

An ecosocialist perspective on Gaia 2.0: The Other World that is Still Possible

David Schwartzman Professor Emeritus, Department of Biology, Howard University, dschwartzman@gmail.com
January 13, 2020

Abstract

Lenton and Latour (2018)) proposed there is now a new phase of gaian history, Gaia 2.0 where humanity is challenged to collectively manage the biosphere in its own interests as well as those of the rest of life on our planet. Here is an ecosocialist perspective on Gaia 2.0. We have argued that there are three critical requirements for still having a remaining chance, if rapidly diminishing, of keep global warming below the IPCC goal of 1.5 °C, namely, demilitarization of the global economy, global solarization of energy supplies coupled with rapid phase out of fossil fuels and the transformation of agriculture to agroecologies (Schwartzman and Schwartzman 2019). Degrowth proposals for the global energy supply would not provide the energy capacity for climate mitigation and adaptation, as well as falling short of creating equity between the global South and North, in particular by keeping most of humanity in a state of energy poverty. Even with the implementation of projected state-of-the-science energy efficiencies in all sectors, the likely necessary level of primary energy consumption by 2050 will be greater than the present level of 18 TW, closer to 25-30 TW. The only feasible way to avoid climate catastrophe are radical changes in both the physical and political economies, notably the degrowth and rapid dissolution of the Military Industrial Complex (MIC) and implementation of a Global Green New Deal as a pathway for global ecosocialist transition.

Introduction

I have been in the Gaia research network since I participated in the first scientific meeting on the Gaia Hypothesis in 1988 sponsored by the American Geophysical Union (Schwartzman et al. 1991). There I met Tyler Volk, a long term collaborator (e.g., Schwartzman and Volk 1989). This research culminated in Volk (1998) and Schwartzman (1999, 2002) and is ongoing (Schwartzman, 2017, 2018). “The Gaia hypothesis ...proposes that living organisms interact with their inorganic surroundings on Earth to form a synergistic and self-regulating, complex system that helps to maintain and perpetuate the conditions for life on the planet.” (https://en.wikipedia.org/wiki/Gaia_hypothesis). There has been a long debate about this hypothesis, and its permutations including the claim that the Earth is itself alive or is an entity with the status as a superorganism. My own research in collaboration with Tyler Volk puts emphasis on the important role of life in the complex system called the biosphere, but life is not the only player in both short and long term biogeochemical cycles so Lovelock’s claim of homeostasis for and by life is overstated (Schwartzman 2015). In particular, Earth’s surface conditions since the origin of life would have been remained habitable for hot temperature microbes even if life’s influence was negligible (Schwartzman and Volk 1989).

Therefore, I was honored to be invited as a panelist in the program of “The Future of Global Systems Thinking: Celebrating James Lovelock’s Centenary”, July 29-31, 2019 at the University of Exeter (Schwartzman 2019). The chief organizer of this event was Tim Lenton, the Director of the Global Systems Institute and a protégé of James Lovelock, the founder of the Gaia hypothesis, with his early collaboration with the great biologist the late Lynn Margulis (Lovelock and Margulis 1974).

Lenton and Latour (2018) have provoked me to think about Gaia 2.0, confronting and going beyond what they recommend. Yes, we have “an occasion to reevaluate our collective goals, as well as the means of achieving them. A central goal for this century is surely to achieve a flourishing future for all life on this planet”, as well as “Creating an infrastructure of sensors that allows tracking the lag time between environmental changes and reactions of societies is the only practical way in which we can hope to add some self-awareness to Gaia’s self-regulation.” They also advise us “that we cannot expect to know the best solution in advance, but only that we can improve the quality of the sensors—both instruments and people—that detect shortcomings and the speed with which we rectify the course.” Nevertheless, I strongly agree with their prescription, “that engineering should shift attention to become as smart as Gaia in achieving nearly closed material cycling powered by sustainable energy. The input of solar energy has the potential to far outstrip current fossil energy consumption, and renewables are rapidly becoming cost-competitive with fossil fuel energy for electricity generation. There should thus be no long-term shortage of energy. The challenge is to design and incentivize a transition to a circular economy. As in the original Gaia, this must be built on waste

products becoming useful resources to make new products. Despite practical obstacles and thermodynamic constraints, there is huge potential to increase material recycling in Gaia 2.0.”

