Sci. & Soc. 3(1):17-28, 2005

Avoiding a Posthuman World

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(Received on 17 October 2004)

Abstract

Future generations cannot declare what they want, but it takes no vision to surmise what they do not want — an uninhabitable planet. Stochastic events, such as large comets hitting Earth, exceptional volcanic eruptions, and natural climate change, may drive humankind to extinction or reduce *Homo sapiens* to a relic species. Unfortunately, present unsustainable practices, including war, may produce the same results in the twenty-first century. Failure to act now may impair the ability to transfer the quest for sustainability to future generations, which is a depressing conclusion that makes a major paradigm shift essential now. Many steps, including population stabilization and decreasing humankind's ecological footprint size, will buy additional time for the transition period. However, humankind must embrace sustainable practices to meet the present emergency and then continue living sustainably forever. The consequence of not doing so is daunting. Even if humans survive as a species, the cultural attributes and quality of life would decline.

Key words: Sustainability; biospheric life support system; evolutionary processes; homocentrism; ecocentrism; posthuman world.

> We are, quite literally, in a new world, a much more peculiar place than it seemed a few centuries back, harder to make sense of, riskier to speculate about, and alive with information which is becoming more accessible and bewildering at the same time. It sometimes seems that there is not just more to be earned, there is everything to be learned.
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> **—Lewis Thomas 1988**
> Foreword, *The Ages of Gaia,* W.W. Norton, New York

> Knowledge alone will not move nations: astonishing and unforeseen events will be required for humanities education.
>
> **—Garrett Hardin**

Introduction

Humankind engages in a variety of high risk behaviors either because it lacks adequate information or because some topics are taboo or "unthinkable." The latter view is exemplified by the Alfred E. Newman practitioners of eco-social analysis.[1] Ehrlich's book (1968) *Population Bomb* was, and still is, derided despite the existence then of 3.5 billion people and approaching twice as many in 2004 with the population growing about 70 million per year. A few scholars, such as Hardin (1974), have noted that a technological solution is not available for every problem, but that one can develop by using intelligence guided by reason and assuming an ethical position on the problem. Hardin (1959) believed that a study of the history of opinion is a necessary preliminary to the emancipation of the mind.

Attaining the global consensus and amity essential to sustainable use of the planet seems, at present, a utopian vision. Making the quest for sustainable use of the planet a reality will only be possible when the alternative — destruction of Earth's biospheric life support system, which will change life for all humankind and possibly lead to the extinction of *Homo sapiens* — is well understood. A far higher level of environmental literacy than now exists in both the general population and its leaders will be necessary for understanding the consequences of destroying the biospheric life support system. Once this level of environmental literacy has been reached, then ethics, guided by science and reason, will provide the essential social framework for achieving a harmonious, mutualistic relationship with natural systems. Much must be done with little time to do it. One hope is that the environmental catastrophes probably required to elicit the necessary paradigm shift do not exceed the resilience of the present biospheric life support system.

[1] Alfred E. Newman is a fictitious character popular in the U.S. some decades ago who felt the "good life" is worry free.

1.0 Being A Good Ancestor

How will posterity regard the present generations — as barbarians who despoiled the planet or as compassionate persons who left a habitable planet for them to enjoy? Solow (1993) believes that present generations cannot know the preferences of posterity and, as a consequence, cannot be expected to act on its behalf. Surely, one of the preferences is a planet with a healthy biospheric life support system that has abundant natural capital and its ecosystem services from which other forms of capital are derived (Hawken et al. 1999). In addition, since the preferences are unknown, posterity may value the natural systems that the present generations are destroying in the name of economic growth and progress. Finally, if present generations seriously disrupt and deplete the basic processes of evolution, consequences are likely to persist for millions of years (Myers & Knoll 2001). These actions are a reprehensible way to treat posterity.

2.0 Living Sustainably

The way to become a respected ancestor is to live sustainably. Unsustainable practices will adversely affect the quality of life of future generations and the survival of the human species, which is not the way to generate respect. Living sustainably is primarily a matter of eco-ethics and sustainability ethics. Ethics will help prevent the misuse of technology. Technology (e.g., windmills) is extremely helpful, but it is not a substitute for ethical behavior.

