

MOTHER NATURE DOES NOT BARGAIN OR FORGIVE

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Pity the meek, for they shall inherit the earth.

Don Marquis

Let us not go over old ground, let us rather prepare for what is to come.

Cicero

Hansen et al. (2008, p. 1) express the present global crisis bluntly: "If humanity wishes to preserve a planet similar to that on which civilization developed and to which life on Earth is adapted, paleoclimate evidence and ongoing climate change suggest that CO₂ will need to be reduced from its current 385 parts per million to *at most* [italics mine] 350 ppm." The first response from people is usually: "What can I do? I'm only one individual." My response to them is that billions of individuals caused the present climate problem; therefore, billions of individuals should be able to correct it by individual lifestyle changes. This effort would involve using far less fossil fuels for transportation (i.e., petroleum), electricity (i.e., coal), and heating (i.e., fossil fuels). Hansen et al. (2008) remark that a 350 ppm atmospheric carbon dioxide target may be achievable by phasing out coal use, except where carbon dioxide is captured (technology not yet available), and by adopting agricultural and forestry practices that sequester carbon.

The 350 ppm target may be too high since persuasive circumstantial evidence (e.g., polar ice sheet melting, Australian "big dry") indicates that 350 ppm was a climate tipping point. If this value is the tipping point, then staying well below it would be prudent in order to avoid the possibility of initiating irreversible catastrophic effects.

Actually, the best way to set a target for atmospheric carbon dioxide is by determining the assimilative capacity of the biospheric life support system for atmospheric carbon dioxide. If atmospheric carbon dioxide continues to increase, as it is in 2008, the assimilative capacity of the biospheric life support system is being exceeded (Cairns 2008). If the carbon dioxide concentration continues to exceed Earth's assimilative capacity, it will continue to accumulate in the atmosphere and klimakatastrophes will increase in severity and frequency.

If Mother Earth were capable of musings, they might read like the following.

"Increased atmospheric carbon dioxide is increasing global heating. I wonder if melting the polar ice sheets might attract humankind's attention to this urgent problem. — Good heavens, humans are viewing the loss of the Arctic ice cover as an opportunity to acquire more petroleum that, when burnt, will increase greenhouse gas emissions."

"Humans seem to be fascinated with food, judging from the number of television shows devoted to cooking. Perhaps if climate change interfered with food production, they might notice the change in the climate. — Oh, no! They not only didn't notice, they are turning corn into ethanol to keep their SUVs going. Why can't they connect the dots?"

"Perhaps increasing the number of pests might attract humankind's attention — such as rice leaf hopper or wheat rust. I might even move some human tropical diseases toward the poles. Just for good measure, destroying large forests with beetles might attract some attention. — Wrong again! Humans are even less observant than I thought. Of course, they gave themselves the species name Homo sapiens, although a wise species should have taken note that the planet is less habitable."

“Humans love talking about the weather. Perhaps a change in rainfall patterns – droughts in some places, floods in others – might increase their focus on the climate. — It worked! But their solution is technological – make freshwater from ocean water. They still haven’t associated climate change with their high fossil fuel/technological/automobile culture.”

“The vast oceans cover approximately 70% of the planet’s surface, are an important source of protein, and are recreationally important (e.g., scuba diving at coral reefs), so any adverse effects upon them (e.g., acidification and declining fishery stocks) should attract immediate, concerned attention. After all, restoring damaged oceanic ecosystems in time frames of interest to humans is highly unlikely. — Sigh. . . wrong again. Humankind has been told about all of these problems but seems unconcerned, even possibly indifferent. Even a charismatic species, such as the polar bear, is not getting protection in its home US state of Alaska. The governor of Alaska, Sarah Palin, has stated that the state will file a lawsuit in the US District Court in Washington, DC, challenging US Interior Secretary Dirk Kempthorne’s decision to grant Endangered Species Act protections to the polar bear. Governor Palin feels that listing the polar bear as a threatened species will slow development in the state (Rosen 2008). What has happened to these humans and the way they think? They should feel a responsibility for all other species with which they share the planet, not just dwell on their fixation on economic growth, which primarily benefits a small portion of their own species. This responsibility requires paying attention to the health and integrity of the biospheric life support system, which has provided conditions favorable to all life now present on the planet. Faith in technology should not replace or impede “good works” that benefit all life forms. Knowing how the world works is more important than knowing how the human economy “works,” since the latter derives its well being from the biosphere, without which the human economy would cease to function. Humans must develop an ecocentric perspective – an understanding of how the complex, interlocking systems are structured and function.”

