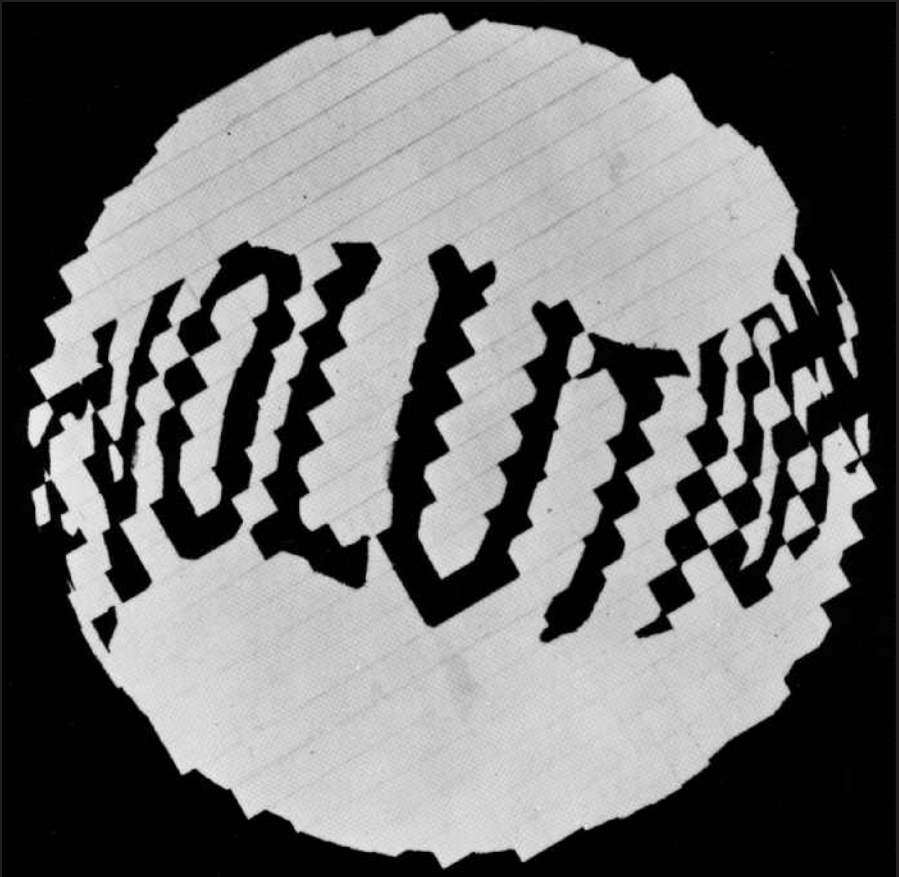


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Teilhard Studies Number 65

Fall 2012

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TEILHARD STUDIES is a monograph series concerned with the future of the human in the light of the writings of Teilhard de Chardin. Two issues each year are planned, to be sent to members of the Teilhard Association.

TEILHARD STUDIES

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ETHICS FOR ECONOMICS IN THE ANTHROPOCENE

Peter G. Brown

We might summarize our present human situation by the simple statement: In the 20th century, the glory of the human has become the desolation of the Earth. And now, the desolation of the Earth is becoming the destiny of the human. From here on, the primary judgment of all human institutions, professions, programs and activities will be determined by the extent to which they inhibit, ignore or foster a mutually enhancing human-Earth relationship.¹

—Thomas Berry

Overview

The human quest for love, power, beauty, happiness, understanding, truth, and the like can be thought of from an ecological perspective: it is enabled by (low entropy) sources of plentiful energy (food, cooking and heating fuel, drought animals, hydro-electric power, fossil fuels, etc.) along with places to put the inevitable (high entropy) waste. As consumption and human numbers have risen, we have ushered in a new era—the Anthropocene—in which we are altering the biogeochemistry of the planet itself, destabilizing climate and influencing co-evolution at the planetary level.² The Anthropocene, itself likely a period of transition, appears to be a regrettable exit from the relatively placid past ten thousand years—the Holocene—a period of climate stability in which “civilization” arose.

Thus we enter the stormy present without an adequate ethical guidance system. In a word, we are lost. The now globally dominant Western culture remains entangled in a project it does not clearly see: the quest to emancipate ourselves from nature; and to assert our superiority over those less blessed—as we Westerners see it—than ourselves. The emancipation project reaches back to the beginnings of agriculture itself and has deep roots in both Biblical and Greek sources—a journey that went further off course in the European Enlightenment.³

Yet help is on the way. The explicit and implicit agendas of ecological economics open our minds to questions about the human/nature relationship that may help us find a path through the thicket. These agendas force us to question arrogant assumptions that are deep in Western culture with regard to our sense of separation from and superiority over other cultures and nature. The insights from ecology and many other sciences in the last 150 years open the door

to a new underlying narrative that provides a foundation for an ethic that is critically needed. This is an ethic grounded on three premises about the human place and role on Earth: 1) as members, not masters of, life's commonwealth, 2) as custodians of Earth's household, and 3) as those entrusted with duties to preserve and enhance the low entropy sources on which a flourishing Earth depends. This in turn provides a tripartite structure built around scale, distribution, and efficiency which provide foci for these postulates. Fresh consideration of the idea of efficiency helps to underpin an account of the virtues that are necessary if we are to achieve a civilization worthy of the name. An ethos—an over-arching understanding of our relationship with life and the world—comes into view. Ethics and ethos alike reground our understanding of how we ought to assess and redirect the global economy and finance; and indeed civilization itself, as we enter the stormy Anthropocene.

