

On Our Own Humanity Emerges into Adulthood

Humanity stands now at a juncture in its relationship with the earth. Ever before, the earth could provide humanity with all its material needs. It has been a fruitful source of space, air, food, and materials, and a welcome sink for our wastes. It is no longer so. By force of numbers we have overwhelmed the earth. But you know this.

My purpose in writing this essay is not to make the case that we have reached the tipping point, that the day of doom is at hand. Others have made that case; I would only be parroting their arguments. It is not my purpose to rouse you to action. Others are more passionate and elegant about it than I can hope to be. If you will not be swayed by them, I can hardly hope to sway you either. It is certainly not my purpose to offer specific solutions to the challenges we face. That vastly outstrips the ambitions of my wisdom. My purpose in this essay is to shape your perspective about the transition to come, to show you a way of looking at it that will engender the right attitude for doing what we must inevitably do.

We Can't Go Back From Here.

Some people may think that we should find a better balance with the earth by returning to an earlier lifeway. But you would not like that life. The most wretched bed you have ever slept in would have been a princely delight to someone from even two centuries ago. The fare at a two-star restaurant today would be finer cuisine than most of our ancestors had for a holiday feast. That nasty bout of flu that knocked you out for two whole weeks would be a minor inconvenience to those in earlier times who lived with constant pain, chronic illnesses, lifelong disabilities, and early death. Your grueling commute would be a luxurious interlude for a peasant who spent hours each day walking between fields, or a farmer who labored hard every moment the sun was in the sky, or the housewife who didn't go beyond her house and yard for months at a time. The most tedious, mindless, or inane television show today would be a heady delight to those who had no access to entertainment beyond what a circle of lifelong acquaintances could provide each other. Our comforts depend on our technologically intensive lifeway. Living the way our ancestors did means living without even the little comforts that are beneath our notice. If people were asked to give up such things or face the possible destruction of the planet, they'd probably take their chances with the planet.

Beyond that, the world cannot support six billion people living as they did before the industrial age. Nature is just not bountiful enough to support these inefficient lifeways. Only our hyper-efficient, technologically-intensive lifeway allows the planet to support such a large population. I defy anyone to describe a humane way to reduce the population to pre-industrial levels, perhaps ten percent of what it is today. It is just not realistic. We cannot go back.

It's About Energy, You Know.

Humanity's recent, spectacular progress in making our world comfortable is really about our use of energy. The industrial revolution, by definition, is the point at which humanity stopped relying on energy that came directly from life – trees for heat, and human and animal muscle for

motion – and began to exploit energy that had been stored in the earth eons ago – coal, petroleum, and natural gas. The availability of fossil energy radically changed our relationship with machines. Our machines couldn't really free people from physical labor until they had fossil fuels to run them. We have pictures, for example, of a Nineteenth Century combine pulled by a team of eight or twelve horses. It certainly would reduce the labor the farmer spent on the harvest, but it increased his labor on animal care. Someone still had to feed all those horses, even when they weren't pulling the combine. Someone still had to muck out their stalls, grow their fodder, and tend to their health. The power of falling water certainly allowed machines to reduce the labor of textile work, but there were only so many streams to dam. We needed fossil fuels before machines could be turned more widely to work that reduced labor.

Consider how much muscle work went into just keeping house in earlier times. Laundry, for example, was an all day task (hauling, scrubbing, wringing, rinsing, wringing, hanging, folding, and hauling), and ironing took most of another day. Now laundry takes a few minutes of muscle labor and modern fabrics have greatly reduced ironing. To provide family food, the housewife grew produce in the yard (tilling, planting, thinning, hoeing, pruning, tending, harvesting, composting, canning) and kept chickens in a coop (housing, feeding, protecting, collecting eggs, cleaning coops, butchering and plucking birds). Now we spend a few muscle-minutes a week selecting food from a grocery store. Baking the week's worth of bread took half a day. Now we buy it in a trice. The day-long effort of sweeping and scrubbing floors is replaced by an hour's waltz with a vacuum cleaner or floor scrubber.

