MuseLetter

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MuseLetter #303 August by Richard Heinberg

This month's MuseLetter begins with a blog I wrote to coincide with the release of a new PCI video challenging the cultural story that technology can fix all of our problems. The next essay, "Are We Doomed? Let's Have a Conversation," is my response to a recent controversial essay in New York Magazine. Finally we circle back to cultural stories with my address to the National Convention of the Theosophical Society in America, revisiting one of my early books, 'A New Covenant with Nature'.

Climate Change Isn't Our Biggest Environmental Problem, and Why Technology Won't Save Us

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Our core ecological problem is not climate change. It is overshoot, of which global warming is a symptom. Overshoot is a systemic issue. Over the past century-and-a-half, enormous amounts of cheap energy from fossil fuels enabled the rapid growth of resource extraction, manufacturing, and consumption; and these in turn led to population increase, pollution, and loss of natural habitat and hence biodiversity. The human system expanded dramatically, overshooting Earth's long-term carrying capacity for humans while upsetting the ecological systems we depend on for our survival. Until we understand and address this systemic imbalance, symptomatic treatment (doing what we can to reverse pollution dilemmas like climate change, trying to save threatened species, and hoping to feed a burgeoning population with genetically modified crops) will constitute an endlessly frustrating round of stopgap measures that are ultimately destined to fail.

The ecology movement in the 1970s benefitted from a strong infusion of systems thinking, which was in vogue at the time (ecology—the study of the relationships between organisms and their environments—is an inherently systemic discipline, as opposed to studies like chemistry that focus on reducing complex phenomena to their components). As a result, many of the best environmental writers of the era framed the modern human predicament in terms that revealed the deep linkages between environmental symptoms and the way human society operates. *Limits to Growth* (1972), an outgrowth of the systems research of Jay Forrester, investigated the interactions between population growth, industrial production, food production, resource depletion, and pollution. *Overshoot* (1982), by

William Catton, named our systemic problem and described its origins and development in a style any literate person could appreciate. Many more excellent books from the era could be cited.

However, in recent decades, as climate change has come to dominate environmental concerns, there has been a significant shift in the discussion. Today, most environmental reporting is focused laser-like on climate change, and systemic links between it and other worsening ecological dilemmas (such as overpopulation, species extinctions, water and air pollution, and loss of topsoil and fresh water) are seldom highlighted. It's not that climate change isn't a big deal. As a symptom, it's a real doozy. There's never been anything quite like it, and climate scientists and climate-response advocacy groups are right to ring the loudest of alarm bells. But our failure to see climate change in context may be our undoing.

Why have environmental writers and advocacy organizations succumbed to tunnel vision? Perhaps it's simply that they assume systems thinking is beyond the capacity of policy makers. It's true: if climate scientists were to approach world leaders with the message, "We have to change everything, including our entire economic system —and fast," they might be shown the door rather rudely. A more acceptable message is, "We have identified a serious pollution problem, for which there are technical solutions." Perhaps many of the scientists who did recognize the systemic nature of our ecological crisis concluded that if we can successfully address this one make-or-break environmental crisis, we'll be able to buy time to deal with others waiting in the wings (overpopulation, species extinctions, resource depletion, and on and on).

If climate change can be framed as an isolated problem for which there is a technological solution, the minds of economists and policy makers can continue to graze in familiar pastures. Technology—in this case, solar, wind, and nuclear power generators, as well as batteries, electric cars, heat pumps, and, if all else fails, solar radiation management via atmospheric aerosols—centers our thinking on subjects like financial investment and industrial production. Discussion participants don't have to develop the ability to think systemically, nor do they need to understand the Earth system and how human systems fit into it. All they need trouble themselves with is the prospect of shifting some investments, setting tasks for engineers, and managing the resulting industrial-economic transformation so as to ensure that new jobs in green industries compensate for jobs lost in coal mines.

The strategy of buying time with a techno-fix presumes either that we will be able to institute systemic change at some unspecified point in the future even though we can't do it just now (a weak argument on its face), or that climate change and all of our other symptomatic crises will in fact be amenable to technological fixes. The latter thought-path is again a comfortable one for managers and investors. After all, everybody loves technology. It already does nearly everything for us. During the last century it solved a host of problems: it cured diseases, expanded food production, sped up transportation, and provided us with information and entertainment in quantities and varieties no one could previously have imagined. Why shouldn't it be able to solve climate change and all the rest of

our problems?