I. Introduction

Enabling a scientifically-based economics (often called ecological economics) to pursue its agenda requires re-examining many fundamental ethical and metaphysical assumptions of Western culture (perhaps dating from at least the beginning of agriculture). Our quest to free ourselves from the bonds of nature and “primitive” cultures has been a hallmark of the Western emancipation project. It has expanded both our understanding and our power, over nature and each other. It laid the foundations for the emergence of the “market civilization”⁴ which now dominates humankind as well as all of nature, amplifying the military/technical hegemony of the European empires with a conceptual *tour de force* built around “free trade” and other elements of the consensus. This idea has been assimilated with the idea of progress. Together they have produced the framework that facilitated and legitimated huge increases in human numbers, consumption, and massive perturbations of natural systems, especially in the second half of the twentieth century.

A thread that runs through this story from its commencement is the quest for sources of low entropy⁵—fertile land, virgin forests, teeming oceans, fuels laid down by Pleistocene summers, Columbian cataracts that turn the turbines, and the labor of billions through empire, slavery, and markets.

But the thread is not without threat. The emancipation project comes with a powerful, perhaps lethal, undertow. For, as we enter the Anthropocene, it is apparent that we have triggered changes in Earth systems that are profound and irreversible in historical time.⁶ Climate change alone will cause the migration of 10s to 100s of millions—perhaps billions—of people, increase the instability in the supplies of food, fiber, and water, spread old and new diseases, and sharply accelerate the decline of other species. Yet it is just one of the burgeoning

problems that we confront. The emancipation project has turned upon itself and is devouring its own possibility though in many cases its ferocity is, and will be, felt first and foremost by those who have just escaped from the clutch of empire. Ironically, many will still find themselves gripped in the glove of economic colonialism⁷ and now anticipating, if not already experiencing, ecological disarray and impending collapse.

The fundamental challenge of a scientifically-based economics is that it rejects the idea that the economy is disembedded. In this way it challenges the emancipation project, which treats humanity as apart from nature. Ecological economics insists instead that the economy is constituted by energy and material flows—it is not a self-contained conceptual system. This fundamental and unavoidable insight requires the development of a new ethical foundation for economics and finance as well as many other disciplines.

But the path of ecological economics must not only challenge our alleged separation from nature. It must also call to our attention the appropriation of Earth's low entropy resources found in world and womb alike. The domination of nature and the domination of people are part of the same process. Justice between and within generations (and, as we will see, species) is an integral part of what is at stake. Hence, there is a second profound challenge: to Europeans as presumptive superiors who may legitimately subjugate, or dominate, the less “enlightened” of ours and other species. This is not to say that Europeans were the only ones to dominate and subjugate others—only that they have been heretofore the most successful.

Identifying these challenges is just a first step. A just and embedded economics alone cannot offer a conceptual global positioning system to guide us as we navigate the stormy Anthropocene. Understanding that economics is disembedded should open our eyes to that same pathology which afflicts finance, law, governance, ethics, and religion. Ironically, if we seize the opportunity, what lies before us is a new and better emancipation. It would entail a re-envisioning of our relationships with life and the world—right relationships in which humans, Earth, and the rest of life are mutually enhancing.

II. The Three Agendas of Ecological Economics

Ecological economics poses a simple question: what would *ecological* economics entail if it rested on a worldview based on current science? Ecological economists have an existing explicit agenda which requires making important adjustments to the frameworks of macro-economics and public finance. These changes can be made while leaving the bulk of the frameworks of economics in particular and contemporary culture in general intact. This I will call the *explicit agenda*.

At the same time ecological economics can be thought of as something stronger and more fundamental, offering a clarion call for a thorough rethink of the human relationship with life and the world. This is accomplished simply by asking the questions that many disciplines making up the edifice of contemporary thought (in addition to economics) might ask. These disciplines include law, governance, finance, ethics, and religion. As we will see, we are in a situation of “All fall down,” as in the nursery rhyme. Like a row of dominos, once one of these structures falls so do the others. This I will call the *implicit agenda*.

But if we can see past this agenda, a different and brighter prospect for life’s future comes into view. Scientific developments of the last two hundred years, particularly in the post World War II period, have challenged mainstream Western culture’s assumptions about the place of humans on Earth and in the Universe. Developments in evolutionary, organismal, and molecular biology, equilibrium and far from equilibrium thermodynamics, quantum theory, complex systems science, astrophysics, cosmology, neuroscience, and certain branches of theology are just some of the elements of a new understanding of who we are, where we came from, and where we may be headed. The implications of *this* burgeoning narrative are profound and far-reaching not only for developments in science but also for economics, finance, law, governance/political science, religion, and ethics. This is I will call the *reconstruction agenda*.

II. A. The Explicit Agenda

Ecological economics emerged in the 1980s as a seemingly natural and unthreatening subject of study. Much of its justification came from *The Limits to Growth* report (1972)⁸ and the work of Nicolas Georgescu-Roegen in the early 1970s.⁹ Drawing from the work of John Stuart Mill, Herman Daly’s *Steady State Economics* (1977)¹⁰ provided further justification of the idea of placing limits on the economy. Ecological economics gained force at about the same time as the Brundtland Report (*Our Common Future*) in 1987 and seemed to accord well with the idea of sustainable development.

