CHAPTER 19

ECONOMIC GROWTH AND THE BIOSPHERE

- ***“[...] THERE SEEMS TO BE ONLY ONE CAUSE BEHIND ALL FORMS OF SOCIAL MISERY: BIGNESS. OVERSIMPLIFIED AS THIS MAY SEEM, WE SHALL FIND THE IDEA MORE EASILY ACCEPTABLE IF WE CONSIDER THAT BIGNESS, OR OVERSIZE, IS REALLY MUCH MORE THAN JUST A SOCIAL PROBLEM. IT APPEARS TO BE THE ONE AND ONLY PROBLEM PERMEATING ALL CREATION. WHENEVER SOMETHING IS WRONG, SOMETHING IS TOO BIG. [...] AND IF THE BODY OF A PEOPLE BECOMES DISEASED WITH THE FEVER OF AGGRESSION, BRUTALITY, COLLECTIVISM, OR MASSIVE IDIOCY, IT IS NOT BECAUSE IT HAS FALLEN VICTIM TO BAD LEADERSHIP OR MENTAL DERANGEMENT. IT IS BECAUSE HUMAN BEINGS, SO CHARMING AS INDIVIDUALS OR IN SMALL AGGREGATIONS, HAVE BEEN WELDED INTO OVERCONCENTRATED SOCIAL UNITS.”*[1]

RECENT HEADLINES IN THE UNITED STATES HAVE FOCUSED ON SUCH ISSUES AS THE DEBT CEILING, THE RECENT CREDIT RATING DOWNGRADE, AND UNEMPLOYMENT.[2]

- *" . . . increasing the average growth rate in the U. S. by one percentage point over the next 20 years would not only result in much higher incomes and more jobs but would also obviate the need for drastic spending cuts today in order to rein in the government deficit."[2]*

ALL GROWTH, EVEN IN WISDOM AND KNOWLEDGE, REQUIRES RESOURCES – MORE GROWTH, MORE RESOURCES.

- **Renewable resources are available on Earth from the Biosphere.**
- **On a finite planet, even renewable resources are finite and this restriction limits growth.**
- **Using more renewable resources than the Biosphere can regenerate is only possible by consuming natural capital, which reduces the rate of resource generation.**
- **Consuming natural capital is unsustainable and is similar to using capital in a bank to maintain an unsustainable lifestyle instead of living on the interest (sustainable).**

EXPONENTIAL GROWTH CANNOT LAST LONG ON A FINITE PLANET.

- **A growth rate of 1% per year results in a doubling time of 70 years, and 1% economic growth is considered modest (http://www.ecofuture.org/pop/facts/exponential70.html).**
- **A growth rate of 3% per year results in a doubling time of 23 years.**
- **If the global population experiences a 1% annual growth rate, then twice as much food, housing, energy, shelter, schools, medical services, clothing, and so on would be needed to care for everyone every 70 years.**
- **At the current population level of 7 billion, resources are not sufficient to provide a quality life for all.**

AN ESTIMATED 30+ MILLION OTHER SPECIES SHARE EARTH WITH HUMANKIND AND ALL REQUIRE SPACE, FOOD, WATER, AND OTHER RESOURCES.

- **Humans are reluctant to admit their dependence on other species; however, these species thrived without humans for billions of years, but humans could not exist without them.**
- **What percentage of Earth's resources should be allocated to *Homo sapiens*?**
- **What percentage of Earth's resources are needed to maintain the biospheric life support system in good health and integrity.**

ALL EXPONENTIAL GROWTH, INCLUDING ECONOMIC GROWTH, SHOULD BE VIEWED WITH EXTREME CAUTION BECAUSE GROWTH CAN QUICKLY PRODUCE SURPRISES.

- **Resource depletion is one such surprise.**
- **Thomas Malthus[3] noted that human population increases exponentially and that food does not. He is still being denounced today for this statement.**
- **M. King Hubbert predicted in 1949 that the fossil fuel era would be of short duration[4] and predicted in 1956 that peak oil would occur in about 1970 and that exponential growth in consumption was the cause.[5] Consequently, energy problems should not be surprises.**

THE 30+ MILLION OTHER SPECIES ON THE PLANET ARE ALSO CAPABLE OF EXPOENTIAL GROWTH. WHY IS EXPONETIAL GROWTH NOT A PROBLEM FOR THEM?

- **Any species that exhausts or damages its resource base is in peril.**
- **Mother Nature (i.e., the universal laws of biology, chemistry, and physics) favors quantity (exponential potential) from which she selects quality (survival of the fittest).**
- **For most all of the 200,000 years that *Homo sapiens* has been on Earth, exponential growth was not a problem — food had to be hunted or gathered daily, which was more difficult than driving to the local grocery store.**
- **Diseases, starvation, tribal warfare, and even predation kept exponential growth reasonably under control.**

DENIERS THAT RESOURCES ARE LIMITING ASSERT THAT HUMAN CREATIVITY AND INGENUITY ARE THE ULTIMATE RESOURCES THAT WILL REPLACE SCARCE RESOURCES WITH SUBSTITUTES.[6]

- **In the 21st century, the financial bubble burst with the collapse of institutions in September 2008 (http://www.telegraph.co.uk/finance/financialcrisis/), with no robust signs of recovery.**
- **The disparity of human access to financial resources (i.e., wealth) has never been greater and is still widening.**
- **Inevitably, a redistribution of resources will occur as a result of a pandemic disease, revolution, or political edict.**
- **This solution will only be temporary if exponential human population growth continues.**

ALL SPECIES ON THE PLANET HAVE *"ECONOMIES"* THAT ARE SIMILAR TO THE ECONOMY OF *HOMO SAPIENS* IN THAT AVAILABLE RESOURCES LIMIT POPULATION GROWTH.