Before commenting on their take on Gaia 2.0, I should mention that Bruno Latour has long promoted the concept of hybridism. “Hybridism holds that reality is made up of hybrids of the social and the natural and that the two terms therefore have no referents any longer, if they ever had.” (Malm 2019, p. 158). I strongly endorse Malm’s critique of hybridism but I find that this concept has little influence on Lenton and Latour’s discussion of Gaia 2.0.

The quality and quantity of global energy supplies is foundational to meeting the goal of a “flourishing future for all life on this planet”. This must inform the design of Gaia 2.0, as we so advocate and analyze in depth in our book “The Earth is Not for Sale” (Schwartzman and Schwartzman 2019). But what is absent in Lenton and Latour’s (2018) article is an examination of the critical political economic obstacles to achieving this future, especially given the rapidly diminishing window of opportunity to implement an effective prevention program to avoid catastrophic climate change (C3), defined as capping warming at near 1.5 °C by 2100 if not sooner.

What is the main obstacle to preventing catastrophic climate change?



From the world-wide web, apparently an installation in mall in China.

In a nutshell, the challenge is to get the baby off the tank, melt it down and make renewable energy technologies like wind turbines, while ensuring the baby, indeed every baby on the planet can live to the world’s highest life expectancy.

In John Milton’s *Paradise Lost*, Moloch is one of the greatest warriors of the fallen angels

"First MOLOCH, horrid King besmear'd with blood

Of human sacrifice, and parents tears, “

William Blake, 1809, *The Flight of Moloch*, watercolour, 25.7 x 19.7 cm. One of illustrations of *On the Morning of Christ’s Nativity*, the poem by John Milton:



So I submit that the obstacle in question is the Military Industrial (Fossil Fuel Nuclear State Terror and Surveillance) Complex, or “MIC” for short, aka the “Molochian Instrument of Carnage”. Haltiwanger (2018) cites a conservative estimate of \$6 trillion and a half a million human lives lost from the war on terror as of fiscal year 2019, derived from the Cost of War project at Brown University's Watson Institute of International and Public Affairs. Recall President Dwight Eisenhower’s farewell speech on January 17, 1961, with his warning about the threat of the military industrial complex; this threat has been hugely magnified especially since 9/11. On this subject, the following selections from William Robinson (2018), a leading scholar of the global political economy (Professor, University of California, Santa Barbara) are very relevant:

‘Neo-liberalism “peacefully” forced open new areas for global capital in the 1980s and the 1990s. This was often accomplished through economic coercion alone, made possible by the structural power of the global economy over individual countries. But this structural power became less effective in the face of the escalating crisis of global capitalism. Opportunities for both intensive and extensive expansion have been drying up as privatizations ran their course, the “socialist” countries became integrated, as the consumption of high-income sectors worldwide reached ceilings, spending through private credit expansion could not be sustained. As the space for “peaceful” expansion, both intensive and extensive, has become ever more restricted, military aggression becomes an instrument for prying open new sectors and regions, for the forcible restructuring of space in order to further accumulation. The train of neo-liberalism became latched on to military intervention and the threat of coercive sanctions as a locomotive for pulling the moribund Washington consensus forward. The “war on terrorism” provides a seemingly endless military outlet for surplus capital, generates a colossal deficit that justifies the ever-deeper dismantling of the Keynesian welfare state and locks neoliberal austerity in place, and legitimated the creation of a police state to repress political dissent in the name of security. In the period that began with the September 11, 2001, attacks in the United States, the military dimension appears to exercise an over-determining influence in the reconfiguration of global politics.’ (p. 117)