Fossil energy freed humans from muscle work so they could work more with their brains. In the Nineteenth Century, a family with any pretensions to a middle class life required hirelings to help with the muscle labor that a decent life required. The family might have a cook and a housekeeper and perhaps a man to keep the stable and drive the carriage and another to tend the grounds. They would probably also use the services a laundress. The family would support the livelihood of three to five people with its income, so they couldn't pay any one very much. Wall plug energy has replaced a household staff. The workforce that would have been devoted to domestic work has moved from inefficient muscle labor to higher value work that machines could not do, especially craft and intellectual labor. As they created more value with their labor, they could be paid accordingly. When people engaged these more productive endeavors, they ignited a virtuous spiral of technology improvements that further reduced the need for muscle labor.

Today, even people who do the heaviest physical labor in a complex society are enormously assisted by fossil-fueled technology. Carpenters use pneumatic nailers and power saws on wood that has been cut to size in a mill and transported to them in a truck. Loggers use chain saws and cherry pickers. Every human endeavor in a complex society leverages energy to free people from routine muscle work so they can concentrate on doing those more valuable parts of the job that demand human intelligence, skill, and dexterity. And as they continually improve the technology to replace the lower-value parts of the human effort, society as a whole becomes more efficient, allowing us to sustain more people more comfortably. So it all begins with energy.

It Doesn't End With Energy, Though.

Our use of energy both demands more materials from the earth and helps us extract them. Our machines need iron and our electrical conductors need copper. Our devices also need great quantities of aluminum, tin, tungsten, titanium, lead, and chromium. Our thinking machines need high quality silicon, along with a number of esoteric minerals like gallium and arsenic. All this, the energy and the materials, we have taken gratuitously from the earth as we have needed it. All this the earth has given generously and without complaint.

And when our purpose for the energy and material was served, the earth took back our wastes. We could cast aside our effluent, our trash, and our scrap with little thought of it afterwards. And the earth took it all back without complaint.

We sculpted the earth to be a better and better home for humanity, as we were able to judge it. We used other species at our will, eliminating our competitors and predators, propagating our food species, and banishing those we could not accommodate. We tunneled through mountains, etched highways into hillsides, and bridged rivers with steel and concrete. We tilled up grassland, dammed and dredged rivers, dug canals and aqueducts, watered deserts, and drained swamps. We timbered forests and cleared scrubland. We drove pilings into soil and bedrock and river bottoms. And the earth bore it all without complaint.

This Goodly Frame, the Earth.

What a magnificent home we have built ourselves on the earth! It is comfortable. It is convenient. It allows us to live easily among a wealth of pleasures.

I do not think that we sinned in this. I do not think that our ancestors who lived in a better balance with nature were more virtuous than we are. They lived as they did because they were less capable than we are. I'm certain that, given a choice, they would gladly trade places with us. Animals are not somehow more virtuous than we, either. They too take from the earth what they can, leave their wastes as they please, and change the environment to suit their own needs. The beaver does not consider migrating fish when it builds its dams across their spawning pathways. A bark beetle will wreak havoc with a pine forest in order to sustain and propagate itself. A mosquito could care less whether its bite kills its victim after its meal is done. I would be very surprised if humans were the first species to drive another species to extinction. Any animal that had our power over nature would use nature for its purposes as we have.

The issue is not whether our ancestors or the animals are more virtuous than we are, but whether we can be more virtuous than they. They acted from their instincts. They did not understand the consequences of their behavior on the earth. The distant consequences of turning the earth to their needs have been too subtle to be discovered without the intellectual inheritance that is unique to modern humans.

Time to Grow Up.

When we humans lived as hunter-gatherers, we took from the earth as an unborn child does from its mother. We were intimate with the earth. Everything we had came to us as we needed it. The

earth breathed for us and ate for us. We eliminated our wastes into the earth's body and it processed them for us. We only took.

Agriculture was humanity's birth into self-reliance. We still lived in the abode of our earth parents. We learned by watching how we might feed, clothe, and shelter ourselves. We lived off the bounty they gave us and suffered when they withheld. In time, we learned to ask for more, and by asking properly, we were given what we needed.

Long before humanity came to be, our earth parents built a rich patrimony of energy but stored it away from our immature reach. Our inheritance also included broad spaces of land, a vast sink for our wastes, and materials for our use. When we entered our adolescence, the industrial age, we began to tap that inheritance. At first, we didn't have to work very hard to obtain this wealth. Coal sat naked on mountain faces. Oil gushed from holes in the ground. Rich, untamed land waited within easy reach. As we matured and our appetites sharpened, we had to work harder and harder to exploit our treasures. This inheritance subsidized us as we grew in knowledge and capability. Without it, we would not have had the ready resources we needed to construct the comfortable lifeway we now enjoy.

