

Can the Journey of the Universe Worldview Guide Us in the Anthropocene?¹

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Once we adopt the broad evolutionary perspective of the “New Story” a sweeping agenda emerges for informing and shaping the human prospect as we enter the Anthropocene. There are at least five questions that are essential to answer if we are to construct a much saner and safer future for ourselves and the rest of life with which we share heritage and destiny than what currently lies before us. These are: 1) What is the nature of the person? 2) What do we know about what we know? 3) What should we do and not do? 4) What would economics look like? 5) What are the most promising politics for an ecological age? The answers to these questions are intertwined and as they emerge will inform afresh our understandings of our relationship with life and the world.

I. A. What is the nature of the person? The “rational person,” who coolly seeks to maximize their own interests and assumes everyone else is doing the same, is a cornerstone of neo-classical economics. This mythological figure has been repeatedly challenged over the years, most recently by behavioral economics and psychology, although without much success in the eyes of the mainstream. This conception of the person is a partial mixture of rationality as conceived during the Enlightenment and the hedonism of thinkers like Bentham and Mill. It contains a narrowly individualistic notion of “the good,” from which compassion and empathy, as well as community and connections, have mostly been stripped away.

The continued findings from evolutionary biology, cognitive science, quantum physics and systems theory are helping to find very different answers to the question of who humans are and what they ought to be. Quantum physics, for example, provides a very different perspective on the human self than that contained in neo-classical economics. Because events at the quantum level cannot be directly perceived by the human senses, we are not normally aware that every aspect of physical reality emerges through the interaction of fields and quanta. But from the perspective of our most advanced scientific knowledge, this is the ground for our existence in physical reality. As Robert Nadeau puts it: “The part we call ‘self’ emerges from and is embedded in a seamless web of activity that is the entire cosmos. Any sense we have of being separate or disconnected from this ground of being... is an illusion that is not in accord with the actual character of [physical] reality.”²

Systems theory tells us there are no individuals as the concept is normally understood, and that human beings live in complex, interlocking environments with other lifeforms that include one another, all the species in their particular ecosystem, hitchhikers and symbiots like bacteria and viruses and much more, with most of this activity well below the level of consciousness. These systems influence and sometimes actually dictate much of our behavior. Seen from the perspective of contemporary systems science, the human self is highly sensitive to initial conditions, subject to multiple feedback loops and given to wide variation in subjective/behavioral outcomes. For example, a huge variety of factors—the weather, a sudden collision with another life form, an indisposition—will change what we do even after a course of action or thinking has been undertaken. We are relational and permeable with respect to energy and matter, and live in a world of shared semiotic meanings. Conscious reasoning is not the primary motivator of our actions—and a great deal of what we think is our knowledge is tacit and creaturely. The self is emerged in and entangled by the brain/body/environment/culture/cosmos.³ If we understood from “the beginning” that the human self is fully embedded our policies with respect to toxins, for example, would likely be very different. We would not regard the world as something “out there” to be exploited; but as part of who we are.

I. B. How the Market Manufactures the Person. Once we recognize the inherently embedded character of the human self, it should come as no surprise that this self is also very much shaped by the human-evolved institutions and assumptions that surround us. As Steven Marglin puts it: “Markets organize the production of goods and services, but at the same time markets produce people: they shape our values, beliefs and ways of understanding in line with what makes for success in the market. Markets thus exist in a kind of symbiosis with the discipline of economics, shaping people to fit the assumptions of the discipline even as economists shape the world in the textbook image of the self-regulating market. A new economy will need a new economics, which goes beyond the calculating, self-interested, individual to take account of community, compassion, and cosmos.”⁴

The brain is a complex, adaptive system, and this is what makes it malleable. The behavioral characteristics of any person, whatever the source of their reinforcement, become possible through the establishment of neurological pathways that then become ingrained. The more the pathways are used, the more they will be used. The more they are associated with the pleasure centers of the brain, the stronger the incentives are to increase their use—something long understood, at least at

some levels, by advertisers. What humans and other animals do—how much time we spend on the computer, for example—actually changes how our brain is constructed.

II. A. What do we know about what we know? From the point of view of contemporary science, the idea of the world as certain and predictable is, at best, an approximation of reality that is held by human societies from time to time. This view, a legacy of the scientific revolution and the Enlightenment of the 17th and 18th centuries, that the world is made up of quantifiable and stable parts, has been replaced or modified by the more recent science of the 19th and 20th centuries, by a view that emphasizes relations and systems. Systems theory is now an established foundation of a scientific understanding of the Universe.