One could describe the explicit objectives of ecological economics as being concerned with three issues: scale, distribution, and efficiency. Scale refers to how the economy can be regarded as a subset of local and global biogeochemical processes (which both determine its content and set limits to its growth). Distribution or fairness is embodied in a commitment to sustainable development with both intra- and inter-generational dimensions.¹¹ Efficient allocation, the central goal of the neo-classical school, is retained. However it must be constrained by considerations of scale and equity. In addition, there is a methodological commitment to use material and energy flows in conceptualizing and measuring the performance of the economy.

Concerns with scale were important precursors in classical economics in the work of Thomas Malthus, and distribution is important in the works of David Ricardo and Karl Marx. Even in the 1950s, Richard Musgrave had included distribution as one of the key branches of public finance along with stabilization and allocation.¹² Distribution, within the frame of ecological economics, offers adjustments to the neo-classical framework to be restorative (rather than revolutionary) of certain classical economics insights and concerns.

Indeed, it seemed that some tools of the neo-classical model could be extended to understanding the relationship between the economy and the natural world in which it is embedded. Ecological economists thought they could retain the ethical perspective that underpinned the neo-classical model they had rejected. One of the forms this takes is the movement to assign monetary values to ecosystem services. This is, in a way, a turn back toward the neo-classical idea of internalizing externalities. It is thought by many, including this author, to constitute a regrettable retreat to the subset of neo-classical economics known as environmental economics. It has served to blur the meaning of ecological economics and to hobble its mission.

II. B. The Implicit Agenda

Ecological economics is radical compared to the status quo—yet it is an essential framework, especially given the current ecological crisis. It is both grounded in a scientific understanding of the world, and has the potential to guide the behavior of one of our principal normative structures (economics). Its founders have issued a clarion call: abandon the fantasies of the neo-classical vision and live in the world as it is currently understood. To be consistent and visionary we must take advantage of the current scientific revolution. This is apparent not only for economics but also for other disciplines founded on dated metaphysical and pre-scientific visions. They may be thought of as orphans whose intellectual parents have perished while they live on.

Here is a preview of the sweep of the revolution: current conceptions of property, which assumes boundaries, and severability underlie the *law* in many countries. Yet, contemporary science emphasizes the interpenetrating character of Earth's natural systems. The evolutionary worldview dethrones humanity and undercuts the presumption that human ownership is morally justified.¹³ "Ownership" is, at best, a diminished concept. Western liberal *political* systems rest on the idea that human actions can be independent of one another, an idea sharply at variance with the law of the conservation of matter and energy, which emphasizes that there are no actions that affect the actor alone. Traffic jams in Dallas may impact the flooding of fields near Dakha. The world's natural systems live under the shadow of the guillotine of *finance*. Being designated as the source

of a lucrative commodity or an attractive “emerging market” can be a death sentence for forests and the flora and fauna within them, not to mention the peoples who have depended on them from time immemorial. Yet finance textbooks do not contain a single word about the relationships between money and the fate of these forests or of the imbalances in the carbon, nitrogen, and hydrological cycles that are massively perturbed by money.¹⁴ Mammon appears to have escaped this world. Our *ethics* are the residue of the crumbled foundations of metaphysics past. For those who consider us free from these dusty encumbrances, a fantasy that one way of behaving is as good as another is espoused. The result is moral and conceptual chaos which eviscerates public discourse and blocks the development of the collective responses needed to avert catastrophe. Ironically, many of the “*faithful*” use their energies in quarrels of doctrine, and retain and pronounce views that are sharply at variance with well-grounded empirical beliefs. Yet, at the same time, strong leadership from faith communities, such as the Catholic, Jewish, Protestant, Bahia, Quaker, and others as well as from the scientific community, is emerging to respond to the decline in life’s prospects. Certain movements emerging in these faiths are reasserting humanity’s place in the Universe based on a modern scientific synthesis. Paradoxically, both the rumblings of collapse and the prospects of timid reconstruction can be found in each of these six arenas.

Systems of faith and academic disciplines alike reflect and legitimate corresponding institutions and practices; these help constitute the fabric of the hegemonic European culture. There is a symbiotic process of legitimation between institutions of higher education and other institutions in the world. Those who march to the (aptly named) tune of “pomp and circumstance” with “parchment” in hand often endow the programs they attended. But the legitimacy of both practice and discipline is erased once the tenuous, nearly nonexistent relationship with contemporary evolutionary and complex systems science is exposed. As currently constituted, they ought to be regarded as a kind of *zombie jamboree* or *danse macabre* (laying waste to the planet) rather than as a triumph of the human mind and spirit. This is not to say that there are no useful ideas in these disciplines or wisdom in the actions of institutions; but it is to say that their *structures* are fatally flawed.

II. C. The Reconstruction Agenda

The agendas of the orphan disciplines must now ground themselves on current scientific conceptions of the world. This understanding has advanced markedly in the 20th century. It provides a broad evolutionary narrative which Thomas Berry coined as the “New Story.”¹⁵ From this vantage point, a sweeping agenda emerges for informing and shaping the human prospect as we recognize

that we have entered the Anthropocene. From this perspective, we are required to re-examine, and ultimately to redefine the emancipation project. The narratives from which we currently take our bearings are simply not true to our circumstances.

