many cultures on issues such as whether nature exists only to be exploited at will—and where that norm exists what might be required to alter it. Even in areas where a naive person might expect agreement, as in support of the United Nation's Universal Declaration of Human Rights, the assumption of easy agreement could be wrong, as we will see.

The really big ecoethical issue is related to this: how to reorganize global civilization ethically and

consciously evolve its norms (Ornstein and Ehrlich 1989) so that it can transition to a sustainable and fair society. That means, among other things, trying to use a device like the MAHB to start a global discussion about ethics. Finding convergence may be challenging: there are few ethical universals, and it is highly unlikely that many will be agreed upon soon—although most ethical systems do converge on some basic elements. A typical case where detailed convergence has not resulted is the 1948 United Nations *Universal Declaration of Human Rights* (UDHR). There was substantial opposition to that declaration among Muslims originally, and they produced a *Universal Islamic Declaration of Human Rights* in contradistinction. The Muslim version assigned certain rights to women, but not equal rights, and did not give everyone the right to marry regardless of religion. It says that Muslims are required not to submit to rule by non-Muslims, allows beating and amputation as punishments, and it puts religious restraints on freedom of speech, just as the United States does (try confessing or advocating atheism in a public school or in the United States Congress). In addition, the UDHR already is, according to some, an umbrella under which the “human rights lobby” in the West justifies international interventions in attempts to control resource flows—a central issue for ecoethics. These actions lead to horrors such as the murder of Muslim children from the air by U.S. air force units seeking to assassinate officials of Al Qaeda (Meyer 2006). On the other hand, human rights can provide an important weapon for the weak, and I believe it would be a better world if basic rights to subsistence and security were accepted while more difficult goals such as gender, racial, and religious equity are pursued.

We clearly need an international discussion of such ecoethical issues, one that involves not just “leaders” but as much of diverse publics as possible. “Rights” should not be just granted from above by those claiming to be in communication with supernatural entities or defined by the powerful, but, I believe, should be voluntary and agreed upon by societies—they should not be imposed upon people, especially not a “right” to abuse the weak or the “other” (<http://web.inter.nl.net/users/Paul.Treanor/human-rights.html>). Indeed, even if some believe rights might stem from supernatural entities, in our current world of many differing religions, rights must nevertheless be

harmonized across religions and other belief systems in order for our world to achieve peace and harmony. Humanity's future hangs on finding some broad agreement on major ecoethical decisions involving difficult topics like population size and the equity of patterns of consumption. One role of the MAHB would be to facilitate discussion and debate of those ecoethical decisions.

Ethics of Public Intellectuals

At all these scales (although especially when one leaves personal decision-making), there are crucial ecoethical issues for public intellectuals as well (Mitchell 2008). An important ethical issue for a scientist in a politically charged world is how much to have opinions, no matter how heterodox, vetted by one's colleagues. That issue came home to me on reading a silly review by Freeman Dyson of two books on "global warming" (Dyson 2008). He tells a largely non-scientifically trained audience that "I consider it likely that we shall have 'genetically engineered carbon-eating trees within 20 years' that could 'convert most of the carbon they absorb ... into liquid fuels and other useful chemicals.'" Merely replanting a quarter of Earth's forests with these miracle trees, he suggests, would solve the climate disruption problem. Dyson likes to make such far-out projections, not mentioning the logistic problems of developing the plants, reaching agreement on their distribution, attempting to put them in place, and the environmental consequences (e.g., loss of biodiversity) if it were successful. Scientists need to make projections, but is it ethical to breed complacency by fooling the technologically ignorant by neglecting critical factors involved in such issues—where the need to take sensible action *right now* is patent (E.g., <http://www.thedailygreen.com/environmental-news/community-news/james-hansen-obama-climate-47010206>)?