“Humans don’t realize that I don’t bargain – if they make plans for 2025, 2050, or some other dates and greenhouse gas emissions keep rising, basic natural laws will not be suspended or modified. Human laws can be repealed or ignored, but not natural laws. The consequences of violating natural laws are severe, often fatal. I do not forgive either, as the fossil record shows. Five great extinctions have occurred and the sixth is well underway. These great extinctions caused species impoverishment, after which new and different complex systems evolved over substantial periods of time. Humans must accept that they are part of a pulsing system – ups and downs will always be present. The tragedy is that humans are causing the pulse, which has already driven approximately 33% of the planet’s species to extinction. Humankind is not the compassionate, lovable species it believes it is.”

Since Mother Nature neither negotiates nor forgives, what should humans do once they accept that they are on a finite planet with finite resources and that the fossil fuel, which enabled them to create a temporary high carrying capacity, is running out quickly? Population growth must be eliminated and then decreased, as well as consumption of natural resources. The Reverend Thomas Malthus failed to foresee the effects of technology based on cheap, abundant fossil fuel, but his analysis was sound, as humans are about to find out. The amenities that humans have taken for granted – abundant food, exponential economic growth, human population growth – must cease. Resources will still exist, but the instinct to solve the problem with resource wars must be effectively suppressed or far too many resources will be used for combat instead of facilitating the transition to resource scarcity.

The new goal for humankind is to determine the planet’s new carrying capacity, which has been adversely affected by global climate change and the decline of cheap petroleum. In addition, humankind must resist the temptation to keep the flow of energy up to peak oil levels by using coal that produces much more greenhouse gases.

Dependence on Oil

No US citizen was surprised when US President George Bush observed in his January 2006 State of the Union address that “America is addicted to oil,” and the remark has been widely quoted. However, Bob

Hopkins has concluded that dependency is a better metaphor than addiction (as quoted by Heinberg 2007, p. 135). Heinberg (2007, p. 137) notes:

Let us translate this thought exercise (societal dependence) to our oil dependency. Might we simply end it by developing new supplies of alternative fuels such as ethanol and biodiesel, or liquids from coal and natural gas? If the analogy holds, the result is likely to be not an actual reduction in oil consumption but merely an added dependency on these alternatives. And indeed this is exactly what we see in most cases; it is difficult to find an instance in which any nation has substantially decreased its existing oil consumption as a result of the development of alternative fuels. In nearly every case alternatives serve merely to reduce the rate of growth in demand for oil. It doesn't hurt, but neither does it address the core problem.

In my opinion, humans are placing their perceived needs well before Mother Nature's needs – that is, preserving the integrity and health of the biosphere. In this case, the health of the biosphere means staying at or below the biosphere's assimilative capacity for greenhouse gases. Since greenhouse gases are rising at a rapid rate, a reduction in consumption of oil and other fossil fuels is essential. Reduction can only be accomplished by dealing head on with the dependency (Heinberg (2007, p. 137). Heinberg (2007, p. 141) remarks: "The problems of Climate Change and Peak Oil both result from societal dependence on fossil fuels. But just how the impacts of these two problems relate to one another, and how policies to address them should differ or overlap, are questions that have so far not been adequately addressed." Climate change concerns carbon emissions and their effects. Peak oil concerns coming shortfalls in the supply of fuels on which society has become overwhelmingly dependent. In my opinion, both problems are being addressed from a homocentric perspective. Climate change studies have a major ecocentric perspective, especially in the scientific reports, but the implementation of remedial actions (or lack thereof) is in the hands of politicians who have a strong homocentric perspective: "I put people ahead of fish (or some other groups of organisms)." Rarely is human dependence upon the biospheric life support system given much attention.