The idea of freeing ourselves from nature, myth, and “the primitive” runs strong and deep in Western culture. Mainstream Western conceptions of ethics and metaphysics begin with ideas of separation. Humanity, created in the image of God, is different in kind from the rest of Creation. The Biblical account of humankind’s early acts sets us apart from God—which has contributed to the fall of humanity and nature alike. We are awarded dominion over a profane Earth. As Carolyn Merchant and Hugh Brody have independently pointed out, an imperative to transform Earth finds its roots in the idea that humanity must retake its rightful place in paradise.¹⁶ Merchant argues that the quest for restoration to paradise forms an underlying narrative that has legitimated the global transformation of nature. This works hand in glove with the “divine mandate” to convert the non-Christian people of the world who are heathen by definition; a mandate that often resulted in the domination, enslavement, and extirpation of peoples and myriad other species.¹⁷

The Greek tradition which forms the other main root of the Western tradition is a culture that, even before the time of Plato (424/423 BCE -348/347 BCE), had wasted much of its own ecological base. Though Greek “primitive religion” had strong naturalist roots, the philosophical traditions stemming from it did not take their nourishment from them. These traditions have heavily influenced historical and contemporary mainstream Western culture. The traditional Greek hero is Ulysses who outwits the gods, outmaneuvers his primitive adversaries, and masters his own temptations by being tied to the mast.¹⁸ In this rationalist stream, humanity is regarded as inherently superior to the other animals. In the convergence of the Biblical and Greek traditions, the world in which we live and move and have our being became something to be owned and used, not loved and respected. Regardless, forms of naturalism still persisted on the margins of the dominant culture,¹⁹ at least until the European Enlightenment of the 17th and 18th centuries; and they continue in various forms in indigenous and even mainstream environmentalism—particularly in the legacy of John Muir. Despite the rebellions of movements like Romanticism, we continue to imagine a world in which we are the principal agents—masters of self and world alike.

For these reasons, the Western tradition (in its main manifestation) now struggles to formulate an ethic of respect and relationship with the nonhuman world. These distant foundational trends set the stage for the scientific and technical revolutions of the last five centuries. These revolutions have radically transformed large parts of Earth’s surface and altered the chemistry of the

atmosphere and oceans. These trends enabled a vast expansion in the human population and consumption which now overwhelm Earth's bio-physical life support systems. We are thus embarked on a tragic course. More fateful still is our resistance to envision and articulate an alternative relationship with life and the world.

III. An Ethics for Economics in the Anthropocene

Having sketched out our situation, what I offer here is an attempt to start over by re-grounding our moral and metaphysical beliefs in a scientific understanding of the world, an understanding, perhaps ironic to many, that has deep resonance with many of the world's religions. Ethical systems typically have at least five features although these can be weighted and function very differently. These are: *a foundation or justification, premises, structured principles or rules, virtues, and a guiding metaphor or ethos.*

III. A. *Foundation*

Like most Western ethical traditions, I will ground my argument in an affirmation of human life; however, I will place the understanding of what life is in a broader and I think deeper context. Beyond this, I want to both affirm and deeply question the emancipation project. I suggest that we should regard it as both a source of great insight and liberation, but at the same time, as the justification for an enormous, unjust, and perhaps fatal hubris. This hubris has legitimated the enslavement and extirpation of many of the world's peoples, decimated natural living and non-living systems (which took billions of years to evolve), and ultimately enslaved us to a false conception of who we are.

At this time in history we are positioned to ask a very simple question: what is life and what makes it possible? In the 20th century, beginning with Erwin Schrödinger's 1945 seminal essay *What is Life?* more light was shed on this question. Schrödinger placed the question within the domain of physics, and more particularly within the current understanding of thermodynamics. He gave humanity the stepping stones for solving one of the great scientific puzzles of the 20th century: how do far from equilibrium systems, like living organisms, come about in an entropic universe? Schrödinger, Prigogine, Schneider, Kay, and others were able to both answer this question *and* connect the answer to the origins and evolution of the universe now widely accepted in the scientific literature.²⁰

If one is to respect life and its flourishing, one must respect what makes life possible. The universe as a whole, the planet, and the other life forms with which we have co-evolved, must also be respected. Unsurprisingly, this mindset may lead one to the insights of the world's religions (though as noted above the doctrines in these traditions have also led us astray). Today's human world, and

the economic forces that drive it, is made possible by forces that also dwarf us. The universe has a beauty and majesty that we can only glimpse. The human mind and spirit are integral parts of this vast system and we can experience this oneness if we can escape the dictatorship of the ego. The latest scientific research confirms that we live in a world of continuous creation, where the universe itself is developing new properties and possibilities all the time. It is, in a sense, learning as we are. Failing to respect these realities diminishes each of us and is imperiling the flourishing of life.

Three questions are essential to answer if we are to construct a sane and safe future for ourselves and the rest of life with which we share heritage and destiny. 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? The answers are intertwined. As they emerge, they will constitute the tissue of a new understanding of our relationship with life and the world.

What follows is a preliminary attempt to set the moral foundations of ecological economics. This will be done by exposing some of the premises on which this emerging discipline must rest. I will then trace how this understanding may develop the other four elements of the ethical underpinnings of the discipline.