For me, as I've already indicated, one of the main ethical issues is whether it is ethical to say that Earth is overpopulated. Does this give aid and comfort to social Darwinists, racists, and Nazis? The sad answer is that it does give some such aid, especially since many people believe that intelligence and other putatively valuable characteristics are correlated with such things as skin color and ethnicity and that it is

people who differ in those characteristics who should be stopped from breeding. Just because this is scientific nonsense (Ehrlich and Feldman 2007; Ehrlich and Holm 1964) does not remove the ethical dilemma. My own conclusion has been that one must tell what one believes is the scientific truth on social issues, but at the same time battle to be sure that those results are not put to malign uses. That, for example, is why after Nobel Laureate William Shockley put forth frankly racist ideas (Shockley 1972), Shirley Feldman and I published a book to refute his views (Ehrlich and Feldman 1977). Unfortunately, our book had little discernable impact.

Of course, for public intellectuals there is the issue of whether it is ethical to ignore the population-deniers—those who claim there is no problem of overpopulation and attempt to deny sound contraception and backup abortion to sexually active people.

The Ethics of Silence

There is substantial agreement among ethicists that, as Dietrich Bonhoeffer put it, "Silence in the face of evil is itself evil" (Cone 2003). The evil in Nazism, against which many inside and outside of Germany did not speak out, or in the sexual abuse of children by priests, which many in the Catholic hierarchy struggled to conceal, was obvious to most people. But the evil in the threat of environmental catastrophe—which may prove to be the greatest evil of all—is less so. Even educated people must work hard to get at least a rough understanding of the multivalent threat, especially since, as already indicated, there is an organized effort to obfuscate much of that threat. This is another cross-scale issue that even penetrates to those small-scale ecoethical decisions. When a dinner companion orders a serving of swordfish or shark's fin soup, is one obliged to say something? Should one speak to the restaurant manager about having such things on the menu? Not always easy choices, I can testify!

And what should society decide is the ethical course when people of good will are not silent but differ greatly in their ethical conclusions? I think legal access to abortion is a lesser evil than forced continuation of pregnancy. Legal abortion seems to have other desirable social and ecoethical consequences, such as likely lowering crime rates by reducing

the number of unwanted children (Donohue and Levitt 2001, 2004) and helping to control the size of the population. Those who feel otherwise certainly speak out, as they should. How such disputes should be settled in a diverse democracy with sizable minorities disagreeing with majorities is not clear, except that great effort should be made to honor the views of the minority—for example, by supplying safe contraception to all sexually active people to make the need for abortion very rare.

One thing is clear to me. Colleagues in ecology and other environmental sciences have a special expertise that ethically demands to be brought before the public, even (or perhaps especially) where there are differences of opinion. I think it is unethical not to divulge the scientific consensus to lay audiences, and ethical to give one's own opinions of the consensus and on what actions would be wise to take on an issue, *as long as the latter are clearly labeled as heterodox in the first case and informed opinion (as opposed to science) in the second.*

Indeed, as I have said earlier, “I’d like to see bioethics evolve further, toward all biologists considering it their duty to report to the public (which ordinarily supports their work) the essential findings of their research—and to train their graduate students accordingly” (Ehrlich 2004).

Basic Principles

My own views of the basic paths that society should pursue to solve the predicament, paths I would consider ecoethical, follow. Others may differ. But if we don’t start debating ecoethics now, I fear the current ethical stasis will persist. So here is what I believe to be necessary:

One: Reduce Birthrates and Reverse Population Growth

Human beings have always fought against early death from accident, hunger, and sickness, and in the past century or so have employed improved sanitation and the use of pesticides and antibiotics to raise life expectancy. Most would agree that has been an ethically sound battle. But given the possible consequences of the explosion in human numbers that has followed reductions of the death rate, it is

essential to pay equivalent attention to the equally ethical challenge of reducing high birthrates. Having intervened artificially in the death rate, I believe humanity is ethically obliged to intervene artificially in the birth rate. Even narrow consideration of reproductive ethics suggests there is no unlimited “right to procreate” (Pearson 2007). When ecoethics are considered, it is clear that one can consider it unethical today for most citizens of developed nations to have more than two children (unless a second pregnancy results in a multiple birth). Programs to educate and open job opportunities for women and to make effective contraception and safe abortion universally available must be an integral part of development policies in poor countries, since this is the most humane and equitable way known to reduce fertility rates. Needless to say, such programs (as well as others) are even more badly needed in rich nations—whose vast overpopulation is an even more serious threat to the human future (Ehrlich and Ehrlich 1989).