Living sustainably requires a mutualistic relationship with Earth's biospheric life support system so that natural capital (living systems and the services they provide) is not diminished. Accumulating natural capital (e.g., old growth forests, fossil water) increases the safety factor in times of stress.

Living sustainably means perpetual use of Earth by one species, *Homo sapiens*.

Publications on sustainability are usually not explicit about the time frame involved. Taken literally, perpetual use means until the sun dies, which may be as much as another 15 billion years. This span is approximately three times as long as the planet has existed. Continental drift, ice ages, and major evolutionary changes to cope with changing conditions are highly probable over this time span. Even the next 5-200 million years will probably be characterized by major environmental and evolutionary changes. *The Future's Wild* is a very readable, well illustrated book that uses scientific evidence to speculate on probable changes in a posthuman world (Dixon & Adams 2003). Avoiding a posthuman world will require a much larger commitment to eco-ethics and sustainability ethics than now exists. At present, such a change most likely will initially occur at the individual and regional level since the world's leaders appear to be primarily focused on economic growth. The internet provides an excellent means of exchanging information at a "grass roots" level.

3.0 Replacing Homocentrism with Ecocentrism

Achieving sustainable use of the planet requires that a concern for Earth replace a concern for humankind since *Homo sapiens* is embedded in the biospheric life support system. In short, all species are coupled to dynamic natural systems and share the fate of these systems. If humankind is not prepared to change present behavior to avoid irreversible harm to natural systems, the options for posterity will not be attractive. If future generations are to be a reality, current generations and ones to come must live sustainably to leave a habitable planet for their descendents. Why is humankind so reluctant to have a free and open discussion on this important topic?

Humankind is arrogant to assume either that it understands Earth's biospheric life support system or that damage to it will not affect human lives. The biospheric life support system is a vast network of processes that operate on time scales dissimilar to those that interest humankind. For example, damaging wetlands and other natural systems to encourage short-term economic development is stupid, even if economists think they can accurately discount future values. "Humanized" environments in which humans now feel most at ease pour wastes into the remaining quality biospheric life support system, degrading it and altering both its structure and function. Increasingly, such developmental activities consume natural capital and the ecosystem services it provides. Should humankind persist in these unsustainable practices until the biospheric life support system can no longer function in a way favorable to humans, a posthuman world is inevitable.

4.0 Anthropogenic Altering of Evolutionary Processes

Much discussion occurs on sustainable agriculture, sustainable transportation, sustainable cities, and sustainable energy (to mention just a few components), but virtually none about the probability that enormous damage to natural systems will disrupt and deplete certain basic processes of evolution. A refreshing exception to this lack of discussion is the US National Academy of Sciences Colloquium on the Future of Evolution (www.pnas.org/cgi/doi/10.1073/pnas.091092498). Myers & Knoll (2001) note that distinctive features of future evolution could include a homogenization of biotas, a proliferation of opportunistic species, a pest-and-weed ecology, an outburst of speciation of taxa that prosper in human-dominated ecosystems, a decline of biodisparity, an end to the speciation of large vertebrates, the depletion of "evolutionary powerhouses" in the tropics, and unpredictable emergent novelties.

The most likely explanation of the failure to examine this potentially major obstacle to achieving sustainability is the poor understanding of evolutionary processes by the world's leaders and the general public. In the United States, a great controversy exists

about including evolution in secondary education textbooks. One side insists that an alternative viewpoint called creationism be given comparable attention. This controversy is occurring despite the fact that evolution, as a process, has been accepted by mainstream science for decades. As a consequence, this battle is about faith/creationism and science/evolution. Both faith and science are important factors in human lives, but they should not be confused. Faith is belief without verifiable proof; science is any branch of study concerned with a body of *observed* (italics mine) material facts. Science can be verified and, arguably most importantly, falsified. Falsifying faith is heretical.

