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Humankind's Ultimate Security

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Abstract : While humankind is obsessed with economic growth, terrorism, and unverified rumors of weapons of mass destruction, a much greater threat to both individual and societal security is developing with frightening rapidity—the increasingly probable failure of the biospheric life support system to continue maintaining conditions that have been favorable to humans for 160,000 years. Worst yet, humankind's unsustainable practices are the primary cause of this threat. An uncharitable person might conclude that humankind is suicidal. After all, why cause global warming, acidification of the planet's oceans, and drive many of the life forms "sharing" the planet into extinction if humankind does not have a death wish? However, reasons to hope exist. Major changes in human behavior could result in a shift from unsustainable to sustainable practices. To be effective, this shift must be based on an objective analysis of the risks to humankind's security based on information generated by the experimental sciences. This analysis would be a major, new undertaking for the experimental sciences, but it is necessary to a sustainable future for humankind.

Key words : Economic growth, Societal security, Biospheric life support system, Terrorism, Unsustainable practices, Greenhouse gases.

Our lives begin to end the day we become silent about the things that matter.

Martin Luther King, Jr.

Wild beasts and birds are by right not merely the property of people who are alive today, but the property of unknown generations whose belongings we have no right to squander.

Former US President Theodore Roosevelt

The genus *Homo* has existed for almost 2 million years on Earth, and the species *Homo sapiens* has existed for approximately 160,000 years. For most of this time, human life in the aggregate has focused on short-term events. Even today, the average human mind still functions best when considering the short-term future—one or two generations at most (Wilson, 1993). The structure and function of the biospheric life support system is poorly understood. Humans take pride in being an intelligent species that now controls nature and, therefore, Earth. However, intelligence that focuses on individual "needs" and "wants," while ignoring the fate of posterity as well as the fate of millions of other species, does not deserve to be characterized as "quickness of understanding."

Choosing To Fail :

In his superb book, Diamond (2005) states : *"Perhaps a crux of success or failure as a society is to know which core values to hold on to, and which ones to discard and replace with new values, when times change"* and provides illustrative examples.

(1) Deeply held religious values: Easter Island is perhaps the best known example of a societal collapse. This society decided to cut down the trees upon which it depended for survival. The trees were used to roll

statues, which were revered, from the stone quarry to the ocean's edge.

(2) Failure to anticipate: Centralized decision-making, substantive flow of information, and formal channels of command should anticipate the outcome of societal practices. However, holding governments and corporations accountable for major failures is not common practice in the United States and many other countries. This failure seems to have happened in the restoration of Iraq (Denton, 2005).

(3) Failure to perceive a problem: The problem may be due to imperceptible rates of change, distant managers, or a slow trend masked by substantial variability (*e.g.*, global warming).

(4) "Rational" bad behavior: A significant number of people can advance their own interests by behavior harmful to other people. The reasoning is sound but not ethical. Hardin's (1968) "The Tragedy of the Commons" exposed this issue many years ago, but the situation appears to be worsening (Cairns, 2003a).

(5) Disastrous values: Governments may not give significant attention to problems that already verge on disaster. In the United States, global worming and other aspects of climate change are not just ignored but often elicit open hostility. For example, US Congressman Joe Barton, Chairman of the House Energy Commerce Committee, who rejects the existence of climate change, demanded personal and private information from scientists whose evidence supports a contrary conclusion (Editorial, 2005a). Another Republican Congressman, Sherwood L. Boehlert, Chairman of the House Science Committee, has called the investigation "misguided and illegitimate." One of the targets, scientist Raymond S. Bradley, University of Massachusetts, called the investigation "intrusive, far-reaching, and intimidating." Bradley remarked that papers are published in peer-reviewed journals and others may point out why its conclusions might be wrong. However, such detractors are identified and readers can judge if these detractors have adequate scientific credentials. Advancements are made by adhering to the scientific process and not through the intervention of a Congressional committee that is partial to one side of the argument. If Congressman Barton wishes to discuss the science of climate change, many avenues are already available. For example, he might actually read the literature himself or ask for a report from the US National Academy of Sciences. If Congressman Barton aims to develop his literacy on climate change, this hostile avenue is a curious approach.

