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The coronavirus has turned our world upside down, I and I've spent the last month reading and writing about it. This month's MuseLetter consists of three of my recent articles on the pandemic. There's more to read daily from other authors at www.resilience.org. Inform yourself and stay well!

Coronavirus, economic networks, and social fabric

The COVID-19 pandemic offers intriguing insights into how networked our modern world has become, and how we've traded resilience for economic efficiency. Case in point: someone gets sick in China in December of 2019, and by March of 2020 the US shale oil industry is teetering on the brink. What's the chain of connection?

- January 2020: The coronavirus epidemic explodes, forcing China to institute a massive quarantine.
- Chinese oil demand craters as a result of hundreds of millions staying home and untold numbers of businesses going offline.
- March 7: Saudi Arabia asks its OPEC partners and Russia to cut oil output to keep prices from crashing.
- March 9: Russia refuses, so the Saudis decide to provoke a price war by producing even more oil and selling it at a discount.
- As a result, world oil prices fall from \$50 (Feb. 17) to \$33 (March 9).
- Meanwhile it is arguably the US, not Russia, that will be hurt most by the price war. As the world's largest oil producer, the US has seen nearly all of its spectacular production growth in recent years coming from light, tight oil produced by fracking. But fracking is expensive; even when prices were higher, the fracking industry struggled to turn a profit on this unconventional petroleum source.
- With an oil price heading toward \$30 or possibly even lower, not even the most efficient fracking companies with the very best acreage can make investors happy. So, dozens of domestic US oil producers are set to go bust (unless the Trump administration bails them out).

What set off this unraveling? It was China's deliberate—and arguably necessary—pull-back from economic connectivity. This tells us something useful about networked systems: unless there is a lot of redundancy built into them, any one node in the network can affect others. If it's an important node (China has become the center of world manufacturing), it can disrupt the entire system. What would redundancy actually mean? If we made more of our products locally, we wouldn't have to depend so much on China. If we

produced more of our energy locally, then our energy system would probably include more redundancy (by way of more types of energy sources), and the world energy economy would be more resilient as a result. Problems would still arise, but they would be less likely to affect the whole system.

So, redundancy is important. However, redundancy is the enemy of economic efficiency. Over the past few decades, economic engineers have created just-in-time supply chains in order to minimize warehousing costs, and have lengthened supply chains in order to access the cheapest labor and materials. Fine—everybody got cheaper products, and China has grown its economy at a blistering pace. But what happens when everybody suddenly needs an N95 facemask while international supply lines are down? Officials can't just call up the local facemask factory and order a new batch; that factory likely closed years ago.

That's just one of the ways in which the coronavirus pandemic presents a daunting challenge to our globally networked economy—while our networked economy also complicates efforts to slow the spread of the virus. When you start to take more networks into account, the picture becomes daunting indeed. What happens to the tourism industry if millions are quarantined and nobody wants to be in close quarters with lots of strangers? How about the airlines? The restaurant and hotel chains? Even a few weeks of dramatically reduced business could be critical to their survival.

Hence government leaders and the masters of the financial universe—the central bankers—are huddling daily to try to figure out how to keep what is currently (in the US) merely a stock market blowout from turning into a serious economic depression. Unfortunately, the tools at their disposal may not be up to the job. That's because the core problem (the pandemic) is not financial in nature. Around 70 percent of the US economy is driven directly by consumer spending. But putting money into people's pockets through lower interest rates or government spending won't make them suddenly decide to go on a cruise, book a flight, or even go out on Friday night to dinner and a movie.

But that's not what concerns me most these days. Instead, it's the social dimension of the coronavirus epidemic. Financial crises are inevitable in an economy that prioritizes the rapid growth of shareholder value and the profits of the investment class. Even more they are inevitable in an economy based on a fundamentally flawed understanding of reality—the implicit assumption that growth in resource extraction, manufacturing, and waste dumping can continue indefinitely on a finite planet. Many ecological thinkers have been making that point for years. But the response to this intrinsic vulnerability that makes the most sense, and the one my colleagues and I have been recommending, is to strengthen community resilience. That means supporting local farmers, manufacturers, merchants, arts groups, and civic organizations of all kinds. Trust is the currency that will enable us to weather the storms ahead, and trust is built largely through face-to-face interaction within communities.

