

LIVING ON AN ALIEN PLANET

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Alien—unlike one's own; strange; repugnant in nature

Living on an alien planet will be difficult. Humankind has produced excessive amounts of greenhouse gases, discharged many thousands of hazardous chemicals into the environment, displaced huge numbers of species from their habitat, and depleted brood stock from oceanic fisheries. In addition, the period following peak oil will mean less energy for heating/cooling, personal transportation, acquiring food from distant locations, and making products with petroleum. Droughts and excessive rainfalls will affect production of foodstuffs, and less energy will be available to store them in cool places. Energy needed for mechanized farming and production of meat will also be less available. Coal is not a substitute for petroleum, neither is nuclear energy – the products made from petroleum cannot easily be made from coal or nuclear energy. Coal also produces more pollutants than petroleum, and high-level nuclear wastes produce a 1-million-year storage problem.

Just these few examples indicate that future generations will inhabit a planet with a rapidly changing climate and, consequently, fewer natural resources. However, fewer resources per capita is not necessarily bad. The New Economics Report (“The(Un)Happy Planet Index”) provides persuasive evidence that happiness (e.g., life satisfaction) is not strongly correlated with resource consumption. The highest rank of life satisfaction is the economically poor Pacific Island of Vanuatu, while the United States is number 150 out of 178 nations in the index.

If no effort is made to reduce greenhouse gases markedly, even survival will be difficult for humankind. However, conserving fossil fuel and emphasizing alternative sources of energy (e.g., wind and solar) could result in a happier life with more social capital. Public awareness of climate change has been inadequate until recently; however, a recent poll shows that 83% of Americans now consider climate change a serious problem. Former Vice-President Al Gore's documentary “An Inconvenient Truth,” cover stories in magazines, and four reports from the Intergovernmental Panel on Climate Change (IPCC; <http://www.ipcc.ch>) have received much coverage from the news media and Congressional hearings – all are responsible for the significant shift in public opinion. In addition, the US Supreme Court has ruled that the US Environmental Protection Agency does have the authority to regulate carbon dioxide.

The Yale Center for Environmental Law and Policy found that 81% of its poll responders agreed that their responsibility is to help reduce the impacts of global heating and that the business community is recognizing society's desire for action on climate change. On the downside, the Gallup News Service Knickerbocker (2007) indicates that Americans believe that the worst manifestations of global heating are in the far distant future, while some world-class scientists, such as James Hansen, believe the timeframe is 5 years or less to begin addressing the problem in a significant way.

United Nations Secretary-General Ban Ki-moon has called for a long-term global response to cope with climate change, noting that the planet's heating is unequivocal, the impact is clearly noticeable, and human activities have, beyond doubt, been contributing considerably to global climate change. The UN Secretary-General also pointed out that human relations are easier in times of plenty, but, when resources are scarce, Earth's fragile ecosystems become strained, along with the coping mechanisms of groups and individuals, which can lead to a breakdown of established codes of conduct and even outright conflict.

Peak oil

Ironically, the burning of fossil fuels has increased global heating, which, along with other types of climate change (e.g., storms, biotic impoverishment), will destabilize both social and ecological systems. Arguably, present human societies have been shaped in a major way by cheap, abundant oil and coal. However, all the peak oil curves, including the classic M. King Hubbard curves, show a very steep decline after the peak has been reached.

The post-petroleum era

Cheap energy has enabled humans to live in habitats that were initially either alien or hostile to humans. It also provided golf courses on the desert; inexpensive high altitude transoceanic airplane flights; suburban sprawl; private, personal transportation; huge nation-states; space flight; ubiquitous plastics; cheap fertilizer; inexpensive food, often from distant places; shopping malls with huge parking lots; and all the trappings of an oil-era society. The oil era began in the early 1900s, is nearing a peak, and is estimated to plunge after reaching that peak to low levels of availability in about 2060 (Heinberg 2005).

Costanza (1999) has four visions of the 21st century. "Star Trek," which Costanza calls the default technological optimist vision, relies on clean energy from fusion but neglects to stabilize the human population, making space colonization essential. Vision 2 is "MadMax: The Technological Skeptic's Nightmare," which occurs after peak oil – all the predictions about the rapidly rising price of oil causing new, cheaper alternatives to emerge just never come to pass. Humankind is witnessing this vision right now. Of course, non-emerging alternatives does not matter because the greenhouse effect will wreck both climate and ecological systems. Vision 3 is "Big Government: Public Interest Trumps Private Enterprise." In this vision, the meltdown of one of France's fission breeder reactors kills 100,000 people and leaves one-quarter of the French countryside uninhabitable. Thus, fusion energy begins to get much attention. The human population is stabilized and loss of biodiversity is arrested. Vision 4 is "Ecotopia: The Low-Consumption Sustainable Vision." This vision emerges because the general public has formed a powerful judgment against the consumer lifestyle and for a sustainable lifestyle. In 2007, energy supplies are diminishing and the alternatives – coal and nuclear energy – have drawbacks. Biofuels have not proven attractive, even with big government subsidies. Worse yet, a mistake in judgment will probably have catastrophic consequences.