Never has science been more important to humankind than it is in the 21st century, especially to understanding many political issues. However, in the United States and too many other nations/states, scientists have less influence than in the not too distant past. Worse yet, scientific results and the scientists who generated them are ignored, harassed, or their findings are disputed and manipulated even with an overwhelming consensus among scientists (*e.g.*, global warming). An uncharitable person might

conclude that intellectual honesty has been replaced by anti-intellectualism and the agenda of powerful, special interest groups. The scientific process is designed to counter denial and other forms of self deception. Those detractors attempting to undermine science often call for "sound science," implying that evidence contrary to their particular political ideology is "junk science." Both the politically "right" and the politically "left" have abused the scientific process so this failing is widespread. Arguably, the most shocking case is that of Soviet scientist Trofim Lysenko, who rose to prominence in 1948 when Lysenko persuaded Stalin to ban the study of genetics. In fact, the term "Lysenkoism" has been used to mean the suppression of science for ideological reasons. People seem to believe that this suppression could not occur in a democracy, but recent events suggest the possibility exists through the targeting of individual scientists (already discussed) and discrediting their evidence or at least diverting their energy from research to supplying information already in the public domain. Discrediting evidence and disrupting the scientific process are different strategies, both of which require serious attention if scientific integrity and intellectual honesty are valued.

One other aspect of the denigration of science deserves serious attention. Raloff (2005) analyzes in detail how US judges increasingly determine what scientific evidence a jury hears. However, John Holdren, Director of Science, Technology, and Public Policy at the Kennedy School at Harvard University, cautions that scientists should not think that science should always determine outcomes—neither should outcomes be defended by distorting the science. A good contrast of these differing views is the fact that the Nobel Peace Prize was awarded to the International Atomic Energy Agency and its chief Mohamed ElBaradei, which the present US administration tried and failed to remove from his position (Smith, 2005).

Upward Trend for Power Use :

The United States uses four times more energy per capita than Brazil. A major reason for this inflated use is American indulgence on high energy consuming products such as computers, plasma televisions, air conditioners, large stereos, "spare" refrigerators, and multiple automobiles. The US state of California per capita electricity use increased 7% in 2004 over 2001. Energy demand is rising in the United States (Luna, 2005) and the rest of the world. In the United States and other developed countries experiencing a high rate of legal and illegal immigration, a major ethical issue emerges. Should immigrants enjoy the same level of resource consumption as citizens? The availability of resources is a primarily attraction for them to developed countries. Is it reasonable to expect them and their descendents to stay within lower energy demands or expectations than established citizens? How can these restrictions be accomplished when the United States already uses approximately 25 percent of the world's resources?

The British have a policy instrument for

reducing greenhouse gases (Anderson *et al*., 2004). Wendling (2005), in discussing the Anderson plan, asked if people would be willing to hand over an identity card every time they filled their gas tanks or would they let the government track each time they used the washing machine. Would the alternative—allowing prices to rise until demand stabilizes—disproportionately and adversely lower energy demands or expectations of established citizens? The choice is between ethics and economics (Cairns, 2003b, 2004). Any plan seems to be an unacceptable intrusion on personal freedom, but alteration of the biospheric life support system due to climate change would be a vastly larger threat to individual freedom. Another major problem is the strong probability that the United States will decline to participate in this undertaking even if other nations agree to do so. Vatikiotis (2005) cites Robert Cooper from the Council of the European Union as declaring that "a second center of power would help keep the United States honest if it was no longer a benign force for good." At the 25th Tallberg Forum in Sweden where these issues were discussed, the participants appeared to be gripped by anxiety over the state of global affairs. Little or no confidence was expressed for global rules and institutions, which are widely believed to be undermined by the United States. Some persuasive evidence indicates that an era of ecological and societal disequilibrum has already begun (*e.g.*, shrinking of Artic Sea ice, avian flu [the 1918 flu virus killed about 50 million people]).

The second center of power is not without merit. The United States has been one of the major obstacles to implementing the global reduction of greenhouse gases. Yet there is evidence that the planet is approaching a climatic tipping point that will probably result in ecological disequilibrium of large systems. For example, the world's largest peat bog in Western Siberia is thawing for the first time since its formation 11,000 years ago (Commentary, 2005). As climate scientist David Vines remarks, "When you start messing around with these natural systems, you can end up in situations where it's unstoppable." This sudden melting of a bog the size of France and Germany combined could release billions of tons of the potent, greenhouse gas methane into the atmosphere (Pearce, 2005).

