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NANOTECHNOLOGY AND THE ENVIRONMENT: ENEMIES OR ALLIES?

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Peter Wicks contends that technology is the fruit of human endeavour and ingenuity, and the reality that we possess the power to effectively and positively influence our future.

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On 18 October 2011 the environmental non-government organization (NGO) Greenpeace issued a press release welcoming a decision by the European Court of Justice (ECJ), ruling that cells derived from human embryos could not be patented, on the grounds (according to Greenpeace's press release) that patents on such cells "would encourage the commercialization of human embryos". The ECJ, which plays a role within the European Union that is loosely analogous to the US Supreme Court, had become involved because a court in Germany, where Greenpeace had brought the case to challenge a patent application there, had referred the case since it involved questions regarding the interpretation of EU law.

The decision provoked a predictable outcry among scientists and (especially) techno-progressives, but the question it raised in my mind was why an environmental NGO, in particular, should have been involved. That there were ethical issues and controversy surrounding the patentability of such technology was clear, but the environmental aspects at play were much less so, and did not seem to have played a major role either in Greenpeace's motivation for bringing the case or in the legal back-and-forth.

Although not specifically related to nanotechnology, the incident came to mind after I was invited to make a presentation (on which this article is based) at Terasem's 8th Annual Workshop on the Geoethics of Nanotechnology[1], since it seemed to me symbolic of a perception I had acquired over the years, namely that the "environmental movement" (for want of a better expression) seemed at times to be

[1] Terasem Movement, Inc. [2012] *8th Annual Workshop on Geoethical Nanotechnology.* http://www.terasemcentral.org/GN8_2012/2012Program.html, retrieved August 12, 2012

more anti-technology and anti-business than it was pro-environment. This contrasts, for example, a recent article by Jamais Cascio[2] in which he points out that technology will need to play an essential role if we are to preserve and/or restore significant wilderness areas on Earth.

As far as nanotechnology is concerned more specifically, a typical expression of the attitude of the environmental community is the following, taken off the website of the Environmental Defense Fund (EDF):

> *Nanotechnology…has great potential to deliver environmental and other benefits, but it may also pose significant risks to human health and the environment. Government and industry should work to identify and manage possible health risks before new products are widely used.*[3]

In the above position, decent lip service is paid to the (potentially enormous and life-saving) benefits of nanotechnology, but the emphasis is on the risks, and the consequent need for regulation.

Reacting to the Evils of Industry

In one sense it should come as no surprise that the environmental movement tends to have an anti-technology bias. It has its roots, after all, in a reaction to the Industrial Revolution, which indeed provoked unprecedented environmental degradation and human misery. It was also in the cauldron of the Industrial Revolution that socialism was borne, for essentially similar reasons, and the negative effect of technology on the environment and human health was further highlighted during the post-war period by such events as the testing of atomic weapons off Bikini

[2] IEET. [2012] "Re-Wilding the Earth" http://ieet.org/index.php/IEET/more/Cascio20120713, retrieved August 12, 2012

[3] Balbus et al [2005] "Getting Nanotechnology Right the First Time" in *Issues in Science and Technology* (Environmental Defense Fund), pp. 65-71. http://www.edf.org/sites/default/files/4816_nanotechstatementNAS.pdf, retrieved August 12, 2012

Atoll, the publication of *Silent Spring*[4] by Rachel Carson, pointing out the dangers of the newly-flourishing chemical industry, and industrial accidents such as Torrey Canyon oil spill.[5] In the mean time technology had produced the truly wonderful prospect of total annihilation through nuclear holocaust, a prospect that was vividly in the minds of that particular generation of protesters. Since then, new technology-induced risks such as ozone depletion, acid rain and (of course) climate change have come to light. Against this background it is hardly surprising that environmentalists tend to see emerging technologies such as genetically modified organisms (GMOs) and nanotechnology with suspicion.

Contradictions

It would be a mistake, however, to present the environmental movement as a monolithic band of neo-Luddites. In fact, as with so many protest movements borne out of a reaction to the negative aspects of historical developments, fundamental contradictions within the movement have started to appear.

One of the most fundamental of these contradictions concerns the philosophical underpinnings of environmental concern, and in particular whether we are supposed to be valuing "nature" for its own sake, or whether we are rather aiming for an environment that is healthy and congenial primarily for human beings. (For now, transhumanism remains too marginal for post-humans to be considered at all by mainstream environmentalists, except possibly as some dark, dystopic fantasy.) What "nature" is supposed to mean is also ambiguous, given that any reasonable definition of nature surely includes *homo sapiens* and the technology that we have developed, but generally what is meant is something like the ecologic balance that existed until humankind came along and disrupted it.

