CHAPTER 20

THE FUTURE OF PROGRESS

Since the Enlightenment unfolded in the late 18th century, life expectancy across the world has risen from 30 to 71, and in the more fortunate countries to 81.[1] When the Enlightenment began, a third of the children born in the richest parts of the world died before their fifth birthday; today, that fate befalls 6 percent of the children in the poorest parts. Their mothers, too, were freed from tragedy: one percent in the richest countries did not live to see their newborns, a rate triple that of the poorest countries today, which continues to fall. In those poor countries, lethal infectious diseases are in steady decline, some of them afflicting just a few dozen people a year, soon to follow smallpox into extinction.

The poor may not always be with us. The world is about a hundred times wealthier today than it was two centuries ago, and the prosperity is becoming more evenly distributed across the world's countries and people. The proportion of humanity living in extreme poverty has fallen from almost 90 percent to less than 10 percent, and within the lifetimes of most of the readers of this book it could approach zero. Catastrophic famine, never far away in most of human history, has vanished from most of the world, and undernourishment and stunting are in steady decline. A century ago, richer countries devoted one percent of their wealth to supporting children, the poor, and the aged; today they spend almost a quarter of it. Most of their poor today are fed, clothed, and sheltered, and have luxuries like smartphones and air-conditioning that used to be unavailable to anyone, rich or poor. Poverty among racial minorities has fallen, and poverty among the elderly has plunged.

The world is giving peace a chance. War between countries is obsolescent, and war within countries is absent from five-sixths of the world's surface. The proportion of people killed annually in wars is less than a quarter of what it was in the 1980s, a seventh of what it was in the early 1970s, an eighteenth of what it was in the early 1950s, and a half a percent of what it was during World War II. Genocides, once common, have become rare. In most times and places, homicides kill far more people than wars, and homicide rates have been falling as well. Americans are half as likely to be murdered as they were two dozen years ago. In the world as a whole, people are seven-tenths as likely to be murdered as they were eighteen years ago.

Life has been getting safer in every way. Over the course of the 20th century, Americans became 96 percent less likely to be killed in a car accident, 88 percent less likely to be mowed down on the sidewalk, 99 percent less likely to die in a plane crash, 59 percent less likely to fall to their deaths, 92 percent less likely to die by fire, 90 percent less likely to drown, 92 percent less likely to be asphyxiated, and 95 percent less likely to be killed on the job.[2] Life in other rich countries is even safer, and life in poorer countries will get safer as they get richer.

People are getting not just healthier, richer, and safer but freer. Two centuries ago a handful of countries, embracing one percent of the world's people, were democratic; today, two-thirds of the world's countries, embracing two-thirds of its people, are. Not long ago half the world's countries had laws that discriminated against racial minorities; today more countries have policies that favor their minorities than policies that discriminate against them. At the turn of the 20th century, women could vote in just one country; today they can vote in every country where men can vote save one. Laws that criminalize homosexuality continue to be stricken down, and attitudes toward minorities, women, and gay people are becoming steadily more tolerant, particularly among the young, a portent of the world's future. Hate crimes, violence against women, and the victimization of children are all in long-term decline, as is the exploitation of children for their labor.

As people are getting healthier, richer, safer, and freer, they are also becoming more literate, knowledgeable, and smarter. Early in the 19th century, 12 percent of the world could read and write; today 83 percent can. Literacy and the education it enables will soon be universal, for girls as well as boys. The schooling, together with health and wealth, are literally making us smarter—by thirty IQ points, or two standard deviations above our ancestors.

People are putting their longer, healthier, safer, freer, richer, and wiser lives to good use. Americans work 22 fewer hours a week than they used to, have three weeks of paid vacation, lose 43 fewer hours to housework, and spend just a third of their paycheck on necessities rather than five-eighths. They are using their leisure and disposable income to travel, spend time with their children, connect with loved ones, and sample the world's cuisine, knowledge, and culture. As a result of these gifts, people worldwide have become happier. Even Americans, who take their good fortune for granted, are "pretty happy" or happier, and the younger generations are becoming less unhappy, lonely, depressed, drug-addicted, and suicidal.

As societies have become healthier, wealthier, freer, happier, and better educated, they have set their sights on the most pressing global challenges. They have emitted fewer pollutants, cleared fewer forests, spilled less oil, set aside more preserves, extinguished fewer species, saved the ozone layer, and peaked in their consumption of oil, farmland, timber, paper, cars, coal, and perhaps even carbon. For all their differences, the world's nations came to a historic agreement on climate change, as they did in previous years on nuclear testing, proliferation, security, and disarmament. Nuclear weapons, since the extraordinary circumstances of the closing days of World War II, have not been used in the seventy-two years they have existed. Nuclear terrorism, in defiance of forty years of expert predictions, has never happened. The world's nuclear stockpiles have been reduced by 85 percent, with more reductions to come, and testing has ceased (except by the tiny rogue regime in Pyongyang) and proliferation has frozen. The world's two most pressing problems, then, though not yet solved, are solvable: practicable long-term agendas have been laid out for eliminating nuclear weapons and for mitigating climate change.