II. B. The Importance of Uncertainty. The systems that make up the universe have multiple, interactive feedback loops, as well as both fragile and robust initial conditions. Knowledge of such systems is typically incomplete, because all knowledge can only be an approximation of reality; so surprises should not surprise us. The universe itself is a complex adaptive system “ever advancing into novelty,” to use Whitehead’s phrase. In that universe, equilibria or static, predictable states—the centerpiece of the neo-classical model—are rare, perhaps even delusional. The overall reality, as Heraclitus wrote, is *change*. In a world of complex systems successfully seeking to maximize a variable like GDP is sure to bring chaos and instability in its wake, since it will perturb the other, constantly changing and evolving systems of which it is a part. For example, the worldwide commitment to economic growth is destabilizing the climate system, even though the latter is certainly not part of the mental construct typically used to think about the economy.

II. C. All Knowledge is Approximate and Provisional. The human ability for abstract reasoning is one of the great adaptive capacities that we have, but it also has many shortcomings. Consider the example of a map of Quebec. A map should tell us as much as possible about the land and water in the Province and it will do this better the more it approaches the size and complexity of what it is trying to represent. That means that the ideal map would be the size of the Province itself; but then it would not be very useful. So we leave lots out on maps and typically make them very small. In the same manner, our abstractions leave out most details, even though much of what we *need* to know is lost in achieving the benefits of abstraction.

III. What should we do and not do? For ethics the implications of moving to a worldview compatible with contemporary science are both deep and wide, though often, not new. Here are four interrelated examples:

III. A. Uncertainty and unpredictability should ground *epistemological humility*. The scientific fact that all human knowledge is partial and provisional has profound implications for action. It should lead us to treat the urge to manage complex systems with enormous caution, while at the same time recognizing that, at the present level of overshoot of ecological capacity, some sort of orderly pullback is essential. In *Water Ethics*, my co-author Jeremy Schmidt and I have called for *compassionate retreat*—a concerted effort to reduce the human impact on Earth’s life and its life support systems.⁵

III. B. For far too long people have embraced a form of “exemptionalism”; the idea that human beings are special, in some miraculous way not a part of nature, and are therefore not subject to its sanctions, controls and limitations. This has led to absurd ideas, such as thinking we can control “pests” with compounds that will affect them—but not us. Recognition that we share heritage and destiny with all the other life on this planet, and the dependence of life on physical and chemical evolution, should lead us to *expand the moral community*.

III. C. Once we recognize that humans, like any other native lifeforms are in a reciprocal relationship with the Earth, the duty to *help restore* the massive damage to the Earth’s living system caused by our species comes into clear and central focus. An ethics of atonement for our lack of respect and responsibility in the past must inform the every action of the children of a new Enlightenment. Yet, we must not fall back into the trap of trying to manage and force complex systems—much of our current trouble is a result of this attitude. Rather we must enable the reconstruction of Nature and stand aside (often in awe) as she flourishes afresh. Atonement, in this case, is more like being a midwife, than a surgeon.

III. D. Energy broadly defined is a fundamental good, that underlies all other “goods.” It enables the far from equilibrium, autocatalytic living organisms. This repositions the eminent philosopher John Rawls’ concept of “primary goods” such as income, wealth, and opportunity, to a secondary status. They all depend on energy. From the perspective of an ecological political economy wasting that which makes life itself possible is a very fundamental moral wrong.⁶ And so it is, in the moral codes of most traditional and aboriginal peoples.

IV. What would economics look like if it were embedded in a scientific understanding of life and the world? How would economics and its goals have to be rethought? Here are some of the ways:

IV. A. Rather than a system with little connection to a scientific understanding of the world, the human economy must be conceived of as an open system, whose processes can and must be described in terms of energy and matter.

IV. B. The ability of the economy to grow in terms of throughput is inherently limited. The ecosphere stays in far from equilibrium conditions maintained by sunlight with slow rates of growth. The current economic growth imperative *far exceeds* the maintenance and growth capacity of these systems. We need to measure the human impact on Earth's life support systems, such as in the idea of "safe operating space"⁷, ecological footprint and the like. These are the measures that must be treated as the true indicators of a functional and supportive economy.