However, the necessary response to the novel coronavirus is social distancing—i.e., reducing face-to-face human connectivity. As people voluntarily retreat from public gatherings, or are forced to do so by regional quarantines, severe impacts are bound to be felt by faith communities and local arts

organizations, as well as local restaurants, farmers markets, and merchants. Sporting events and concerts are being canceled, and the public's direct engagement with local and national politics is suffering as well. Public transit systems are emptying.

We need to be thinking of ways to keep civic connections alive for the next while. The pandemic will not last indefinitely: the virus itself may be here for good, but one way or another it and humanity will negotiate some sort of biological accommodation. Most likely, humans will achieve herd immunity, perhaps aided by vaccines. Our urgent task is to keep our communities healthy and resilient in the interim.

Of course, we still have the internet and social media. We should make the most of them, even though in "normal" times these often distract us from face-to-face interaction or reduce our social skills. For the time being, we can use these tools to keep up not just with the news, but with all the people we care about. I've even heard of innovative communitarians setting up Zoom conferences with their neighbors so they can stay in "touch." Unfortunately, there's no app yet that can show up at a farmers market, admire the produce, talk about the weather, and bring home a basket of fresh veggies.

Humor can help with emotionally processing difficult information (though its use can be tricky, as many people's emotions are raw these days). There's a lot to process—and not just fears of getting COVID-19 or of seeing a 401k disappear. Will we have to cancel our vacation? Should I go to my yoga class or stay home? How can I make ends meet if I can't work for the next few weeks due to quarantines? How much should we disrupt our routines? Should my company be doing more to protect employees and customers? These questions and more are stoking interpersonal tensions between spouses, between parents and children, between co-workers, and between employers and employees. Normalcy bias and denial can lead to complacency when action is needed, while panic can lead to poor choices and the dismissal of one's genuine concerns by friends and colleagues. One solution is to engage friends, neighbors, co-workers, and family in conversations about the virus, actively listen to their concerns, and gently steer those conversations in a prosocial direction that takes into account the seriousness of the situation and our need to change behavior. Ironically, the most pro-social behavior at the moment is to stay home. Meanwhile, make commonsense preparations: stock up on enough supplies to get you through a month without going out, and think about what you'll do.

Remember: humanity has survived epidemics much worse than this one. My wife Janet just passed along this historical tidbit: it seems that early in William Shakespeare's career as an actor and writer, London theaters were closed by order of the Privy Council (June 23, 1592), which was concerned about a plague outbreak and the possibility of civil unrest. But the theaters reopened in June 1594 and Shakespeare went on to write his most famous plays. Like Will, we'll get through this.

Connections will be strained in the coming weeks—some of them interpersonal and local, some economic and global. It's up to us to nourish the connections that are most essential, while finding backups for those that can no longer be relied on. What do we need and value most? How can we support one another? These are the sorts of questions we might ask ourselves

in the days ahead—and we may have plenty of time on our hands at home to contemplate them.

Like Previous Pandemics, COVID-19 Will Shape the Fates of Nations

For the last couple of weeks, I've been delving back into one of my favorite books, "Plagues and Peoples," by the celebrated historian William H. McNeill. Its relevance to today's headlines is fairly obvious. What makes the book so compelling is McNeill's ecological sensibility: He understands human beings as biological organisms embedded in living systems. For him, conquerors like Genghis Khan are macropredators, disease organisms are micropredators, and human history is the tale of how both have shaped population levels and relative degrees of social power.

In his discussion of the role of diseases in the political developments of 18th-century Europe, McNeill makes this remarkable observation:

[T]he rise of Great Britain in comparison with France in the course of the eighteenth century depended, among other things, on the remarkable population growth that set in earlier and continued longer in Britain than in France. Political institutions, the distribution of coal and iron ore, social structures, values, and individual inventiveness all played a role in defining the over-all result: but in light of what can now be said about the retreat of plague, malaria, and other infectious diseases from the English countryside, together with England's head start in the deliberate control of smallpox, it seems clear enough that divergent disease experiences in the two countries had much to do with their divergent population histories.

