

**Wear It Out
Use It Up
Make It Do
Do Without¹**

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The era of cheap, abundant fossil energy is ending, which means that the acquisition and production of material goods will be greatly diminished. Availability per capita will depend primarily on two factors: (1) the extent to which global heating and other types of climate change affect agricultural productivity and regeneration of natural resources (e.g., forests, fisheries) and (2) the time it takes to stabilize human population and reduce it to remain within Earth's carrying capacity for humans.

Finite Resources/Finite Planet

Trainer (2007) notes: "The most serious fault in our society is the commitment to an affluent-industrial-consumer lifestyle and to an economy that must have constant and limitless growth in output." The degree to which various nations achieve this goal varies. For example, Trainer remarks that rich countries, with about one-fifth of the planet's people, are consuming about three-fourths of the planet's resource production. Clearly, production of foodstuffs is declining, due to climate change (e.g., droughts, floods, pests), while the population is increasing at about 1.5 million/week. This increase is occurring despite marked reductions in life expectancy in some regions of the world. For example, Brown (2006, p. 99) calls attention to the fact that life expectancy among the 750 million people living in sub-Saharan Africa has dropped from 61 to 48 years of age due to the spread of the HIV virus. In addition, the production of oceanic fisheries, which supplied 17 kilograms of seafood per capita worldwide in 1988, has fallen to 14 kilograms (Brown 2006, p. 91). Since fisheries are collapsing worldwide and oceans are becoming more acidic and since persuasive evidence shows that plastic is actually choking sea otters and turtles and being ingested even by krill (Weisman 2007, p. 116-118), a variety of adverse ecological effects will only become more severe. The decline in the productivity of oceanic fisheries will continue, especially since 90% of the large fish in the oceans have disappeared over the last 50 years, according to a Canadian-German science team's published study in the journal *Nature*.

Economist Boulding's Utterly Dismal Theorem

In 1798, Thomas Malthus made his famous prediction that the human population would outrun food supply, initially leading to a decrease in food per person. He has been denounced for over two centuries because cheap fossil energy (e.g., petroleum, coal, natural gas), plus agricultural technology, have provided major increases in the food supply. In 1802, just a few years after Malthus published his essay on population, the global human population was 1 billion. At present (2007), the global human population is approximately 6.6 billion. These numbers would appear to negate Malthus' prediction. However, the huge surge in human population growth in just over 200 years was made possible by two factors that are unique and temporary: (1) an abundance of cheap, readily available fossil energy (i.e., petroleum, coal, natural gas) and (2) increased productivity of a finite supply of arable land made possible by fertilizers (some from petroleum) and an infrastructure to plow, care for crops, harvest crops, and transport crops to distant markets – all facilitated by cheap fossil energy. Diminished fossil energy supplies and global heating and other types of climate change are having a negative effect upon agriculture and marine fisheries (already suffering from over harvesting). It is quite probable that production of foodstuffs will not keep pace with human a population growth.

Boulding's (1971) Dismal Theorem states: "If the only ultimate check on the growth of population is misery, then the population will grow until it is miserable enough to stop its growth." Boulding's (1971, p. 137)

¹ This saying is from a hand-stitched sampler that my companion of 63 years, Jeannie, made for our oldest daughter Karen at her request. It beautifully sums up the low-material-possession lifestyle that must now replace the "shop-til-you-drop" lifestyle of many American citizens.

Utterly Dismal Theorem addresses the population surge made possible by cheap fossil energy and improved agricultural technology. This theorem states:

Any technical improvement can only relieve misery for a while, for so long as misery is the only check on population, the (technical) improvement will enable the population to grow, and will soon enable more people to live in misery than before. The final result of (technical) improvements, therefore, is to increase the equilibrium population, which is to increase the total sum of human misery.

Persuasive evidence of this situation is available at present when 1 billion (the total population in Malthus' time) are starving or malnourished, poorly housed, lacking adequate health care and safe drinking water, and inadequately educated for the present highly technical world. It would appear that Malthus (and more recently Paul R. Ehrlich [1968]) was right after all – as was Kenneth Boulding.