III. A. 1. What is the nature of the person?

I start here because the concept of the person is one of the cornerstones of the economics we seek to recast. The “rational person,” who coolly seeks to maximize his/her own interests and assumes everyone else does 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, though it has gained little success in changing mainstream thinking. This conception of the person is a mixture of rationality (as conceived during the Enlightenment) and the hedonism of thinkers like Bentham and Mill. It contains an individualistic notion of “the good,” where notions of compassion and empathy as well as community and connections have largely been stripped away and have been replaced by a self-interested consumer engaged in choosing under conditions of scarcity among alternative goods that satisfy personal preferences.

The embedded permeable person

Continued findings from evolutionary biology, cognitive science, quantum physics, and systems theory are suggesting different answers to the question of who humans are and what we can aspire to. Quantum physics, for example, provides a different conception of the human self than that found in neo-classical economics. Because events at the quantum level cannot be directly perceived by the human senses, we are not normally aware that all 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.”²¹

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 life forms that overlap with one another.²² We live in a world swarming with hitchhikers and symbiots like bacteria and viruses. Most of this activity is well below the level of consciousness. These systems influence and, at times, dictate our behavior. Among our truer identities is our immune system, identifying and re-identifying what is us and what is not us at every moment. 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—can change our course of action. We are relational and permeable with respect to energy and matter. We 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 emergent in, and entangled by, the brain/body/environment/culture/cosmos.²³ If we understood from “the beginning” that the human self is fully embedded, our policies with respect to toxins, for example, could be very different. We would not necessarily regard the world as something “out there” to be exploited, but rather, as part of who we are. How we think of the self in our culture has a tendency to block the understanding of our embeddedness in the physical world.

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 shaped by the institutions and cultural 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.”²⁴

To escape the lethal grip of the “market civilization” we need a fresh conception of the person which reflects both our ontological and cultural embeddedness.

The brain is a complex, adaptive system, and this is what makes it malleable. Many of the behavioral characteristics of human beings, whatever the source of their reinforcement, are enabled through the establishment of neurological pathways that become ingrained. The more the pathways are used in the present, the more they will be used in the future. The more these pathways 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.

III. A. 2. What do we know about what we know?

According to contemporary science, the idea of the world as certain and predictable is, at best, an approximation of reality. This view is a legacy of the Newtonian revolution and the recent European Enlightenment. But this view, which holds that the world is made up of quantifiable and stable parts has been modified by 19th and 20th century science that emphasizes relations and systems. Indeed, systems theory is now an established foundation for a scientific understanding of the Universe.

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. The universe itself is a complex adaptive system “ever advancing into novelty,” to use Whitehead’s phrase. Hence, 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 by causing perturbations in other changing and evolving systems. For example, international commitments to economic growth are destabilizing the climate system, even though the climate system is typically not part of mainstream economic discourse.

Knowledge is Approximate and Provisional

The human ability for abstract reasoning is one of our great adaptive capacities, 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. The more the map approaches the size and complexity of what it is trying to depict, the more accurate the depiction. Thus, an ideal map of Quebec

would be the size of Quebec itself, but then it would not be very useful. 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. Our sensory systems naturally edit out the blooming, buzzing confusion of the world; we operate through gestalts. And, the more those gestalts are mistaken, the more hazardous they are.

Is intelligence lethal? One thing we need to consider is the question of the adaptive advantage of intelligence. Noam Chomsky recently summarized Ernst Mayr's arguments on this question as follows:

. . . [what] he basically argued is that intelligence is a kind of lethal mutation. And he had a good argument. He pointed out that if you take a look at biological success, which is essentially measured by how many of us are there, the organisms that do quite well are those that mutate very quickly, like bacteria, or those that are stuck in a fixed ecological niche, like beetles. They do fine. And they may survive the environmental crisis. But as you go up the scale of what we call intelligence, they are less and less successful. By the time you get to mammals, there are very few of them as compared with, say, insects. By the time you get to humans, the origin of humans may be 100,000 years ago, there is a very small group. We are kind of misled now because there are a lot of humans around, but that's a matter of a few thousand years, which is meaningless from an evolutionary point of view.²⁵

From this perspective, what is remarkable about our intelligence is how it is both highly adaptive while at the same time quite stable. Humans are inventive creatures; new products, discoveries, scientific and technical insights pervade our age. But concurrently, we fail to examine the underlying assumptions of the emancipation project. We are insightful within it; but not about it. These inquiries are blocked in part because they touch on religion—contentious terrain, terrain that sparked the devastating religious wars in Europe of the 16th and 17th centuries. The result of these wars was that we disentangled religion from politics, a key to the subsequent success of liberal societies. But this was not without cost; for it allowed the development of superficial narratives—ungrounded in a sense of our place in the universe. In North America the task of taming the continent and improving our material circumstances took precedence. It seemed more desirable and safer to concentrate on technique (means) rather than to reflect on ends.²⁶ Our culture is profoundly and tragically allergic to any self-conscious metaphysics, and as a result has embraced a decadent materialism that now is undercutting life's prospects.

The Western philosophical project has not been self-correcting. This is not to say that in the late 19th and in the 20th century there were not philosophers who tried to exhibit the limits and dangers of the emancipation project. These

included Bergson, Schweitzer, and Whitehead; but they were marginalized as the less threatening narrow debate between the Kantians and utilitarians took center stage in ethics as well as social and political philosophy. Our challenge in these early days of the Anthropocene is to prove Mayr and Chomsky wrong; to show that intelligence can be self-correcting and highly adaptive. If we do not succeed, life's prospects will be dim indeed.