Of course, ignoring the systemic nature of our dilemma just means that as soon as we get one symptom corralled, another is likely to break loose. But, crucially, is climate change, taken as an isolated problem, fully treatable with technology? Color me doubtful. I say this having spent many months poring over the relevant data with David Fridley of the energy analysis program at Lawrence Berkeley National Laboratory. Our resulting book, *Our Renewable Future,* concluded that nuclear power is too expensive and risky; meanwhile, solar and wind power both suffer from intermittency, which (once these sources begin to provide a large percentage of total electrical power) will require a combination of three strategies on a grand scale: energy storage, redundant production capacity, and demand adaptation. At the same time, we in industrial nations will have to adapt most of our current energy usage (which occurs in industrial processes, building heating, and transportation) to electricity. Altogether, the energy transition promises to be an enormous undertaking, unprecedented in its requirements for investment and substitution. When David and I stepped back to assess the enormity of the task, we could see no way to maintain current quantities of global energy production during the transition, much less to increase energy supplies so as to power ongoing economic growth. The biggest transitional hurdle is scale: the world uses an enormous amount of energy currently; only if that quantity can be reduced significantly, especially in industrial nations, could we imagine a credible pathway toward a post-carbon future.

Downsizing the world's energy supplies would, effectively, also downsize industrial processes of resource extraction, manufacturing, transportation, and waste management. That's a systemic intervention, of exactly the kind called for by the ecologists of the 1970s who coined the mantra, "Reduce, reuse, and recycle." It gets to the heart of the overshoot dilemma—as does population stabilization and reduction, another necessary strategy. But it's also a notion to which technocrats, industrialists, and investors are virulently allergic.

The ecological argument is, at its core, a moral one—as I explain in more detail in a just-released manifesto replete with sidebars and graphics ("There's No App for That: Technology and Morality in the Age of Climate Change, Overpopulation, and Biodiversity Loss"). Any systems thinker who understands overshoot and prescribes powerdown as a treatment is effectively engaging in an intervention with an addictive behavior. Society is addicted to growth, and that's having terrible consequences for the planet and, increasingly, for us as well. We have to change our collective and individual behavior and give up something we depend on—power over our environment. We must restrain ourselves, like an alcoholic foreswearing booze. That requires honesty and soul-searching.

Hello Humanity, it's me, Technology. We need to talk.

In its early years the environmental movement made that moral argument, and it worked up to a point. Concern over rapid population growth led to family planning efforts around the world. Concern over biodiversity declines led to habitat protection. Concern over air and water pollution led to a slew of regulations. These efforts weren't sufficient, but they showed that framing our systemic problem in moral terms could get at least some traction.

Why didn't the environmental movement fully succeed? Some theorists now calling themselves "bright greens" or "eco-modernists" have abandoned the moral fight altogether. Their justification for doing so is that people want a vision of the future that's cheery and that doesn't require sacrifice. Now, they say, only a technological fix offers any hope. The essential point of this essay (and my manifesto) is simply that, even if the moral argument fails, a techno-fix won't work either. A gargantuan investment in technology (whether next-generation nuclear power or solar radiation geo-engineering) is being billed as our last hope. But in reality it's no hope at all.

The reason for the failure thus far of the environmental movement wasn't that it appealed to humanity's moral sentiments—that was in fact the movement's great strength. The effort fell short because it wasn't able to alter industrial society's central organizing principle, which is also its fatal flaw: its dogged pursuit of growth at all cost. Now we're at the point where we must finally either succeed in overcoming growthism or face the failure not just of the environmental movement, but of civilization itself.

The good news is that systemic change is fractal in nature: it implies, indeed it requires, action at every level of society. We can start with our own individual choices and behavior; we can work within our communities. We needn't wait for a cathartic global or national sea change. And even if our efforts cannot "save" consumerist industrial civilization, they could still succeed in planting the seeds of a regenerative human culture worthy of survival.

There's more good news: once we humans choose to restrain our numbers and our rates of consumption, *technology can assist our efforts*. Machines can help us monitor our progress, and there are

relatively simple technologies that can help deliver needed services with less energy usage and environmental damage. Some ways of deploying technology could even help us clean up the atmosphere and restore ecosystems.

But machines won't make the key choices that will set us on a sustainable path. Systemic change driven by moral awakening: it's not just our last hope; it's the only real hope we've ever had.

