

TURNING THE ARROW

When shooting for progress, we need to have better aim.

As I write this, spring is busting out all over, and I can't help but feel philosophical about the rhythms of nature. The trees are budding, the perennials in the garden are shaking off their hibernal slumber, and a birdsong is awakening me a good thirty minutes before my alarm goes off.

Whereas the seasons are a cycle, a sequence of events and circumstances that repeat in a predictable way, other phenomena are more like arrows. They don't repeat so much as move in a direction—if not with a purpose, then at least with some sense of progression via a series of permanently altered states.

Elements of human society have this characteristic. Our mastery of the physical world is a result of the accumulation of insights into how the universe works. It is the cumulative nature of our collective knowledge that allows us to get better over time, rather than simply run laps. Every spring the crops start over from seeds, while if every time we wanted to launch a rocket we had to first replicate Galileo's apocryphal cannonball experi-



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ments off the Leaning Tower of Pisa, we'd never launch any rockets at all.

That the natural world should be one of cycles and the human world one of arrows has a certain satisfying asymmetry to it. Ecosystems are self-sustaining, making do with no external inputs, save (practically speaking) the inexhaustible supply of energy from the sun. On occasion, everything has come crashing down due to exogenous cataclysms, but the biosphere has never destroyed itself—*precisely because it is predicated on cycles*. Such a system is optimized for survival because it recycles (almost) perfectly. It doesn't grow; it merely changes. So there are no real "advances."

In contrast, humans have managed to get off the hamster wheel of cycle-based change by creating an "arrow" of progress defined not merely by survival but by our own values. These include relatively base "creature comforts" that show up in our ever-increasing consumption of material goods, as well as in the ability to live increasingly moral lives. It's easy to be overwhelmed by the misery and evil that are all too evident around us, but over the sweep of human history, there is solid evidence that we're learning and improving in ways that matter to us. In fact, there's a compelling case to be made that our material, scientific, and moral vectors of advancement are locked in a positive feedback loop. For instance, Ben Friedman, in his book *The Moral Consequences of Economic Growth*, shows how improvements in our material lives drive improvements in our value systems: Growth creates optimism for the future and a willingness to include others in our prosperity.

Even so, it's not difficult to find evocative descriptions of some dire futures for humanity. Global climate change, water shortages, the exhaustion of various natural resources, decreasing biodiversity, economic collapse, and overpopulation are only six horsemen in the cavalry of the apocalypse that some feel is bearing down on us.

There are those who find it tempting to dismiss this sort of "end of days" talk as merely the wild-eyed rantings of the Cassandras who come to prominence whenever times get tough. On the other hand, there is data that we should take seriously. For example, in 1970, the Club of Rome think tank sponsored a two-year research project to model the impact of continued economic development to the year 2100. The Club's simulations showed that growth in population and per-capita wealth would continue through about 2030, followed by a rapid and irreversible decline as we ran out of pretty much everything.

On one level, this view of things seems little more than a quantified version of the Malthusian stance that since population increases geometrically but resource production increases arithmetically, we'll eventually end up with more people than we can support. Malthus was, of course, famously wrong: We have not had to cope with mass starvation (most famines have typically been a consequence of poor decisions, not a lack of food) because we have increased our output in keeping with increases in demand.

Updates of the original Club of Rome study published in 1992 and 2002 argued that the data on population, resource

scarcity, and environmental degradation were all more or less in line with the trajectories modeled in 1972, despite the remarkable technological advances of the intervening thirty years. Perhaps Malthus was mistaken because he made an extrapolation based on an empirical claim (geometric increases in population vs. arithmetic increases in production), while the Club of Rome's projections have proved accurate because they rest their case on a philosophical one: When progress depends upon the use of oil, or wood, or chromium, or anything that is not renewed by photosynthesis at the rate of consumption, then we're doomed to overshoot and collapse.

Another way of looking at this kind of system-level observation is in terms of a key assumption about any system

resource base. There are serious arguments for this view in what's called the steady-state economy, a system based on actually *preventing* growth, never mind limiting it. It requires a set of incentives and structures that one of the founders of this movement, Herman Daly, summarizes as "mutual coercion, mutually agreed upon."

An arrow-based view will be sympathetic and even inspired by arguments developed by Ray Kurzweil in his 2005 book *The Singularity Is Near*. He posits a "law of accelerating returns," which implies that although the Club of Rome might have captured the last thirty years of lockstep exponential growth in production and consumption, those two curves have very different causal mechanisms and are about to diverge dramatically and for the better. Technology, according to Kurzweil, will soon allow humanity to transcend biology in a way that would ultimately reduce to near zero our net consumption of natural resources even as output continues to increase—in short, infinite productivity.

Commercial organizations are made of systems, as well—socioeconomic ones—that perhaps yield to this same type of cycle-versus-arrow analysis. Take, for instance, the well-described progression from freewheeling start-up to semi-structured midsized company to process-driven maturity (assuming you're lucky enough to make it that far). One view is that

this is an arrow: No company lives forever, large firms inevitably become sclerotic and die, and any attempt to reinvigorate them is unnatural life support that merely prolongs suffering and delays

the ascent of someone else's arrow. If you believe that, you might view the federal government's interventions on behalf of some companies as deeply misguided: The government shouldn't be trying to "save" these companies; at most, it should be seeking their soft landings.

On the other hand, if you think companies are—or at least can be—driven by an underlying cycle, then you'll have very different views. David Hurst, in his 1991 book *Crisis and Renewal*, explains how successful companies are blinded by success, which leads to crisis. Intriguingly, Hurst claims the crisis phase is a nearly inevitable component of the cycle of high-performing companies. Consequently, organizational crisis might no more be a pathology than a tree losing its leaves in autumn. If you sign up for this view of things, crisis is not the end but the beginning of renewal. So long as interventions in failing companies are aimed at progressing through stages of a cycle, they can be seen as accelerating in a potentially beneficial way an entirely natural course of things.

Now, a feature of cycles is that they end up where they started; indeed, for the steady-state economy folks, this is their signal virtue. Organizations subject to crisis and renewal, however, often end up in different places—some stronger, some weaker. In short, they have combined the cycle and the arrow and ended up with a *spiral*—some upward and some down the drain. A key, it seems, to getting on the one you want is accepting that very often you can't avoid any stage of the cycle. The mistakes and missteps that led to any current misery, had they been avoided, might have left you on a potentially unsustainable arrow. Sadly, we frequently can't change until we reach the limits of our current trajectory. But if we accept this fact, then, once there, permanent collapse need not be the inevitable outcome . . . if only we can turn the arrow into a cycle. ■



GROWTH CREATES OPTIMISM FOR THE FUTURE AND A WILLINGNESS TO INCLUDE OTHERS IN OUR PROSPERITY.

we care about: whether it is at its core a cycle or an arrow. If you sign up for a cycle-based view of things, cutting per-capita consumption is an unavoidable element of any response to a dwindling