

Rachel's Environment & Health News
#805 – Living Within Limits
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It came out of the blue, an attack on the precautionary principle by the New York Times. The Times ran its anonymous broadside in its Sunday Week-in-Review section November 21 under the sub-heading, "ECO- ECONOMICS UNMASKED." [1]

The main point of the Times's attack is that the environmentalist perspective on the world has now become mainstream and has "corrupted the study of economics." The Times says this corruption takes two forms:

- (1) an obsession with the need for limits, and
- (2) the assumption that people need to be cautious about economic development because it could have harmful unintended consequences, which has led people to foolishly embrace the precautionary principle. [2]

The Times was quoting from an article by one Daniel Ben-Ami, titled "The dismal quackery of eco-economics," which appeared in October on a British web site called "spiked" (<http://www.spikedonline.com>). The full Ben-Ami article is available at <http://www.rachel.org/library/getfile.cfm?ID=491>.

At first blush, Mr. Ben-Ami appears to be an extremely learned scholar, a master of both philosophy and economics, tossing off names like Condorcet, Diderot, Goethe, Hume, Kant, Thomas Paine, Voltaire, Rousseau and Adam Smith. Unfortunately, Mr. Ben-Ami's scholarship turns out to be just a lot of fancy dancing around a cloud of flatulence -- in reality, a pop-gun attack on the precautionary principle by a guy who must have slept through high-school physics.

Mr. Ben-Ami argues at great length that there are no real limits on economic growth because (a) when we run out of one resource, like copper, we'll simply substitute another; and (b) the amount of energy available to us is enormous because of sunlight.

What Mr. Ben-Ami overlooks is the second law of thermodynamics, which tells us that all transformations of energy and matter -- in other words, all economic activities -- produce an increase in entropy, more commonly known as waste, pollution, disorder, externalities, side effects, or unintended consequences. [3] Therefore, the second law tells us, the ultimate limit on economic growth is the unintended consequences that it creates in the form of waste and disorder -- not the shortage of materials or energy. [4] On a finite planet, there is only so much waste and disorder that can be tolerated before the place becomes intolerably degraded -- and that's the kind of limit that is peeking over the horizon in modern times.

The second law tells us that these unintended effects are inevitable; they cannot be avoided. We can reduce the harms associated with modern technologies, but we cannot eliminate them. To avoid turning the planet into an uninhabitable dump, we must learn to live within limits.

The second law tells us that everything we do leaves behind a mess, and the more we do, the bigger the mess becomes. Want more coal? Then someone is going to remove more mountain tops in West Virginia and dump them into the nearest creek. Want to burn more oil? Then someone is going to cut roads and move heavy equipment into unspoiled areas and eventually warm the whole planet, leading to more floods and hurricanes and malaria and yellow fever. Need more food? Then someone is going to cut down more forests, leading to more soil erosion, more nutrients misplaced and more "dead zones" in the oceans. We all sense intuitively that there is no such thing as a free lunch, and the second law tells us that we are right, and it tells us why.

In truth, some of my environmentalist friends don't like to acknowledge it, but even solar energy requires us to rip up the earth and build more platforms and towers and cables and substations to capture and transform energy and transmit it to where it's wanted.

Of course we have been remarkably inefficient in the past and with greater efficiency we could create less damage while getting the same benefits -- but eventually we hit irreducible limits on efficiency (limits defined by the second law) and, at that point, the only way to make less of a mess is to do less.

Eventually economic growth (growth in the amount of "stuff" we move around) must slow and then stop. On a finite planet, there is no way around these limits. That's what the second law says, and no one has ever found a way around it. Even when Newtonian physics gave way to quantum physics around 1900, the second law maintained its status as a fundamental law of the universe. It is the ultimate limiting law of nature. [4]

There was a time when we seemed to be able to evade the limits of nature. At least that's how it appeared. That was because the world was nearly empty (of humans and their artifacts). When damage occurred it seemed local and of no great consequence, and we just moved on to a new place. But now the world is full. This is new, and Mr. Ben-Ami and the editors at the New York Times haven't yet modernized their thinking. We live in a different world than the one our grandparents inhabited. Growth used to be necessary and good, but that's no longer always the case. New conditions require new thinking. This is what the precautionary principle is about -- innovative thinking to keep pace with a changing world.

Mr. Ben-Ami does get one thing right -- many in the "Third World" remain poor and malnourished while we in the overdeveloped North are trying to find our belly buttons amongst the rolls of fat. [5]

The simple fact is, we in the U.S. long ago produced more goods and services than any one society could possibly need to claim the "good life." In the U.S., there's already way more than enough to go around -- it's just that 1% of our U.S.

population has appropriated 40% of everything and is reluctant to share.[6] And that 40% is relentlessly pumping out propaganda like Mr. Ben-Ami's brand of "scholarship," pretending that more growth will somehow feed the Third World poor. No, it won't -- the way things are set up now, more growth will merely give the world's wealthiest 1% more opportunities to make themselves even wealthier, and the Third World poor will remain poor. Indeed, the way things are set up now, more growth won't even help the poor in the U.S.[7] It is not for lack of food that hunger still plagues this, the wealthiest society the world has ever known [<http://www.centeronhunger.org/facts.html>]. It is for lack of sharing. We throw out half the food we grow, instead of making an effort to share it with those who are hungry.[8]