Global Food Situation

Use of corn and other foodstuffs for production of alternative fuels has already substantially increased the price of corn and, since corn is used as animal feed, the price of beef, milk, poultry, etc. In addition, China's prosperity is also increasing the price of milk – more discretionary income has led to a more than 25% higher demand for milk per year; China is now consuming about 30% of the world's milk output (Walker 2007). China has approximately 20% of the world's population, but only 7% of its arable land – 0.27 hectares per capita, or less than 40% of the world's per capita average, one-eighth the US level, and one-half India's level (Walker 2007). However, China's recent affluence has caused significant inflation, which could easily be exacerbated globally if the 1.1 billion people in India also become more prosperous.

Effect on the Ever Present Poor

The Millennium Development Declaration of the United Nations of September 18, 2000, included eradicating extreme hunger and poverty. Economist William Easterly is quoted by Schlesinger (2007, p. 61) as estimating that, while developed nations have donated \$568 billion in aid to Africa since the 1960s, the poverty has only worsened. The population of sub-Saharan Africans living on less than US\$1 per day rose from 41 to 46% between 1981 and 2001 – indicating that 150 million more individuals are in unenviable circumstances. Worse yet, the life expectancy of the 750 million people in this region is now about 46 years. Economist Jeffrey Sachs believes that the UN Millennium Villages Project will simultaneously improve agricultural yields, health care, and societal infrastructure and increase available clean water and access to sanitation. Economist Sachs believes this project will provide an economic cushion against unexpected problems.

The Severe Penalties of Ecological Disconnects

The professions of economics and ecology have virtually no theoretical and working relationships. Even though the UN Millennium Villages Project (Schlesinger 2007) appears insightful, carrying capacity for humans is not mentioned for the sub-Saharan habitat that serves as the life support system. Achieving the goals of the project means developing a harmonious relationship with the local ecosystems. Subsidizing the habitat with fertilizer and outside financial aid is only a short-term, temporary tactic for the transition period that is expected to lead to sustainable use of the habitat.

The situation in China is no more reassuring since food has been imported since at least 2004. However, pollution of aquatic systems, which has apparently driven China's freshwater dolphin to extinction (World Service Staff 2007), and the loss of arable land through development are arguably more serious problems. As a caveat, developed countries, such as the United States, have ecological deficits that are often rather large. These deficits are the consequences of overusing the biological capacity available per capita. The world has 11.2 billion hectares of biologically productive land and water, or 1.7 global hectares per person (11.2 ÷ 6.6), assuming no land is set aside for other species that constitute the human biospheric life support system.

However, Klinkenberg (2007) remarks that a June issue of the journal *Science* noted that by 1995 only 17% of the world's land area had escaped direct influence by humans. The article takes as a working assumption: "There really is no such thing as nature untainted by people." However, nature provides both natural capital and ecosystem services to humans without which humans could not survive. Moreover, humankind is not treating natural systems as the life support systems necessary to its survival and well being. Worse yet, practices are reducing biocapacity globally. For example, Shapiro (2007) reports on the severe shortage of water in Crete, which a local official, Costas Kaliokannakis, says was not known in his childhood years: "this is the first time I've seen that we've completely run out of water." Rainfall has been slight, and

water is inadequate for irrigation. Temperatures have been over 40°C and have caused wildfires, electrical blackouts, and some deaths.

Professor Costas Kosmas of the University of Athens wants people to think intently about the problems of heat and drought and about the way people make these problems worse (Shapiro 2007) – good advice for the entire planet, not just for Crete. Professor Kosmas explains: “When the land is degraded and desertified, this affects the climate, affects the economy, affects the environment.” One does not need to be a professional ecologist to know that the biocapacity of Crete is diminishing.