Further, ‘The attacks of September 11, 2001, were a turning point in the construction of a global police state. The United States state took advantage of those attacks to militarize the global economy, while it and other states around the world passes draconian “anti-terrorist” security legislation and escalated military (“defense”) spending. The Pentagon budget increased 91% in real terms from 1998-2011, and even apart from special war appropriations, it increased by nearly 50 percent in real terms during this period. In the decade from 2001-2011, military industry profits nearly quadrupled. Worldwide, total defense outlays (military, intelligence agencies, Homeland Security) grew by 50 percent from 2006 and 2015, from \$1.4 to \$2.03 trillion. The “war on terrorism,” with its escalation of military spending and repression alongside social austerity, has collateral political and ideological functions. It legitimizes the new transnational social control systems and the creation of the global police state in the name of security. It allows states to criminalize social movements, resistance struggles, and “undesirable” populations.’ (p.193)

It is important to note that even the mainstream U.S. press is deeply concerned about this outcome, as it critiques the U.S. administration’s prioritizing the interests of the MIC over the concerns of climate change and global human needs (e.g., The New York Times Editorial 2019). Of course, to recognize the vicious cycle of the State Terror Apparatus and its terrorist antagonist in reproducing endless global conflicts in no way justifies terrorism, rather this recognition points to the solution by breaking this cycle, reprioritizing the colossal expenditures of both money and human resources, thereby undermining the support for terrorism by terminating conflicts with just solutions, improving the quality of life especially in the global South. The war on terror also creates a pretext for imperialist instigated regime change as we now witness with respect to Iran. Indeed, former national security advisor John Bolton called the assassination of Iran’s Major General Qassem Soleimani “the first step to regime change in Tehran” (NY Times, January 7, 2020, A10). No accident that Iran has the world’s 4th largest oil reserves, while Venezuela, another target of regime change, has the biggest reserves (Schwartzman and Saul 2019).

Rather than naming our era the Anthropocene, I join Malm and Hornborg (2014) and Malm (2016) in considering a substitute the Capitalocene to focus attention on the global reproduction of capital, and in particular on militarized fossil capital in its murderous assault on both humans and nature.

Given this reality, humanity faces this challenge at the beginning of the 21st century:

Can the monstrous boulder of *militarized fossil capital* be pushed down the slope to its well-deserved sedimentary cemetery of prehistory on a path that minimizes the destruction of nature and humans?

The Military Industrial (Fossil Fuel Nuclear State Terror and Surveillance) Complex (MIC) is a block to achieving global cooperation for rapid curb on global greenhouse gas emissions and a full transition to wind/solar power. As the instrumental arm of the imperial foreign policy of the MIC, the Pentagon/NATO along with the \$2 trillion per year in military spending are the critical obstacles posed by the MIC, not the sizable, but widely exaggerated greenhouse gas emissions of the Pentagon itself.

To summarize, the MIC is likely the biggest single obstacle to preventing C3:

- 1) The MIC is the present core of global capital reproduction with its colossal waste of energy and material resources.
- 2) The integration of fossil fuel/nuclear industry in MIC.
- 3) The MIC's dominant role in setting the domestic/foreign policy agenda of the United States, with no evidence of weakening in the present administration.
- 4) Pentagon as the "global oil-protection service" for the U.S. imperial agenda, or even for the transnational capital class itself. Also the Pentagon functions as protection service for strategic metals.
- 5) The Imperial Agenda blocks the global cooperation and equity required to prevent C3.