The Methane Feedback Loop :

A worst-case scenario, now increasingly probable, is based on the assumption that increased greenhouse gases will accelerate global worming. The thawing of the peat bog in Siberia is resulting in the release of methane, a potent greenhouse gas which will almost certainly accelerate the rate of global warming which, in turn, will thaw more peat bogs, permafrost, and tundra, further accelerating the release of methane into the atmosphere. At some tipping point, global temperature increases will be beyond human control. This increase will, in turn, change the rate of climate change, which will have adverse effects upon humankind's food supply at a time when 3 billion additional people are predicted to be added to the planet's population in the next 30 years. Regrettably,

most people judge global warming and other aspects of climate change on their personal experience. In Blacksburg, Virginia, the summer daytime temperatures up to August 16, 2005, have been in the 80s and low 90s Fahrenheit. However, in Phoenix, Arizona, the temperature in July 2005 passed 110 degrees Fahrenheit day after day. Las Vegas, Nevada, experienced 117 Fahrenheit, clearly barely tolerable for most people and life threatening for the elderly and very young. Air conditioning makes these conditions more tolerable but entails huge expenditures of energy. If the energy delivering system fails during summer, the situation will be catastrophic for people living in areas close to or at the limits of human tolerance. Since much of the electricity is generated with fossil fuels, the production of anthropogenic greenhouse gases will increase. This situation is yet another ominous feedback loop. If the price of electricity increases, the poor, especially the homeless, will be disproportionately affected. Switching from fossil fuels to nuclear power is not risk free. The US Environmental Protection Agency has just revised its health standard for the proposed nuclear waste storage at Yucca Mountain, Nevada, so that radiation releases are limited for one million years. To put this requirement in perspective, *Homo sapiens* is estimated to have been on Earth for a mere 160,000 years (Janofsky, 2005). If the present US administration continues to emphasize the uncertainties in the evidence for global warming (which global mainstream science does not), how can creditability on this prediction be established?

Stochastic Events Occur :

American politicians place great emphasis on the uncertainties in science, especially research on global warming. However, uncertainties exist in every part of human life, including politics, the stock market, the outcome of US efforts in Iraq and Afghanistan, and the possibility of inflation (to mention a few of the seemingly endless probabilities). Any process involving a randomly determined sequence of observations, each of which is a sample of one element of a probability distribution, will always have uncertainties. How ironic that politicians, whose misjudgments are legendary, use uncertainty in science to denigrate the carefully structured scientific investigations published in peer-reviewed journals. Krugman (2005) notes that people are not living in an America of the past, where even partisans changed their views when faced with the facts, but in a country that no longer recognizes a nonpolitical truth. Humankind persists in destroying the biospheric life support system, not only without apology but also with calling the destruction "progress." Terrorists are not the major threat to security—humans are! Humankind should at least be willing to express regret that unsustainable practices are the major threat to the human species and most other life forms on the planet. Terrorists kill thousands of people—unsustainable practices, if continued, will eventually destroy the biospheric life support system and billions of humans who depend upon it for survival.

The Ultimate Security :

Surely humankind's ultimate security is to maintain the biospheric life support

system that has been so favorable to the human species for the entire time it has been on the planet. All other types of security, however important, are secondary. Ecological overshoot is just one of the many indications that humankind has failed to perceive its practices as jeopardizing the integrity of the biospheric life support system. An alternative explanation for the failure to cherish and protect the system is ignoring the consequences of unsustainable practices because acknowledging them would require major changes in human behavior. Arguably, denial that the problem exists is more comfortable in the short term than decreasing the size of the individual ecological footprint. Stated more bluntly, citizens of the United States and other countries with an ecological deficit simply will not lower their environmental impact because they feel a quality life must be based on high energy use and many material possessions. However, if citizens of less affluent countries do not preserve their ecological life support systems, a small per capita ecological footprint is not particularly appealing. The basic problem is simply more individuals than a finite planet with finite resources can support. One of the major threats to global security is "rational behavior" in which individuals (and corporations) advance their interests by behavior harmful to other people. Economist Kenneth Boulding's dismal theorem predicts that, if misery and starvation are the primary regulators of human population growth, they will continue until misery and starvation halt it.

One of humankind's core assumptions is that technology will eliminate problems of misery and starvation. However, technology has failed to do so thus far, and estimates are that an additional 3 billion people will be added to Earth's population by 2050. Of course, no curve can keep rising forever, and predicting when a violent cutback in human population size will occur is impossible. How can anyone maintain belief in any meaningful security under these circumstances?

Another core value is the belief that exponential economic growth is essential to society (Bartlett, 2004). Core values that threaten humankind's security must be reexamined to determine if the perceived benefits substantially outweigh perceived risks. An equally important point is that benefits accrue to a few people while the risks are shared by all. Many environmental problems are the result of activities that benefit few people while a vast majority shares the risks.