Depending on the position one takes in relation to this debate, humans will be seen either (corresponding to the Abrahamic traditions) as some kind of pinnacle of creation, perhaps with a duty of stewardship over the "natural" environment, or as a kind of cancer on the planet. But there are other contradictions. Traditionally virulently anti-nuclear, some parts of the environmental movement have started to take on a more nuanced position with regard to nuclear power as a possible transitional solution to slow down global warming. On the other hand, as apparently benign a technology as wind farms is seen by some as disfiguring the local environment and posing a danger to local wildlife.

Towards an alliance between techno-progressives and environmentalists

An example of a more (techno)progressive attitude on the part of an environmental NGO is the World Wildlife Federation (WWF) promotion of a boat that runs entirely on solar energy, and which recently visited the Galapagos islands. WWF reports on their website that the stated goal of the visit "was to promote solar power, efficient energy and ecological mobility by providing information and increasing awareness of the importance of renewable energy".

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[4] Carson. R. [1962] *Silent Spring* (Houghton Mifflin, New York).

[5] Marine Management Organisation [2012] "Incidents: Torrey Canyon 1967" http://marinemanagement.org.uk/protecting/pollution/incidents_torreycanyon.htm, retrieved August 12, 2012

Credit: http://gizmodo.com/5908112/this-huge-ship-just-sailed-around-the-world-powered-by-nothing-but-sunshine

In order to consolidate such progressive thinking amongst environmentalists, and close the gap between the attitude of environmentalists and techno-progressives, I suggest that techno-progressives need to adopt the following attitudes in their discussions with environmentalists, or when discussing environmental issues, risks and impacts more generally.

In the first place techno-progressives need to lobby in favour of an environmentalism that respects human aspirations. We do not need to be polite about nihilistic thinking that imagines that "the planet would be better off without us", or pessimistic, guilt-inducing emphasis on shrinking one's ecological footprint or rejecting growth. The best way to reduce one's ecological footprint is, after all, to stop breathing.

On the other hand, there are four ways in which techno-progressives can show that we recognize a legitimate basis for environmentalists' suspicions of technology.

1. It does not help to deny that technology has its drawbacks as well as its benefits. There are always winners and losers; always unforeseen or unintended consequences; always hard choices to be made. The more that techno-progressives understand and emphasise the negative, along with the positive, the more credible we will be in the eyes of the public, and in particular the environmentally conscious.

2. To the extent that much suspicion of technology, including among environmentalists, is in reality the result of simple fear of change, techno-progressives can also help to promote greater mutual understanding by recognizing that fear of change is real and legitimate and can, when channeled appropriately, be perfectly healthy. Despite its association with the political left, the environmental movement is in many respects a conservative movement, and when "conservative" simply refers to a desire to preserve what is best about the *status quo,* it plays a positive and essential role.

3. Neither techno-progressives nor environmentalists are rational beings, any more than any other human animal. Acknowledging and accepting this can defuse much of the heat between those of opposing views, where the competing sides (as exemplified in the "religion wars" at the Institute for Ethics in Emerging Technologies [IEET] a few months ago) tend to be

experts in pointing out the flaws in their opponents' reasoning, while remaining blissfully ignorant about their own.

4. In addition to the predictable negative impacts of technology, there are of course the less likely but still possible catastrophic consequences, and nanotechnology is rich with the potential to provide fodder for disaster scenarios. Once again, recognizing this and encouraging environmentalists (and others) to focus specifically on the genuine risks, rather than just maintaining a blanket opposition, can be more effective than downplaying them. In this context, perhaps Greenpeace is not so stupid to fear the over-commercialization of human embryos…

Of course, if we embrace the points above we might start to wonder whether we are (or should be) "techno-progressive" at all. But to this we have a clear answer. "Technology" does not primarily mean a man in a white coat being cruel to animals. Technology is the fruit of human endeavour and ingenuity. It is the expression of the belief, and indeed the reality that we humans do have the power to influence the future, together with the discipline and know-how to do so effectively. This is the message that we should be shouting from the rooftops: however we define the problem, technology has to be the solution. There can be no other.

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