

HOMAGE TO ROBERT HOOKE: WHY THERE ARE SO MANY FOSSIL SPECIES

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Most evolving lineages, human or otherwise, when threatened with extinction don't do anything special to avoid it! George C. Williams

There are some people who live in a dream world, and there are some who face reality, and then there are those who turn one into the other. Douglas H. Everett

It's not denial. I'm just selective about the reality I accept. Bill Watterson

Know what's weird? Day by day, nothing seems to change. But pretty soon, everything's different. Bill Watterson

Delay is the deadliest form of denial. G. Northcote Parkinson

Denial is a common tactic that substitutes deliberate ignorance for thoughtful planning. Charles Tremper

If I see an ending, I can work backward. Arthur Miller

No matter what we call it, poison is still poison, death is still death, and industrial civilization is still causing the greatest mass extinction in the history of the planet. Derrick Jensen

I can't visualize the situation in which we nuke ourselves into extinction. John Keegan

Truth may sometimes hurt but delusion harms. Vanna Bonta

Why waste time learning, when ignorance is instantaneous. Bill Watterson

I liked things better when I didn't understand them. Bill Watterson

The problem with the future is that it keeps turning into the present. Bill Watterson

From 1948 to 1966, I was employed by the Academy of Natural Sciences, founded in 1812, which was full of fossil animals and plants. Although many people have never heard of Robert Hooke, 1635-1703, he was a founder of modern science – a creative person then called a polymath and more recently called a Renaissance Man. Hooke was born on the Isle of Wight, which is rich in fossils and exposed cliffs where many are found. Of importance to this commentary was Hooke's insight of 1667 that resulted from an examination of a seashell fossil from which many life forms arose, flourished, and disappeared, leaving no living descendants. Hooke's insight was viewed as both inconceivable and an affront to the existence of God – Hooke's insight was thought to imply that He made mistakes. Nearly two centuries later, paleontologist Richard Owen espoused the view that humans could have played a major role in the disappearance of many species. This view has since been supported from evidence of the extinction of species on islands to North America's woolly mammoths and camels.

How could this phenomenon be so? For most of the 2 million years that the genus *Homo* has been on the planet, nature, particularly large predatory animals, has been regarded with fear and awe. Now, thanks to modern technology and cheap, abundant fossil energy, humans are changing the climate and are, arguably, the major factor in the extinction of and reduction of the population size of many species. The media reports that polar bears, rhinoceros, penguins, snowy leopards, humpback whales, and other charismatic species may soon become extinct. Many people anguish over these possible extinctions, but the possibility of humankind's own extinction does not register. Here in the small town of Blacksburg, Virginia, changes are still too subtle and slow for many citizens to perceive. The supermarkets have a variety of foodstuffs available and the prices are still acceptable. At the pump, the price of gasoline actually decreased in December 2007 but, in late February 2008, is again over US\$3 per gallon.

Extinction can occur suddenly, as it did when the asteroid that killed the dinosaurs hit planet Earth. Extinction can happen more slowly, as it did more than 2 billion years ago when microorganisms capable of putting oxygen into the atmosphere appeared and killed most of the anaerobic life forms living in an atmosphere loaded with methane and carbon dioxide. Or, extinction can result from long-term incremental changes in habitat that are characteristic of long-term cycles on Earth. The 160,000 years that *Homo sapiens* has been on the planet is a small fraction of the 4.5 billion years Earth has existed. Persuasive evidence indicates that humankind could also be driven to extinction by a rapid release of methane by the melting of the frozen hydrates on the ocean floor due to global heating (National Geographic News, 2007, 19 Dec <http://news.nationalgeographic.com/index/html>).

Humankind may be delusional in believing something (e.g., technology) or someone will save it from extinction. I was delusional when I believed that humankind was willing to change its lifestyle dramatically (e.g., excessive use of fossil fuels) to achieve sustainable use of the planet. In chapter 25 of my autobiography (www.johnciarns.net), the transition from that belief to a quest for survival for the human species is discussed.

The UN global climate change conference in Bali has prompted me to consider a number of questions.