The requirements for preventing Climate Catastrophe

The following are arguably the three critical requirements to have a chance to prevent C3:
global demilitarization, solarization of energy supplies and agroecologies replacing industrial/GMO agriculture

To eliminate energy poverty and have the capacity to confront climate adaptation and mitigation, more energy than now consumed is needed, roughly equivalent to 25 trillion watts (TW) compared to present primary consumption of 18 TW. Hence, I reject as inadequate prescriptions that promise meeting some sustainable goals (e.g., Grubler et al. 2018; see detailed critique in Schwartzman and Schwartzman 2019, p.243-244) while failing to deliver this imperative energy capacity. Even worse are arguments for degrowing the global energy supplies:

"But given the limitations and expense of renewable energy systems, **any transition to a just and sustainable world requires a vastly reduced demand for energy compared to what is common in the developed regions of the world today [bold added]**, and this necessitates giving up growth-based, consumer societies and the energy-intensive lifestyles they support and promote." (p.99, Alexander 2014)

The reader should see my detailed critique of degrowth in Schwartzman (2012, 2014a, 2014b, 2014c).

Further, Kallis, a leading degrowther, has repeated the same point:

"**The global material and energy "throughput" has to degrow [bold added]**, starting with those nations that are ecologically indebted to the rest. Energy and material throughput have to degrow because the materials extracted from the earth cause huge damage to ecosystems and to the people that depend on them." (p.192, Kallis 2019)

The three main renewable energy sources are wind power (mainly sited in oceans), photovoltaics and concentrated solar power. We modeled a global transition to these renewable energy sources (Schwartzman and Schwartzman 2011). We concluded the following:

Assuming the state of the science wind/solar technological capacities in 2011, using 1 to 2% of current annual consumption of energy (then 85% derived from fossil fuels, now it is 80%) for wind/solar power creation per year, a global-scale transition can be achieved in no more than 30 years, ending with zero anthropogenic carbon emissions from the energy sector, providing the rough minimum of 3.5 kilowatt/person energy consumption for all. Improvements in wind/solar technologies will make this transition easier and faster, specifically because of likely increases in the Energy Return/Energy Invested Ratio ("EROEI"), requiring less fossil fuel input.

Following up the insightful discussion of recycling in Lenton and Watson (2013) in their section on “Recycling the Manufactured Environment” (p406-408), I take note of Lenton et al. (2016):

“A solar powered recycling revolution” is a welcome end section to this paper. I have long been advocating the same approach, recognizing that besides avoiding the well-known negative impacts of fossil fuels and more contentiously nuclear power, high efficiency collection of solar radiation with wind and solar technologies has the capacity to do the work required for recycling. The energy base of the global physical economy is critical: global wind/solar power will pay its “entropic debt” to space as non-incremental waste heat, unlike its unsustainable alternatives (Schwartzman, 1996, 2008, 2009).” (C3-C4, Schwartzman 2016a)

Further, as the global solar power infrastructure grows and replaces fossil fuels then the capacity to recycle without the negative impacts of the latter will grow, with a goal of phasing out mining and actually increasing the material throughput via industrial ecologies, especially as the huge material infrastructure of the MIC is recycled in the process of demilitarizing the global economy.

From the Capitalocene to the Solarcommunicene

I submit that an effective prevention program to avoid C3 will require organizing a transnational movement in the near future, with the strength to defeat the imperial agenda of militarized fossil capital, dissolve the MIC, and in this process, implement an ecosocialist Global Green New Deal (GGND; see Schwartzman 2011), thereby opening up a post capitalist path to the solarcommunicene. “You may say I am a dreamer, but I am not the only one” !

I define the solarcommunicene as a socially governed global civilization realizing a 21st Century version of Marx’s vision of communism:

“From each according to her ability, to each according to her needs”

“Her” refers to both humans and nature (ecosystems)

Marx’s phrase ‘From each according to his ability, to each according to his needs’ actually has roots in the Bible, specifically in the New Testament:

‘In Acts of the Apostles the lifestyle of the community of believers in Jerusalem is described as communal (without individual possession), and uses the phrase “distribution was made unto every man according as he had need”’.

I note that Marx’s communism did not exist in 20th Century “real existing socialism”, let’s not confuse communist party rule with the vision of Marx’s communism. Let’s not throw the baby out with the dirty bathwater left by those examples of highly problematic attempts of constructing post capitalist systems in very difficult conditions (see Schwartzman 2016b).