Speculative Future Scenario

An infinite number of possible scenarios exist for the future of life on Earth, all of which may be strongly influenced by stochastic events. As a father and a grandfather, I hope the following assumptions are wrong.

- (1) The term *sustainable* means a practice that can be maintained over time. I have always preferred the phrase *sustainable use without abuse* since *sustainable development* on a finite planet is an oxymoron. Bartlett (1997-1998) gives a detailed discussion of the term *sustainability* that superbly analyzes the use and misuse of this term. Present human population growth and the use of fossil fuels and other natural resources are clearly not sustainable. Tainter (1988) and Diamond (2005) both note that collapse of complex societies is frequently the fate of societies that ignore the basics of carrying capacity and resource use.
- (2) Humankind is damaging the biospheric life support system by driving species to extinction and co-opting both space and resources needed to preserve the system's health and integrity. The biospheric life support system has maintained conditions favorable to the genus *Homo* for approximately 2 million years. The biospheric life support system will probably return to a quasisteady state even after a major extinction (i.e., 90+%), but the new conditions may not favor the genus *Homo*.
- (3) As Heinberg (2007, p. 6) notes: "Nevertheless the general picture is inescapable; it is one of mutually interacting instances of overconsumption and emerging scarcity." In short, humankind has grossly exceeded Earth's carrying capacity. No cheap, abundant energy will be available to fuel an attempt to further increase humankind's resource base. The inevitable result is a major population crash, featuring starvation, disease, and death.
- (4) Climate change will persist for centuries due to the long residence time of carbon dioxide in the atmosphere.

How Did We Get in this Predicament?

Heinberg (2007, p. 175-176) remarks:

The economists had been operating on the basis of their own religion – an absolute, unshakable faith in the Market-as-God and in supply and demand. They figured that if oil started to run out, the price would rise, offering incentives for research into alternatives. But the economists never bothered to think this through. If they had, they would have realized that the revamping of society's entire energy infrastructure would take decades, while the price signal from

resource shortages would come at the exact moment some hypothetical replacement would be needed. Moreover, they should have realized that there was no substitute capable of fully replacing the energy sources they had come to rely on.

Hardin (1998, p. 1) discusses another human attribute – the ability to ignore unpleasant things. He uses the example of an infant trying to escape a threatening face by burying its head in a blanket as in the myth of an ostrich burying its head in the sand. He speculates that the infant's mind moves along the following sort of logical path: "My world is what I see. If I do not see something, it does not exist. I will cause the fearful object to cease to exist by wiping out its image." At the other end of the age range, the elderly might simply say: "I don't want to hear about that (e.g., global heating, peak oil, price increases for food)." Hardin (1998, p. 45) also addresses another human foible – doing nothing: "Yet to do nothing is not a realistic option because *nothing ever happens*." For example, humankind is not following the conservative recommendations in the Intergovernmental Panel on Climate Change reports to any significant degree, and, as a consequence, anthropogenic greenhouse gas emissions are increasing markedly. In fact, Sherwood Rowland, Nobel Laureate atmospheric chemist, estimates the peak atmospheric concentration of carbon dioxide could be 1,000 ppm. The current concentration is about 385 ppm, after never topping 280 ppm for at least 650,000 years (Revkin 2008a).

New and Old Words

The growing urgency of the climate crisis has generated some new words. *Klimakatastrophe* (climate disaster) is the German Language Association word of 2007. An equally alarming new word is *hypermortality*, which is defined as an extraordinary tendency toward death (Walker 2008). The UN Development Program Report entitled "Demographic Policy in Russia" states: "The Russian phenomenon of hypermortality comes to be observed primarily in working-age populations. . . Compared to the majority of countries that have similar levels of economic development, mortality is 3-5 times higher for men and twice as high for women" (Walker 2008). Another new word is *envirogee*, whose "semi-official designation *climate refugee* is defined as a displaced person who has been forced to migrate because of environmental devastation" (Thill 2008). Perhaps these new words will create a sense of urgency which seems, at times, to be totally lacking in public discourse on climate change.