For all the bleeding headlines, for all the crises, collapses, scandals, plagues, epidemics, and existential threats, these are accomplishments to savor. The Enlightenment is working: for two and a half centuries, people have used knowledge to enhance human flourishing. Scientists have exposed the workings of matter, life, and mind. Inventors have harnessed the laws of nature to defy entropy, and entrepreneurs have made their innovations affordable. Lawmakers have made people better off by discouraging acts that are individually beneficial but collectively harmful. Diplomats have done the same with nations. Scholars have perpetuated the treasury of knowledge and augmented the power of reason. Artists have expanded the circle of sympathy. Activists have pressured the powerful to overturn repressive measures, and their fellow citizens to change repressive norms. All these efforts have been channeled into institutions that have allowed us to circumvent the flaws of human nature and empower our better angels.

At the same time . . .

Seven hundred million people in the world today live in extreme poverty. In the regions where they are concentrated, life expectancy is less than 60, and almost a quarter of the people are undernourished. Almost a million children die of pneumonia every year, half a million from diarrhea or malaria, and

hundreds of thousands from measles and AIDS. A dozen wars are raging in the world, including one in which more than 250,000 people have died, and in 2015 at least ten thousand people were slaughtered in genocides. More than two billion people, almost a third of humanity, are oppressed in autocratic states. Almost a fifth of the world's people lack a basic education; almost a sixth are illiterate. Every year five million people are killed in accidents, and more than 400,000 are murdered. Almost 300 million people in the world are clinically depressed, of whom almost 800,000 will die by suicide this year.

The rich countries of the developed world are by no means immune. The lower middle classes have seen their incomes rise by less than 10 percent in two decades. A fifth of the American population still believes that women should return to traditional roles, and a tenth is opposed to interracial dating. The country suffers from more than three thousand hate crimes a year, and more than fifteen thousand homicides. Americans lose two hours a day to housework, and about a quarter of them feel they are always rushed. More than two-thirds of Americans deny that they are very happy, around the same proportion as seventy years ago, and both women and the largest demographic age group have become unhappier over time. Every year around 40,000 Americans become so desperately unhappy that they take their own lives.

And of course the problems that span the entire planet are formidable. Before the century is out, it will have to accommodate another two billion people. A hundred million hectares of tropical forest were cut down in the previous decade. Marine fishes have declined by almost 40 percent, and thousands of species are threatened with extinction. Carbon monoxide, sulfur dioxide, oxides of nitrogen, and particulate matter continue to be spewed into the atmosphere, together with 38 billion tons of CO_2 every year, which, if left unchecked, threaten to raise global temperatures by two to four degrees Celsius. And the world has more than 10,000 nuclear weapons distributed among nine countries.

The facts in the last three paragraphs, of course, are the same as the ones in the first eight; I've simply read the numbers from the bad rather than the good end of the scales or subtracted the hopeful percentages from 100. My point in presenting the state of the world in these two ways is not to show that I can focus on the space in the glass as well as on the beverage. It's to reiterate that progress is not utopia, and that there is room—indeed, an imperative—for us to strive to continue that progress. If we can sustain the trends in the first eight paragraphs by deploying knowledge to enhance flourishing, the numbers in the last three paragraphs should shrink. Whether they will ever get to zero is a problem we can worry about when we get closer. Even if some do, we will surely discover more harms to rectify and new ways to enrich human experience. The Enlightenment is an ongoing process of discovery and betterment.

How reasonable is the hope for continuing progress? That's the question I'll consider in this last chapter in the Progress section, before switching in the remainder of the book to the ideals that are necessary to realize the hope.

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I'll start with the case for continuing progress. We began the book with a non-mystical, non-Whiggish, non-Panglossian explanation for why progress is possible, namely that the Scientific Revolution and the Enlightenment set in motion the process of using knowledge to improve the human condition. At the time skeptics could reasonably say, "It will never work." But more than two centuries later we can say that it *has* worked: we have seen six dozen graphs that have vindicated the hope for progress by charting ways in which the world has been getting better.

Lines that plot good things over time cannot automatically be extrapolated rightward and upward, but with many of the graphs that's a good bet. It's unlikely we'll wake up one morning and find that our buildings are more flammable, or that people have changed their minds about interracial dating or gay teachers keeping their jobs. Developing countries are unlikely to shut down their schools and health clinics or stop building new ones just as they are starting to enjoy their fruits.

To be sure, changes that take place on the time scale of journalism will always show ups and downs. Solutions create new problems, which take time to solve in their term. But when we stand back from these blips and setbacks, we see that the indicators of human progress are cumulative: none is cyclical, with gains reliably canceled by losses.[3]

Better still, improvements build on one another. A richer world can better afford to protect the environment, police its gangs, strengthen its social safety nets, and teach and heal its citizens. A better-educated and connected world cares more about the environment, indulges fewer autocrats, and starts fewer wars.