In other words, the solarcommunicene is a global commons, socially managed at all scales, powered by the nuclear reactor 93 million miles away, because only this reactor, fusing hydrogen to helium in the Sun’s core, can supply both the quantity and quality of energy to the Earth’s surface sufficient to meet this objective. I note that in the historic interview of James Lovelock in the Lovelock Centenary, both Tim Lenton and James Lovelock agreed that nuclear power is the desired energy source for humanity’s future, but Lenton and I favor this source being a safe distance 93 million miles away, rather than fission power on the Earth’s surface.

Conclusion

Of course having this vision of the future, utopian rather than dystopian, the common theme of science fiction, is far from sufficient, it must be followed up by concrete activity, foremost political organizing for a GGND. Climate science is telling us this process must start now in a world dominated by capital reproduction. We should recognize the essential role of green capital in achieving a GGND, both for its financing of an ever growing renewable energy infrastructure replacing fossil fuel as well as its political activity in defeating the agenda of militarized fossil capital. We should recognize the potential critical role of transnational green capital as a countervailing force to defeat this

agenda; see the analysis of Robinson (2018). I note that at a Board meeting of the journal *Science & Society* on December 8, 2018, Robinson presented an outline of his book. In the question period, Robinson agreed with my point regarding this key role of transnational green capital. I was delighted to share my Lovelock Centenary panel with a leading spokesperson for green capital and sustainability, John Elkington, who originated the triple bottom line framework for business, confronting the social, environmental (or ecological) and financial impacts. Since the coalition for a GGND must be led by those most affected by the climate/environmental crisis, namely working people and social movements around the world, especially in the global South, green capital will be challenged on multiple fronts in this process. I am convinced that a robust GGND will ultimately lead to a radical transformation of global political economy, resulting in “a flourishing future for all life on this planet”.

Note: This paper is updated and expanded from my presentation on Panel 2: How can we create positive change (towards Gaia 2.0)? James Lovelock Centenary, The Future of Global Systems Thinking, Global Systems Institute, University of Exeter, July 31, 2019.

References

- Alexander S (2014) Ted Trainer and the Simpler Way: A Sympathetic Critique. *Capitalism Nature Socialism* 25(2): 95-111.
- Grubler A, Wilson C, Bento N, et al. (2018) A low energy demand scenario for meeting the 1.5 °C target and sustainable development goals without negative emission technologies, *Nature Energy, Supplementary Information* 3: 515-527, doi.: 10.1038/s41560-018-0172-6.
- Haltiwanger J (2018) America's 'war on terror' has cost the US nearly \$6 trillion and killed roughly half a million people, and there's no end in sight, November 14, *Business Insider*, Online at <https://www.businessinsider.com/the-war-on-terror-has-cost-the-us-nearly-6-trillion-2018-11>.
- Kallis G (2019) Socialism Without Growth. *Capitalism Nature Socialism* 30(2): 189-206.
- Lenton TM, Latour B (2018) Gaia 2.0. *Science* 361: 1066-1068.
- Lenton TM, Pichler PP, Weisz H (2016) Revolutions in energy input and material cycling in Earth history and human history. *Earth Syst. Dynam.*, 7, pp. 353–370.
- Lenton T, Watson A (2011) *Revolutions that Made the Earth*. Oxford UK: Oxford University Press.
- Lovelock J E, Margulis L (1974) Atmospheric homeostasis by and for the biosphere: the Gaia hypothesis. *Tellus* 26: 2–10.
- Malm A (2016) *Fossil Capital: The Rise of Steam Power and the Roots of Global Warming*, Verso, London.
- Malm A (2019) Against Hybridism: Why We Need to Distinguish between Nature and Society, Now More than Ever. *Historical Materialism* 27.2: 156–187.
- Malm A, Hornborg A (2014) The geology of mankind? A critique of the Anthropocene narrative. *The Anthropocene Review* 1(1): 62–69.
- Robinson WI (2018) *Into the Tempest: Essays on the New Global Capitalism*. Chicago: Haymarket Press.
- Schwartzman D (1996) Solar Communism. *Science & Society* 60(3): 307-331.
- Schwartzman D (1999, 2002) *Life, Temperature, and the Earth: The Self-Organizing Biosphere*, Columbia University Press.

