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Unlimited limits and the challenges of living in reciprocity with nature

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I object to the question on which this volume focuses. It assumes that biophysical limits are real and knowable rather than a human construct associated with a particular understanding of how natural systems might behave. Limits have been an extremely useful construct for critiquing the even simpler construct that assumes science and technology can provide unlimited economic growth. Nature, however, has zillions of limits that are crossed all of the time, and not only by people (Giorgos Kallis 2019). Nature is continually changing and reconstructing itself in response to zillions of events. The idea that people can affect nature and have it resiliently return to an historic equilibrium unless we affect it too much is a myth. Yes, nature reconstructs, but never completely, always moving to a new state with every provocation, whether by a weather event, bacterial evolution that resets the balance of larger species, or numerous other changes including those initiated by people. And the idea of limits makes little sense for stock resources which come in ever lower qualities, i.e., ever more tightly bound in the complex natural order.

The idea of limits assumes nature, or discrete components of nature, operate in an equilibrium state to which it returns aOer being perturbed. If the perturbation is too great, however, pushing the system beyond its limit, well, all hell breaks loose, we really cannot say. In this constructed framing, illustrated by a ball rolling about in a bowl, people obviously need to avoid perturbing nature too much, i.e., pushing the ball out of the bowl. To some extent, we seem to observe such phenomena in ecosystems. We may think of nature as being in equilibrium, or in a disturbed state from which it will recover, or having been pushed beyond recovery, but that is because of how we think, perhaps because of something ingrained in our consciousness. The ball is rolling out of the bowl all of the time, changes occur, but all hell does not break loose.

Ecosystems too are a human construct that has nearly defined the discipline of ecology. Yet the boundaries of any ecosystem being implied by one ecologist overlap with or fit within the ecosystems of other ecologists. How the multiply conceived ecosystems work together across scales and through time is not well addressed by the discipline. Yes, there are clear examples of people overfishing and destroying a fishery, but many changes occurred in the process that would have prevented their return to their previous state. And the state of the fishery would have changed over time regardless of human intervention.

I came to this heretical position as a friend of Herman Daly. In the 1970s, I asked him at what level should an economy be when in a steady state. He replied that this would be determined by scientists who understood the limits of the natural system. I was studying the economics of agricultural pest management, chemical and biological, at the time. I was rapidly learning evolutionary ecology, a

perspective on an always changing world. I was becoming aware that of the many ways that biologists think, only a few include a ball rolling around in a bowl. But the problem runs deeper. Most scientists over the past century worked with smaller and smaller fragments of reality. The few scientists who have strived for a more systemic view are still rapidly learning. Our understanding of the climate system is an existential example. With the tremendous increase in our understanding of the climate system over the past half century, climate scientists were still surprised by how much heat the oceans were absorbing. They were further surprised by how ocean currents and atmospheric jet streams responded and unleashed whiplash weather around the globe. These climate system surprises meant the efforts of economists to determine optimal mitigation and adaptation pathways were mere sophistry (Norgaard forthcoming).

Again, with respect to the climate crisis at hand, note that 1.5C is a goal, we know the consequences will be worse at 2C, and extremely difficult at 4C. But there is no limit at which all hell breaks loose. The consequences just get exponentially worse, we think. In the most systemic area of human understanding of the world in which we live, there are a zillion limits we have been crossing and can continue to cross. Just as surely if greenhouse gas emissions are not mitigated, the heat will eventually kill all people and most other species too.

I think we can further work with the biophysical limits framing as critique, but it is a very troublesome framing for actually "operating" an economy. How should we respond to the mess we are in? Of course, we should rapidly switch to renewable energy, eat less meat, farm with nature, and produce less plastic and pesticides. I am a firm believer in rapid, deep degrowth, preferably planned to assure justice, so that we can slow the pace at which people affect natural and social system change (Kallis et al 2020). I have no way of knowing, but I also sense that the global economy will crash, and many lives will be lost. While I avoid contemplating the possible tragedy ahead, I am fascinated by how people might recover from such a tragedy and live more sustainably in the future. Indeed, if we could foresee tenets that might sustain people in the future and start following them rather than modern economistic beliefs, we might temper the tragedy.

We are talking about new beliefs, not scientific breakthroughs. I do have hopes that human knowledge will become better synthesized and the processes of science more participatory and democratic. Knowledge needs to be much more widely shared to be effective, especially in tumultuous times. Even so, decisions, whether by individuals, corporations, or governments, are based on beliefs about reality and morality. Beliefs are necessary because human understanding of reality is fragmented with innumerable scientists knowing bits and pieces with no meta model to bring whole understanding. Moral philosophy is similarly inchoate. Christian beliefs guided what were publicly understood to be good decisions by Euromericans for centuries, but economic beliefs in individualism, property rights, materialism, markets with perfectly informed actors maximizing their own well-being, capitalism, and economic growth as human progress became dominant among Euromericans during the 20th century and were spread worldwide after WWII.