IV. C. "Production" dismembers the complexity of these far from equilibrium systems, and often produces wastes that are toxic to life, whereas an economics for the Anthropocene must work hand in hand with thermodynamic and other processes and produce digestibles in both quantity and quality.

IV. D. While many economists claim that their discipline is value free (while being freely prescriptive), certain ethical questions must be central to a new economics. These include: What is 1. Well-being of life and its support systems? 2. Poverty? How can it be vigorously addressed? 3. A fair share of Earth's life support capacity for humanity, in relation to other species? 4. A fair share for countries ranging from Canada to Bangladesh?⁸

IV. E. A fundamental principle of macroeconomics, seen from the perspective of the limits of our knowledge and our planet, has to be *precaution*. The overriding objective of macroeconomic policy is stability, and as a consequence the "good" humans have to learn to be cautious about is the health of the Earth's life support systems. This good is often pursued by traditional and aboriginal groups whose watchword was often restraint and self-imposed limits, as with harvests.

IV. F. A key element in an ethically-grounded, macroeconomic system has to be an understanding that the right relationship between the economy and the Earth must be a mutually enhancing one. Once we recognize our permeable character, for example, we open the door to measuring the success *of an economy* by reference to the toxic load in our bodies and other living beings.

And once we recognize the role of the market in determining character and social values, we can no longer avoid the question: is the market reinforcing the creation of the kind of people we want? Or not? More broadly, is it helping to move us toward the cultivation and elevation of the mind and spirit of a human animal who lives respectfully on the Earth, and who can easily express reverence for life and the sources of its being?

V. A. *Politics for an Ecological Age.* The enabling conditions of the “flowering” of political liberalism are in the process of unraveling. The evolutionary processes that gave rise to complexity on Earth set the stage for a unique period in human history, which can be benchmarked as the beginning of agriculture. This organic complexity, and the attendant energy stored in it, began to be both systematically and massively enhanced and harvested. As William Ophuls points out in *A Requiem for Modern Politics* in the subsequent evolution into industrial societies, this attempt to enhance and then harvest has turned into a riotous feast on every one of the world’s natural systems.⁹ It has resulted in (1) extensive settlement of “new” territory; (2) explosion of human population growth; (3) exponential growth in the (wasteful) use of matter and energy; (4) deliberate destruction of complex natural systems in favor of simplified systems; (5) intense and sometimes bellicose competition; (6) chronic boom and bust cycles; and (7) mass extinctions, possibly including our own.

We are now in what Nicholas Georgescu-Roegen called the flamboyant period—a time now drawing to a close and almost certainly not to be repeated as we enter the Anthropocene. This period gave rise to liberal politics and economics that arose from the ashes of the Middle Ages and the religious wars that attended its demise. **Yet liberal ethics, economics, and politics itself is now on the chopping block of history, as its assumptions crumble and its enabling conditions unravel.**

V. B. What kinds of institutions are implied by and required for assuring a flourishing Earth and a long and prosperous human presence here? Once an Earth systems point of view is adopted, does it become evident that the system of nation states is intrinsically incapable of addressing the problems of the Anthropocene? Is there sufficient (or any) evidence that democratic institutions are likely to achieve essential long term fiduciary goals? Is a democracy based on an idea of responsible citizenship more of an illusion than a reality in the electronic age of bread and circuses?

V. C. From the point of view of a scientific understanding of the world many of the assumptions underlying liberal politics are problematic and have to be reviewed with new ends in mind. Here are some of them:

Property. The idea of ownership of the Earth is difficult to ground. From a systems perspective the idea of severability is problematical. The morality of turning over complex and fragile portions of the Earth to individuals who are poorly informed, often outright ignorant, and who have no concept of fiduciary duties, cannot be justified. The question that must be confronted is how property is to be understood once humans are seen as members, not masters, of the community.

Human Rights. Often rights concepts are not connected to *responsibilities* and hence the relational dimension of our lives is understated, even ignored. But even when responsibility is included, this concept leads us away from understanding the essentially embedded nature of human beings in the natural world, as well as the chimera of any separate, isolated “self.” Extending the idea of rights to nature itself, such as in the Ecuadorian Constitution, is a healthy attempt to rebalance our discourse.