Anarchy :

Anarchy can be triggered by a breakdown of the social system, which could result from a failure of the biospheric life support system and/or the technological life support system. In addition, these systems are interactive and might well malfunction simultaneously. The severe hurricane that hit the US Gulf Coast in 2005, including the major city of New Orleans, Louisiana, confirmed the power of nature.

Flood waters in the city, much of which is below sea level, resulted in a major exodus of people from their homes, which is a great hardship for them and, assuredly, will have some impact upon the areas that offer them refuge. Serious impacts that

should have been anticipated were the hurricane and subsequent floods that overwhelmed the area hospitals (Chan and Harris, 2005). Nurses and physicians squeezed hand-held ventilators for those who could not breathe. At one private 317-bed hospital, patients were lying on the floor. Two public hospitals did not have funds to hire helicopter companies to evacuate patients. Staff members could do little more than comfort dying patients.

Dowd (2005) remarks that, when limited resources are combined with incompetent government, lethal events occur. She notes that an affluent nation such as the United States has been once more plunged into a "snake pit" of anarchy—death, looting, raping, marauding thugs, suffering innocents, a shattered infrastructure, and a gutted police force plus insufficient troop levels. Buncombe and Gumbel (2005) noted that chaos ruled, including looting and gunfire. A risk of an even more catastrophic breakdown due to under-prepared and under-resourced federal authorities charged with coping with this major tragedy was clearly demonstrated by Hurricane Katrina. Both shame and outrage ensued, as well as a national disbelief that the world's sole remaining superpower either could not or had not responded more rapidly and effectively to a disaster that has been one of the US government's worst case scenarios for years (Purdum, 2005). One newspaper (Editorial, 2005b) described the event as a man-made disaster. The prestigious journal *Scientific American* (2005) reported that the possibility had been known for years that a major hurricane could swamp New Orleans with 20 feet of water, killing thousands. The article noted that human activities along the Mississippi River have dramatically increased the risk. One of the best reports on the subject of climate change is the Pentagon Report (Schwartz and Randall, 2003). The purpose of the report was to "imagine the unthinkable," but, after Hurricane Katrina hit New Orleans (Fischetti, 2005; Dao and Kleinfield, 2005), the report no longer seems extreme. The Pentagon Report notes that, once temperature rises above some threshold, adverse weather conditions could develop relatively abruptly. Changing weather patterns would affect both natural resources and crop yields. However, one of the key findings is that one should expect societal levels of violence and disruption, stemming from the stresses created by an abrupt change in climate, to pose a different type of threat to national security. The New Orleans experience following Hurricane Katrina confirmed the prediction of food shortages and lack of potable water, as well as decreased carrying capacity for humans in the area. Hospitals, police forces, power delivery, etc. were all severely affected. A number of conflict scenarios due to climate change now appear much more probable than they did when the Pentagon Report was issued in 2003.

Seeking Security :

Among the various definitions of *ultimate* is "maximum." Since many forces of nature are beyond human control, *ultimate* should be interpreted in the environmental setting as the maximum

security that can be achieved by modifying human behavior and practices. Global warming is a good illustrative example. Not all greenhouse gases are of anthropogenic origin, but enough are so that humankind could markedly reduce the risks of global warming and other types of climate change. The risks associated with climate change are so formidable that resisting the implementation of the changes that would reduce risk is irrational. Nevertheless, this resistance is precisely what is happening in the United States. One reason for this resistance is the low level of scientific literacy (Dean, 2005). The United States has some of the world's best scientists; however, one adult American in five believes that the sun revolves around Earth, a concept science had abandoned by the 17th century. If the general public does not understand science, then politicians who are strongly influenced by special interest groups and who urge continuing unsustainable practices that markedly increase risk to the general public cannot be penalized. Everyone contributes to global warming and has the power to do something about it.

Denial is one of the ways humans cope with problems. Short term, denial may even be a survival mechanism. Long term, denial means a failure to avoid serious risks. However, risks could still be reduced if more attention were given to scientific studies and to preventative measures based on these studies. Major risks are associated with climate change and damage to the biospheric life support system.

No human activity has zero risks, but some activities have a much higher probability of harm than others and deserve the most attention. However, some comparatively low risks are receiving the most public attention and funds, while some high-risk activities (*e.g.*, production of anthropogenic greenhouse gases) receive a disproportionately lower share of public attention and funding. If probability of harm to large numbers of people were used to determine where societal efforts would provide the greatest benefits to the largest number of people, security would be improved without increased monetary allocations. Ultimate security is merely an exercise in cost/benefit analysis.

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