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This month's Museletter begins with "Deadly Optimism, Useful Pessimism," which warns against the former and shows how the latter could help us find a path towards realistic alternatives. The second article, "Will civilization collapse because it's running out of oil?," summarizes an important new research paper by peak oil debate veterans Jean Laherrère, Charles Hall, and Roger Bentley.

Deadly Optimism, Useful Pessimism

Humanity is hurtling into an era of ecosystem breakdown and social collapse. Most people will understandably respond with horror, gloom, and hostility. But these reactions will just make matters worse. What's really needed is a realistic sense of what's possible, and a dogged determination to heal division, protect nature and culture, and build sustainable alternatives to our current fossil fuel-based, centralized industrial support systems. Psychologists have a name for this attitude—defensive pessimism, which we'll explore below. What we *don't* need is uncritical optimism, which contributed to our current mess.

The Era of Deadly Optimism

Most people's brains have soaked for decades in a marinade of rosy expectations. Since the 1950s, forecasts for the human future could be summarized by the adjectives *more*, *bigger*, and *faster*. Our political leaders and cultural icons encouraged us to think that more human problems (including disease and poverty) will be solved with each passing year; that we will unravel the mysteries of biology, astronomy, and other scientific fields; that we will access limitless new energy sources; and that technology-derived comfort, convenience, and connectivity will increase and become available to more people.

This pervasive optimism was based on the actual experience of much of humanity, which saw wonders unfold throughout the 20th century (though a large number of people were not invited to the feast; indeed, their lives, labor, and resources were part of the menu). New technologies, from farm tractors to computers, gave humans the ability to do lots of things more quickly and easily—and to do things that were previously unimaginable, like bouncing laser beams off the surface of the Moon to precisely measure its distance from Earth, or [putting a motor](#) inside your ice cream cone so you don't have to keep turning it by hand. Hundreds of millions of new jobs sprang up in thousands of new occupational fields. Scientists sequenced the human

genome and gathered data from the fringes of the universe. Lifespans increased. Wages for most workers rose, enabling them to buy more stuff. And many businesses enjoyed decade after decade of brimming profits, with owners of stocks and bonds happily coming along for the joyride.

Optimism was a self-reinforcing feedback: the system delivered more, people came to expect more, so the system was primed to deliver still more. The result was continued economic growth, with the global economy doubling in size every two or three decades.

This always-accelerating conveyor belt of industrial production and disposal depended not just on the increased availability of energy and materials, but also on rising expectations. Optimism greased the wheels of commerce, with society operating as an optimism-generating machine.

Tipping into Pessimism

Of course, there was a downside to fossil-fueled, optimism-propelled growth. Exponentially increasing humanity's resource extraction, industrial production, and waste dumping resulted in far more pollution of the environment. The most insidious form of pollution turned out to be greenhouse gases (released from the burning of fossil fuels), which are now undermining climate stability and throwing into doubt the survival not only of human civilization, but also that of millions of other species. At the same time, these activities steadily depleted resources—both renewable ones, like fish, forests, and freshwater, and nonrenewable ones, like metal ores and fossil fuels themselves. Even the minerals needed to replace fossil fuels with alternative energy sources like solar panels and wind turbines are depleting quickly, limiting the long-term prospects for “green growth.” Industrial expansion also crowded out wild nature, with populations of mammals, birds, reptiles, amphibians, and insects [declining by two-thirds, on average](#), during the past half-century. At the same time, economic inequality increased to grotesque extremes.

News about these worrisome developments has tended to trickle out to the general public in occasional, disconnected stories to which only a minority pay much attention. Nevertheless, the accumulating weight of scientific studies and news reports, in addition to the lived experience of increasing numbers of people who've been forced to flee wildfires and floods or to endure famines, is leading to a gradual but widespread shift in attitude.

In short, it is becoming apparent to a rapidly growing portion of the global populace—though perhaps not yet a majority—that expectations of perpetually having more cannot continue to be met. The price of 70 years of unconsidered optimism is coming due.

Now the human world is flipping to a status where most things will be continually getting worse. Housing and food are becoming less affordable. Institutions are becoming less stable and functional. Not only are natural disasters becoming more frequent and severe, but recovery from them is more problematic. Supply chains are less reliable. Authoritarianism is on the rise. The economic playing field is increasingly tipped in favor of those already wealthy. Political polarization is spiking, and the ability of governments to solve problems is waning.