- Schwartzman D (2008) The Limits to Entropy: Continuing misuse of thermodynamics in environmental and Marxist theory. *Science & Society* 72(1): 43-62.
- Schwartzman D (2009) Ecosocialism or Ecocatastrophe? *Capitalism Nature Socialism* 20(1): 6-33.
- Schwartzman D (2011) Green New Deal: An Ecosocialist Perspective. *Capitalism Nature Socialism* 22(3): 49-56.
- Schwartzman D (2012) A Critique of Degrowth and its Politics. *Capitalism Nature Socialism* 23(1): 119-125.
- Schwartzman D (2014a) Ted Trainer and the Simpler Way: A Somewhat Less Sympathetic Critique. *Capitalism Nature Socialism* 25(2): 112-117.
- Schwartzman D (2014b) My Response to Trainer. *Capitalism Nature Socialism* 25(4): 109-115.
- Schwartzman D (2014c) Is zero economic growth necessary to prevent climate catastrophe? *Science & Society* 78 (2): 235-240.
- Schwartzman D (2015) From the Gaia hypothesis to a theory of the evolving self-organizing biosphere. *Metascience* 24: 315–319.
- Schwartzman D (2016a) Interactive comment on “Revolutions in energy input and material cycling in Earth history and human history” by T. M. Lenton et al. *Earth Syst. Dynam. Discuss.*, C1-C8, doi:10.5194/esd-2015-90-RC1.
- Schwartzman D (2016b) Beyond Eco-Catastrophism: The Conditions for Solar Communism, In *Socialist Register 2017*, edited by L. Panitch and G. Albo, MR Press, pp.143-160.
- Schwartzman D (2017) Life’s Critical Role in the Long-term Carbon Cycle: the Biotic Enhancement of Weathering, *AIMS Geosciences* 3(2): 216 -238.
- Schwartzman D (2018) The dialectics of biospheric evolution, In: *The Truth is the Whole: Essays in Honor of Richard Levins*, Editors: Tamara Awerbuch, Maynard S. Clark, and Peter J. Taylor, pp. 21-33. The Pumping Station: Arlington MA.
- Schwartzman D (2019) *My Take on Gaia 2.0*, this presentation and responses to questions on Wednesday, July 31 is found at: https://www.youtube.com/watch?time_continue=8&v=xRHpCpFDNXg, starting at 3:16:00, lasting a bit over 6 minutes. Conference Program, Abstracts: <https://www.lovelockcentenary.info>.
- Schwartzman D, Evans J, Okrend H, Aung S (1991) Microbial weathering and gaia, In *Scientists on Gaia*, Editors: S.H. Schneider and P. J. Boston, MIT Press, pp. 320-329.
- Schwartzman D, Volk T (1989) Biotic Enhancement of Weathering and the Habitability of Earth, *Nature* 340, 457-460.
- Schwartzman D, Saul Q (2019) The path to climate justice passes through Caracas, Online at: <https://mronline.org/2019/06/25/the-path-to-climate-justice-passes-through-caracas/>.
- Schwartzman P, Schwartzman D (2011) *A solar transition is possible*. Online at: <http://solarUtopia.org>.
- Schwartzman P and Schwartzman D (2019) *The Earth is Not for Sale: A Path Out of Fossil Capitalism to the Other World That is Still Possible*. Singapore: World Scientific.
- The New York Times Editorial (2019) Rethinking America’s Approach to the World. August 19. A22.

Volk T (1998) *Gaia's body: Toward a physiology of earth*. New York: Springer.