Collapse of complex societies

Both nation-states and individual life styles are heavily dependent upon cheap, abundant energy. If the downturn in energy following peak oil is as steep as the rise in oil consumption was and if it occurs as most predictive models indicate, societal disequilibrium is likely. Global heating is worsening, population is still expanding, and resource wars are increasingly common. Collapse of complex societies is likely. Tainter (1988) defines such collapse as a rapid transformation to a lower degree of complexity, typically involving significantly less energy consumption. Humankind lived, for most of the 160,000 years it has been on Earth, as low-density foragers that were spread thinly over the planet or as farmers in egalitarian communities of no more than a few dozen individuals (e.g., Carneiro 1978). White (1959) has remarked that such a cultural system, based primarily on human labor, can generate only about 1/20 horsepower per capita. More complex societies require much energy and time to maintain. Before fossil fuels, increasing the complexity of a society meant that the majority of its population had to work harder (Tainter 1996). At present, ecological, social, and economic simplicity will likely result from the reduction in cheap energy. Citizens of developed countries are unprepared to live as if they were living in an undeveloped country, yet doing so could be the worst case scenario if reducing greenhouse gases is too little and too late.

Climate knowledge vs climate action

Americans believed, by 52% to 36%, that protecting the environment was a greater priority than stimulating the economy, and 68% thought encouraging energy conservation was more important than increasing energy production, which was only emphasized by 21% (Staff Writers 2007). However, only 38% stated that they supported a higher tax on gasoline to discourage energy consumption and to fight global heating. This percentage dropped to only 20% if the tax increase was US\$2 a gallon (3.8 liters), which would effectively increase the current gas price by more than 40%. Tony Juniper of Friends of the Earth was quoted by Hill et al. (2007) as stating that far more fundamental lifestyle changes are needed than have been considered by the UN's Intergovernmental Panel on Climate Change (Report #3, 2007, <http://www.ipcc.ch>).

How alien a planet?

Monbiot (2007a) remarks that any level of climate change (2° of heating above preindustrial levels) is dangerous for someone. The carbon dioxide level in the atmosphere has risen from 280 parts per million (ppm) in the early 1600s to 380 ppm at present (IPCC 2001, <http://www.ipcc.ch>). If carbon dioxide equivalent concentrations are stabilized at 400 ppm or below, the chance is an average of 28% that temperatures will rise by over 2° (Monbiot 2007a). If greenhouse gases reach a concentration of 550 ppm (carbon dioxide equivalent), the chance is 63-99% (with an average value of 82%) that global heating will exceed 2° (Meinshausen 2006 as quoted by Monbiot 2007a).

A rise above 400 ppm of atmospheric carbon dioxide equivalent in the 21st century is increasingly probable. Even at this level, humankind will be living on an “alien planet” where conditions are markedly different from those to which humans have become accustomed. For example, the Amazon forest was near its critical resiliency in 2005 (Monbiot 2007b, p. 9). With just a small degree of heating, the Amazon basin could have a dramatic reduction in vegetation. Dying systems can release greenhouse gases. Australia is already experiencing unusual conditions (e.g., the Big Dry), as are many other parts of the planet (e.g., the polar regions). In other cases, environmental change is occurring, but more rapidly than originally thought. For example, Dr. Julienne Stroeve’s team reported that, since 1953, the area of Arctic sea ice in September has declined at an average rate of 7.8% per decade (as reported by Revkin 2007). However, computer simulations of the same period have an average rate of ice loss of 2.5% per decade. This difference may well be true for other estimates, so time may be shorter than anticipated for adjusting to alien conditions.

Renewable energy sources

At present rates of consumption, renewable energy sources cannot replace fossil fuels so humankind is left with coal (up to 200 years supply) that pollutes or nuclear energy (1-million-year, high-level waste storage problems) or fusion (still an unrealized dream). This quandary will create a different world and uncertainties will cloud the future. For example, some recent studies indicate that present scientific estimates about natural absorption of carbon dioxide are too optimistic (Spotts 2007). Another example of uncertainty is the honeybee colony collapse disorder that threatens the supply of foodstuffs from plants that require pollination (Borenstein 2007). If this problem is solved, more challenges will surface in an era of rapid climate change.

Present and future changes

The Intergovernmental Panel on Climate Change, Group III Summary (IPCC, 4 May 2007, <http://www.ipcc.ch>) for policymakers indicates a 70% increase in global greenhouse gas emissions between 1970 and 2004. However, the largest growth in global greenhouse gas emissions between 1970 and 2004 has come from the energy supply sector (an increase of 145%). The IPCC gives three stabilization levels for 2030 (Table SPM.4, p. 15): (1) 445-535 ppm CO₂-equivalent; (2) 535-590; (3) 590-710. Each of these levels would result in a quite different planet. At the top of the range, the planet may be so alien that it is not habitable for humans at present population levels. At present, some heavily populated areas are already at risk. For example, Bangladesh is very vulnerable to climate change since the nation consists of a series of low-lying delta islands and salt is contaminating the coastal soils and drinking water (Goering 2007). Bangladesh has 140 million people, many of whom live in the delta area and could quickly become environmental refugees.

The IPCC (<http://www.ipcc.ch>) reports are superb, but do not adequately address ecological overshoot (resource use exceeds regeneration), now at about 24%, in a substantive way. Climate change will probably have adverse effects on the planet’s ability to regenerate resources. Even if climate change did not affect the planet’s regeneration of resources, a 24% ecological overshoot is far from sustainable. Pursuit of perpetual economic growth, as being practiced at present, has produced ecological collapse that will worsen if present practices continue. Exceeding Earth’s carrying capacity will result in economic collapse since natural capital is the basis for producing all other forms of capital.

Acknowledgments. I am indebted to my Editorial Assistant Darla Donald for assistance in the preparation of this manuscript for publication.

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