All of these trends are serious enough. But for people who study underlying system dynamics, concern runs even deeper. Many scientists believe that impacts of climate change have been [underestimated](#) by officials. The world's oceans, which supply half of Earth's oxygen, appear to be [dying](#). A third of the planet's farmable topsoil is [already gone](#) due to industrial agriculture, and, in a business-as-usual scenario, the rest will disappear in just [50 years](#). Fossil fuels are depleting rapidly, but alternative energy sources [will not be capable](#) of replacing them at our current scale of energy usage. We live, after all, on a finite planet.

It takes a while for the weight of all this information to sink in. For many people in the prime of life or older, optimism still reigns. Indeed, it is easy to cite examples of futurists and think tanks still pumping out [childishly imaginative, limit-free visions](#) of what humanity will achieve in the remainder of this century. But surveys say that [more than two thirds](#) of Americans believe today's children will be financially worse off than their parents. And, according to another [recent poll](#), roughly half of 10,000 people aged 16 to 25 surveyed across ten countries think that humanity is doomed; three quarters of the group surveyed agree that “the future is frightening.”

In China, the [bai lan](#) or “let it rot” movement is spreading among young people. The slang term was coined to reflect a sense of doom and despondency. Chinese urban unemployment for people aged 16 to 25 is running at over 18 percent, and millions who have trouble finding jobs are simply shelving long-term plans and staying home watching TV. The future is hopeless, so why bother?

But time wasted in binge watching is hardly the worst possible outcome from optimism's reversal. A growing sense of [nihilism](#) among young people worldwide has in some cases contributed to [alt-right movements](#) that are bent on authoritarianism, misogyny, and race baiting. If optimism supercharged humanity's euphoric wave of expansion in recent decades, rising pessimism could accelerate all the disintegrative trends—environmental, political, economic, and social—that we may face in the coming decades.

The Psychology of Hope and Gloom

At the same time as we are cresting last century's wave of giddy optimism and beginning our descent, psychologists are learning more about how personal frames of mind shape our actions, health, and daily experience.

In [clinical studies](#), it's been found that having a positive outlook on life is associated with 35 percent lower rates of heart disease and 14 percent reduced rates of early death. Optimists also have better coping skills and tend to engage in healthier behaviors (diet, exercise, etc.).

Some psychologists believe a cheerful outlook is also an evolutionary advantage. According to [terror management theory](#), once humans developed language and a consciousness of death, they tended to become vulnerable to psychological paralysis, knowing that personal oblivion could come at any moment. The belief in an afterlife may have emerged as an adaptation that enabled people to engage in everyday activities less burdened by their awareness of mortality. Today, billions of people believe that when they die they will be reunited with loved ones and will enjoy an eternity of bliss. The

fact that these beliefs have spread and persisted in the absence of physical evidence to support them suggests they meet some deep personal need.

Meanwhile, even though pessimism may lower your life expectancy, it turns out to have its own [slate of advantages](#). A certain type of pessimism, which experts call [defensive pessimism](#), is linked to the ability to make more accurate predictions and to better assess risks and threats. Defensive pessimists don't just have a gloomy outlook; they've learned to harness negative thinking to improve their coping and adaptive skills through goal orientation. They think and plan more carefully than others. The motivating ideal of the defensive pessimist might be stated as "respecting limits and living well within them."

However, there is also a more familiar kind of pessimism, characterized by the tendency not only to expect the worst, but to give up trying to improve one's life conditions and instead to blame oneself or others for unwanted outcomes. This kind of pessimism can be demoralizing, dispiriting, and even enraging. People who frame the world this way tend to [experience](#) more isolation, greater conflict and stress, poorer health, and reduced well-being.

One could argue that defensive pessimism isn't pessimism at all, but something more akin to realism—a wise middle ground between two positions that are both ultimately cop-outs to responding rationally and usefully to what transpires. But for the moment let's stick with the terminology that psychologists are using.

Swimming Against the Tide

If the late 20th century was an era filled with technological wonders and dominated by optimism, the remainder of the current century, featuring threats and disappointments galore, will likely be characterized by pervasive pessimism. But pessimism of what kind?