5.0 Developing a Systematic and Orderly Plan

Sustainable use of the planet will remain only an aspiration, at best, or a denial of the consequences of unsustainable practices, at worst, until the approach involves clear, plausible goals based on coherent, globally debated plans. If the debate fails to produce relatively rapid, remedial measures fairly quickly, human society as presently known is probably doomed. The global warming issue is a good illustrative case. The US National Academy of Sciences and other prestigious scientific groups have concluded that the scientific evidence for climate change is persuasive. However, the US government continues to ignore the evidence and continues calls for more studies without explicitly identifying what additional types of evidence are needed beyond what has been accepted by mainstream science. A refreshing exception is the "leaked" US Pentagon report that warns of the possibility of climate wars (Environmental News Service 2004). Only a mature approach will suffice if humankind truly intends to leave a habitable planet for posterity. This approach requires an adherence to ecological and sustainability ethics (Cairns 2003a) that soar above self-serving, short-term economic interests so that the planet's biospheric life support system is healthy and robust. These ethics must not be weakened by an irrational sentimentality that proposes all humans should "enjoy" the same level of resource consumption characteristic of the United States and Canada and to a lesser degree by most other developed nations. The spirit of the actions is what counts! The spirit should not be arrogant, self-serving, lacking in compassion and empathy, and careless about future consequences. In short, humankind must abandon unsustainable practices and replace them with sustainable practices. Further, a commitment to ensure that pre-established quality control conditions are being met is essential to sustainable use of the planet. If quality control conditions are not being met, immediate corrective action must be taken. The quality control system must be in place before Earth's truly wild places disappear entirely, since wild and pristine areas are necessary for determining what constitutes a self-regulating system.

6.0 It's the Environment, Stupid!

During his campaign for the presidency of the United States, former President Clinton repeatedly asserted, "It's the economy, stupid!" His meaning, of course, was that the economy was the basic driving force for the nation. Presumably a substantial number of voters agreed, since he was elected. However, the emerging paradigm of natural capitalism (Hawken et al. 1999) offers a green alternative to the present economic system. Natural capital (living systems and the ecosystem services they provide) is used by the industrial/economic system to provide the materials, goods, and services upon which humankind depends. Technology has made it possible for humankind to exploit, at an unprecedented rate, the store of natural capital that has accumulated for approximately 4 billion years. At the present rate of resource depletion (both by use and destruction), the supply will be much less by the end of the twenty-first century. Loss of natural capital means loss of "interest" in the form of ecosystem services, which constitute Earth's biospheric life support system. Without question, a massive increase has occurred in the nineteenth and twentieth

centuries in both prosperity and manufactured capital. During the same period, a massive increase has occurred in the destruction of natural capital to the extent that the process cannot continue indefinitely. In short, present economic ideology is not sustainable. Continuing the dominant economic paradigm increases the probability of a posthuman world.

Persuasive evidence indicates that a sustainable world might be achieved. Taking precautionary measures to improve the likelihood of sustainability is prudent, as is estimating the consequences of not doing so. Two illustrative lists of practices that would lead to both sustainable use and a posthuman world follow.

7.0 The Case for a Posthuman World

1. The human population is still increasing exponentially and will soon outstrip its resource base unless birth rate globally is reduced to replacement rate or less.

2. The planet's biotic crisis is likely to result in both a major extinction of species and the disruption of critical evolutionary processes. This occurrence might produce a pest-and-weed ecology not likely to be favorable to humankind.

3. The increasingly stressed relationship between the economy and the biospheric life support system is taking an increased toll on the economic system (Brown 2001), as well as most other life forms with which humans share the planet.

4. The human mind does not have the capacity to grasp reality in its full chaotic richness; nor does the human body last long enough for the brain to process information piece by piece like an all-purpose computer (Wilson 2003).

5. Corporate globalization is responsible, in large part, for rising economic inequality (Hines 2003). If this inequality results in increased social unrest (possibly societal disequilibrium), this situation does not favor a transition to a sustainable world since the transition will require active support from a majority of the world's people.

6. Feedback loops, such as changing some ecosystems from methane sinks to methane sources, could speed up global climate change so that the attempts of human society to take remedial measures would be too slow and ineffective.

7. Many catastrophic events are synergistic rather than additive, thus increasing the likelihood of unmanageable catastrophic events.

8. Many individuals still see a clash between "human values" and the "natural world." Failure to recognize that humankind is dependent upon the natural world is a major obstacle to the quest for sustainable use of the planet.