Public support of prudent population policies needs to be encouraged everywhere. The United States should play a crucial role in supporting such policies, providing both ethical and financial support. The goal must be to halt population increase as soon as humanely possible, and then reduce human numbers until births and deaths balance at a population size that can be maintained with desired lifestyles and without irreparable damage to humanity’s natural life-support systems. Of course, a global discussion over the next several decades will be required to reach a consensus on those lifestyles and thus on the appropriate population size, which current experience suggests must be smaller than the present nearly 6.8 billion. But there are supremely important ecoethical decisions to be made in seeking such consensus—ethics about lifestyle choices, the value of real (and potential) people in the future, and so on. In this area of ethics, the theory is better developed (e.g., Dasgupta 2005) than the practice (Daily et al. 1994).

Fortunately, the target can be tentative, since (if we’re lucky and avoid enormous rises in death rates) it may well be a half century before a worldwide decline can even begin, and subsequently there will be many further decades to consider and evaluate the best level at which to stabilize our numbers. This means we can take action now without worrying about making a mistake by promoting a population that is smaller than optimum. The more successful we

are, the more buffering we'll have against disaster and the more resilient our society will become. What form that action should take, however, should also be a matter of public debate. It must be emphasized, however, that some form of social action will doubtless be required to keep the human population at a desirable size. Contrary to the implicit assumptions of demographers and others (Engelman 2008), human beings have no evolved mechanisms to balance birth and death rates. Indeed the common assumption that becoming rich will automatically keep fertility rates satisfactorily low has been revealed recently as likely incorrect (Myrskylä et al. 2009).

Two: Emphasize Conserving More Than Consuming and Equity More Than Competition

With any given set of technologies, there is a trade-off between the numbers of people in a society and the level of per capita physical affluence that can be sustainably supported. The more people there are, the smaller the average share of the pie must be. Those wishing to keep individual slices large are faced with the necessity of further limiting the number of people. In failing to do that, one is faced with controlling consumption to avoid collapse—despite the lack of developed mechanisms for so doing. There are no consumption condoms or after-buying-spree pills.

One way of dealing with these unavoidable trade-offs would be a cultural shift away from manufacturing ever more gadgets to creating an ethic focused more on appreciation and better stewardship of Earth's aesthetic assets or even toward encouraging the production of ecologically benign aesthetic "gadgets" like paintings, sculptures, novels, dances, and symphonies. We might even encourage people hooked on consumption to go to the virtual world of Second Life (<https://secure-web6.secondlife.com/my/>), where one can own infinite gadgets, construct a huge, gorgeous house, and have minimal environmental impact (it takes energy to run the computer servers that create the Second Life world). Those steps, if combined with a decline in population size, careful husbandry of manufactured and natural capital (our ecological assets), and a crash program to abandon the use of fossil fuels and transition to sustainable energy technologies (which can be made more resilient from the start by avoiding huge, centralized energy grids), could eventually permit large numbers of people to live satisfactory lives.

Of course, all this would require abandoning the irrational norm that constant growth in consumption per person, even for the wealthy, is automatically good and can continue forever. It would also involve abandoning the norm that in its most extreme form is expressed as "whoever dies with the most toys wins" and replacing it with one focused on "whoever does the most for those who have too little wins." It would mean learning to judge satisfaction more in absolute, not positional (relational), terms. There obviously are gigantic issues of cultural attitudes, preferences and lifestyles involved here, which demand deep consideration. And finally, it would require abandoning the norm, especially in the United States, that redistribution of wealth from those relatively well-off to those with less is automatically bad.

