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*Thanks for your patience while I continue working on my book-in-progress. For a sneak preview of the ideas taking shape, see 'Power, the Acceleration of Cultural Evolution, and Our Best Hope for Survival', below. Also in this Museletter is 'Calling all Butterflies', a short piece I wrote on how chaos theory might give us hope in a world in crisis. Thanks for all of your support throughout the year, and I wish you and yours a happy solstice/holiday season.
Richard*

Power, the Acceleration of Cultural Evolution, and Our Best Hope for Survival

These days I'm deep in the process of writing a book on power—both physical power (humanity's power over nature) and social power (the power of some people over others). The book's first few chapters explore the historical process by which we developed our currently awesome powers, starting with control of fire, simple stone tools, and language. Once we had these, the pace of human empowerment picked up dramatically. We didn't have to wait for biological evolution to slowly deliver improved organs; cultural evolution could rapidly supply new ideas, behaviors, and tools—which often took the forms of *prosthetic* organs (such as clothing and weapons) that enabled us to take over habitat from other creatures.

While the pace of cultural evolution was much faster than that of biological evolution, major cultural innovations like the domestication of plants and animals, the creation of the first states, and the emergence of the earliest empires were still spaced thousands of years apart. However, our sudden access to the storable, portable, and concentrated energy of fossil fuels, starting roughly in the 19th century, sped up cultural evolution to the point where disruptive cultural innovations began to be separated by mere decades, sometimes just years.

One of the factors driving cultural evolution is the rebounding interaction of technology and language. Writing, the alphabet, printing, the telegraph, telephone, radio, television, internet, and social media have sped up and spatially expanded human interaction, giving us the ability to cooperate in ever larger groups, in effect granting us expanding power over space and time.

This Great Acceleration of cultural evolution is both a danger and an

opportunity. I'll explore the opportunity in a moment; meanwhile, the danger is easy to see: developments are occurring so fast that it's hard for many people to adapt to what is already happening in our world, much less to foresee or forestall the next disruptions. At the same time, we've set large processes in motion that are spiraling entirely out of our control—notably, the planetary feedbacks associated with climate change.

We humans are aggregating more power, and doing so more unequally across society, than in any previous period in history. Power is good; without it, we would be powerless. But it is possible to have too much of a good thing, and that's an apt way of describing the human predicament in the early 21st century.

The problem of too much power is not unique to humans, nor to this historical moment. Evolution has found many ways of preventing power from overrunning environmental limits, and human societies have evolved ways of reining in bullies and limiting extreme economic and social inequality. In my book, I propose a new bio-social principle in evolution—the Optimum Power Principle—to describe these pathways for curbing extreme power in the short run, so that total power over time can be maximized. However, strategies to avert the concentration of too much power, whether in nature or human society, are partial and imperfect. They can't entirely prevent occasional excesses.

The only real solutions to our current extinction-level dilemmas (the climate crisis, biodiversity loss, pervasive chemical pollution, resource depletion, increasing economic inequality leading to political dysfunction, population growth, and the availability of weapons of mass destruction) involve *giving up* power in various forms and to varying degrees: restraining our energy usage, reducing population, leaving giant tracts of land for biodiversity recovery, and banning nuclear weapons. Given the current benefits of power and the momentum of history, that is a difficult message for many people—especially, for powerful people—to hear. That's why advocates for this or that "solution" often take care to speak only of job creation and profit opportunities when discussing the costs and benefits of addressing our collective problems.

The strong likelihood is that we are headed toward what economists glibly call a "correction," though not just in stock market values but also in population, consumption levels, and biodiversity. If we hope to minimize the shock and casualties, we will need to mobilize cooperation and behavior change at a speed and scale that are unprecedented.

Fortunately (or unfortunately, depending on how you look at it) cultural evolution is now happening faster than ever. There's certainly no guarantee that it will work to our advantage: the internet and social media could easily create opportunities for extraordinary levels of cooperation, but along competing lines, thereby defeating any effort to build a unified coalition of humanity willing to check its power now so that it can sustain itself and the biosphere over a much longer period.