McNeill goes on to cite England's successful management of infectious disease as one of the critical developments of 18th century history, fostering the rise of the British Empire and thereby reshaping the world order, from the Americas to Asia. He also attributes the rise of "enlightened" philosophical and social world views during this period at least partly to the development of scientific methods of disease suppression.

All of which leads me to contemplate the current coronavirus pandemic in the context of history, and to propose a simple thesis: The ways that nations respond to the pandemic today will largely determine their fortunes and fates over the next couple of decades at least, and perhaps beyond. Nations that are more successful at controlling the disease and minimizing fatalities will enjoy more social cohesion, while those that delay active measures to control its spread will see greater social stress, and a crippling of public faith in leaders and institutions.

Of course, nations that already enjoy high levels of social cohesion and sound leadership are better positioned to successfully contain the pandemic. Thus, the coronavirus may end up simply being a magnifier of trends already in progress. If it is true, as [some have argued](#), that the United States is an [empire in decline](#), the virus may simply speed up the erosion of its global influence. And if some Asian nations seem destined for a [more prominent place](#) in international politics and commerce, the pandemic could propel them to that

position even faster.

As for economic impacts, there may be no way to avoid extreme and enduring damage to markets and supply chains. Delaying containment measures in order to maintain business as usual would likely lead to overwhelmed health care systems and, in turn, higher death rates. Fear of contagion would then likely cause disruptions of trade and commerce at least as severe as those triggered by the proactive lockdown measures that have already been enacted in some of the countries furthest along in the pandemic cycle — notably China, whose economic activity seems to have [shrunk](#) remarkably in the past two months. One way or another, we seem to be in for a global [depression](#). But, as with the pandemic, the ability of nations to weather hard economic times may depend largely on factors of leadership and social cohesion.

It's already apparent that clear government messaging, widespread testing, and early lockdowns in countries like [Taiwan](#) have worked to curtail the outbreak and foster widespread compliance with government recommendations. Compare this with President Trump's sometimes dismissive and often counterfactual comments about the pandemic, the U.S. government's failure to roll out a robust testing program, and its lagging effort at containment. Of course, U.S. politics were already highly polarized, thus complicating the task of coordinating a coherent large-scale response by local, state, and federal governments. But crucial missteps early in the cycle may eventually lead to even more divisiveness, as the economic and social tensions resulting from mounting casualties and months of lockdown erode the patience of a restive public.

Boris Johnson's recent, now countermanded [strategy](#) of allowing the virus to spread in U.K. so as to develop "herd immunity" contrasts strongly with his nation's historic successes in minimizing disease three centuries ago. While inoculation against smallpox began as a folk remedy in Arabia, North Africa, Persia, and India sometime in the distant past, [Mary Wortley Montagu](#)'s introduction of the practice to England — after witnessing it in Turkey in 1717 — led to its general adoption throughout Europe. In that instance, efforts in Britain to control disease resulted not just in the saving of lives, but in enhanced general trust in the nascent scientific method. In contrast, Johnson's zigzagging coronavirus messaging has thus far sown only confusion.

We shall see. Trends are still developing, we're still early in the pandemic cycle, and there is still time for strategies to shift. In any case, the events that are unfolding now will likely prove to be historically decisive.

This article was originally published on [Undark](#). Read the [original article](#).

How Does Pandemic Change the Big Picture?

As of 2019, the Big Picture for humanity was approximately as follows. *Homo sapiens* (that's us), a big-brained bipedal mammal, had spent the Pleistocene epoch (from 2.5 million years ago until 12,000 years ago) developing its ability to control fire, talk, paint pictures, play bone flutes, and make tools and clothes. Language dramatically enhanced our sociality and helped enable us to invade and inhabit every continent except Antarctica.