- **Fossil fuel has temporarily given humans increased energy availability and consequently more access to resources than any other species.**
- **However, economic growth based on access to resources enhanced by technology is temporary because technology accelerates exhaustion of resources.**
- **Human economic growth has impoverished most other species on the planet by habitat destruction, appropriation of space (e.g., urbanization), use of freshwater, and climate change (e.g., spread of pine bark beetles).**
- **In short, humans have reduced Earth's carrying capacity for other species and diminished the health and integrity of the Biosphere.**

ECONOMIC GLOBALIZATION HAS RESULTED IN AN UNPRECEDENTED RELOCATION OF PLANETARY RESOURCES AND DEPLETED THE NATURAL CAPITAL OF MANY REGIONS.

- ***"We can now redefine human carrying capacity as the maximum rates of resource harvesting and waste generation (the maximum load) that can be sustained indefinitely without progressively impairing the productivity and functional integrity of relevant ecosystems wherever the latter may be located."***[7]

- **The source of renewable resources (natural capital) is rapidly diminishing and the human population is expanding exponentially.**

- **The pressures of economic growth are destabilizing human society by excessive resource use and damage to natural capital.**

"AFTER REMAINING FAIRLY CONSTANT FOR MOST OF HUMAN HISTORY, LIFE EXPECTANCY (THE AVERAGE NUMBER OF YEARS A PERSON CAN EXPECT TO LIVE) HAS NEARLY DOUBLED IN THE PAST CENTURY. THE MAXIMUM LIFE SPAN — THE LONGEST NUMBER OF YEARS A HUMAN BEING HAS LIVED — HAS INCREASED SPECTACULARLY AS WELL."[8]

- **The food crisis of 2011 will probably determine whether life expectancy of humans can continue to increase spectacularly.**

- ***"Population growth, rising affluence, and the use of grain to fuel cars"*** **has caused a spike in commodities prices.**[9]

- ***"Soil erosion, aquifer depletion, the loss of cropland to nonfarm uses, the diversion of irrigation water to cities, the plateauing of crop yield in agriculturally advanced countries, and . . . crop-withering heat waves and melting mountain glaciers and ice sheets"*** **have impacted supplies of food.**[9]

"THOSE WHO MAKE PEACEFUL REVOLUTION IMPOSSIBLE WILL MAKE VIOLENT REVOLUTION INEVITABLE."[10]

- **Higher prices for resources (e.g., food) are causing social unrest globally.**
- **Technological solutions are always short term in exponential population growth circumstances.**
- **Biospheric refugees in crowded, unsanitary camps increase the likelihood of a pandemic disease.**
- **The Biosphere can no longer be treated as a common ground.**
- **Exponential population growth is not sustainable on a finite planet.**
- **A peaceful revolution in lifestyle is necessary to cope with the eight interactive global crises.[11] Growth, including economic growth, is the problem — not the solution.**
- **Humankind must never forget it lives on a finite planet with finite resources.**

Acknowledgments. I am indebted to Darla Donald for transcribing the handwritten draft and for editorial assistance in preparation for publication and to Paul Ehrlich and Paula Kullberg for calling useful references to my attention.

References

[1]Kohr, L. 1957. *The Breakdown of Nations*. Routledge & and Kegan Paul, London.

[2] Acemoglu, D. and J. A. Robinson. In press. *Why Nations Fail: The Origins of Power, Prosperity and Poverty*. Random House Digital Inc., New York.

[3] Malthus, T. 1798. *An Essay on the Principle of Population*. J. Johnson, London.

[4] Hubbert, M. K. 1949. Energy from fossil fuels. *Science* 109:103-109.

[5] Hubbert, M. K. 1956. Nuclear energy and the fossil fuels. Publication 95, Exploration and Production Research Division, Shell Development Company, Houston, TX.

[6] Simon, J. 1996. *The Ultimate Resource 2*. Princeton University Press, Princeton, NJ.

[7] Rees, W. E. 1996. Revisiting carrying capacity: area-based indicators of sustainability. *Population and Environment* 17(3):195-215.

[8] Sonnega, A. 2006. The future of life expectancy: have we reached the ceiling or is the sky the limit? Population Reference Bureau, Washington, DC.

[9] Brown, L. R. 2011. The great food crisis of 2011. Earth Policy Institute 10Jan http://www.earth-policy.org/plan_b_updates/2011/update90.

[10]Kennedy, J. F. 1962. Speech to the White House. Public Papers of the Presidents of the United States, p. 223.

[11]Cairns, J., Jr. 2010. Threats to the biosphere: eight interactive global crises. *Journal of Cosmology* 8:1906-1915.