But our patrimony is about spent. For decades we had thought that we would run out of fuels first, but now we see that our sink, the atmosphere, is more finite than the source. We are also running out of ready sources of some vital minerals like copper and titanium. Soon we must leave behind the easy solution of living off our patrimony. We will have to make our way using what we already have in hand. All the materials the earth ever gave us are still around, though we must be more clever about reusing them. But the earth spent generously, even lavishly on our education. The complex society we have built with our patrimony has brought us exactly the knowledge we need to understand our effect on the earth at exactly the time when we stand to upset the balance beyond even humanity's ability to survive the changes. Our complex society brought us the knowledge we need to sustain ourselves without drawing on the depleted patrimony much longer.

Furthermore, this juncture comes at exactly the moment in human history when an enormous fraction of the earth's people is ready to embrace the technological lifeway that needs these resources. Those developing societies are the younger siblings of the advanced societies. We who matured first and had first access to our common inheritance now have a moral duty to use our knowledge to bring our younger siblings to the kind of comfortable maturity that we enjoy. I cannot – I *will* not imagine the conflict that would ensue if we deliberately tried to withhold this advancement from them for the sake of our own comfort.

Peace Unto This House

Now is our virtue to be tested. If we continue to act as amoral animals, nature will bring humanity back into balance with the environment, and nature will be brutal. If advanced societies use their advantage to selfishly withhold resources from developing societies for the sake of their own comfort, the envy of the poor will ignite such mayhem as the world has never yet known. I believe we are already seeing the harbingers of this in the activities of terrorists, incited to envious rage by the hardships and hopelessness they endure. But it is not realistic to

ask advanced societies to cease their progress or step backwards until the developing societies catch up. The Robin Hood solution will only incite defensiveness from the advanced societies. Instead, advanced societies must experiment with new ways of living without our patrimony.

This new virtue will ask those of us in developed societies to change our attitude toward consumption. A critical mass of us has now achieved about as much comfort and satisfaction from material goods as they have power to provide. More and richer food will only make us fatter. A larger wardrobe just wastefully fans our vanity. Bigger houses only collect dust at the expense of the environment. Furthermore, if we continue to pursue our happiness through consumption, price competition from us affluent people will drive the cost of sustenance beyond what capitalism can provide to less affluent people.

Instead of seeking our comfort and pleasures through ever more material goods, we should seek richer forms of happiness by cultivating a taste for refined rewards. We can preserve, restore, and enjoy nature. We can build friendships and cherish our families. We can stimulate our bodies with physical and athletic pursuits. We can cultivate a taste for artistry in all its forms. We can develop our minds with intellectual pursuits. And most especially, we can pursue the deep gratification that comes from service to others. Maturing beyond our thoughtless adolescence, for society as for individuals, means outgrowing our reckless pursuit of narrow pleasures.

It's About Education, You Know

The essential foundation for this new virtue is a broad and deep education that reaches every person. Our animal body brings us the instincts we need to pursue easy, physical pleasures through consumption. To move beyond the tyranny of our animal instincts, our minds must be purposely redirected through education. The education we will need for the future requires intensive instruction in the arts and sciences, along with serious physical education. We must also have a broad and deep understanding of our relationship to the natural world, to the past, to one another, and to the rest of humanity. Most of all, we must learn to learn, to love learning, and to convert learning into creative new endeavors that can improve our culture. Education will be to the future what fossil fuels has been to the industrial age: the fount of our wealth and continued development. There really is no alternative.

Advanced societies spent humanity's energy patrimony developing a store of knowledge to become humanity's working capital. That knowledge must now be put to use to continue humanity's development. Developing societies, even more than advanced ones, should take advantage of this knowledge to circumvent the developmental missteps made by their older siblings. The assumptions behind economic development have changed. Developing societies will need the knowledge capital built by advanced societies, along with their own virtuous wisdom, to move along the path of development in a way that will be sustainable in the long run. They should adapt the advances that have been made by developed countries.