During the Holocene epoch (the last 12,000 years), we started living in permanent settlements, developed agriculture, and built state societies with kings, slavery, economic inequality, full-time division of labor, money, religions, and armies. The Anthropocene epoch (more of a brief interlude, really) dawned only a couple of centuries ago as we humans started using fossil fuels, which empowered us dramatically to grow our population and per capita consumption rates, mechanize production and transport, and basically dominate the entire planet. The mechanization of agriculture, by making the landed peasantry redundant, led to mass urbanization and quickly pumped up the size of the middle class. However, the use of fossil fuels destabilized the global climate, while also vastly increasing existing problems like pollution, resource depletion, and the destruction of habitat for most wild creatures. In addition, over the past few decades we learned how to use debt to transfer consumption from the future to the present, based on the risky assumption that the economy will continue to grow forever, thereby enabling future generations to pay for the lifestyle we enjoy now.

In short, the Big Picture was one of ever-increasing power and peril. Suddenly it has changed. A pattern of furious economic growth, consistent over many decades since the dawn of the Anthropocene (with only occasional interruptions, primarily consisting of the Great Depression and two World Wars), has slammed precipitously into the wall of pandemic (un)preparedness. In an effort to limit mortality from the novel coronavirus, governments around the world have put their economies into a state of suspended animation, telling most workers to stay home and to avoid direct contact with others.

How is this development impacting trends that were already underway? Will future generations look back on the coronavirus pandemic as a blip or a game changer? Let's review a few of the major trends that developed during the Anthropocene and engage in a little informed speculation about how they might be affected by the COVID-19 outbreak.

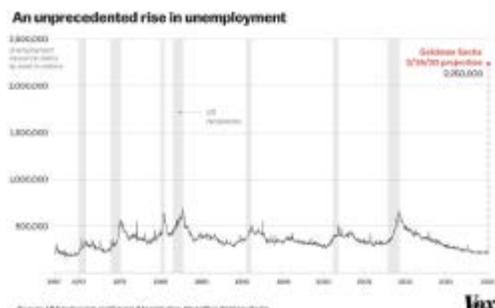
Climate change: In [China](#), lockdowns of workers and closures of companies have led to a dramatic reduction in greenhouse gas emissions. Over the coming weeks, emissions for the world as a whole could fall by ten percent or more. Note to climate warriors: don't cheer too loudly; folks who are out of work won't appreciate gloating greenies.

The world's response to the coronavirus undermines the argument that governments cannot reduce carbon emissions because doing so would hurt their economies. Clearly, national leaders felt that the more immediate (though, in the larger scheme of things, much less significant) threat of pandemic justified shutting down commerce. Climate activists should now feel emboldened to make the following case: If economic degrowth is what it takes to preserve a habitable biosphere, then world leaders can and must find fair and humane ways to reduce society's scale of energy usage, resource extraction, manufacturing, and waste dumping—all of which contribute to climate change.

However, the pandemic is [not good news](#) for the transition to renewable energy. Supply chains for solar and wind companies have been disrupted, and demand for new installations is down. And with super-cheap oil and gas in the offing (see "Resource Depletion," below), market forces are likely to

hinder rather than help both the renewables industry and the shift to electric cars.

Economic inequality: For the gig economy, and for people living paycheck to paycheck (which includes up to [74 percent](#) of Americans earning hourly wages), the coronavirus lockdown is a catastrophe. Over the short term, existing economic inequalities will result in highly unequal levels of sacrifice and suffering. It may be relatively easy for low-wage workers to rationalize a mandated week or two at home as a forced vacation, but if tens of millions of Americans with no savings experience several months without income, regional social stresses could build to the breaking point. That's one reason government officials are talking about cash handouts.



[Link to original VOX article with chart](#)

Over the longer term, recent absurd levels of inequality could get seriously snipped. In his book *The Great Leveler*, historian Walter Scheidel argues that, in the past, economic inequality has been reversed most dramatically by what he calls the “Four Horsemen”—mass mobilization for warfare, transformative revolution, state collapse, and plague. Currently many governments are undertaking economic re-allocation efforts equivalent in scale to those seen in the World Wars. For example, Denmark is paying 75 percent of wages (for salaries up to ~\$50k/year) for companies that would otherwise have to lay off workers, for a period of three months. This not only enables quarantined workers to survive, but allows them to stay on the payroll and not have to go through a rehiring process later.