9. Although global environmental governance may be essential to sustainable use of the planet, it is still in the developmental stages (e.g., Paterson et al. 2003).

10. Regrettably, scientific research commonly focuses on narrowly defined issues (reductionist science), but the complex problems humankind faces require synthesis.

11. An increasingly stressed relationship between the economy and Earth's ecosystems is taking a growing economic toll. This situation could overwhelm the worldwide forces of progress and lead to economic decline (Brown 2001). In short, the economic system, which many people believe will bail humankind out of any adverse

situation, may collapse as it did for many lost civilizations when natural capital was severely diminished.

12. Two or more generations may be needed to confirm that sustainability has been achieved. Political leaders and the general public accustomed to short-term results may not have the motivation to persist that long.

13. If ecosystem services decline significantly, the transition time to achieve sustainability may be seriously reduced.

14. The transition to sustainable use of the planet will almost certainly involve many unanticipated difficulties (e.g., Vouk 2003).

8.0 Sustainability Practices for Avoiding a Posthuman World

1. Awareness of the issues of sustainability and sustainable development is increasing in the educational system, business, and a small portion of the general public and its leaders.

2. Natural systems are both the basis of human capital and the planet's biospheric life support system. All social and cultural systems must learn to use, but not abuse, these natural systems in order to live sustainably.

3. A restructuring of the global economy is necessary so that sustainability is a consequence of satisfying the basic principles of ecology (Brown 2001).

4. Thirty-one countries in Europe, as well as Japan, have stabilized their population size (Population Reference Bureau 2001). This result is one of the major conditions for sustainable use of the planet. China is moving toward population stabilization.

5. The precautionary principle (e.g., Tickner 2003), which bridges the gap between science and policy by encouraging policies that protect human health and the environment in the face of uncertain risks, is gaining acceptance.

6. The essence of the Hippocratic Oath (e.g., "First do no harm."), which underscores a duty to prevent damage to human health, is now increasingly being extended to the planet's biospheric life support system.

7. The myth that environmental policy is antithetical to economic growth is being challenged (e.g., Wilson 2002).

8. Restoration of damaged ecosystems (e.g., National Research Council 1992) facilitates the enlargement of undamaged natural systems and the creation of new naturalistic systems by restoring ecosystems damaged by human activities. The National Research Council (the operating arm of the US National Academies of Science and Engineering) recommends establishing goals for restoring a specific percentage of damaged ecosystems in a particular time period.

9. The myth that species extinction, at present rates, is normal is increasingly noted as demonstrably and dangerously false. Ecological restoration has demonstrated that rare and declining species often thrive when their habitat is restored.

10. Acknowledgment is being given that sustainable development poses different challenges in different places (Vouk 2003).

11. Recognition is emerging that Second World Countries were misdeveloped rather than underdeveloped (Vouk 2003).

12. A solar/hydrogen economy is feasible (e.g., Brown 2001).

13. A new materials economy is feasible (e.g., Brown 2001).

14. Persuasive case histories indicate that natural capitalism works (e.g., Hawken et al. 1999).

9.0 Alternative Scenarios

Durant and Durant (1968) remarked: nature first selects for quantity from which she selects quality. Since the human population reached 6 billion in late 1999 and may reach 10 billion or more in the twenty-first century, how will quality[2] be selected? Illustrative examples of natural selection include pandemic disease, global famine, protracted war, and loss of species dominance, all of which would significantly reduce population size. A worst case scenario would be a sudden, major global climate change accompanied by famine, disease, and resource wars. This event could drive *Homo sapiens* to extinction or could result in a few, highly territorial tribes representing a fraction of the present population. Major global climate change would doubtless result in a dramatic decrease in the available area favorable to human habitation. Since most easily accessible natural resources have been used or depleted, a collapse of the technological/economic systems would make it difficult, arguably impossible, to return to human society's present condition. This blow would be serious, probably fatal, to economic globalization, but might well benefit development of social capital. As Ehrlich (2000) noted, humankind is basically a small-group species trying to adjust to enormous population size in an increasingly urbanized world.