The technological advances that have propelled this progress should only gather speed. Stein's Law continues to obey Davies's Corollary (Things that can't go on forever can go on much longer than you think), and genomics, synthetic biology, neuroscience, artificial intelligence, materials science, data science, and evidence-based policy analysis are flourishing. We know that infectious diseases can be extinguished, and many are slated for the past tense. Chronic and degenerative diseases are more recalcitrant, but incremental progress in many (such as cancer) has been accelerating, and breakthroughs in others (such as Alzheimer's) are likely.

So too with moral progress. History tells us that barbaric customs can not only be reduced but essentially abolished, lingering at most in a few benighted backwaters. Not even the most worrying worrywart expects a comeback for human sacrifice, cannibalism, eunuchs, harems, chattel slavery, dueling, family feuding, foot-binding, heretic burning, witch dunking, public torture-executions, infanticide, freak shows, or laughing at the insane. While we can't predict which of today's barbarisms will go the way of slave auctions and autos-da-fé, heading that way are capital punishment, the criminalization of homosexuality, and male-only suffrage and education. Given a few decades, who's to say they could not be followed by female genital mutilation, honor killings, child labor, child marriage, totalitarianism, nuclear weapons, and interstate war?

Other blights are harder to extirpate because they depend on the behavior of billions of individuals with all their human stains, rather than policies adopted by entire countries at a stroke. But even if they are not wiped off the face of the earth, they can be reduced further, including violence against women and children, hate crimes, civil war, and homicide.

I can present this optimistic vision without blushing because it is not a naïve reverie or sunny aspiration. It's the view of the future that is most grounded in historical reality, the one with the cold, hard facts on its side. It depends only on the possibility that what has already happened will continue to happen. As Thomas Macaulay reflected in 1830, "We cannot absolutely prove that those are in error who tell us that society has reached a turning point, that we have seen our best days. But so said all before us, and with just as much apparent reason. . . . On what principle is it, that when we see nothing but improvement behind us, we are to expect nothing but deterioration before us?"[4]

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In chapters 10 and 19 I examined replies to Macaulay's question which foresaw a catastrophic end to all that progress in the form of climate change, nuclear war, and other existential threats. In the rest of this one I'll consider two 21st-century developments that fall short of global catastrophe but still have been taken to suggest that our best days are behind us.

The first raincloud is economic stagnation. As the essayist Logan Pearsall Smith observed, "There are few sorrows, however poignant, in which a good income is of no avail." Wealth provides not just the obvious things that money can buy, such as nutrition, health, education, and safety, but also, over the long term, spiritual goods such as peace, freedom, human rights, happiness, environmental protection, and other transcendent values.[5]

The Industrial Revolution ushered in more than two centuries of economic growth, especially during the period between World War II and the early 1970s, when the Gross World Product per capita grew at a rate of around 3.4 percent a year, doubling every twenty years.[6] In the late 20th century, eco-pessimists warned that economic growth was unsustainable because it exhausted resources and polluted the planet. But in the 21st, the opposite fear has arisen: that the future promises not too much economic growth but too little. Since the early 1970s, the annual rate of growth has fallen by more than half, to around 1.4 percent.[7] Growth over the long term is determined largely by productivity: the value of goods and services that a country can produce per

dollar of investment and person-hour of labor. Productivity in turn depends on technological sophistication: the skills of the country's workers and the efficiency of its machinery, management, and infrastructure. From the 1940s through the 1960s, productivity in the United States grew at an annual rate of around 2 percent, which would double productivity every thirty-five years. Since then it has grown at a rate of around 0.6 percent, which would require more than a century to double.[8]

Some economists fear that low rates of growth are the new normal. According to "the new secular stagnation hypothesis" analyzed by Lawrence Summers, even those paltry rates can be maintained (in conjunction with low unemployment) only if central banks set interest rates at zero or negative values, which could lead to financial instability and other problems.[9] In a period of rising income inequality, secular stagnation could leave a majority of people with static or falling incomes for the foreseeable future. If economies stop growing, things could get ugly.

No one really knows why productivity growth slacked off in the early 1970s or how to bring it back up.[10] Some economists, like Robert Gordon in his 2016 *The Rise and Fall of American Growth*, point to demographic and macroeconomic headwinds, such as fewer working people supporting more retirees, a leveling off in the expansion of education, a rise in government debt, and the increase in inequality (which depresses demand for goods and services, because richer people spend less of their incomes than poorer people).[11] Gordon adds that the most transformative inventions may already have been invented. The first half of the 20th century revolutionized the home with electricity, water, sewerage, telephones, and motorized appliances. Since then homes haven't changed nearly as much. An electronic bidet with a heated seat is nice, but it's not like going from an outhouse to a flush toilet.