The Third World DOES need -- and deserves[9] -- economic growth, but we live on a planet that is already showing signs of serious stress from past growth, such as:

** global warming;[10]

** depleted ozone layer;[11]

** women's breast milk contaminated with hundreds of industrial poisons [don't get me wrong: breast-feeding is still the best way to nourish an infant];[12]

** drinking water laced with low levels of viagra, antidepressants, chemotherapy toxicants and several hundred other "personal care products" designed to be biologically active;[13]

** children's cancers and other environment-related diseases increasing;[14]

** many species of birds, fish, amphibians and mammals already extinct, and thousands more soon to become so;[15]

** and these are just a few of the more obvious signs that we have exceeded the natural limits of the Earth. This list could be readily extended.

Intentional, targeted economic growth IS the answer to poverty in the Third World but, on a planet that is already stressed by the side-effects of growth, the "developed" countries have to stop growing in order to make room for growth in the Third World. Economist Herman Daly spelled this out some years ago.[16]

Regional economic growth can continue, but it must be limited to those places where it is needed. The U.S. doesn't need more growth -- we just need more sharing to give everyone an opportunity to obtain a modicum of life's blessings. A full employment policy, to give everyone a decent job who wants a job would be a good first step (accompanied of course by a family-sustaining minimum wage).

In the U.S. there's already plenty to go around. Our capitalist economy has done well by us, but it's now obvious that it has grown so large that it is wrecking the planet -- because of the inevitable waste and disorder that accompanies economic activity. So we need to learn to discern limits and live within them, aiming not to grow but to maintain the productive capacity that 400 years of hard work and economic growth have given us.

Hitting the limits to growth also means we need to learn to share because we can no longer rely on growth to expand everyone's piece of the pie. Now we must pay attention to divvying up the pie more carefully, more fairly. The natural limits of the Earth require it, plus it will be good for our souls. Wasn't it Jesus who said, "It is easier for a camel to go through the eye of a needle than for a rich man to enter into the kingdom of heaven"?

To summarize: Based on his misinterpretation of the second law of thermodynamics, Mr. Ben-Ami says there are no real limits on human activity because we are such an ingenious species that we can always figure out some way to get around any limits that nature may impose. Economists may claim this is true, but physicists know it's not. That's what the second law is about -- there really ARE limits to growth, limits imposed by the unintended mess we make whenever we do anything useful. Physicists call the mess "entropy" -- and it takes the form of chemical wastes, heaps of mine spoils, polluted water, unhealthy air, eroded hillsides, and sick children. For any beneficial activity, the mess can be reduced, but it cannot be eliminated.

For 400 years, the western ideology of "progress" has told us that any limits can be evaded if we are clever enough. But now we know that's false, and we have to learn to live in this new world, bounded by limits. Doing so will still demand that we be clever -- to get the benefits we need while doing the least harm.

Every industry will need people to rethink and redesign almost everything they've been doing. Such innovation will create tons of good jobs. But the world of limits will also require us to be not only clever but also wise, asking, Which activities are truly beneficial, and which are not? And: Which benefits can we do without? In the new world of limits, we will always ask, of every activity, is this necessary? And: Is this the best we can do? This leads naturally to a discussion of alternatives, which is the heart of a precautionary approach.[17]

Mr. Ben-Ami represents the old, defunct way of looking at the world: do whatever might make a profit, then phoney up a risk assessment to prove that it's safe. We now know that this old "risk assessment" approach produced enormous harm -- to our health, to the ecosystems that our economy depends upon, and to our democracy. (How can we claim to have a democracy when 1% of the people own 40% of everything? Does money not translate into political power? Who are we kidding?)

Mr. Ben-Ami represents a point of view that has been relegated to the heap of outmoded ideas, alongside the flat earth theory and the use of leeches to cure disease.

There is a broader shift happening in our culture, from short-term gain to long-term sustainability -- or ultimately from a value system based on money to one based on life.

The precautionary principle is a powerful new anchor for a traditional value system based on compassion, cherishing community, environmental stewardship and nurturing future generations within a framework of wisdom and forward

thinking. Precaution is the future -- positive, powerful, healthy, and good.

--Peter Montague

[1] <http://www.rachel.org/library/getfile.cfm?ID=495>

[2] For a brief discussion of the precautionary principle, see http://www.rachel.org/bulletin/index.cfm?issue_ID=532

[3] Mr. Ben-Ami actually does discuss the second law, for the purpose of dismissing its role in placing limits on economic growth. He says, "One popular [environmentalist] approach was to argue that economic growth is limited by the amount of energy in the world. The idea was developed by Nicholas Georgescu-Roegen, an American economist of Romanian origin, in the 1970s and has more recently been taken up by the likes of Elmar Altvater, Herman Daly and Jeremy Rifkin. This idea was expressed in scientific terms as a consequence of the second law of thermodynamics, which states that the useful forms of energy in any closed system decline over time. An alternative way of expressing the same idea is that the entropy (disorder) in a closed system increases over time. But as previous articles on spiked have argued, environmentalists grossly underestimate the amount of energy available on earth. In any case, the earth is not a closed system -- it receives an enormous amount of energy from the sun every day. So the idea that the availability of energy limits economic activity has no basis in science."