Are We Doomed? Let's Have a Conversation.

My most recent essay, in which I discussed a highly publicized controversy over the efficacy of plans for a comprehensive transition to an all-renewable energy future, garnered some strong responses. "If you are right," one Facebook commenter opined, "we are doomed. Fortunately you are not right." (The commenter didn't explain why.) What had I said to provoke an expectation of cataclysmic oblivion? Simply that there is probably no technically and financially feasible energy pathway to enable those of us in highly industrialized countries to maintain current levels of energy usage very far into the future.

My piece happened to be published right around the same time *New York Magazine* released a controversial article titled "The Uninhabitable Earth," in which author David Wallace Wells portrayed a dire future if the most pessimistic climate change models turn to reality. "It is, I promise, worse than you think," wrote Wells. "If your anxiety about global warming is dominated by fears of sea-level rise, you are barely scratching the surface of what terrors are possible, even within the lifetime of a teenager today." Wells's article drew rebukes from—of all people—climate scientists, who pointed out a few factual errors, but also insisted that scaring the public just doesn't help. "Importantly, fear does not motivate," responded Michael Mann with Susan Joy Hassol and Tom Toles, "and appealing to it is often counter-productive as it tends to distance people from the problem, leading them to disengage, doubt and even dismiss it."

It's true: apocalyptic warnings don't move most people. Or, rather, they move most people away from the source of discomfort, so they simply tune out. But it's also true that people feel a sense of deep, unacknowledged unease when they are fed "solutions" that they instinctively know are false or insufficient.

Others came to Wells's defense. Margaret Klein Salamon, a clinical psychologist and founder of the climate action group The Climate Mobilization, which advocates for starting a "World War II-scale" emergency mobilization to convert from fossil fuels, writes, "it is OK, indeed imperative, to tell the whole, frightening story. . . . [I]t's the job of those of us trying to protect humanity and restore a safe climate to tell the truth about the climate crisis and help people process and channel their own feelings—not to preemptively try to manage and constrain those feelings."

So: Are we doomed if we can't maintain current and growing energy levels? And are we doomed anyway due to now-inevitable impacts of climate change?

First, the good news. With regard to energy, we should keep in mind the fact that today's Americans use roughly twice as much per capita as their great-grandparents did in 1925. While people in that era enjoyed less mobility and fewer options for entertainment and communication than we do today, they nevertheless managed to survive and even thrive. And we now have the ability to provide many services (such as lighting) far more efficiently, so it should be possible to reduce per-capita energy usage dramatically while still maintaining a lifestyle that would be considered more than satisfactory by members of previous generations and by people in many parts of the world today. And reducing energy usage would make a whole raft of problems—climate change, resource depletion, the challenge of transitioning to renewable energy sources—much easier to solve.

The main good news with regard to climate change that I can point to (as I did in an essay posted in June) is that economically recoverable fossil fuel reserves are consistent only with lower-emissions climate change scenarios. As BP and other credible sources for coal, oil, and natural gas reserves figures show, and as more and more researchers are pointing out, the worst-case climate scenarios associated with "business as usual" levels of carbon emissions are in fact unrealistic.

Now, the bad news. While we could live perfectly well with less energy, that's not what the managers of our economy want. They want growth. Our entire economy is structured to require constant, compounded growth of GDP, and for all practical purposes raising the GDP means using more energy. While fringe economists and environmentalists have for years been proposing ways to back away from our growth addiction (for example, by using alternative economic indices such as Gross National Happiness), none of these proposals has been put into widespread effect. As things now stand, if growth falters the economy crashes.

There's bad climate news as well: even with current levels of atmospheric greenhouse gases, we're seeing unacceptable and worsening impacts—raging fires, soaring heat levels, and melting icecaps. And there are hints that self-reinforcing feedbacks maybe kicking in: an example is the release of large amounts of methane from thawing tundra and oceanic hydrates, which could lead to a short-term but steep spike in warming. Also, no one is sure if current metrics of climate sensitivity (used to estimate the response of the global climate system to a given level of forcing) are accurate, or whether the climate is actually more sensitive than we have assumed. There's some worrisome evidence the latter is case.