III. A. 3. What should we do and not do?

Contemporary sciences call into question one of the key ideas of economic and political liberalism: 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 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. Yet despite the pedigree of these two philosophers, the assumptions their ideas contain have become problematical as foundations for economic and political liberalism alike.

Locke's ideas about what one *thinks* is private have been transformed into the idea that one can live however one wants. And, in the tradition of Veblen, Clive Hamilton and others have noted that consumptive goods became key markers of social status in the 20th century. When we connect the foundational principles of political liberalism to the basic laws of chemistry and Earth systems science there are two distressing implications. First, in normal chemical reactions matter is neither created nor destroyed. This means that the carbon released when fuel is burned in, say, a Toronto traffic jam directly affects the interests of people and composition of ecosystems around the world. Second, the process of burning fuel inevitably creates waste heat, most of which is radiated into space causing a net decline in the stocks of useable energy on Earth.

We must see that how we *live* is **often unavoidably** harmful to others. There are *no actions that affect us alone*. The conceptual and moral underpinnings of economic and political liberalism were flawed *from the beginning*. We have no choice but to recognize that, as Thoreau articulates, “our whole life is startlingly moral. There is never an instant's truce between virtue and vice.”²⁷ It is critical that we interrogate the ideas of liberty and freedom.²⁸ What do they mean once we consider them in the context of a scientific understanding of the world? And what are their relationships to justice? In a world of limits, liberty may be legitimately exercised only if one is using only his/her fair share of low entropy sources and sinks. Properly understood, true liberty lives in a modest room *within* the

mansion of justice. Hence “justice” for us must be understood, as it was for Aristotle, as both a particular virtue and as one overarching concept that holds the rest of morality in balance.

III. B. Premises

Henceforth, one can see that ecological economics rests on at least three rather simple, interconnected premises. I call them premises because within the scientific paradigm they are self-evident.

Membership: *Escaping the undertow of the emancipation project*

The Western tradition has become globally hegemonic. It has also come to embrace 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. But from a scientific perspective, humans are fully embedded in and creatures of the world. The children of the universe are related to all Earthly life; like all life on this planet, humans have co-evolved with Earth itself. Recognition that we share heritage and destiny with all other people and all other life on this planet as well as the dependence of life on physical and chemical evolution must lead us to *expand the moral community*. The attitude of domination of the world and its peoples must be replaced with *respect and reciprocity toward all that is*. Humans are *members of, not masters over, life’s commonwealth*.²⁹ *It is the flourishing of all persons and the rest of life that matters.*

The alleged superiority of the West is a conceit that has legitimated slaughter, slavery, empire, the appropriation and liquation of precious sources of low entropy, and the filling of sinks locally and globally. The most recent manifestation of this pathology is the world economic system, underpinned by assassination, terror, and covert military operations.³⁰ All persons in all cultures and all generations have equal moral claims to flourishing, constrained and enhanced by the claims of other species for their place in the sun. We are not the chosen species, or the chosen people. This, if you like, is the new emancipation.

House-holding: *The idea of natural resources needs to be radically revised*

When humans see themselves as members of the natural community, the idea that Earth and life exist solely for our utility becomes absurd. The world is not a collection of sources for satisfying our desires; nor is it a place to dispose of the waste stream inevitably created by those satisfactions. Rather, it should be considered a commonwealth where all species interact with each other and the

planet's biophysical systems in a manner that facilitates the thriving of life. Ultimately, this thriving ought to continue on its metaphysical journey into novelty. *The idea of Earth as a collection of resources and waste receptacles must give way to that of Earth as life's household (oikos).*

Entropic Thrift: *Low entropy stocks and flows and the sinks for high entropy waste must be used judiciously and with respect*

Like all other far from equilibrium systems, life depends on low entropy—a fundamental good. Low entropy is the preservation of Earth's capacity to support flourishing human and natural communities—it makes all life possible. Broadly defined, energy is a fundamental good that underlies all other “goods.” It enables the far from equilibrium, autocatalytic living organisms to exist and thrive. This repositions the eminent philosopher John Rawls' concept of “primary goods” such as income, wealth, and opportunity to a secondary status since they all depend on energy. In ecological political economy, wasting that which makes life itself possible is a fundamental moral wrong.³¹ *Earth's limited capacity to construct and maintain far from equilibrium systems implies limits to legitimate human appropriation of energy and sinks. They must be conserved for future human generations and for the flourishing of life itself.*

Today there is considerable interest in the restoration of the commons spurred by Peter Barnes, Josh Farley, and many others. One way to think of successful common property systems such as described in Ostrom's *Governing the Commons*, is that they manifest a resting point, or temporary halt, perhaps lasting as long as millennia on the entropic highway. They keep their stocks and flows of low entropy sources in balance, and they avoid filling their sinks. They are masters at moderation.

III. C. Principles

Ecological economics has an implicit structure of concern.³² These are matters of: 1) scale or size of the economy relative to Earth's capacities, 2) fair distribution of these capacities, and 3) efficiency in allocation. These provide the foci for considerations of ethics within the paradigm.