Economics has been predominantly a system of deductive logic built on assumptions politically supported by shared economistic beliefs. I am not denying that thousands of economists have kept very busy deducing what happens when one of these beliefs is replaced by something closer to reality. Behavioral economics has gently, empirically documented how most economic assumptions are wrong. I am not denying that there are multiple patterns of thinking and a rich diversity of knowledge among economists. But when more than one assumption is made more realistic, market logic and economic logics generally break down into an inconclusive morass of "if this, then that" statements that are to complex for policy making and ignored. To the extent economics influences public policy, it is

through the publicly shared beliefs that support economists' basic deductive logic. This is what holds the mainstream of the profession together. These beliefs also conveniently support the economy and the powerful interests they have created.

The challenge now is to envision new beliefs, new tenets, new ideology to support human provisioning to tame the foreseeable tragedy and sustain surviving people and other species as the global climate continues to rapidly and chaotically manifest new conditions for the next century or two. An ideology portends a utopia (Mannheim 1936). The neoliberal free- market capitalist utopia was a perfectly functioning global economy with perfectly informed capitalists, laborers, and consumers equating gains and losses at all possible margins while optimally growing through capitalists efficiently investing in scientific research and the development of new technologies along with their implementation. An essential supporting belief of this utopia, given the focus of this series of papers, was that the evolving complex natural order could be divided into parts and owned as property. The rights to use property, the mechanism through which we have defined how we interact with nature, were very difficult to tie down, let alone change to fit new understandings of nature.

It is difficult to conceive of a utopia in the midst of the unfolding climate disaster. Such a utopia needs to be dynamic and resilient. My utopia is a pluriverse of cultures engaging in alternative experiments with how to observe, learn from, and live reciprocally within a rapidly changing nature (Norgaard 1994, Escobar 2018). Cultures could learn from the experiments of others. The argument is as basic as the adage "don't put all of your eggs in one basket", but we have to imagine learning, thinking, experimenting eggs. Diverse traditional cultures have long been resiliently adapting to modernity without fully succumbing. Moderns can turn off the pressure, support the global diversity we have, and learn with it. But my argument has slipped from utopia to its possible ideology.

To support a global pluriverse, we need broad tenets within which different cultures can coevolve with their environment and with each other. The first tenet would be to respect cultural diversity. Respecting diversity is always a good idea once we dampen mechanistic efficiency thinking from our consciousness and admit evolutionary and coevolutionary understanding with selection for resiliency. The second tenet would be to respect nature as a system we are living within and of which we are a part. Indeed, just as modern people have held markets and growth as sacred, so might people begin to treat the complex, changing natural order as sacred. Modern economics assumed that humanity was being liberated from the whims of nature and that better science and new technologies would soon offset any problems that might arise. This belief has proven disastrously false. Furthermore, the scientific challenges of keeping up with nature's whims will be even greater with whiplash weather over the coming century or two (Norgaard, Wiens, et al 2021).

And this leads to my suggestion for a third tenet. Observing, discovering nature's awe, interpreting, and understanding nature should be widely shared. Similarly, many should be in tune with, interpreting and understanding how society is faring and helping assure that it is functioning effectively. For three hundred millennia, more than a thousand times longer than modernity, people lived as hunter-gatherers. Everyone was expected to understand their natural world and to report novel observations to the tribe as a whole. But now in a rapidly changing natural order, a fourth tenet to sustain this pluriverse. Anticipating a changing world and adapting rapidly, resiliently, and tentatively will be necessary in continually changing times.

People would also be adapting to changes suggested or mandated from different levels of government. Having this understanding as a part of human consciousness will help the process. Lastly, my fifth

tenet is that people's novels, poetry, visual arts, and music need to support their hopes to live reciprocally, embedded within the changing complex natural order.

Within this possible utopia, I foresee property rights changing frequently. Just as importantly, property rights holders would be obligated to understand and be responsible for upholding the common ecological and social good in their day-to-day decisions on the use of property (Barnes 2021, Hermann-Pilath 2023). Modern social philosophers stressed liberty, freedom from authority which the individual had not approved, and since universal approval was hard to imagine, a right to freedom could always be claimed. Similarly, modern natural philosophers and later scientists promised freedom from the whims of nature. Modern economists argued that property and markets provided such freedom, and arguments that include responsibilities of any kind, except the responsibility to maximize profits, are rare among economists. It is hardly surprising that capitalism reigns, the most irresponsible are the richest, and natural and social systems are disintegrating. In a sustainable provisioning system, people will be living embedded in society and nature and living in reciprocity with each of them. Such a system would entail people being responsible to both systems, not striving for freedom from them.

People's identities, their sense of living meaningful lives, would dramatically shift toward finding value in participating in the new learning, deliberating, adapting cultural systems.

Morality and reality, especially as the realities in which people live change, need to be at the forefront of living meaningful lives. Caring and cooperating must give meaning. Rugged individualism must become totally passe. At the same time, people do need to pay attention to their own condition so as to be able to help others. Being a trusted, helpful participant in the new learning and adapting system is where personal meaning should lie.

Now the issues complexly interlinked rattle in my mind. Yes, somehow a pluriverse would also need to include some level of global support for the western science that informs and assures mitigating climate change as well as how to live embedded in and in reciprocity with nature. Yes, markets would still be an important social system component even as polycentric collective action would become much more important than it is now. I have strayed far beyond the question posed for this volume. I hope to stimulate thinking and discussion on what I think are more appropriate though even more difficult questions concerning how future generations might be able to live while being embedded in an evolving natural order that our generations have disturbed.

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