John Maynard Keynes

Keynes was a member of the “Bloomsburg Group” at Cambridge University, which included Virginia Woolf, Arnold Bennett, H. G. Wells, and John Galsworthy (<http://www.blupete.com/Literature/Biographies/Philosophy?Keynes.htm>). This group believed that man has power to change things and attacked “naturalists” who believed that humans are creatures of their environment (i.e., natural systems):

For at least another hundred years we must pretend to ourselves and everyone that fair is foul and foul is fair; for foul is useful and fair is not. Avarice and usury and precaution must be our gods for a little longer still (Keynes quote from 1930; http://www.brainyquote.com/quotes/authors/j/john_maynard_keynes.html).

The day is not far off when the economic problem will take the back seat where it belongs, and the arena of the heart and the head will be occupied or reoccupied, by our real problems – the problems of life and of human relations, of creation and behavior and religion (Keynes quote from 1930; http://www.brainyquote.com/quotes/authors/j/john_maynard_keynes.html).

Capitalism is the astounding belief that the most wickedest of men will do the most wickedest of things for the greatest good of everyone (http://thinkexist.com/quotes/john_maynard_keynes/).

Why all the focus on John Maynard Keynes? Because economic growth has been the primary focus of both world leaders and the world society in the 20th century and the beginning of the 21st century, and Keynes has been described as the most influential economist of the 20th century. In contrast, Earth’s ecological life supports are in imminent peril. The best evidence of this danger is that US President George Bush has stated that efforts to reduce greenhouse gas emissions would not be considered if they interfered with the economy. In practice, the US Congress and the general public have been unable to agree on the strong measures needed to avoid a major climate tipping point, although there is much discussion of planning to do something by 2050.

Of particular interest in the Keynes’ quote is the idea that economic growth should not be perpetual but rather last “. . .at least another hundred years.” Since this statement was made in 1930, the time span is remarkably similar to the estimated 100- year industrial era of 1930 to 2030, which depends on cheap fossil energy. Equally interesting is another portion of the quote: “Avarice and usury and precaution must be our gods for a little longer still.” A subsequent quote indicates that the economic problem will take the back seat and the arena of the heart and mind will be occupied or reoccupied. This statement seems startlingly similar to Eisler’s (2007) call for a caring, compassionate economics. Eisler (2007, p. 153) notes that John Maynard Keynes and John Kenneth Galbraith were deeply concerned about human welfare but that the primary, often sole, focus in US economic schools continued to be market centered. Of course, economists such as Herman Daly take a broader view, especially in the field of ecological economics. They are aware of the massive threats to natural systems and call for a more ecologically responsible economic system.

The Disconnect Between Science and Politics

Science is a system of acquiring knowledge based on the scientific method, as well as the organized body of knowledge gained through such research. Politics is the process by which groups of people make decisions. As Bill McKibbin (2007, August 11 letter to environmental community) states:

There are occasional moments in history when we desperately need leadership, and this is one of them. If we’re going to deal with global warming,

then we need to go beyond politicians who say the right words and find champions who will do the tough work to transform our energy economy.

His goals are: an 80% reduction in carbon emissions by 2050, 10% in three years; a moratorium on new coal-fired plants; and a Green Jobs Corps to help fix homes and businesses so their targets can be met. Begley (2007) has written a superb article about one of the major factors responsible for the vast gulf between science and politics in the United States – this factor is the well funded effort that gives equal time to the tiny group of minority global warming doubters, some with no scientific credentials, despite the well established scientific process, which is based on the preponderance of validated evidence and published in peer-reviewed professional journals.

Ethics Anyone?

Keynes expected individuals to treat avarice and usury as gods for at least 100 years and then enter the arena of the heart and head after that time. This ethical transformation is a Dr. Jekyll/Mr. Hyde act, very difficult for an individual and arguably impossible for a society. As a caveat, my hope for a willing transition from a fossil energy to an alternative society may be equally hopeless.