Its principal insight is that the size or **scale** of the economy relative to Earth's biophysical systems must be explicitly addressed in formulating and implementing economic policy. This has at least two dimensions: 1) maintenance of the low entropy sources of life and 2) avoidance of filling sinks with more high entropy waste than they can process. The first, as emphasized by Nicholas Georgescu-Roegen, Herman Daly, and others in this tradition, is a fundamental concern; it entails the prudent use and restoration of low entropy stocks and flows. The second requires an acknowledgement, understanding, and respect for

the fact that nature has only limited capacity to process the high entropy waste stream produced by society. Hence the atmosphere can be overloaded with carbon dioxide, streams with phosphorous and nitrogen and the like. The failure to operate the economy within the “resilience limits” of Earth’s sources and sinks can bring about massive, even catastrophic, instability incompatible with life’s flourishing.

Though it is useful analytically to separate issues of scale, in practice this is quite misleading.³³ Transgressions of Earth’s resiliency limits are heavily dependent on purchasing power, or lack of it. The “well to do” 500 million or so are the main current contributors to climate change. These people are in continuous violation of the “golden rule.” The radically poor billions contribute very little, though poverty often stimulates local ecological degradation. In some countries, the wealthy have simply bought the political process and use their control to prevent desperately needed climate-related legislation and even discussion of the impending disaster.

A core concern within ecological economics is the idea of intergenerational **fairness**. One generation has no right to deplete the sources or fill the sinks required for the flourishing of future generations. Position in time is morally irrelevant. We have a duty to pass along a world that is at least as good as the one we found. In the contemporary scientific narrative, position in space is also morally irrelevant. All persons alive today are descendents of a small group of people; all of us share common DNA, the capacity for complex symbolic thinking—and consequent participation in cultural narratives; and in our time, we share a common, emerging, global narrative and, of course, a collective, and perhaps tragic, destiny. The cultures of the world and their physical circumstances have selected for different talents, skin color, customs, and the like. Insofar as our differences are a result of biological and cultural evolution, there is no evidence that one group is more deserving than another.

Within the evolutionary tradition, matters of **fair distribution** are best informed by the idea of flourishing. One could start in this direction with Amartya Sen’s work on capabilities and functionings.³⁴ Sen’s work is shaped by clear criticisms of the Western emancipation project that legitimated empire on the presumed basis of European superiority. But in two other closely connected respects he remains entangled in it: 1) the human-focused individualism of the neo-classical model and 2) an instrumentalist, arm’s length view of the natural world. Hence Sen nods in the right direction, but the reconstruction agenda of ecological economics requires a fundamental rethinking of fair distribution—the foundations of which lie beyond the purview of the emancipation project.

For example, with respect to climate change, Henry Shue has suggested there are four questions of justice: 1) Who pays the costs of avoiding future global warming? 2) Who pays the cost of making the adjustments to warming that is not, or cannot be, prevented? 3) What background conditions of wealth and power would make bargaining over 1 and 2 fair? and 4) What rights are there to future emissions within some cap designed to stabilize concentrations to avert runaway climate change (if such a course is still open to us).³⁵

The reconstruction agenda of ecological economics suggests that the analysis of questions of fair distribution must be rethought in a broader context. Words like “**who**,” “**pay**” and “**cost**” take on different meanings. Let’s begin with “**who**”: Within the evolutionary framework, in which ecological economics finds its home, there is no reason why only human flourishing should matter. Rather it is the flourishing of all of life that must be the principal moral concern of *economic* and other policy. Regardless of the distributive framework one accepts, the challenge tabled by ecological economics is that we must have an account of fair shares of Earth’s life support capacity for all the members of life’s commonwealth.

Ideas such as “**cost**” and “**pay**” must also be thought of in a broad context—a context that includes, but goes well beyond, money. Our understanding must be grounded in the use of Earth’s life support systems. A logical place to begin is with the use of low entropy sources, and the use of sinks—both in the present—but also in the past and in the future. There can be no question that peoples of the industrialized nations owe a huge climate debt to those in the “South.” In part, this debt can be paid in technology transfer and in part with money—but, in both cases, the postulate of “entropic thrift” must be front and center. If money transferred to Kenya to combat drought is derived from pumping and burning more fossil fuel, then we have defeated our purposes. The use of money for any purpose, including discharging of debt, must be done in a manner that is constrained by the limits of Earth’s life support systems and the obligation to protect and enhance a flourishing Earth.

Efficiency is a core concept in ecological economics—but it is nested. Efficiency in this discipline is more complex and quite diverse from the neo-classical conception. Once scale and distribution concerns have been met, a *highly* modified version of the neo-classical conception of efficiency comes into play. It is essential to see that “efficiency” is a derivative concept—typically depending on assumptions that are not explicit; but in all cases, it is something that is done in support of an end or objective. To be true to its objectives, ecological economics must reject a foundational idea of the neo-classical model—that efficiency is the maximization of individual preferences. Instead, efficiency is enacted by fostering and supporting persons with the virtues set out in section III. D. below and by maintaining, restoring, and enhancing the well-being of other

species and their enabling conditions. It is essential that we replace the current goal of constructing and motivating “consumers” to maximize consumption. Instead, the construction of ecological *citizens* must be a core goal of economic policy.

III. D. *Virtues*

The postulates and principles of ecological economics requires the cultivation of a new body of virtues. Here are some examples.

A. The ***courage*** required for a thorough re-grounding of the human project and prospect. We cannot rise to the challenge set out by ecological economics by simply extending vocabulary from the worldview we are trying to overturn, as for instance in the concepts of natural capital and ecosystem services. A rethink is required of the language, structures, practices, and guiding principles that inform our current system.