Clearly, a pessimism of paralysis and blame will just make matters even worse. Humanity will face challenges enough from rising seas, broken supply chains, and failing food systems. If people's willingness to sacrifice and work together for the common good erodes as well, then the grimmest of dystopian nightmares may await us. What will it take for individuals and communities to survive the coming era—psychologically, socially, and physically? Only an obdurate defensive pessimism will help.

Humans are herd animals often subject to excess. So, as a member of the herd, if you want to contribute to society's long-term stability, or even if you just want to have a balanced, insightful view of the world, it's often helpful to be willing to swim against the tide. However, bucking the herd is seldom easy, and risks social isolation and loss of income or status.

In the era of optimism, some of the most socially relevant and prophetic voices were those providing a counterbalance to unrealistic expectations by pointing out the absurdity of perpetual growth and the costs of ongoing industrial expansion. Examples include economist Herman Daly, who pioneered the idea that a non-growing or "[steady state](#)" economy could better serve human needs while reducing environmental impacts; the [Rodale Institute](#) and [permaculture](#) networks, which pointed out the downsides of

industrial agriculture and promoted ecologically sound alternatives; philosopher [Ivan Illich](#), who promoted communitarian “tools for conviviality” and low-tech alternatives to modern industrialized medicine and mass compulsory education; [Vandana Shiva](#), [Helena Norberg Hodge](#), and many others who promoted Indigenous people’s control over land, livelihoods, and culture; Jerry Mander and colleagues at the [International Forum on Globalization](#), who critiqued corporate-led globalization; and the tens of thousands of aid workers in countries around the world who strove to [reduce population growth](#) by promoting family planning and women’s empowerment.

As we enter the age of consequences, a similar counterbalance is needed. The antidote to destructive pessimism isn’t a bigger dose of unrealistic optimism (though many people and [organizations](#) are still trying to convince us that exponential population and consumption growth will work out just fine in the end). Indeed, more and more people are resorting to rage, fatalism, nihilism, and escapism precisely because what they are actually experiencing is so incongruent with the dominant cultural narrative of progress and abundance. Instead, the most helpful attitude from here on will be a refusal to accept the inevitability of the very worst outcomes. It is a stubborn insistence on imagining alternatives to growth and working hard to realize them—while acknowledging that most of our existing technological and social structures were designed during the era of expansion and will likely fail under conditions that are now emerging. Italian philosopher Antonio Gramsci (1891-1937) may have put it most succinctly in his motto, “pessimism of the intellect, optimism of the will.”

Consider again the *bai lan* movement mentioned above. What might happen if a substantial proportion of the discouraged Chinese young people now staring at screens started working together to build resilience in their local communities? Of course, the fact that China is an authoritarian, top-down society may militate against such grassroots efforts. But that doesn’t make the task impossible; it merely means it may be easier elsewhere.

During the 20th century, human life support systems (food, health care, building construction, transportation, and manufacturing) came to be dominated by giant, centralized infrastructure projects led and funded by governments, banks, and corporations. This century, as those centralized systems fail due to lack of energy, broken supply chains, and the consequences of climate change, new grassroots social structures will need to spring up to meet basic community needs. In a recent journal article, [“Pedagogy of agency and action, powers of 10, and fractal entanglement: Radical means for rapid societal transformation toward survivability and justice,”](#) authors Mark McCaffrey and Jean Boucher argue that “decentralized, community-based meso-scale efforts to mitigate and adapt to global change provide a practical ‘sweet spot’ between an individual human being and all humanity, between a person and the planet.” This research confirms the observation that helped energize the [Transition Initiatives](#) over a decade ago: local community-scale action has the best chance of breaking through national and global gridlock to address human needs in a time of ecosystem loss and institutional failure.