- (1) Why was the United States the only developed nation that strongly resisted quantification of goals to reduce greenhouse gas emissions?
- (2) Why have so many developing countries taken a much stronger stand on greenhouse gas emissions than at the last UN meeting on climate change? Clearly, one answer is that they are suffering disproportionately from greenhouse gas emissions.
- (3) Why did former US Vice-President Al Gore's speech (Editorial 2007a), which referred to US obstruction of climate change initiatives, get a powerful ovation?
- (4) How can a nation, which fought on two major fronts in World War II and in approximately four years supplied and equipped not only its own armed forces but those of allies, state with a straight face that it cannot raise fuel efficiency of its average automobiles and light trucks by approximately 10 miles per gallon by 2020?
- (5) How, when scientifically sound plans and technologies for the major production of solar power are available (e.g., Zweibel et al. 2008), can the United States excuse its failure to make a major commitment to this alternative source of energy?
- (6) During World War II, food and gasoline were rationed in the United States and citizens made significant sacrifices, even though the homeland was not under attack. Years ago, a US Pentagon report (Townsend and Harris 2004) warned of nuclear conflict, mega-droughts, famine, and widespread rioting – all due to climate change. Shouldn't Americans reduce their carbon footprints to prevent these catastrophes?
- (7) Friedman (2007) notes “. . . our generation has entered a phase that no previous generation has ever experienced: the Noah phase.” He quotes Sigmar Gabriel, Germany's environmental minister, who remarks to the BBC: “Up to 150 species are becoming extinct every day . . . The web of life that sustains our global society is getting weaker and weaker.” And yet, humankind is accelerating this trend, not stopping it. Why is that? Reducing individual carbon footprints by reducing travel for recreation, religious and political meetings, and even

distant meetings to save the environment would help. Yet, individuals are not willing to “sacrifice” their personal “needs” to save the biospheric life support system that makes life on Earth possible for humans. Why is that?

Results without Sacrifice

When people asked President Bush what they could do for the country after September 11 terrorist attacks, he responded: go shopping and keep the economy strong. This statement seems ludicrous when the nation is fighting two wars with no tough sacrifices (except for military families where sacrifice is exceptional, especially where one family member has served two or more tours of duty). Persons who feel they are green (i.e., good environmentalists) boast of recreational trips to Australia, Ireland, etc. Some are on “round the world” trips where just listing the various locations takes an entire page. The greenhouse gas emissions must be staggering, but are never mentioned. Other people affirm: “When you are on the Titanic, you might as well go FIRST CLASS.” Increasing evidence indicates that they may be right, but reasons for hope still exist. My viewpoint is to keep working, even when the evidence for human survival is not reassuring – other species may still benefit.

Personal Choices

Some suggestions to consider follow.

- (1) Barbara Kingsolver and many others suggest eating local produce, not because long distance transportation produces more greenhouse gases, but primarily because it is better for individuals, who should try to meet all their needs locally as much as possible – especially recreational and spiritual. Perhaps just taking the time to interact with local people might well have the same effect.
- (2) On 17 November 2007, I was unable to attend my mentor’s (Ruth Patrick) 100th birthday celebration. I deeply regretted not being able to see old friends, but, if I had suffered bad effects to my health from the travel, etc., I would have lost months of writing. At nearly 85, my resiliency is greatly decreased. However, Ruth asked me to write the genesis and history of the Limnology Department of the Academy of Natural Sciences, which she founded and where I worked from 1948 to 1966. This writing will result in a much more meaningful interaction than toasting her at a birthday party and permitted me to keep my carbon footprint small by not traveling.
- (3) I am writing this section on 23 December 2007, when gifts are mentioned continuously. Why not give a gift to yourself and one to your species simultaneously? Travel less, use less energy, and consume less and you will be part of the solution and not part of the problem. The time not spent on travel and shopping is a gift to yourself. Use it to go for a quiet walk, read a book, or meditate. By reducing consumption and your carbon footprint, you have improved the probability of leaving a habitable planet for posterity.
- (4) Since each individual is different, each must decide what gift to give to the human species and what gift to give to oneself. For example, one of my long time friends took an automobile trip of 5,500 miles last spring. Since I kept my total automobile mileage under 600 miles for 2007, he and I obviously need different goals for reducing greenhouse gas emissions. The extended trip my colleague took would be described by some as “love miles,” but Mother Nature makes no dispensation for them. Mine were all medical – family physician, cardiologist, dentist, and physical therapist. Since I no longer need physical therapy, I may be able to accumulate well under 400 total miles on my automobile in 2008. Most people I encounter do not take this reduction seriously, but the survival of human society, as it is currently known, is at stake, as well as survival of the nearly 1 billion persons who go to bed hungry each night and the additional 2 billion who are malnourished. Turning food (e.g., corn) into fuel (e.g., ethanol) is not good for hungry people.