Another explanation is cultural: America has lost its mojo.[12] Workers in depressed regions no longer pick up and move to vibrant ones but collect disability insurance and drop out of the labor force. A precautionary principle prevents anyone from trying anything for the first time. Capitalism has lost its capitalists: too much investment is tied up in "gray capital," controlled by institutional managers who seek safe returns for retirees. Ambitious young people want to be artists and professionals, not entrepreneurs. Investors and the government no longer back moonshots. As the entrepreneur Peter Thiel lamented, "We wanted flying cars; instead we got 140 characters."

Whatever its causes, economic stagnation is at the root of many other problems and poses a significant challenge for 21st-century policymakers. Does that mean that progress was nice while it lasted, but now it's over? Unlikely! For one thing, growth that is slower than it was during the postwar glory days is still growth—indeed, exponential growth. Gross World Product has increased in fifty-one of the last fifty-five years, which means that in each of those fifty-one years (including the last six), the world got richer than it was the year before.[13] Also, secular stagnation is largely a first-world problem. Though it's a tremendous challenge to get the most highly developed countries to become *even more* highly developed, year after year after year, the less developed countries have a lot of catching up to do, and they can grow at high rates as they adopt the richer countries' best practices (chapter 8). The greatest ongoing progress in the world today is the rise of billions of people out of extreme poverty, and that ascent need not be capped by the American and European malaise.

Also, technologically driven productivity growth has a way of sneaking up on the world.[14] People take a while to figure out how to put new technologies to their best use, and industries need time to retool their plants and practices around them. Electrification, to take a prominent example, started in the 1890s, but it took forty years before economists saw the boost in productivity that everyone was waiting for. The personal computer revolution also had a sleeper effect before unleashing productivity growth in the 1990s (which is not surprising to early adopters like me, who lost many an afternoon in the 1980s to installing a mouse or getting a dot matrix printer to do italics). Knowledge about how to get the most out of 21st-century technologies may be building up behind dams that will soon burst.

Unlike practitioners of the dismal science, technology watchers are adamant that we are entering an age of abundance.[15] Bill Gates has compared the forecast of technological stagnation to the (apocryphal) prediction in 1913 that war was obsolete.[16] "Imagine a world of nine billion people," write the tech entrepreneur Peter Diamandis and the journalist Steven Kotler, "with clean water, nutritious food, affordable housing, personalized education, top-tier medical care, and nonpolluting, ubiquitous energy."[17] Their vision comes not from fantasies out of *The Jetsons* but from technologies that are already working, or are very close.

Start with the resource that, together with information, is the only way to stave off entropy, and which literally powers everything else in the economy: energy. As we saw in chapter 10, fourth-generation nuclear power in the form of small modular reactors can be passively safe, proliferation-proof, waste-free, mass-produced, low-maintenance, indefinitely fueled, and cheaper than coal. Solar panels made with carbon nanotubes can be a hundred times as efficient as current photovoltaics, continuing Moore's Law for solar energy. Their energy can be stored in liquid metal batteries: in theory, a battery the size of a shipping container could power a neighborhood; one the size of a Walmart could power a small city. A smart grid could collect the energy where and when it's generated and distribute it where and when it's needed. Technology could even breathe new life into fossil fuels: a new design for a zero-emissions gas-fired plant uses the exhaust to drive a turbine directly, rather than wastefully boiling water, and then sequesters the CO_2 underground.[18]

Digital manufacturing, combining nanotechnology, 3-D printing, and rapid prototyping, can produce composites that are stronger and cheaper than steel and concrete and that can be printed on site for construction of houses and factories in the developing world. Nanofiltration can purify water of pathogens, metals, even salt. High-tech outhouses require no hookups and turn human waste into fertilizer, drinking water, and energy. Precision irrigation and smart grids for water, using cheap sensors and AI in chips, could reduce water usage by a third to a half. Rice that is genetically modified to replace its inefficient C3 photosynthesis pathway with the C4 pathway of corn and sugarcane has a 50 percent greater yield, uses half the water and far less fertilizer, and tolerates warmer temperatures.[19] Genetically modified algae can pull carbon out of the air and secrete biofuels. Drones can monitor miles of remote pipelines and railways, and can deliver medical supplies and spare parts to isolated communities. Robots can take over jobs that humans hate, like mining coal, stocking shelves, and making beds.

In the medical realm, a lab-on-a-chip could perform a liquid biopsy and detect any of hundreds of diseases from a drop of blood or saliva. Artificial intelligence, crunching big data on genomes, symptoms, and histories, will diagnose ailments more accurately than the sixth sense of doctors, and will prescribe drugs that mesh with our unique biochemistries. Stem cells could correct autoimmune diseases like rheumatoid arthritis and multiple sclerosis, and could populate cadaver organs, organs grown in animals, or 3D-printed models with our own tissue. RNA interference could silence pesky genes like the one that regulates the fat insulin receptor. Cancer therapies can be narrowcasted to the unique genetic signature of a tumor instead of poisoning every dividing cell in the body.