These are all very big "ifs"—and it seems unbelievably Pollyannish to think such changes can be made. That underlines the need for directed cultural evolution, finding practical ways to alter how we deal with our non-genetic information so that we can achieve the required changes in norms. Here the issues of who does the "directing" and what role(s) government should play raises an army of ethical issues. The whole dilemma is made more challenging by the growing *culture gap*. All members of a hunter-gatherer group possessed the vast majority of the non-genetic information of the group. Today each member of a university faculty has much less than a billionth of the non-genetic information possessed by *Homo sapiens*; lack of a common knowledge base seems a major barrier to re-orienting people's norms, especially when that lack ordinarily includes the most basic facts about how the world works.

Meanwhile, despite the ethical uncertainties, humanity needs to tackle the most essential elements of change now. All of our consumption requires energy, and the whole overconsumption question is made more complex because the necessary changes in energy technology away from the use of fossil fuels are an ecoethical imperative. Thus we need a global World-War-II-type mobilization to shift to more benign energy technologies and reduce the chances of a worldwide climate disaster. Current financial problems may help create an opening for such momentous changes, which would enormously benefit not only human health and the environment but also international security and the global economy in the long run. It would also help avoid more resource

wars, which otherwise might be triggered over fossil fuel supplies or over water supplies stressed by climate disruption. In the worst (and far from impossible) case, a nuclear war ending civilization could result—an ethically horrendous result from any sane person’s point of view.

Three: Judge Technologies Not Just on What They Do *for* People but Also *to* People and Their Life-Support Systems

A novel synthetic chemical added to the plastic of a baby bottle may increase its durability, but if it leaches into the bottle’s contents or into the environment and functions as an endocrine-disrupting agent, is the risk worth the benefit? Many of the hormone-mimicking toxins human beings synthesize and release into the environment have non-linear dose-response curves, which means they may be more dangerous in tiny concentrations than high ones (Myers and Hessler 2007). Freons (chlorofluorocarbons) appeared extremely beneficial as refrigerants until it was discovered they could destroy the stratospheric ozone layer and with it all life on land. Essentially nothing is known about dangerous synergistic interactions among the hundred thousand or so toxins circulating globally. All this means that ecoethical decisions about synthetic chemicals face huge uncertainties.

Risk cannot be avoided completely, but a cultural change toward careful benefit-cost analyses and deployment only of technologies that carry very clear benefits is another ecoethical imperative. They will help humanity keep the odds in its favor. For example, suppose a new synthetic chemical shows great promise of curing pancreatic cancer, a disease that is almost always quickly fatal. Even if it were toxic to healthy people and other organisms, we likely would take a chance and use it, risking damage when some of it inevitably gets loose in the environment. On the other hand, if a new chemical made eyelash glue somewhat stickier, an honest benefit/cost analysis would probably lead to a prohibition on its manufacture. Toxics are a particularly difficult place to build resilience into the system; great care should be taken to minimize their release.

Four: Transform the Consumption of Education

Education is what economists call a “non-rival good”—something that can be consumed without

reducing the amount available to others—and as such it is an ideal consumption good for a sustainable society. It must be noted, however, that care must be taken to provide educational opportunities as equitably as possible. In our society, education has a positional aspect: if some have a great deal, it decreases the value of the less well-educated for jobs, political power, and so on. It is widely recognized that literacy and civic education are keys to “development”. Including much discussion of ecoethics in civic education could help direct cultural evolution toward sustainable development. Emphasis should be placed on values such as satisficing (Daly and Farley 2004) for the many as opposed to optimizing for the few.

Education clearly should be remodeled with the aim of closing key parts of the culture gap. Unless a much larger fraction of the human population becomes aware of the predicament we all face, the science of that predicament’s basic elements and possible solutions, and the ecoethical issues involved, sustainability is unlikely to be reached. To help increase the size of the educated fraction, ecoethical education should begin in first grade—not “see Spot run” but “see the plant grow in the sun.”