But let's step back a bit. If we're interested in signs of impending global crisis, there's no need to stop with just these two global challenges. The world is losing 25 billion tons of topsoil a year due to current industrial agricultural practices; if we don't deal with that issue, civilization will still crash even if we do manage to ace our energy and climate test. Humanity is also over-using fresh water: ancient aquifers are depleting, while other water sources are being polluted. If we don't deal with our water crisis, we still crash. Species are going extinct at a thousand times the pre-industrial rate; if we don't deal with the biodiversity dilemma, we still crash. Then there

are social and economic problems that could cause nations to crumble even if we manage to protect the environment; this threat category includes the menaces of over-reliance on debt and increasing economic inequality.

If we attack each of these problems piecemeal with technological fixes (for example, with desalination technology to solve the water crisis or geo-engineering to stabilize the climate) we may still crash because our techno-fixes are likely to have unintended consequences, as all technological interventions do. Anyway, the likelihood of successfully identifying and deploying all the needed fixes in time is vanishingly small.

Many problems are converging at once because society is a complex system, and the challenges we have been discussing are aspects of a systemic crisis. A useful way to frame an integrated understanding of the 21st century survival challenge is this: **we humans have overshot Earth's long-term carrying capacity for our species**. We've been able to do this due to a temporary subsidy of cheap, bountiful energy from fossil fuels, which enabled us to stretch nature's limits and to support a far larger overall population than would otherwise be possible. But now we are starting to see supply constraints for those fuels, just as the side effects of burning enormous amounts of coal, oil, and natural gas are also coming into view. Meanwhile, using cheap energy to expand resource-extractive and waste-generating economic processes is leading to biodiversity loss; the depletion of soil, water, and minerals; and environmental pollution of many kinds. Just decarbonizing energy, while necessary, doesn't adequately deal with systemic overshoot. Only a reduction of population and overall resource consumption, along with a rapid reduction in our reliance on fossil fuels and a redesign of industrial systems, can do that.

Economic inequality is a systemic problem too. As we've grown our economy, those who were in position to invest in industrial expansion or to loan money to others have reaped the majority of the rewards, while those who got by through selling their time and labor (or whose common cultural heritage was simply appropriated by industrialists) have fallen behind. There's no technological fix for inequality; dealing with it will require redesigning our economic system and redistributing wealth. Those in wealthy nations would, on average, have to adjust their living standards downward.

Now, can we do all of this without a crash? Probably not. Indeed, many economists would regard the medicine (population reduction, a decline in per-capita energy use, and economic redistribution) as worse than whatever aspects of the disease they are willing to acknowledge. Environmentalists and human rights advocates would disagree. Which is to say, there's really no way out. Whether we stick with business as usual, or attempt a dramatic multi-pronged intervention, our current "normal" way of life is toast.

Accepting that a crash is more or less inevitable is a big step, psychologically speaking. I call this *toxic knowledge*: one cannot "un-know" that the current world system hangs by a thread, and this understanding can lead to depression. In some ways, the systemic crisis we face is analogous to the individual existential crisis of life

and death, which we each have to confront eventually. Some willfully ignore their own mortality for as long as possible; others grasp at a belief in the afterlife. Still others seek to create meaning and purpose by making a positive difference in the lives of those around them with whatever time they have. Such efforts don't alter the inevitability of death; however, contributing to one's community appears to enhance well-being in many ways beyond that of merely prolonging life.

But is a crash the same as doom?

Not necessarily. Our best hope at this point would seem to be a controlled crash that enables partial recovery at a lower level of population and resource use, and that therefore doesn't lead to complete and utter oblivion (human extinction or close to it). Among those who understand the systemic nature of our problems, the controlled crash option is the subject of what may be the most interesting and important conversation that's taking place on the planet just now. But only informed people who have gotten over denial and self-delusion are part of it.

This discussion started in the 1970s, though I wasn't part of it then; I joined a couple of decades later. There is no formal membership; the conversation takes place through and among a patchwork of small organizations and scattered individuals. They don't all know each other and there is no secret handshake. Some have publicly adopted the stance that a global crash is inevitable; most soft-pedal that message on their organizational websites but are privately plenty worried. During the course of the conversation so far, two (not mutually exclusive) strategies have emerged.

The first strategy envisions convincing the managers and power holders of the world to invest in a no-regrets insurance plan. Some systems thinkers who understand our linked global crises are offering to come up with a back-pocket checklist for policy makers, for moments when financial or environmental crisis hits: how, under such circumstances, might the managerial elite be able to prevent, say, a stock market crash from triggering food, energy, and social crises as well? A set of back-up plans wouldn't require detailed knowledge of when or how crisis will erupt. It wouldn't even require much of a systemic understanding of global overshoot. It would simply require willingness on the part of societal power holders to agree that there are real or potential threats to global order, and to accept the offer of help. At the moment, those pursuing this strategy are working mostly covertly, for reasons that are not hard to discern.