Global education could be transformed. The world's knowledge has already been made available in encyclopedias, lectures, exercises, and datasets to the billions of people with a smartphone. Individualized instruction can be provided over the Web to children in the developing world by volunteers (the "Granny Cloud") and to learners anywhere by artificially intelligent tutors.

The innovations in the pipeline are not just a list of cool ideas. They fall out of an overarching historical development that has been called the New Renaissance and the Second Machine Age.[20] Whereas the First Machine Age that emerged out of the Industrial Revolution was driven by energy, the second is driven by the other anti-entropic resource, information. Its revolutionary promise comes from the supercharged use of information to guide every other technology, and from exponential improvement in the technologies of information themselves, like computer power and genomics.

The promise of the new machine age also comes from innovations in the process of innovation itself. One is the democratization of platforms for invention, such as application program interfaces and 3-D printers, which can make anyone a high-tech do-it-yourselfer. Another is the rise of technophilanthropists. Instead of just writing checks for the naming rights to concert halls, they apply their ingenuity, connections, and demand for results to the solution of global problems. A third is the economic empowerment of billions of people through smartphones, online education, and microfinancing.

Among the world's bottom billion are a million people with a genius-level IQ. Just think what the world would look like if their brainpower were put to full use!

Will the Second Machine Age kick economies out of their stagnation? It's not certain, because economic growth depends not just on the available technology but on how well a nation's financial and human capital are deployed to use it. Even if the technologies are put to full use, their benefits may not be registered in standard economic measures. The comedian Pat Paulsen once observed, "We live in a country where even the national product is gross." Most economists agree that GNP (or its close relative, GDP) is a crude index of economic thriving. It has the virtue of being easy to measure, but because it's just a tally of the money that changes hands in the production of goods and services, it's not the same as the bounty that people enjoy. The problem of consumer surplus or the paradox of value has always bedeviled the quantification of prosperity (chapters 8 and 9), and modern economies are making it more acute.

Joel Mokyr notes that "aggregate statistics like GDP per capita and its derivatives such as factor productivity . . . were designed for a steel-and-wheat economy, not one in which information and data are the most dynamic sector. Many of the new goods and services are expensive to design, but once they work, they can be copied at very low or zero costs. That means they tend to contribute little to measured output even if their impact on consumer welfare is very large."[21] The dematerialization of life that we examined in chapter 10, for example, undermines the observation that a 2015 home does not look much different from a 1965 home. The big difference lies in what we *don't* see because it's been made obsolete by tablets and smartphones, together with new wonders like streaming video and Skype. In addition to dematerialization, information technology has launched a process of *demonetization*.[22] Many things that people used to pay for are now essentially free, including classified ads, news, encyclopedias, maps, cameras, long-distance calls, and the overhead of brick-and-mortar retailers. People are enjoying these goods more than ever, but they have vanished from GDP.

Human welfare has parted company from GDP in a second way. As modern societies become more humanistic, they devote more of their wealth to forms of human betterment that are not priced in the marketplace. A recent *Wall Street Journal* article on economic stagnation noted that a growing share of innovative effort has been directed toward cleaner air, safer cars, and drugs for "orphan diseases" that each affect fewer than 200,000 people nationwide.[23] For that matter, health care in general has risen from 7 percent of research and development in 1960 to 25 percent in 2007. The financial journalist who wrote the piece noted, almost in sadness, that "drugs are symptomatic of the rising value affluent societies place on human life. . . . Health research is displacing R&D that could have gone toward more mundane consumer products. Indeed, . . . the rising value of human life virtually dictates slower growth in regular consumer goods and services—and they constitute the bulk of measured GDP." A natural interpretation is that this tradeoff is evidence for the acceleration of progress, not the stagnation of progress. Modern societies, unlike the miserly comedian Jack Benny, have a quick reply to the mugger's demand, "Your money or your life."

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A very different threat to human progress is a political movement that seeks to undermine its Enlightenment foundations. The second decade of the 21st century has seen the rise of a counter-Enlightenment movement called populism, more accurately, authoritarian populism.[24] Populism calls for the direct sovereignty of a country's "people" (usually an ethnic group, sometimes a class), embodied in a strong leader who directly channels their authentic virtue and experience.

Authoritarian populism can be seen as a pushback of elements of human nature—tribalism, authoritarianism, demonization, zero-sum thinking—against the Enlightenment institutions that were designed to circumvent them. By focusing on the tribe rather than the individual, it has no place for the protection of minority rights or the promotion of human welfare worldwide. By failing to acknowledge that hard-won knowledge is the key to societal improvement, it denigrates "elites" and "experts" and downplays the marketplace of ideas, including freedom of speech, diversity of opinion, and the fact-checking of self-serving claims. By valorizing a strong leader, populism overlooks the limitations in human nature, and disdains the rule-governed institutions and constitutional checks that constrain the power of flawed human actors.