Global Catastrophe Risk

The global situation is far more serious than most people realize (McKibben 2008). For example, Monbiot (2007) calls attention to a paper by Andrew J. Weaver and colleagues who indicate that, even with a 90% cut in greenhouse gas emissions by 2050, the 2°C crucial threshold will be broken eventually. The Intergovernmental Panel on Climate Change summary notes that persuasive evidence indicates that, to prevent global warming from eventually exceeding the 2°C, the entire planet needs to cut greenhouse gas emissions to roughly 15% of the volume in 2000. Monbiot (2007) reports that the global figures for carbon dioxide production in 2000, divided by the current population of 6,635 million, gives a baseline figure of 3.58 tons of carbon dioxide per person. If the population remains constant, an 85% cut means that global output per capita should be reduced to 0.537 tons by 2050. The United Kingdom currently produces 9.6 tons per capita and the United States produces 23.6 tons per capita. Reducing these figures to 0.537 tons means a 94.4% cut in the United Kingdom and a 97.7% cut in the United States. However, if the population rises to 9 billion by 2050, as projected, the cuts rise to 95.9% for the United Kingdom and 98.3% for the United States. Why do I think this

reduction will not happen? Why do I get the impression that most people are not yet ready to give up a high energy lifestyle on the basis of overwhelming scientific evidence?

Global Equality

The economy has been globalized – will equality, fairness, and dignity of each individual also be globalized? Of course, inequities in wealth will probably always be present, but should comparable inequities in the “right” to pollute the global commons be permitted? For example, China’s total emissions of carbon dioxide will soon exceed those of the United States, although China’s per capita emissions are approximately 3 tons, compared with 10 tons in Japan and 20 tons in the United States (Martinot and Junfeng 2007, p. 10). Is this situation one of ethics and morals when the planet is in imminent peril due to global heating and other types of climate change? American citizens, as a group, may be suffering from empathy deficit disorder (EDD). People suffering from EDD are unable to step outside themselves and tune into what other people experience (LaBier 2007). Lack of empathy is an essential part of mental health and essential to human health in ways not apparent before globalization. Unlike sympathy – which reflects understanding of another person’s situation, but viewed through one’s own lens – empathy is what one feels when one enters the world of another person (LaBier 2007). One can develop EDD by too much self-absorption and can overcome EDD by retraining the brain to take advantage of what is known as neuroplasticity. As thoughts, feelings, and behavior are refocused in the desired direction, the brain regions associated with them are reinforced (LaBier 2007). An interesting, but not surprising, actuality is that poor people often have little empathy for those poorer than they are. “Across the developing world, migrants move to other poor nations as often as they move to rich ones. Yet, their numbers and hardships are often overlooked” (DeParle 2007).