The second strategy consists of working within communities to build more societal resilience from the ground up. It is easier to get traction with friends and neighbors than with global power holders, and it's within communities that political decisions are made closest to where the impact is felt. My own organization, Post Carbon Institute, has chosen to pursue this strategy via a series of books, the Community Resilience Guides; the "Think Resilience" video series; and our forthcoming compendium, *The Community Resilience Reader*. Rob Hopkins, who originated the Transition Towns movement, has been perhaps the most public, eloquent, and upbeat proponent of the local resilience strategy, but there are countless others scattered across the globe.

Somehow, the work of resilience building (whether top-down or bottom-up) must focus not just on maintaining supplies of food, water, energy, and other basic necessities, but also on sustaining social cohesion—a culture of understanding, tolerance, and inquiry— during times of great stress. While it's true that people tend to pull together in remarkable ways during wars and natural disasters, sustained hard times can lead to scapegoating and worse.

Most people are not party to the conversation, not aware that it is happening, and unaware even that such a conversation is warranted. Among those who are worried about the state of the world, most are content to pursue or support efforts to keep crises from occurring by working via political parties, religious organizations, or non-profit advocacy orgs on issues such as climate change, food security, and economic inequality. There is also a small but rapidly growing segment of society that feels disempowered as the era of economic growth wanes, and that views society's power holders as evil and corrupt. These dispossessed—whether followers of ISIS or Infowars— would prefer to "shake things up," even to the point of bringing society to destruction, rather than suffer the continuation of the status quo. Unfortunately, this last group may have the easiest path of all.

By comparison, the number of those involved in the conversation is exceedingly small, countable probably in the hundreds of thousands, certainly not millions. *Can we succeed?* It depends on how one defines "success"—as the ability to maintain, for a little longer, an inherently unsustainable global industrial system? Or as the practical reduction in likely suffering on the part of the survivors of the eventual crash? A related query one often hears after environmental lectures is, *Are we doing enough?* If "Enough" means "enough to avert a system crash," then the answer is no: it's unlikely that anyone can deliver that outcome now. The question should be, What *can* we do—not to save a way of life that is unsalvageable, but to make a difference to the people and other species in harm's way?

This is not a conversation about the long-term trajectory of human cultural evolution, though that's an interesting subject for speculation. Assuming there are survivors, what will human society look like following the crises ensuing from climate change and the end of fossil fuels and capitalism? David Fleming's *Surviving the Future* and John Michael Greer's *The Ecotechnic Future* offer useful thoughts in this regard. My own view is that it's hard for us to envision what comes next because our imaginations are bounded by the reality we have known. What awaits will likely be as far removed from from modern industrial urban life as Iron-Age agrarian empires were from hunting-and-gathering bands. We are approaching one of history's great discontinuities. The best we can do under the circumstances is to get our priorities and values straight (protect the vulnerable, preserve the best of what we have collectively achieved, and live a life that's worthy) and put one foot in front of the other.

The conversation I'm pointing to here is about fairly short-term actions. And it doesn't lend itself to building a big movement. For that, you need villains to blame and promises of revived national or tribal glory. For those engaged in the conversation, there's only hard work and the satisfaction of honestly facing our predicament with an

attitude of curiosity, engagement, and compassion. For us, threats of doom or promises of utopia are distractions or cop-outs.

Only those drawn to the conversation by temperament and education are likely to take it up. Advertising may not work. But having a few more hands on deck, and a few more resources to work with, can only help.

A New Covenant with Nature

All human societies exhibit beliefs and practices that could be called spiritual. However, these beliefs and practices vary widely. There are strong patterns in this variability that seem tied to society's basic economic underpinnings—whether people derive their sustenance from hunting and gathering, horticulture, or agriculture. Among agricultural societies variability seems tied to phases of urban development ("civilization.)" Today, have we reached a new and stable stage in societal evolution, or are we on the cusp of a shift as profound as any in human history? In this presentation of the 131st Summer National Convention of the Theosophical Society in America, Richard Heinberg explores the role of spirituality in that shift, and what changes in spirituality are likely to accompany the transition?