Populism comes in left-wing and right-wing varieties, which share a folk theory of economics as zero-sum competition: between economic classes in the case of the left, between nations or ethnic groups in the case of the right. Problems are seen not as challenges that are inevitable in an indifferent universe but as the malevolent designs of insidious elites, minorities, or foreigners. As for progress, forget about it: populism looks backward to an age in which the nation was ethnically homogeneous, orthodox cultural and religious values prevailed, and economies were powered by farming and manufacturing, which produced tangible goods for local consumption and for export.

Chapter 23 will probe the intellectual roots of authoritarian populism more deeply; here I will concentrate on its recent rise and possible future. In 2016 populist parties (mostly on the right) attracted 13.2 percent of the vote in the preceding European parliamentary elections (up from 5.1 percent in the 1960s) and entered the governing coalitions of eleven countries, including the leadership of Hungary and Poland.[25] Even when they are not in power, populist parties can press their agendas, notably by catalyzing the 2016 Brexit referendum in which 52 percent of Britons voted to leave the European Union. And in that year Donald Trump was elected to the American presidency with an Electoral College victory, though with a minority of the popular vote (46 percent to Hillary Clinton's 48 percent). Nothing captures the tribalistic and backward-looking spirit of populism better than Trump's campaign slogan: Make America Great Again.

In writing the chapters on progress, I resisted pressure from readers of earlier drafts to end each one by warning, "But all this progress is threatened if Donald Trump gets his way." Threatened it certainly is. Whether or not 2017 really represents a turning point in history, it's worth reviewing the threats, if only to understand the nature of the progress they threaten.[26]

- **Life** and **Health** have been expanded in large part by vaccination and other well-vetted interventions, and among the conspiracy theories that Trump has endorsed is the long-debunked claim that preservatives in vaccines cause autism. The gains have also been secured by broad access to medical care, and he has pushed for legislation that would withdraw health insurance from tens of millions of Americans, a reversal of the trend toward beneficial social spending.
- Worldwide improvements in **Wealth** have come from a globalized economy, powered in large part by international trade. Trump is a protectionist who sees international trade as a zero-sum contest between countries, and is committed to tearing up international trade agreements.
- Growth in **Wealth** will also be driven by technological innovation, education, infrastructure, an increase in the spending power of the lower and middle classes, constraints on cronyism and plutocracy that distort market competition, and regulations on finance that reduce the likelihood of bubbles and crashes. In addition to being hostile to trade, Trump is indifferent to technology and education and an advocate of regressive tax cuts on the wealthy, while appointing corporate and financial tycoons to his cabinet who are indiscriminately hostile to regulation.
- In capitalizing on concerns about **Inequality**, Trump has demonized immigrants and trade partners while ignoring the major disrupter of lower-middle-class jobs, technological change. He has also opposed the measures that most successfully mitigate its harms, namely progressive taxation and social spending.
- **The Environment** has benefited from regulations on air and water pollution that have coexisted with growth in population, GDP, and travel. Trump believes that environmental regulation is economically destructive; worst of all, he has called climate change a hoax and announced a withdrawal from the historic Paris agreement.
- **Safety**, too, has been dramatically improved by federal regulations, toward which Trump and his allies are contemptuous. While Trump has cultivated a reputation for law and order, he is viscerally uninterested in evidence-based policy that would distinguish effective crime-prevention measures from useless tough talk.