Of course, a huge number of scenarios exist between a utopian vision of future Earth and the worst case scenario. The only assertion that can be made with reasonable confidence is that change will occur. The quest for sustainable use of the planet is an attempt to influence change in ways favorable to posterity and also to humans now alive and the other life forms with which they share the planet. The crucial determinants of the quest are: (1) leaving a habitable planet for future generations, (2) protecting the health and integrity of the biospheric life support system, including natural capital and the ecosystem services it provides, (3) achieving a more equitable and fair distribution of resources within the human species and with the species that comprise the biospheric life support system, (4) protecting evolutionary processes so that humans are not the primary selective force on other species, (5) balancing the rates of technological and social change, (6) restoring damaged ecosystems to the extent necessary to protect the biospheric life support system, (7) monitoring the health and condition of natural systems so that prompt corrective action can be taken if there is a threat to their health and integrity, (8) determining the carrying capacity of each bioregion and staying below that critical threshold — this determinant will involve a free and open discussion of the desirable quality of life for members of the human and other species, (9) halting *Homo sapiens* as the serial killer of other life forms in the biosphere, (10) abandoning the illusion that, should a major mortality of humans occur, the remainder could "live off the land" as did ancient humans when populations were sparse and widely scattered, (11) knowing what to do is not enough — humankind must act in time, and (12) restoring far more natural systems than are destroyed — humankind must again coevolve with other life forms.

The way that humankind responds to these illustrative issues will determine the alternative scenarios likely to be experienced. Wilson (2002) remarked: "As cognitive scientists have focused on the nature of the mind, they have come to characterize it not just as a physical entity, the brain at work, but more specifically as a flood of scenarios." Stochastic events do occur and will probably

[2] Ecological quality is based on fitness rather than qualities (e.g., creativity, compassion) humans value. These two different viewpoints are not necessarily incompatible.

have a significant impact on the quest for sustainable use of the planet.

Conclusions

Homo sapiens has survived for over 200,000 years on an Earth dominated by nature for most of this time span. Doubt continues to increase that the human species can survive on a planet that it has altered so dramatically from the one on which humans originated and thrived. Humankind has driven species to extinction and seriously threatens the survival of a substantial number of those that remain. A posthuman world would probably have a biosphere more closely resembling the prehuman era than the present biosphere and be composed of dramatically different species with functional roles similar to those in prehuman ecosystems.

I remain cautiously optimistic about what humankind can do to achieve sustainable use of the planet and increasingly pessimistic about what it will do. At present, the dominant view seems to be anthrocentrism — nothing matters except what affects humankind. However, increasing numbers of humans favor extending "rights" to other charismatic, non-domesticated species — pathocentrism. In the last few decades, ecocentrism, which favors a harmonious, mutualistic relationship with natural systems, has been increasingly accepted. Since all three levels of thought are based on value judgments and ethical principles, they are not as mutually exclusive as they may seem on first inspection. However, problems occur when personal ethics are set aside to meet obligations to corporations, nation-states, and the like. Such artifacts of the human social system have no dependable ethical constructs to ensure self-restraint or good behavior. Most of the incentives (e.g., profits, resource acquisition) push in the opposite direction. In fact, corporations have powerful incentives to externalize their costs by using common grounds (public air, water, and land) for waste disposal.

McNeill & McNeill (2003) remarked that human society is a huge web of cooperation and competition sustained by massive flows of information and energy (one might well add natural resources). They feel it is an open question how long these flows might last. Clearly, natural resources (e.g., fossil fuels and fossil water) are being used at an unsustainable rate, so both the societal web and the interdependent web of life are exceedingly vulnerable. As McNeill & McNeill (2003) noted, history is driven by human ambition to alter present conditions to match hopes. How the hopes are pursued is determined by the information, ideas, and examples available to them.