So, what would community-based defensive pessimists actually do? Here are just a few examples:

- [Carbon farming](#), which builds topsoil while capturing and storing atmospheric CO₂
- [Low tech](#)—the revival of past, and often forgotten, technologies as a ways to cope under conditions of more expensive and less abundant energy
- Mutual support networks like [Via Campesina](#), the international peasants’ movement representing millions of poor farmers worldwide
- Ecosystem protection and restoration led by [Indigenous peoples](#)
- The visionary work of [Doug and Kris Tompkins](#) to buy large tracts of land and set it aside for ecosystem restoration and recovery
- Energy rationing systems—such as [tradable energy quotas](#), pioneered by the late British economist David Fleming
- [Transition engineering](#), as explored by Susan Krumdieck and colleagues
- Building (or rebuilding) strong neighborhood networks so that people can support each other in times of need (and have some fun in other times).

If all this sounds a bit like what the critics of technological over-optimism were promoting back in the 20th century, there are reasons for that—as well as multiple links of inspiration and connection. What was sustainable then is sustainable now. But the terrain is shifting beneath our feet. Increasingly, we are not just swimming against a tide of centralized industrialism, but are forced to find ways to replace systems as they crash. Our tasks are therefore of greater urgency. On the other hand, however, human energy is likely to be freed up by the collapse of optimism. Young people are desperate to have a future, and millions could be recruited to alternatives-building efforts if the options were made clear to them.

A couple of big things are needed to facilitate the process. One is a political environment where autonomous small-group action is still possible (this means somehow staving off far-right authoritarianism wherever possible). The second is a systematic transfer of resources, primarily land and money, from the retiring generation, who benefitted most from growth, toward organizations of young people, who will be saddled with growth’s consequences. Defensive pessimists—hey, that’s a terrible label for recruiting purposes; let’s just call ourselves resilience builders—are unlikely to become the majority in the years and decades ahead, just as those who questioned growth were a neglected minority during the century of over-optimism. But resilience builders may end up making the crucial difference between survivable hard times and utter human failure.

Will civilization collapse because it’s running out of oil?

Will civilization collapse because it’s running out of oil? That question was debated hotly almost 20 years ago; today, not so much. Judging by Google searches, interest in “peak oil” surged around 2003 (the year my book [The Party’s Over](#) was published), peaked around 2005, and drifted until around 2010 before dropping off dramatically.

Well, civilization hasn’t imploded for lack of fuel—not yet, at least. Instead, oil has gotten more expensive and economic growth has slowed. “[Tight oil](#)”

produced in the US with fracking technology came to the rescue, sort of. For a little while. This oil was costlier to extract than conventional oil, and production from individual wells declined rapidly, thus entailing one hell of a lot of drilling. During the past decade, frackers went deeply into debt as they poked tens of thousands of holes into Texas, North Dakota, and a few other states, sending US oil production soaring. Central banks helped out by keeping interest rates ultra-low and by injecting trillions of dollars into the economy. National petroleum output went up farther and faster than had ever happened anywhere before in the history of the oil industry.

Most environmentalists therefore tossed peak oil into their mental bin of “things we don’t need to worry about” as they focused laser-like on climate change. Mainstream energy analysts then and now assume that technology will continue to overcome resource limits in the immediate future, which is all that really seems to matter. Much of what is left of the peak oil discussion focuses on “peak demand”—i.e., the question of when electric cars will become so plentiful that we’ll no longer need so much gasoline.

Nevertheless, those who’ve engaged with the oil depletion literature have tended to come away with a few useful insights:

- Energy is the basis of all aspects of human society.
- Fossil fuels enabled a dramatic expansion of energy usable by humanity, in turn enabling unprecedented growth in human population, economic activity, and material consumption.
- It takes energy to get energy, and the ratio of energy returned versus energy spent (energy return on investment, or EROI) has historically been extremely high for fossil fuels, as compared to previous energy sources.
- Similar EROI values will be necessary for energy alternatives if we wish to maintain our complex, industrial way of life.
- Depletion is as important a factor as pollution in assessing the sustainability of society.

Now a new research paper has arrived on the scene, authored by Jean Laherrère, Charles Hall, and Roger Bentley—all veterans of the peak oil debate, and all experts with many papers and books to their credit. As its title suggests (“[How Much Oil Remains for the World to Produce? Comparing Assessment Methods, and Separating Fact from Fiction](#)”), the paper mainly addresses the question of future oil production. But to get there, it explains why this is a difficult question to answer, and what are the best ways of approaching it. There are plenty of technical issues to geek out on, if that’s your thing. For example, energy analytics firm Rystad recently [downgraded world oil reserves](#) by about 9 percent (from 1,903 to 1,725 billion barrels), but the authors of the new research paper suggest that reserves estimates should be cut by a further 300 billion barrels due to long-standing over-reporting by OPEC countries. That’s a matter for debate, and readers will have to make up their own minds whether the authors make a convincing case.