For example, wall-plug energy in every structure will certainly be essential to any vision of a developed society. Advanced countries developed their power generation and distribution infrastructure around the riches of our fossil energy patrimony. We have centrally located power

generation stations burning fossil fuels and connected to structures by tons of copper. That was just the best way to provide power with the available technology, but it assumed we have an atmosphere to soak up our effluent and copper in abundance. Things have changed. Societies that are developing their infrastructure from scratch should leap frog that system and focus on distributed power generation from renewable sources, and high efficiency structures and devices.

Education should also allow developing countries to bypass the painful lessons advanced societies learned in how to structure their society. Chief among these are the rule of law, especially as it applies to official corruption. Almost as important is the empowering of people at every level to have a say in things that affect their well-being, especially the conditions of their employment. Thus, the moral agenda for developing countries should focus on building the physical and cultural infrastructure using the best practices achieved by developed countries.

It Doesn't End with Education, Though.

For education to be effective, people must be physically, mentally, and emotionally healthy. Too many people, even in advanced societies, cannot achieve the full potential of their education because they come to school with disabilities that interfere with learning. Effective health care tailored to the needs of the individual, including help with mental and emotional problems, is the essential foundation of the whole paradigm for progress in the Twenty-first Century. Without health care, education cannot be effective. Without education, advanced societies cannot retrain themselves away from the animal impulse for consumption. Unless advanced societies reduce their consumption, there will not be enough resources to allow developing countries their opportunity to consume their way to equivalent comfort. Without education, developing countries will fumble painfully through the obvious mistakes that will delay their development.

The most obvious and direct way advanced societies can continue the development of humanity is through research and development. An advanced society is not the best place to manufacture products that require low-skill labor. Indeed, this low-skilled work will allow our younger siblings to mature their own affluence, confidence, and self-reliance. Advanced societies are the ideal place to generate and develop new products with high-skill labor. Furthermore, new technologies tend to be expensive until their development costs are paid back and before the economies of scale kick in. Advanced societies are the right venue to adapt and refine new, expensive products. Once the price has come down, products can be brought into developing countries to propel them ahead. The last decades have shown how this works in the case of information technology and portable telephony.

Advanced societies must also experiment with ways to improve the intangible elements of human culture. In particular, we must evolve capitalism to the next level. Capitalism is unarguably the best economic system for creating wealth for all. The communist experiment showed that it is not realistic to try to cultivate personal and civic virtue for a more disinterested economic system. Yet capitalism in its present form depends upon easy access to our patrimony, so it must change. There is nothing to fear in this. Capitalism has evolved before, and for the better. Remember that in the Nineteenth Century, unregulated capitalism brought both enormous benefits and enormous harms. The Twentieth Century learned how to control its worst harms with government regulation, taxes, central banking, and collective bargaining, while at the same

time expanding the number who benefit from the system. But these techniques are only effective within a national context. Advanced societies in the Twenty-first Century must evolve capitalism to work in the international context as well as it does in the national context.

Ever Upward

Humanity is moving into a brand new phase, as different from what went before as the agricultural and industrial revolutions were. Some have called it the technology revolution, but this focuses on only the most superficial aspect of the change. The emergence of technology as a major force in daily life may actually be more of a coincidence than a driver of what is to come. Technology allowed world societies to achieve sufficient complexity to link every person on the globe together in a palpable way. But the next step involves a qualitative change in our attitudes towards ourselves, our fellow humans, and our environment.

In the next phase, personal virtue will not be enough. We must come together around new, collective imperatives that acknowledge our essential unity. This unity is no longer an abstract concept, as classic religionists have preached it. It is now tangible. What affects one part of the world community can and eventually will affect others. We must strive to identify and nurture the new virtues that humanity will need to work together, and to institutionalize those virtues within human cultures around the globe.

At humanity's beginning, we existed in a benign and dependent balance within the womb of the earth. This balance was sustainable but not particularly comfortable. Seeking greater comforts beyond the womb upset the balance, but in maturing, we gained the knowledge for a productive adulthood. We are now in a position to return to a benign balance with the earth. In doing so, we do not so much close a circle as ascend the first twist of a spiral. In this new balance, we are both less dependent on the earth's bounty and vastly more comfortable.