- The postwar **Peace** has been cemented by trade, **Democracy**, international agreements and organizations, and norms against conquest. Trump has vilified international trade and has threatened to defy international agreements and weaken international organizations. Trump is an admirer of Vladimir Putin, who reversed the democratization of Russia, tried to undermine democracy in the United States and Europe with cyberattacks, helped prosecute the most destructive war of the 21st century in Syria, fomented smaller wars in Ukraine and Georgia, and defied the postwar taboo against conquest in his annexation of Crimea. Several members of Trump's administration secretly colluded with Russia in an effort to lift sanctions against it, undermining a major enforcement mechanism in the outlawry of war.
- **Democracy** depends both on explicit constitutional protections, such as freedom of the press, and on shared norms, in particular that political leadership is determined by the rule of law and nonviolent political competition rather than a charismatic leader's will to power. Trump proposed to relax libel laws against journalists, encouraged violence against his critics at his rallies, would not commit to respecting the outcome of the 2016 election if it went against him, tried to discredit the popular vote count that did go against him, threatened to imprison his opponent in the election, and attacked the legitimacy of the judicial system when it challenged his decisions—all hallmarks of a dictator. Globally, the resilience of democracy depends in part on its prestige in the community of nations, and Trump has praised autocrats in Russia, Turkey, the Philippines, Thailand, Saudi Arabia, and Egypt while denigrating democratic allies such as Germany.
- The ideals of tolerance, equality, and **Equal Rights** took big symbolic hits during his campaign and early administration. Trump demonized Hispanic immigrants, proposed banning Muslim immigration altogether (and tried to impose a partial ban once he was elected), repeatedly demeaned women, tolerated vulgar expressions of racism and sexism at his rallies, accepted support from white supremacist groups and equated them with their opponents, and appointed a strategist and an attorney general who are hostile to the civil rights movement.
- The ideal of **Knowledge**—that one's opinions should be based on justified true beliefs—has been mocked by Trump's repetition of ludicrous conspiracy theories: that Obama was born in Kenya, Senator Ted Cruz's father was involved in John F. Kennedy's assassination, thousands of New Jersey Muslims celebrated 9/11, Justice Antonin Scalia was murdered, Obama had his phones tapped, millions of illegal voters cost him the popular vote, and literally dozens of others. The fact-checking site *PolitiFact* judged that an astonishing 69 percent of the public statements by Trump they checked were "Mostly False," "False," or "Pants on Fire" (their term for outrageous lies, from the children's taunt "Liar, liar, pants on fire").[27] All politicians bend the truth, and all sometimes lie (since all human beings bend the truth and sometimes lie), but Trump's barefaced assertion of canards that can instantly be debunked (such as that he won the election in a landslide) shows that he sees public discourse not as a means of finding common ground based on objective reality but as a weapon with which to project dominance and humiliate rivals.
- Most frighteningly, Trump has pushed back against the norms that have protected the world against the possible **Existential Threat** of nuclear war. He questioned the taboo on using nuclear weapons, tweeted about resuming a nuclear arms race, mused about encouraging the proliferation of weapons to additional countries, sought to overturn the agreement that prevents Iran from developing nuclear weapons, and taunted Kim Jong-un about a possible nuclear exchange with North Korea. Worst of all, the chain of command gives an American president enormous discretion over the use of nuclear weapons in a crisis, on the tacit assumption that no president would act rashly on such a grave matter. Yet Trump has a temperament that is notoriously impulsive and vindictive.

Not even a congenital optimist can see a pony in this Christmas stocking. But will Donald Trump (and authoritarian populism more generally) really undo a quarter of a millennium of progress? There are reasons not to take poison just yet. If a movement has proceeded for decades or centuries, there are probably systematic forces behind it, and many stakeholders with an interest in its not being precipitously reversed.

By the design of the Founders, the American presidency is not a rotating monarchy. The president presides over a distributed network of power (denigrated by populists as the "deep state") that outlasts individual leaders and carries out the business of government under real-world constraints which can't easily be erased by populist applause lines or the whims of the man at the top. It includes legislators who have to respond to constituents and lobbyists, judges with reputations of probity to uphold, and executives, bureaucrats, and functionaries who are responsible for the missions of their departments. Trump's authoritarian instincts are subjecting the institutions of American democracy to a stress test, but so far it has pushed back on a number of fronts. Cabinet secretaries have publicly repudiated various quips, tweets, and stink bombs; courts have struck down unconstitutional measures; senators and congressmen have defected from his party to vote down destructive legislation; Justice Department and Congressional committees are investigating the administration's ties to Russia; an FBI chief has publicly called out Trump's attempt to intimidate him (raising talk about impeachment for obstruction of justice); and his own staff, appalled at what they see, regularly leak compromising facts to the press—all in the first six months of the administration.

Also boxing a president in are state and local governments, which are closer to the facts on the ground; the governments of other nations, which cannot be expected to put a high priority on making America great again; and even most corporations, which benefit from peace, prosperity, and stability. Globalization in particular is a tide that is impossible for any ruler to order back. Many of a country's problems are inherently global, including migration, pandemics, terrorism, cybercrime, nuclear proliferation, rogue states, and the environment. Pretending they don't exist is not tenable forever, and they can be solved only through international cooperation. Nor can the benefits of globalization—more affordable goods, larger markets for exports, the reduction in global poverty—be denied indefinitely. And with the Internet and inexpensive travel, there will be no stopping the flow of people and ideas (especially, as we will see, among younger people). As for the battle against truth and fact, over the long run they have a built-in advantage: when you stop believing in them, they don't go away.[28]

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The deeper question is whether the rise of populist movements, whatever damage they do in the short term, represents the shape of things to come—whether, as a recent *Boston Globe* editorial lamented/gloated, "The Enlightenment had a good run."[29] Do the events around 2016 really imply that the world is headed back to the Middle Ages? As with climate change skeptics who claim to be vindicated by a nippy morning, it's easy to overinterpret recent events.