However, one's expectations for change should not be too high! The term *peak oil* was used in 1956 by M. King Hubbert, a petroleum geologist, who predicted that US oil production would peak in the early 1970s, followed by a declining curve. This curve, now validated, is a classic, but still causes fear (Wilson 2008). The reason for the fear is that petroleum has produced a period of unparalleled economic growth, and resistance is strong to the idea that limits to growth exist or, worse yet, a return to a lower growth era. Wilson (2008) makes another important point:

When speaking of energy issues, politicians will often use the euphemism of energy security, acknowledging that the US has only three percent of the world's oil reserves and warning that most of the rest of it belongs to unfriendly or unstable governments. While there is truth to this type of statement, it sets up a framework for conflict by creating the perception that there is plenty of oil left but bad people are keeping it away from us.

Wilson (2008) further remarks that politicians of both parties are willing to play the fear card and promote quick-fix measures that are ineffectual or downright ridiculous. This approach does not develop a good relationship with Mother Nature. Many congressional Republicans favor drilling in the Arctic National Wildlife Refuge, which would, at peak production, only meet 2% of the US oil demand (Wilson 2008). However, the Congressional Peak Oil Caucus Co-chair, Congressman Roscoe Bartlett (Rep), favors saving the Arctic oil for a real emergency. Clearly, the automobile culture puts drilling far ahead of alternative energy sources.

US Legislation

At present, many energy bills are before the US Congress. However, a recent poll carried out by the Public Opinion and Policy Center (2008) of the National Center for Public Policy Research found that 65% of Americans reject spending even a penny more for gasoline in an effort to reduce greenhouse gas emissions. A 203-page report, "The Effects of Climate Change on Agriculture, Land Resources, Water Resources and Biodiversity in the United States," is a part of a continuing assessment of global heating questions that was initiated by US President George Bush in 2003. The report notes that the rise in concentrations of carbon dioxide in the atmosphere from anthropogenic sources is influencing climate patterns and vegetation across the

United States and will significantly disrupt water supplies, agriculture, forestry, and ecosystems for decades (Revkin 2008b)

One would hardly guess that the climate report just discussed had little influence on the Lieberman-Warner climate bill, which effectively died in the Senate on 6 June 2008 (Sheppard 2008). The bill aimed to cut global heating emissions by 66% by 2050 (Zabarenko 2008). This value is far below the reduction in emissions recommended by the Intergovernmental Panel on Climate Change reports, but would have been a step in the right direction.

Tim Profeta, Director, Duke University's Nicholas Institute for Environmental Policy Solutions, stated: "Not many people see this [the Lieberman-Warner Bill] as a serious piece of legislation that will become law this year" (Eilperin and Mufson 2008). US Senator Barbara Boxer has stated: "This is landmark legislation, and enacting landmark legislation is never as easy task. There is always an excuse not to act – but in this case, the longer we wait, the harder it gets to solve this problem. Time is our enemy, and every expert has told us we face dangerous consequences from unchecked global warming if we do not address this problem now" (Eilperin and Mufson 2008).

Why Did Humankind Get into this Perilous State?

The short answer to the question of why humankind got into this perilous state is that it ignored scientific evidence. The "investigative reporters" failed to state that the preponderance of evidence confirms that global heating is indeed occurring and that anthropogenic greenhouse gas emissions were a major component of the change. Of course, overwhelming scientific evidence exists, but not enough in the United States to elicit major remedial actions.

Unquestionably, denial was a major factor in humankind's failure to address climate change threats. Worse yet, in the United States, science was suppressed and distorted when it was perceived as a threat to political ideology. For example, *The New York Times* stated:

The Bush administration has worked overtime to manipulate or conceal scientific evidence – and muzzled at least one prominent scientist – to justify its failure to address climate change . . . This administration long ago secured a special place in history for bending science to its political ends. One costly result is that this nation has lost seven years in a struggle in which time is not on anyone's side" (Editorial 2008).

The editorial also reported that an internal investigation by the National Aeronautic and Space Administration's inspector general concluded that political appointees in the agency's public affairs office had tried to restrict reporters' access to its leading climate scientist Dr. James Hansen. The investigation also found that politics played a heavy role in the office and that it had presented information about global heating "in a manner that reduced, marginalized or mischaracterized climate-change science made available to the general public" (Editorial 2008). Fortunately, humankind is better off because James Hansen refused to be silenced. Few scientists could have endured the stress he was subjected to and continued their research, but Hansen did.