Nevertheless, the possibility now exists for rapid shifts in human

understanding and behavior—and such shifts are essential if we are to avert the worst impacts from our past and present actions and create future societies that live happily within natural limits. As I said above, our only way out of our predicament is to give up various forms of power, often to significant degrees. Humans are well acquainted with the problem of over-accumulation of power, and cultural evolution has supplied plenty of ways of solving it—from the ancient Australian Aboriginal tradition of not hunting the red kangaroo in its mating season, to trade unions and democracy, environmental regulations, and modern billionaires like Tom Steyer who say, “Please tax me.” Today’s local newspaper here in Santa Rosa, California, featured a story about crab fishermen on the Sonoma coast who are voluntarily [delaying their crabbing season](#) (thereby incurring a substantial financial loss) in order to protect migrating whales.

We humans have the innate capability to proactively reduce our own powers—and are often happy to do this, as long as we feel that the process of doing so is fair and that others are sacrificing too. That’s why rationing succeeded during World War II. This being the case, it makes sense for those of us with an ecological, systemic view of the human condition to communicate strategically about *why* so many crises are currently converging (too much power), and to investigate and promulgate ways to reduce energy and material consumption, as well as population, as fairly as possible. Maybe, if we’re on the side of nature and future generations, cultural evolution will give us a boost.

Calling All Butterflies

The butterfly effect is a feature of chaos theory, emerging from the work of meteorologist and mathematician Edward Lorenz. It’s usually defined as the sensitive dependence of deterministic nonlinear systems on initial conditions, such that a small change in an earlier state can result in large differences in a later state.

Lorenz cited the metaphorical example of the flapping wings of a butterfly possibly influencing the formation and path of a far-off tornado weeks later. The discovery of the effect came about as the result of running a weather model with and without seemingly inconsequential data rounding; the rounded data resulted in a significantly different result. Lorenz’s explanation of this effect caught the popular imagination, leading even to a motion picture titled “The Butterfly Effect” starring Ashton Kutcher (I wouldn’t recommend it).

As Peter Dizikes wrote in the [Boston Globe](#), pop culture mostly gets the butterfly effect wrong. We naturally want to run the tape backward to trace how each little event caused some later big event. But Lorenz used his butterfly metaphor to suggest that predictability is “inherently limited.” As Dizikes explains, this misuse of the idea “speaks to our larger expectation that the world should be comprehensible—that everything happens for a reason, and that we can pinpoint all those reasons, however small they may be. But nature itself defies this expectation.”

Of course, most of what we do in life is based on rational expectations of specific results. We pay for products and services, and lodge complaints when those products and services don’t meet

certain standards. We offer our labor to employers with the expectation of a wage or salary. But life isn't always rational. As Lorenz found, there are domains that are best described as chaotic, where predictions and expectations are often frustrated.

I'd argue that the realms of public opinion and policy formation are, at least in part, chaotic. Big money buys guaranteed results in elections and regulatory decisions—usually. But not always: occasionally, a small group, even a single individual, with few resources manages to decisively shift public perception, discussion, and action. The myriad possible examples include Joan of Arc, the Zapatistas, and Mohamed Bouazizi, [the Tunisian fruit vendor](#) who set off the Arab Spring by setting himself on fire after refusing to pay a bribe to the police.

Knowing that the connection, within chaotic systems, between action and consequence is tenuous and unpredictable, it makes perfect sense to act, at least sometimes, in ways that may seem irrational. Specifically, it makes sense to act on the basis of impulses like hope, love, creativity, and joy even when no result can be predicted.

From a rational standpoint, it may be clear that humanity is headed toward dire outcomes from climate change, resource depletion, species extinctions, pollution, too much debt, and too much inequality. And it appears the deck is stacked in favor of powerful groups and institutions that, for reasons of narrow and temporary self-interest, thwart actions that might relieve these crises. What could a [little nonprofit organization](#) do to change the outcome? Rationally speaking, not much. But if that organization is speaking an otherwise excluded truth, [who knows](#)? There's only one way to find out. Maybe the path of that tornado bearing down on us is less predetermined than we think.

Please help us avert the tornado by [donating](#) to support the work of Post Carbon Institute.