Thus, the current pandemic might arguably qualify as two of Scheidel's Horsemen (mass mobilization and plague). The investor class is witnessing capital destruction at a prodigious rate and scale, while government efforts at maintaining civility and social well-being may entail providing a safety net for those with the least. Of course, this isn't the way social justice advocates envisioned reining in inequality, but the result may end up being equivalent to another New Deal, and [possibly even a Green New Deal](#).

Biodiversity loss: The novel coronavirus pandemic almost certainly began in wild animal markets in Wuhan, China. As Carl Safina put it in a [recent article](#), “Humans caused the pandemic by putting the world's animals into a cruel blender and drinking that smoothie.” While there have been other zoonotic epidemics in recent years, including HIV, the Marburg virus, SARS, and the 2009 H1N1 “swine flu” pandemic, the global coronavirus outbreak could provide a teachable moment, when wildlife conservation organizations can call successfully for an international moratorium on the trade or sale of any non-domesticated animal species (with zoos providing a highly regulated exception).

Otherwise, don't expect much of a change in the overall declining trend in the numbers of insects, reptiles, amphibians, and wild birds and mammals with which we share this little planet.

Overpopulation: A few cynical millennials have called the novel coronavirus the "[Boomer Remover](#)" due to its tendency to attack the elderly with greatest virulence. Because humanity has recently been adding 80 million new members per year (births minus deaths), an erasure of one year's net growth in population is possible in a worst-case scenario. However, the potential for a short-term moderation of our overall pattern of demographic expansion could be at least partly offset by the results, starting nine months from now, of hundreds of millions of people of reproductive age worldwide staying home for weeks with little to keep them busy. For wealthy nations with falling fertility levels, a much bigger threat to human population stability will likely continue to be posed by the buildup of [endocrine-disrupting chemicals](#) in the environment. For poor nations with high population growth trends, equal education opportunities for everyone regardless of gender will substantially help reduce growth rates.

Resource depletion: With manufacturing on the skids, demand and hence prices for most commodities are plummeting. The world's most economically crucial commodity, oil, has seen its price fall from \$50 a barrel to close to \$20 (as of this writing); some analysts are forecasting prices in the single digits. With oil usage crashing, petroleum storage capacity will run out, at which point producers will have no choice but to mothball some oil wells. Oil companies will likely be bailed out, but cannot be profitable under current conditions. The prospect of ever ramping world oil extraction rates back up to recent levels seems dim. It is likely, then, that the long-anticipated moment of the world oil production peak has already occurred, with little fanfare, in November, 2018.

Of course, the blowout in oil markets is a result of economic disaster rather than sound policies of resource conservation. Therefore, adaptation on the part of industry and society as a whole will be chaotic. The international implications are fraught and hard to predict: several key Middle Eastern nations will see their economies shredded by low oil prices, and Great Powers (specifically, China and Russia) may seek to take advantage of the moment by seeking to realign alliances in the region.

Pollution: Marshall Burke of Stanford University has recently [written](#) that "the reductions in air pollution in China caused by this economic disruption likely saved 20 times more lives in China than have currently been lost due to infection with the virus in that country." Reduced rates of manufacturing and consumption should help to reduce overall pollution, but of course this is the side effect of crisis, not the result of sound policy. Therefore, without environmental policy interventions, there's no reason to expect pollution reduction benefits to be sustained. Just one example of how some temporary benefits could be balanced by new harms: The use of [single-use plastics](#) is likely to increase during the pandemic response.