Finally, humankind got where it is because the CEOs of some corporations require scientific evidence far beyond what they provide when they engage in an activity that affects the environment. For example, Cattaneo (2008) states:

Rex Tillerson, chairman and chief executive officer of Exxon Mobil Corp., the world's largest oil-and-gas company, came out swinging Wednesday against the environmental movement, arguing the science of climate change is far from settled and that his company views it as its 'corporate social responsibility' to continue to supply the world with fossil fuels . . . Mr. Tillerson also said he expects little delay in the \$8-billion Kearsarge oilsands project in Alberta, after a court challenge by environmental organizations this month resulted in the withdrawal of a key federal permit, halting important work.

Redesigning to Favor Mother Nature

Scientists at Brown University (MLA 2008) have demonstrated that richer plant diversity significantly enhances an ecosystem's productivity. This evidence highlights a very important benefit – capturing a major contributor to global warming – carbon dioxide. Despite persuasive evidence of this type that humans derive enormous benefits from ecosystem services, such as carbon dioxide capture, they still depend upon undeveloped, unproven technology (e.g., "clean" coal). Ecosystem services must be given the attention they

deserve before humans damage natural capital so severely that the services decline, disappear, or no longer benefit the genus *Homo*.

Social Evolution

In their superb book *The Dominant Animal*, Paul and Anne Ehrlich (2008, pp. 3, 4) state: “Humanity’s rise to dominance is a result of both genetic and cultural evolution, both of which led to scientific advances that have spawned ever more powerful technologies . . . Knowledge of these reciprocal evolution-environment interactions is critical to our ability to make wise decisions affecting the long-term success of our species and of the natural world upon which it is utterly dependent.” The Ehrlichs then note (2008, p. 4) the astonishing increase in knowledge about how Earth and its inhabitants – including humans – interact and how they have changed over time: “In theory, we could use that knowledge to create a sustainable civilization – one in which human beings live happy, productive lives into the indefinite future. Whether we can manage that in practice remains to be seen.” Humankind has made no acknowledgment that it is utterly dependent upon Earth’s life support system, although discussion of the human economic system is dominant. Wynn (2008) reports that the US chief climate negotiator, Harlan Watson, has commented that big cuts in greenhouse gas emissions cannot be met by 2020: “It’s frankly not do-able for us.” Had the United States not been a climate change denier for nearly eight years, a more positive statement might have been made.

The Ehrlichs (2008, p. 368) conclude:

Humanity’s globalizing civilization must take this enhanced opportunity to explore conscious evolution and try new ways of organizing societies to cooperate to solve its burgeoning global problems. . . And humanity must do this even without assurance that the steps taken will be successful. Dealing with such profound questions along with the consequences of overpopulation, economic inequity, and the erosion of environmental resilience will surely not be easy. But each day that we do nothing forecloses options for creating a better future for ourselves and our fellow inhabitants of Earth. The qualities that made it possible for us to become the dominant animal could now be put to use in creating a sustainable future for ourselves and the rest of the world.

Conclusions

Anthropogenic greenhouse gases are still pouring into the atmosphere at a rate that far exceeds the biosphere’s capacity to absorb them. Much talk and little corrective action have been the response to catastrophic climate change thus far. In the United States, resistance to remedial action has been formidable in the federal political system and from organizations funded by some powerful corporations. The general public has inadequate literacy and numeracy to grasp fully the complex systems-level climate change problem. All too many political leaders emphasize adverse effects on the economy when greenhouse gas emission reductions are discussed. However, the human economy will not survive if climate change adversely affects water supply and food production or makes much of the planet uninhabitable by humans. If climate change continues at its present rate, *Homo sapiens* could become extinct or suffer a massive reduction in population size. If biotic impoverishment (i.e., species extinction and/or population declines of many species) continues at its present rate, the biospheric life support system may cease to maintain conditions favorable to humankind.

Still, scientists must continue to generate information about the effects of greenhouse gas emissions and do everything possible to dramatically reduce them. Doing nothing is not an option, however daunting the obstacles to success.

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