Five: Rapidly Expand Our Empathy

We’re a small-group animal trying to live in large groups. Although we can no longer associate exclusively with a clan of, say, 125 relatives, most of us have a group of “pseudokin”—friends and close associates of about the same number. In both cases, people tend to develop a sort of “we versus them” culture, with the “themness” increasing with physical and cultural distance. Thanks in part to global communications, people are gradually gaining more empathy toward others distant from us in skin color, gender, religion, class, culture, or physical space, but our ability to inflict harm on them has also increased. Cultural evolution is not reducing this discounting by distance (caring less about situations the further away they are) fast enough (e.g. Singer 2009). The same can be said about discounting by time—not caring enough about the world we will leave to our descendants in the more distant future. Can affluent people in the West learn to empathize enough with a child in Darfur to take real action to save her? Can they learn to care about the world her grandchildren

will live in, and act to move that society towards peaceful sustainability? Can we develop institutions, educational programs, and incentives that play to human self-interest, that will help reduce the two kinds of discounting? If the global community takes step five, the answers to both ecoethical questions will be “yes,” and we’ll be on the kind of road that could lead to a level of global co-operation that might allow one or two, perhaps three billion, small-group animals to live together sustainably in relative peace, in the next century.

Six: Decide What Kind of World We All Want

What are the ultimate goals of our lives? Do we all have similar goals, or can we find a *modus vivendi* if basic cultural goals are very diverse and cannot be harmonized? Most development literature simply assumes that “modernization” in the style of today’s rich countries should be the goal of all nations—and perhaps that is what people want. Still, are Americans really happier traveling to work an hour or more each day wrapped in a ton or two of steel and breathing smog that threatens their lives? While the U.S. GDP has multiplied almost five times since 1958, satisfaction, as shown by surveys, has not increased at all. The situation in other rich countries is similar. Must all nations then strive to emulate the American superconsuming, fossil-fuel-based lifestyle? The prospect looked bleak enough in 1972 when political scientist Dennis Pirages and I first asked (in a *New York Times* op-ed) what the world would be like if the then 800 million Chinese got automobiles. Now 1.3 billion Chinese apparently have that goal, but fortunately are still a long way from it.

Or should such goals be considered unethical and thus be discouraged? Should all of humanity strive together to seek a more equitable global society, which could replace today’s range of super-rich to desperately poor populations in which the split between top and bottom widens as population and consumption growth continues?

One possibility already mentioned is for humanity to initiate the MAHB to begin a discussion of the economic, social, political, and ethical systems that will best fulfill human desires (and principles) as we struggle to live in gigantic, culturally diverse groups. How, for example, do we take advantage of the enormous benefits that market mechanisms provide to

societies while constraining their propensity to do enormous damage when unregulated? Starting and maintaining a global cultural-ethical discussion would help determine the kinds of lifestyles and relationships people really want. Armed with that knowledge, the world community could try to establish as accurately as possible the conditions of population size, consumption patterns, economic arrangements, and technologies appropriate to make such lifestyles and relationships sustainable and resilient. All of this, of course, would go against the often-recognized “stickiness” (inertia) of culture. But as many cases show, that stickiness can be overcome. It may be that even the Weberian “Protestant ethic” work-to-grow-forever culture that has long had development experts in its death grip can be altered in ways that could lead to a sustainable global culture.

The culture of United States, for example, could evolve by adopting some ideas from other cultures, such as more vacation time from European cultures, a tradition of siestas from Mexico, or a more contemplative view of life from various aspects of Buddhism. The U.S. could meet developing cultures halfway by focusing less on “standard of living” and more on “quality of life.” After all, whoever said that the goal of human life should be to be a workaholic striving to be surrounded with every bauble and gadget advertisers press on us?

In the ~200,000 year history of modern *Homo sapiens*, nation-states are a recent invention, existing for only a tiny fraction of our existence. In their modern form, they are little more than 200 years old. We need to look closely at possible alternatives that could combine greater awareness of the problems of living at a global scale while retaining the small-group psychological comfort that may well be essential for agreeing on ecoethics. We must find ways to achieve agreement on how we should treat each other and our life-support systems within groups—nations—where we feel we “belong,” and also among groups that are comprised of “others”: no small challenge. More cooperation at a global level is clearly necessary for civilization’s long-term survival. Problems such as climate disruption, global toxification, resource wars, decimation of the planet’s biodiversity, loss of the crucial services that flow from humanity’s natural capital, and escalating chances of global epidemics cannot be solved one nation-state at a time. Ecoethics are a global concern,

and we need to find ways to bend cultural evolution in practical directions if attention to them is ever to be more than a fond hope.