Global debt bomb: The world economy is again in a deflationary moment, as it was in 1932 and 2008. For central banks and governments, all fiscal efforts will be geared toward re-inflating an economy that is otherwise hissing and flattening. There is a heightened risk that investors will realize

that, in a no-growth world, their financial instruments are inherently worthless, forcing not just a collapse of the market value of stocks, but a repudiation of the very rules of the game. However, since the coronavirus epidemic itself will eventually subside, the more [likely outcome](#) is a period of defaults and bankruptcies mitigated by heroic levels of Fed bond purchases, and government bailouts (of the oil and airline industries, just for starters) and deficit spending. Eventually, if money printing goes exponential, hyperinflation is a possibility, but not soon. Big takeaway: the financial system has been destabilized and, like the oil industry, may never return to “normal.”

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Let’s return to the question posed above: Will humanity look back on the coronavirus pandemic as a blip or a game changer? The likely answer depends partly on how long the pandemic lasts, and that, in turn, will depend largely on how soon tests become widely available, and when treatments and vaccines are found. US Government documents marked “not for public release” suggest [significant shortages](#) not just of medical equipment, but also of general goods over the next 18 months for government, industry, and private citizens, if solutions are not quickly forthcoming.

The level at which the game is changed also depends on the degree of downturn in employment and GDP. Fred Bullard, President of the St. Louis Fed, has gone on record [saying](#) that the US unemployment rate may hit 30 percent in the second quarter because of shutdowns to fight the coronavirus, and that GDP could drop 50 percent. This would be economic carnage far beyond the scale of the Great Depression (the United States unemployment rate in 1933 was 25 percent; its GDP fell an estimated 15 percent). If the global economy falls that far, and remains locked down even for a few weeks, label the coronavirus “game changer, big time.”

But a change to what? Dystopian possibilities come only too readily to mind. However, in conversation, some of my think-tank colleagues have suggested the pandemic could turn out to be a “Goldilocks” crisis that would disrupt the global order just enough, and in such a way, as to foster a response that sets at least some societies on a trajectory toward cooperation, redistribution, and degrowth.

First, governments often deal with shortages (foreseen in the report cited above) through the tried-and-true strategy of quota rationing. As Stan Cox details in his indispensable book [Any Way You Slice It: The Past, Present, and Future of Rationing](#), quota rationing doesn’t always work well; but when it does, the results can be fairly admirable. During both World Wars, Americans participated enthusiastically in rationing programs for food, tires, clothing, and more. Britain continued its rationing programs well after the end of WWII, and surveys showed that, during the period of rationing, Britons were generally better fed and healthier than either before or after. In most imaginary scenarios for deliberate economic degrowth, quota rationing programs for energy and materials figure prominently.

Cox concludes that rationing programs tend to be more successful when people are united against a common enemy, and when shortages are believed to be temporary. Despite President Trump’s efforts to dub it the “Chinese

virus,” SARS-Cov-2 has no inherent nationality, nor is it Democrat or Republican. It is indeed a common enemy, and people tend to become more cooperative when faced with a collective threat. Further, epidemiologists agree that the threat will have an end point, even if we don’t know exactly when that will be. Therefore, conditions for success in rationing exist, and rationing could help foster more communitarian and cooperative attitudes overall.

Also, as discussed above, the pandemic has the potential for significant economic leveling. Historically, not all leveling moments featured increased cooperation: when initiated by state collapse or transformative revolution, leveling has been accompanied by widespread suffering and bloody conflict. However, during the great leveling moments of the twentieth century—the Depression and the two World Wars—Americans managed to pull together with a sense of shared sacrifice.

Over the longer term, we are still faced with the challenges of climate change, resource depletion, overpopulation, pollution, and biodiversity loss. While the pandemic might have minor or temporary spinoff effects that ameliorate these problems, it won’t solve them. Significant, sustained collective effort will still be required to transform energy systems, economies, and lifestyles (though the pandemic could transform economies and lifestyles in unpredictable ways). If the coronavirus response puts us on a cooperative footing, all the better. Of course, that would be at the expense of currently unknown ultimate numbers of fatalities and sicknesses, as well as widespread fear and privation. The potential bits of silver I’ve mentioned are the linings of a cloud; but, as [Monty Python](#) can still remind us via YouTube, it’s always good to look on the bright side of life.