Wisdom

None of the numerous definitions of *wisdom* are entirely satisfactory. *Wisdom* is often considered to be a trait that can be developed by experience, but not thought. Hall (2007) uses sociologist Monika Ardelt’s working definition of *wisdom*, which integrates three separate but interconnected approaches of dealing with the world: cognitive, reflective, and emotional. Ardelt cites the well known serenity prayer as an example of a proverb that emphasizes the discernment implicit in *wisdom*: “God grant me the serenity to accept the things I cannot change; the courage to change the things I can; and the wisdom to know the difference.” Humankind cannot repeal the laws of nature, such as gravity, the greenhouse effect, or carrying capacity, so humans must accept that they must obey nature’s laws or suffer severe consequences. Developing nations will require major help to stabilize their populations, reduce greenhouse gas discharges, and cope with the declining availability (i.e., increased cost) of petroleum. “We are doomed to die; let us spend” (Hall 2007) is the advice of the ancient Sumerians – is it wise to do so? Wouldn’t it be better to rephrase the Sumerian statement of 5,000 years ago to: “We are doomed if we continue to live unsustainably and we resolve to correct this error immediately”? Since acquisition of knowledge and the analysis of that information filtered through the emotions are central to wisdom, compassionate humans would help Earth and the developing countries that need help.

How can this goal be immediately implemented? Although US President Bush has increased the nation’s foreign assistance, it is still only 0.2% of the economy and some 50% less, proportionally, than Britain’s and less than 25% the level of Sweden’s and Norway’s. Moreover, only about 50% of the foreign aid of the United States is devoted to programs aimed at alleviating poverty and promoting development (which could include alternative energy sources and population stabilization) (Editorial 2007b). The United States should become one of the world’s leading nations in eliminating global heating, climate change, and ecological overshoot and keeping human populations within Earth’s carrying capacity.

Religion

Father Thomas Berry (1988) notes:

Economics as a religious issue can be dealt with in different ways. One way is to begin with the religious quest for justice. In this context, we have a special concern that the well-being of the society be shared by all, especially that the basic life necessities be available to the less privileged. Such an approach emphasizes our social and political responsibilities to ensure that the weak or less gifted are not exploited by the strong and the competent. . . The moral-religious critique in this country generally concerns the issue of our capitalist market economy that neglects its social responsibilities. The remedy offered, in accord with Biblical and moral principles, is to incorporate everyone in the functioning and benefits of the economy. Admirable as this approach may be, it

may bring about only temporary improvement since the more basic difficulty may not be the social issue, but the industrial economy itself. At least in its present form, the industrial economy is not a sustainable economy. . . So long as the human process is integral with the processes of nature, the human economy is sustainable into the future.

Berry (1988, p. 77) superbly sums up the present situation in the United States:

Nor have our moral theologians been able to deal with our abuse of the natural world. After dealing with suicide, homicide, and genocide, our Western Christian moral code collapses completely; it cannot deal with biocide or genocide. Nor have church authorities made any sustained protest against the violence being done to our planet.

These extensive quotes from Father Berry have been used because he spent most of a long lifetime in religious studies and had the courage to identify failures in humankind's relationship with the natural world. At present, attempts are being made to use technology to solve problems that are essentially ethical/moral. The continually shrinking natural preserves are being invaded by large numbers of people riding all-terrain vehicles that destroy habitats (Barringer and Yardley 2007). Sorry to say, nature is not sacred to these people – but, economic growth is. Humans are driving species to extinction in the name of economic progress.

I wrote this commentary because even global climate change, overpopulation, and ecological overshoot have not caused most people to realize that *Homo sapiens* could become a fossil with no living representatives remaining on Earth (such as the fossils that Robert Hooke identified in 1667) . One need not read the scientific literature to become aware of crucial developments that could, if not halted, cause *Homo sapiens* to become extinct. For example, McKibben (2007) writes that James Hansen (a scientist with impeccable, decades long, correct predictions on climate change) presented a paper at the American Geophysical Union Conference that indicates that humankind has already gone too far on greenhouse gas emissions. Recent evidence (e.g., glaciers melting much more rapidly than predicted) supports Hansen's view. Does this evidence mean that humankind is doomed? It does not! However, the evidence does mean that humankind had better take remedial measures now or things will get much worse. The inadequate remedial measures discussed at the UN Bali Conference were blocked by the US envoys until the very last minute, and, even then, the agreements were far from adequate. People are not prepared to ban coal-fired power plants or to have a tax on carbon high enough to be certain that tar sands and oil shale are left in the ground. Just as humankind must accept its own mortality, it must also accept that its present lifestyle will probably cause billions of deaths and might even cause its own species to become extinct.

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