B. 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*, Jeremy Schmidt and I have called for a *compassionate retreat*—a concerted effort to reduce the human impact on Earth’s life and its life support systems.³⁶

C. A quest for ***atonement*** for what we have wrought in the domination of the natural world and our fellow humans. Ecological Economics argues that the human enterprise has grown too large. These measures all carry the same basic message—that there are limits to Earth’s life support systems, that we are approaching these limits, and that these limits are likely past their ability for self-renewal. We need to be prepared to respond to the collapse of whole systems (such as is currently underway in the oceans or with the destabilization of the climate system). *Life’s flourishing is in decline and the rate of deterioration is rapidly increasing*. Once we recognize that humans, like any other native life form, are in a reciprocal relationship with Earth, the duty to *help restore* the massive damage to Earth’s living system caused by our species comes into clear and central focus.³⁷ An ethics of atonement for our lack of respect and responsibility in the past must inform every action of the children of a new and re-grounded Enlightenment.

Yet, we must not fall back into the trap of over-managing and forcing complex human or natural systems—much of our current trouble is a result of this attitude. Rather we must enable the reconstruction of nature and societies and stand aside (often in awe) as they flourish afresh. The reconstruction agenda of ecological economics stands both in reference to, and apart from, the very idea that we

ought to have an *agenda* in the governance of complex systems. We cannot take our first ethical step upon presumed ideas about what we ought to do. Rather, it must emerge from an empirical understanding of our place in a broader community of life.

Atonement, in this case, is more like being a midwife than a surgeon. This can be achieved through activities such as re-greening the Emerald Planet. In the future, this will require radical reductions in human consumption in the so-called developed countries, increases in consumption in many places, and reductions in fertility virtually everywhere. Education of women and access to reproductive health services are key to advancing toward a humane lowering of the human population. Of course, not all cultures have the same debts to try to come to terms with, even remotely. The legacy of carbon emissions of the North is immense.

D. Treat all living beings justly and leave them a **fair share** so they may flourish. Marine protected areas, Ramsar sites, and the like are just small steps in this direction. The human enterprise should be structured to live interstitially with life's commonwealth. Pockets of this are already arising. For instance, the Chicago Wilderness Society works to preserve and integrate natural waterways and other ecosystems with the urban/suburban landscape of Chicago.

E. **Respect** all that is. As most or all of the world's religions recognize we should understand ourselves as citizens of the cosmos, as finite actors in an infinite narrative. We are custodians of a tiny fragment of this story. When we gratuitously alter Earth—for instance, to fuel the North American automobile and truck fleets—and its attendant land use patterns, we show disrespect for the sources of our being. On the other hand, when we tread lightly on Earth, with modest family sizes, low carbon footprints, and the like, we show respect.

The State of the Virtues is an economic indicator. In our culture, where the economy is the central and ubiquitous institution, virtues are a major force in the construction of self-identity and expression. Hence, one of the principal tests of an economy must be the kind of citizens it produces. A major goal must be the cultivation and maintenance of the aforementioned virtues. This point aligns well with Sen's perspective that a principal goal of economic policy is to enable human flourishings,³⁸ while at the same time respecting and enabling the flourishing of other species.

III. E. *Ethos*

The Western idea of “progress,” which arguably took firm root within the emancipation project about 500 years ago, informed our expectations that the future will be better in some way than the present. It formed the overarching idea of our culture (subject to many interpretations, to be sure). “Progress,” which

today tends to be understood as increased consumption by a massive human population, is now in the process of devouring its own possibility. The sustainability discourse that has become prominent since the Brundtland Report has revealed its impotence and can be thought of as only a timid step away from the dominance of this idea of progress and an accommodation to forces and worldviews that are perpetrating the crises in which we are entrapped. It is a quest for another ethos which has yet to find a footing and whose comforting rapprochement with the status quo wasted at least two decades.

Once we recognize the radical agenda of ecological economics, we are offered a different over-arching ethos. Its framing metaphor is “right relationship”—respect for and reciprocity with life’s commonwealth. This involves an end to slavery, an end to the tyranny of the market over humanity and nature alike, and the celebration of our citizenship in a universe ever evolving into novelty. In short, good house holding—or, better yet, Earth Citizenship.³⁹

Notes:

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2. A future worthy of the human community as a high expression and a mode of fulfillment of the earth's evolutionary process.
3. A future worthy of the generations that will succeed us.

Guided by the writings of Pierre Teilhard de Chardin, the Association seeks to bring an encompassing perspective to this great task of shaping the well-being of the Earth community at a time when so many disintegrating forces are at work. Teilhard's vision of the sequential evolution of the universe provides a firm and inspiring basis upon which to envision a sustainable future. This vision flows through his unified narrative of the evolutionary sequence of the emerging universe—the galaxies, the solar system, the Earth with its living forms, human history, and humanity's place in the evolving cosmos. This narrative from its origin to the human phenomenon can provide a firm and inspiring basis upon which to proceed. Now, for the first time, humanity is converging towards a new unity in diversity in shaping a multiform planetary civilization. To assist in this work, the Association, since its foundation in 1967, has sponsored annual conferences, lecture series, and a variety of publications.

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We might summarize our present human situation by the simple statement: In the 20th century, the glory of the human has become the desolation of the Earth. And now, the desolation of the Earth is becoming the destiny of the human. From here on, the primary judgment of all human institutions, professions, programs and activities will be determined by the extent to which they inhibit, ignore or foster a mutually enhancing human-Earth relationship.²⁹

—Thomas Berry