For readers who just want the bottom line, here goes. The most sensible figure for the aggregate amount of producible “conventional oil” originally in place (what we’ve already burned, plus what could be burned in the future) is about 2,500 billion barrels. We’ve already extracted about half that amount.

When this total quantity is plotted as a logistical curve over time, the peak of production occurs essentially now, give or take a very few years. Indeed, conventional oil started a production plateau in 2005 and is now declining. Conventional oil is essentially oil that can be extracted using traditional [drilling](#) methods and that can flow at surface temperature and pressure conditions naturally. If oil is defined more broadly to include unconventional sources like tight oil, tar sands, and extra-heavy oil, then possible future production volumes increase, but the likely peak doesn't move very far forward in time. Production of tight oil can still grow in the Permian play in Texas and New Mexico, but will likely be falling by the end of the decade. Extra-heavy oil from Venezuela and tar sands from Canada won't make much difference because they require a lot of energy for processing (i.e., their EROI is low); indeed, it's unclear whether much of Venezuela's enormous claimed Orinoco reserves will ever be extracted.

Of course, logistical curves are just ways of using math to describe trends, and trends can change. Will the decline of global oil production be gradual and smooth, like the mathematically generated curves in these experts' charts? That depends partly on whether countries dramatically reduce fossil fuel usage in order to stave off catastrophic climate change. If the world gets serious about limiting global warming, then the downside of the curve can be made steeper through policies like carbon taxes. Keeping most of the remaining oil in the ground will be a task of urgency and complexity, one that cannot be accomplished under a business-as-usual growth economy. We'll need energy for the energy transition (to build solar panels, wind turbines, batteries, heat pumps, electric cars, mass transit, etc.), and most of that energy, at least in the early stages of the transition, will have to come from fossil fuels. If oil, the most important of those fuels, will be supply-constrained, that adds to the complexity of managing investment and policy so as to minimize economic pain while pursuing long-range climate goals.

As a side issue, the authors note ([as have others](#)) that IPCC estimates of future carbon emissions under its business-as-usual scenario are unrealistic. We just don't have enough economically extractable fossil fuels to make that worst-case scenario come true. However, even assuming a significant downgrade of reserves (and thus of projected emissions), burning all of the oil we have would greatly exceed emissions targets for averting climate catastrophe.

One factor potentially limiting future oil production not discussed in the new paper has to do with debt. Many observers of the past 15 years of fracking frenzy have pointed out that the industry's ability to increase levels of oil production has depended on low interest rates, which enabled companies to produce oil now and pay the bills later. Now central banks are raising interest rates in an effort to fight inflation, which is largely the result of higher oil and gas prices. But hiking interest rates will only discourage oil companies from drilling. This could potentially trigger a self-reinforcing feedback loop of crashing production, soaring energy prices, higher interest rates, and debt defaults, which would likely cease only with a major economic crash. So, instead of a gentle energy descent, we might get what Ugo Bardi calls a "[Seneca Cliff](#)."

So far, we are merely seeing crude and natural gas shortages, high energy prices, broken supply chains, and political upheaval. Energy challenges are

now top of mind for policymakers and the public in a way that we haven't seen since oil prices hit a record \$147 barrel in 2008, when peak oil received some semblance of attention. But now we run the risk of underlying, irreversible supply constraints being lost in the noise of other, more immediate contributors to the supply and price shocks the world is experiencing—namely lingering effects from the pandemic, the war in Ukraine and sanctions on Russian oil and gas, and far stricter demands for returns from domestic investors.

Keeping the situation from devolving further will take more than just another fracking revolution, which bought us an extra decade of business-as-usual. This time, we're going to have to start coming to terms with nature's limits. That means shared sacrifice, cooperation, and belt tightening. It also means reckoning with our definitions of prosperity and progress, and getting down to the work of reconfiguring an economy that has become accustomed to (and all too comfortable with) fossil-fueled growth.