Some of these disconnects are due to disconnects between disciplines (e.g., economics, ecology, the social sciences) and, alternatively, deliberate deception. For example, Monbiot (2007) notes:

While no expense is spared in expanding motorways, airports, and thermal power stations, every possible tactic is used to frustrate the programme for installing renewable power. The reason is not hard to fathom; big business has invested massively in constructing old technologies, and wants to maximise its returns before switching to the new ones. It also demands the hyper-mobility which enables its executives and its goods and services to go anywhere at anytime.

Monbiot (2007) also raises an important question about the effect of advertising upon societal decisions. The *Independent* (a UK newspaper) raises a difficult question about where to draw a line beyond which advertisements cannot go. However, nearly all advertising promotes excessive consumption, which damages the biospheric life support system. Thomas Jefferson hoped that an informed, literate citizenry was the answer, but that does not seem to be working now. Perhaps the right questions are just not being asked.

What are the Right Questions?

Physicist John Wheeler observes: “We make the world by the questions we ask” (as quoted by ecological economist Herman E. Daly 2007). Daly suggests: “Why not ask, can we systematically continue to emit increasing amounts of CO₂ and other greenhouse gases into the atmosphere without eventually provoking unacceptable climate changes? Scientists will overwhelmingly agree the answer is no.” Some illustrative questions follow, not necessarily in order of importance.

(1) Is it wise for the United States to allow persons with no significant scientific credentials to alter scientific reports and attempt to impede government scientists from informing the general public about new developments in their field of competence? The answer should be “no,” but the record shows otherwise. The experiences of world-class government scientist James Hansen documents that the answer is not a resounding “no.”

(2) Is it ethical/moral to have more than 1.3 billion people “over-nourished” (i.e., obese) and more than 800 million people starving or severely malnourished (Stix 2007)? The answer should be a resounding “no”; however, the poor can also be obese (e.g., Popkin 2007), so the problem is more complex than it initially appears. Pinstrup-Anderson and Cheng (2007) also note that one-eighth of the world’s people do not have enough to eat.

(3) Is economic growth more important than preserving the integrity of the biospheric life support system that has produced conditions favorable for the genus *Homo* for over 1 million years and for *Homo sapiens* for approximately 160,000 years? Enlightened self interest should produce another resounding “no,” but, in practice, economic growth is worshipped worldwide and the environment is being degraded globally.

(4) Should humans have empathy and compassion for other life forms even if they did not constitute the biospheric life support system? The answer to the question depends on whether humans consider themselves a *part* of nature rather than *apart* from nature. Perhaps the answer is already evident by the practice of labeling natural systems as resources and commodities.

(5) Is producing biofuels an environmentally friendly (i.e., green) process? Brahic (2007) answers this question:

It sounds counterintuitive but burning oil and planting forests to compensate (for greenhouse gas emissions) is more environmentally friendly than burning biofuels. So say scientists who have calculated the net emissions between using land to produce biofuels and the alternative: fuelling cars with gasoline and replanting forests on the land instead.

(6) Is the carbon footprint larger when one travels by air? Protesters camped out at Heathrow Airport, near London, in mid-August 2007, to say “yes.” Merrick, one protestor, stated: “Aviation is a luxury we can live without. It has to be scaled right back” (Rice-Oxley 2007). Rice-Oxley (2007) makes some important points: (a) “aircraft not only produce carbon dioxide but also nitrous oxide (a powerful greenhouse gas) and condensation trails, which may also contribute to global heating,” (b) “given the limited prospects for a technological solution, a growing body of evidence is arguing for efforts to manage demand for air travel,” (c) “some experts believe that personal carbon budgets – rationing – may be the only solution,” (d) “it is too late for voluntary mechanisms; carbon allowances are the only fair way to deal with this.”