This passage reveals a fundamental misinterpretation of the second law's role in limiting economic growth. Mr. Ben-Ami says that environmentalists claim that "economic growth is limited by the amount of energy in the world... [because] the useful forms of energy in any closed system decline over time [which can also be expressed as] the entropy (disorder) in a closed system increases over time." Having set up this straw man, Mr. Ben-Ami then knocks it over by pointing out that the Earth isn't a closed system because sunlight is constantly streaming in (perhaps Nicholas Georgescu-Roegen and Herman Daly had somehow not noticed the sun?), as if to imply that the second law therefore doesn't pertain on Earth. It is impossible to know whether this misinterpretation of the second law results from disingenuous intentions or from ignorance. In any case, this misinterpretation of the second law is put into service as part of a larger argument that there are no physical limits to economic growth, which adds up to a colossal misconstruction of the importance and meaning of the second law.

[4] See, for example, Jack Hokikian, *The Science of Disorder; Understanding the Complexity, Uncertainty, and Pollution in Our World* (Los Angeles, Calif.: Los Feliz Publishing, 2002); ISBN 0-9708953-2-1.

[5] See, for example, Jim Jong Kim and others, *Dying for Growth; Global Inequality and the Health of the Poor* (Monroe, Maine: Common Courage Press, 1999); ISBN 1-56751-160-0.

[6] Chuck Collins and Felice Yeskel, *Economic Apartheid in America* (New York: New Press, 2000); revised and corrected data available at http://www.ufenet.org/research/Economic_Apartheid_Data.html#p55

[7] See for example, William Julius Wilson, *The Truly Disadvantaged* (Chicago: University of Chicago Press, 1987); ISBN 0-226-90131-9. And see Chuck Collins and Felice Yeskel, *Economic Apartheid in America* (New York: The New Press, 2000); ISBN 1-56584-594-3. See also Michael Zweig, *The Working Class Majority; America's Best Kept Secret* (Ithaca, N.Y.: Cornell University Press, 2000); ISBN 0-8014-3637-0. And see G. William Domhoff, *Who Rules America?* (Mountain View, Calif: Mayfield Publishing, 1998); ISBN 1-55934-973-5.

[8] Environment News Service, "Half the American Harvest Goes to Waste," November 24, 2004. Available at <http://www.rachel.org/library/getfile.cfm?ID=497>

[9] The Third World deserves our help because conditions there were intentionally created by Europeans as they "developed" themselves while subjugating the Third World. For an overview, see "Chapter 10. Creating the Third World" in Clive Ponting, *A Green History of the World* (New York: Penguin Books, 1991); ISBN 0140176608. And see Walter Rodney, *How Europe Underdeveloped Africa* (Washington, D.C.: Howard University Press, 1981); ISBN 0-88258-096-5.

[10] http://www.greenfacts.org/studies/climate_change/

[11] Athens News Agency, "Ozone Layer Will Remain Vulnerable in Coming Decades," June 17, 2004. <http://www.rachel.org/library/getfile.cfm?ID=496> .

[12] See for example, Thaddeus Herrick, "Toxins in Breast Milk: Studies Explore Impact Of Chemicals on Our Bodies," *Wall Street Journal* January 20, 2004. <http://www.rachel.org/library/getfile.cfm?ID=498> .

[13] See, for example, "Drugs in the water," *Rachel's Environment & Health News* #614 (Sept. 3, 1998); available at http://www.rachel.org/bulletin/index.cfm?issue_ID=501 . And see Christian G. Daughton and Thomas A. Ternes, "Pharmaceuticals and Personal Care Products in the Environment: Agents of Subtle Change," *Environmental Health Perspectives* Vol. 107 Supplement 6 (December 1999), pgs. 907-938, available at <http://ehp.niehs.nih.gov/members/1999/suppl-6/907-938daughton/daughton-full.html>

[14] See, for example, "Tracey J. Woodruff and others, "Trends in Environmentally Related Childhood Diseases," *Pediatrics* Vol. 113, No. 4 (April 2004), pgs. 1133-1140. <http://www.rachel.org/library/getfile.cfm?ID=451>

[15] Agence France Presse, "Nearly 16,000 Species Threatened with Extinction: Report," Nov. 17, 2004. <http://www.rachel.org/library/getfile.cfm?ID=499>

[16] Herman E. Daly, *Beyond Growth* (Boston: beacon Press, 1996); ISBN 0-8070-4708-2. For a summary of Daly's arguments, see http://www.rachel.org/bulletin/index.cfm?issue_ID=1186 .

[17] Mary O'Brien, *Making Better Environmental Decisions; An Alternative to Risk Assessment* (Cambridge, Mass.: MIT Press, 2000); ISBN 0-262-15051-4.

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