Self-regarding acts. Perhaps the core idea of political liberalism is that each person is free to act as he or she wishes so long as that action does not harm other persons. Two important sources of this idea are John Locke’s *A Letter Concerning Toleration* (1689) and John Stuart Mill’s *On Liberty* (1859). Locke held that our religious beliefs are internal matters and hence matters of faith should be beyond the legitimate reach of the state, whose principal tasks are external—to secure “life, liberty and property.” Mill held that the state has no right to interfere in what he called “purely self-regarding acts.”—though interpreting this phrase has proved contentious, even for Mill himself. Yet despite the pedigree conferred by the quality of these two philosophers, the assumptions these ideas contain that now underlie political and economic neo-liberalism are becoming very problematical.

What has happened since Locke wrote is that his rather sensible idea that what one *thinks* is private, has been transformed into the idea that one can *live* however one wants. And, as Clive Hamilton and others have noted, in the 20th century how one lives, indeed how one defines oneself, has come to be understood widely (especially in the Anglophone economies) though not universally, by what one consumes or “owns.” When we connect the foundational principles of political liberalism to the 1st law of thermodynamics, the implications are highly distressing. This cosmic law states that matter is neither created nor destroyed. This means that the carbon released when fuel is burned in a Toronto traffic jam

directly affects the interests of people and ecosystems around the world. When we connect this to the question of reparation duties to environmental refugees, we must see that how we *live* is harmful to others. It also raises the question as to whether there are *any* purely self-regarding acts. **And whatever may have been the case when the human population was small and the consequences of our acts inconsequential, in the “full world” in which we live there are *none—no actions which affect us alone.*** We have no choice but to recognize that, as Thoreau says, “our whole life is startlingly moral. There is never an instant’s truce between virtue and vice.”¹⁰

The Perils of “Progress.” For at least the last several centuries our expectations about the future have been centered around the idea that the future will be better in some way than the present. This is very different from the cyclic view of traditional communities still in existence around the world, and even in Europe until the late Middle Ages. It has allowed us not to develop any theory about our *duties to the future*. In fact, neo-classical philosophy assumes that the future may be discounted since, in part, it is assumed that we will all be better off than we are today.

The downward spiral from the Holocene to the Anthropocene no doubt began many centuries, likely millennia, ago.¹¹ But the Western idea of “progress,” which arguably took root about 500 years ago gave new impetus to these trends. Perhaps the *coup de grace* was delivered by the Post-War assimilation of the idea of progress with economic growth and an expanding population. “Progress,” now understood as increased consumption for massive human populations is now in the process of devouring what makes it possible.

Conclusion

We have entered the Anthropocene with conceptions that did not even work in the relatively placid Holocene; indeed these failed conceptions distracted us from the monumental changes we induced, and thus helped to pave the way for the sweeping changes now underway. What I have sketched here is a far reaching agenda to rethink our circumstances; and to build and act on a different, but not mainly new, agenda for the human prospect. It must be grounded in humility and penance for what we have wrought. The key to a flourishing future, such as it may be, is to be found more in controlling ourselves than the world around us---and in a return to the ancient wisdoms that everything that is, is Holy.

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Notes

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² Draft paper by Robert Nadeau (and contents added).

³ This description of the self is taken, with modifications from Wendy Wheeler’s *The Whole Creature*, and draws heavily on conversations and correspondence with Robert Nadeau.

⁴ An unpublished article by Steven Marglin.

⁵ Peter G. Brown and Jeremy J. Schmidt, “*An Ethic of Compassionate Retreat*”, in *Water Ethics, Op. Cit.*, pp. 265-283.

⁶ Howard. T. Odum, “Energetic Basis for Religion,” in *Environment, Power and Society* (New York: Wiley, 1971)

⁷ Rockstrom *et. al.*, “Planetary Boundaries,” in *Ecology and Society*, 14 September 2009

⁸ Some of the points in this section are derived from the work of Georgiana Galiussi.

⁹ William Ophuls, *Requiem for Modern Politics* (Boulder, Colorado: Westview Press, 1997) See especially pages 1-28.

¹⁰ Henry David Thoreau, *Walden* (New York: W.W. Norton and Co, 1992) p. 146

¹¹ See, for example, William F. Ruddiman’s *Plows, Plagues and Petroleum: how humans took control of climate* (Princeton: N.J.: Princeton University Press, 2005) for an analysis how humans have likely disrupted the climate cycle beginning with agriculture