(7) Is living in coastal cities safe? “No” say many of the former and present residents of New Orleans! Freudenberg et al. (2007) remark: “Katrina showed, unfortunately, that we do not seem to have the same level of technological capacity to undo the damage we create – to nature, to humans, or both.” And further:

When Katrina hit New Orleans, what came through the levees was more than just a rush of floodwater. It was tragically graphic evidence that scientists’ warnings about the risks of environment damage need to be taken seriously, and that boosters’ claims of economic benefits need to be subjected to equally serious scrutiny. The leaders of New Orleans ignored that evidence, and the city suffered the consequences. The rest of us watched the painful learning experience. The question is whether we will actually learn from it.

In addition, living in other coastal cities is risky, too. Almost 80% of the world’s population lives less than 50 kilometers (30 miles) from a coastline, an inconvenient location since one of the effects of global heating is rising sea levels (Mongalvy 2007).

(8) Would individuals drive less to reduce greenhouse gas emissions and, thus, reduce the rate of global heating? The answer to this question usually is “I cannot possibly reduce my driving.” However, if the question is rephrased to: “Would you like to leave a habitable planet for your children and grandchildren?”, the answer is almost always “yes.” Usually the person then asks: “How can I do that?” People just have not connected personal lifestyle with the future of their descendents. The planet is in imminent peril because people cannot, or will not, connect the most obvious dots.

(9) Are individuals part of the solution or part of the problem (i.e., environmental degradation)? Some people remember the early Earth Day statement: If you’re not part of the solution, you’re part of the problem. Anyone who believes that peak oil will occur in the middle of the 21st century is part of the problem: “Based on (our) analysis,’ the U.S. Department of Energy confidently asserted in 2004, ‘[we] would expect conventional oil to peak closer to the middle than to the beginning of the 21st century’” (as quoted in Klare 2007). Klare (2007) notes: “As originally formulated by petroleum geologist M. King Hubbard in the 1950s, the concept holds that worldwide oil production will rise until approximately half of the world’s original petroleum inheritance has been exhausted; once this point is reached, daily output will hit a peak and begin an irreversible decline.” The exact year of the peak is of some interest, but the part of the century in which this occurs is critical to industrial society. Klare (2007) notes that Hubbert’s successors, including Professor Emeritus Kenneth Deffeyes of Princeton University, contend that about one-half of the original supply of oil has been consumed and, it is, or very near, the peak production moment predicted by Hubbert. Klare (2007) makes another very important point – the first half of the world’s oil to be extracted and consumed will be the *easy* half. The last half will be the *tough* half. The remaining oil is located in politically dangerous areas, deep below the surface, and mostly in small, hard to find reservoirs. Depending on biofuels to replace lost fossil energy is not sound policy. For example, a team of UK-based scientists have suggested (in the journal *Science*) that reforestation and habitat protection are better options. The scientists state that forests could absorb up to nine times more carbon dioxide than the production of biofuels could achieve on the same area of land (BBC News 2007).

Actually, one can reduce the questions to a few that are so brutally frank that they will offend many people.

(1) Is this automobile or plane trip so important that I am willing to be part of collective actions that will place billions of people at risk because the ultimate result will be irreversible climate change that might well be unsuitable for humans, including my children and grandchildren?

- (2) What if everyone on the planet consumed as many resources (e.g., energy, material goods, food) as one average citizen of the United States? What then?
- (3) How will future generation of humans, if they exist, view over consumption and other excesses of the Industrial Age?

Conclusions

Humankind is now living in very perilous times and the peril is imminent. When Jeannie produced the sampler that serves as the title for this commentary, she was concerned with the resources in our possession, not the planet's. Humankind's profligate use of finite fossil energy and excessive use of Earth's natural capital are not only unsustainable but may be fatal for civilization and even the human species. Humankind is sleepwalking toward the precipice of a global climatic tipping point, but is focused primarily on perpetual economic growth. Time may exist, a decade at most, to initiate strong remedial measures (e.g., 80% reduction of greenhouse gas emissions), but motivation to do anything that might be effective is lacking – I cling to the probably irrational hope that political leaders will emerge who will be willing to accept scientific evidence, rather than suppress or ridicule it. Perhaps my hope is just the ultimate expression of denial. May it not be so!

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