In order to achieve sustainable use of the planet, materialphilia must decline and biophilia increase (Cairns 2003b). If humankind is to preserve Earth's biospheric life support system, it must shift from a predominantly homocentric system of ethics to a system of eco-centric ethics. To leave a habitable planet for posterity, humankind must embrace sustainability ethics (Cairns 2003a). Arguably, most species decline or become extinct through loss of habitat. Unfortunately, most humans mistakenly assume their habitat consists primarily of human made artifacts — cities, highways, shopping malls, and the like. All these artifacts serve some purpose, but the basic life support system for humankind is the biospheric life support system, which, at present, maintains the climate, Earth's atmosphere, and the like within limits that are favorable to *Homo sapiens*. Ironically, humankind is destroying that habitat at an alarming rate. The human species will not flourish if present unsustainable practices that destroy or impair the biospheric life support system continue. The quest for sustainable use of the planet is basically an aspiration to keep the biospheric life support system functioning indefinitely, as it has for the last million years or more. If humankind fails to achieve this task, it will literally have committed suicide. If humankind does achieve the task, it will have earned its scientific name *Homo sapiens*.

Acknowledgement

I am indebted to Karen Cairns for transferring the handwritten first draft to the computer and to Darla Donald for editorial assistance.

References

1. Brown L.R., *Eco-economy*, W.W. Norton, London, UK, 2001.

2. Cairns J. Jr., 2003a, "Eco-ethics and Sustainability Ethics, Part I." *Ethics in Science and Environmental Politics*, Eco-Ethics International Union, Oldendorf/Luhe, Germany. http://www.esep.de/journals/esep/esepbooks/EB2pt1.pdf

3. Cairns J. Jr., 2003b, "Materialphilia, Biophilia and Sustainable Use of the Planet." *International Journal of Sustainable Development and World Ecology* **10,** 43-48.

4. Dixon D. and Adams J., *The Future's Wild*, Firefly Books, Toronto, Canada, 2003.

5. Durant W. and Durant A., *The Lessons of History*, Simon and Schuster, New York, USA, 1968.

6. Ehrlich P.R., *The Population Bomb*, Ballantine Books, New York, USA, 1968.

7. Ehrlich P.R., *Human Natures*, Island Press, Shearwater Books, Covelo, CA, USA, 2000.

8. Environmental News Service, 2004, "Leaked Pentagon Report Warns of Coming Climate Wars." http://www.ens-newswire.com/ens/feb2004/2004-02-23-09.asp#anchor1

9. Hardin G., *Nature and Man's Fate*, Rinehart Publishers, New York, USA, 1959.

10. Hardin G., 1974, "Lifeboat Ethics: The Case Against Helping the Poor." *Psychology Today* **43,** 124-126.

11. Hawken P., Lovins A. and Lovins H., *Natural Capitalism: Creating the Next Industrial Revolution*, Little, Brown & Co., New York, USA, 1999.

12. Hines C., 2003, "Time to Replace Globalization with Localization." *Global Environmental Politics* **3**(3), 1-7.

13. McNeill J.R. and McNeill W., *The Human Web*, W.W Norton, New York, USA, 2003.

14. Myers N. and Knoll A.H., 2001, "The Biotic Crisis and the Future of Evolution." Proceedings of the Natural Academy of Science **98**(10), 5380-5392.

15. National Research Council, *Restoration of Aquatic Ecosystems: Science, Technology, and Public Policy*, National Academy Press, Washington, DC, USA, 1992.

16. Paterson M., Humphreys D. and Pettiford L., 2003, "Conceptualizing Global Environmental Governance: From Interstate Regimes to Counter-hegemonic Struggles." *Global Environmental Politics* **3**(2), 1-1.

17. Population Reference Bureau, *World Population Data Sheet (wall chart).* Population Reference Bureau, Washington, DC, USA, 2001.

18. Solow R.M., "Sustainability: An Economist's Perspective," in Dorfman R. and Dorfman N. (ed), *Economics of the Environment: Selected Readings*. W.W. Norton, New York, USA, 1993.

19. Tickner J.A. (ed), *Environmental Science and Preventive Policy*, Island Press, Washington, DC, USA, 2003.

20. Vouk V., *Sustainable Development for the Second World*, World Watch Paper 167, Worldwatch Institute, Washington, DC, USA, 2003.

21. Wilson E.O., *The Future of Life*, Alfred A. Knopf, New York, USA, 2002.

22. Wilson E.O., 2003, "The Serpent." *Wild Earth* **13**(2/3), 16-22.