Pollyannaish Conclusion

What are our chances of success? One can think of civilization as the conjoining of two complex adaptive systems (Levin 1999): the global ecosystem and the human social-economic-political system embedded within it. A complex adaptive system (CAS) is one where multiple actors or elements interacting as they pursue their perceived goals at an individual scale produce collective large-scale consequences, including “self organization,” that “emerge” from their behavior. The market is sometimes mentioned as a prime example of a CAS in which an emergent property is efficiency and the collective good of society, a macroscopic phenomenon traceable to individual agents following simple rules.

One of the major problems with a CAS is that the nature and timing of emergences is impossible to predict. That freeways will have traffic jams even if there are no accidents and all obey the traffic rules is a simpler example—in this case we know they will occur, but we can’t predict their timing or scale. The market itself continuously demonstrates such unpredictability. The recent economic downturn triggered by the housing bubble in the United States is a stunning instance. History is replete with such examples; the origin and continuation of the twentieth century World Wars is a sad recent example. A similar situation can be seen in the unpredictability of weather relative to climate, and of climate changes in response to alteration in the gaseous composition of the atmosphere. What all this means in relation to the practical ethics of achieving a sustainable society is simple: There is no way of predicting a correct course that guarantees success.

That, however, is not a counsel of despair. We do know a series of steps that could reduce the chance of undesirable properties emerging, and for dealing with them when they do emerge. One obvious conclusion is that sensibly and humanely *reducing the scale of the human enterprise* (e.g. Ehrlich and Ehrlich 2005) is essential. Saying it is easy, but getting started on it is daunting, although not impossible. After all, some population sizes have

already begun to shrink, the economy is at least temporarily in decline, reducing per capita consumption but, sadly, more among the poor than the rich. But the rich with the right encouragement might actually find less consumption a decent trade-off for long-term survival, and supporting green technologies is becoming a norm (as testified by the popularity of hybrid vehicles).

Another step is to increase the *resilience* of societies and their modularity so that the spread of everything from epidemic disease or starvation following crop failure to financial disasters and wars can be restricted. These are issues that demand the attention of humanity as a whole, and would require much ecoethical discussion—an important activity for the MAHB. For example, would people prefer lower-cost electricity from a central grid or electricity less subject to interruption from a disseminated source? Should a nation opt to be food self-sufficient when in most circumstances staple foods can be had at lower prices through international trade? Of course, low price and dependability may be simultaneously attainable, but these are the sorts of resilience choices that are likely to face us, mixed in with a variety of issues in the categories of “freedom” and “justice”.

Living in two complex adaptive systems means that we can count on big surprises, but we can’t predict when and how they will occur. So when we’re trying to steer the cultural evolution of the dominant animal in ecoethical directions, we should always be thinking of ways to build redundancy and resilience into the interwoven human and natural economies. We must carefully consider the power that we have as the dominant animal, and, needless to say, also how power is wielded both within and between groups—an issue too frequently ignored in our search for sustainability.

Is there any hope of expanding human ethical concerns and generating more discussion of them? I’d like to think so—while there appear to be few traces of an immutable human *nature* (Ehrlich 2000) there are lots of signs of hard-wired human *needs*: food, clothing, shelter, sex, security, and education (at least through social learning) come to mind immediately (e.g., Maslow 1943). Today at least a billion people do not have those needs met. Nonetheless, the world has finally arrived at the point where *everyone’s* ability to satisfy needs is threatened, and where the

chances of avoiding calamity depend on many of the ecoethical issues I've discussed. So maybe a threat to supplying the needs of even the rich can lead to a global discussion that could change our natures and our fate.

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