For one thing, the latest elections are not referenda on the Enlightenment. In the American political duopoly, any Republican candidate starts from a partisan floor of at least 45 percent of the votes in a two-way race, and Trump was defeated in the popular vote 46–48 percent, while benefiting from electoral shenanigans and from campaigning misjudgments on Clinton's part. And Barack Obama—who in his farewell speech actually *credited the Enlightenment* for the "essential spirit of this country"—left office with an approval rating of 58 percent, above average for departing presidents.[30] Trump entered office with a rating of 40 percent, the lowest ever for an incoming president, and during his first seven months it sank to 34 percent, barely more than half of the average rating of the nine previous presidents at the same point in their terms.[31]

European elections, too, are not depth-soundings for a commitment to cosmopolitan humanism but reactions to a bundle of emotionally charged issues of the day. These included, recently, the euro currency (which arouses skepticism among many economists), intrusive regulation from Brussels, and pressure to accept large numbers of refugees from the Middle East just when fears of Islamic terrorism (however disproportionate to the risk) were being stoked by horrific attacks. Even then, populist parties have attracted only 13 percent of the votes in recent years, and they have lost seats in as many national legislatures as they have gained them in.[32] In the year following the Trump and Brexit shocks, right-wing populism was repudiated in elections in the Netherlands, the United Kingdom, and France—where the new president, Emmanuel Macron, proclaimed that Europe was "waiting for us to defend the spirit of the Enlightenment, threatened in so many places."[33]

But far more important than the political events of the mid-2010s are the social and economic trends that have fostered authoritarian populism—and more to the point of this chapter, that may foretell its future.

Beneficial historical developments often create losers together with the winners, and the apparent economic losers of globalization (namely the lower classes of rich countries) are often said to be the supporters of authoritarian populism. For economic determinists, this is enough to explain the rise of the movement. But analysts have sifted through the election results like investigators inspecting the wreckage at the site of a plane crash, and we now know that the economic explanation is wrong. In the American election, voters in the two lowest income brackets voted for *Clinton* 52–42, as did those who identified "the economy" as the most important issue. A majority of voters in the four *highest* income brackets voted for Trump, and Trump voters singled out "immigration" and "terrorism," not "the economy," as the most important issues.[34]

The twisted metal has turned up more promising clues. An article by the statistician Nate Silver began, "Sometimes statistical analysis is tricky, and sometimes a finding just jumps off the page." That finding jumped right off the page and into the article's headline: "Education, Not Income, Predicted Who Would Vote for Trump."[35] Why should education have mattered so much? Two uninteresting explanations are that the highly educated happen to affiliate with a liberal political tribe, and that education may be a better long-term predictor of economic security than current income. A more interesting explanation is that education exposes people in young adulthood to other races and cultures in a way that makes it harder to demonize them. Most interesting of all is the likelihood that education, when it does what it is supposed to do, instills a respect for vetted fact and reasoned argument, and so inoculates people against conspiracy theories, reasoning by anecdote, and emotional demagoguery.

In another page-jumper, Silver found that the regional map of Trump support did not overlap particularly well with the maps of unemployment, religion, gun ownership, or the proportion of immigrants. But it did align with the map of Google searches for the word *nigger*, which Seth Stephens-Davidowitz has shown is a reliable indicator of racism (chapter 15).[36] This doesn't mean that most Trump supporters are racists. But overt racism shades into resentment and distrust, and the overlap suggests that the regions of the country that gave Trump his Electoral College victory are those with the most resistance to the decades-long process of integration and the promotion of minority interests (particularly racial preferences, which they see as reverse discrimination against them).

Among the exit poll questions that probed general attitudes, the most consistent predictor of Trump support was pessimism.[37] Sixty-nine percent of Trump supporters felt that the direction of the country was "seriously off track," and they were similarly jaundiced about the workings of the federal government and the lives of the next generation of Americans.

Across the pond, the political scientists Ronald Inglehart and Pippa Norris spotted similar patterns in their analysis of 268 political parties in thirty-one European countries.[38] Economic issues, they found, have been playing a smaller role in party manifestoes for decades, and noneconomic issues a larger role. The same was true of the distribution of voters. Support for populist parties is strongest not from manual workers but from the "petty bourgeoisie" (self-employed tradesmen and the owners of small businesses), followed by foremen and technicians. Populist voters are older, more religious, more rural, less educated, and more likely to be male and members of the ethnic majority. They embrace authoritarian values, place themselves on the right of the political spectrum, and dislike immigration and global and national governance.[39] Brexit voters, too, were older, more rural, and less educated than those who voted to remain: 66 percent of high school graduates voted to leave, but only 29 percent of degree holders did.[40]

Inglehart and Norris concluded that supporters of authoritarian populism are the losers not so much of economic competition as *cultural* competition. Voters who are male, religious, less educated, and in the ethnic majority "feel that they have become strangers from the predominant values in their own country, left behind by progressive tides of cultural change that they do not share. . . . The silent revolution launched in the 1970s seems to have spawned a resentful counter-revolutionary backlash today."[41] Paul Taylor, a political analyst at the Pew Research Center, singled out the same counter-current in American polling results: "The overall drift is toward more liberal views on a range of issues, but that doesn't mean the whole country's buying in."[42]

Though the source of the populist backlash may be found in currents of modernity that have been engulfing the world for some time—globalization, racial diversity, women's empowerment, secularism, urbanization, education—its electoral success in a particular country depends on whether a leader materializes who can channel that resentment. Neighboring countries with comparable cultures can thus differ in the degree to which populism gains traction: Hungary more than the Czech Republic, Norway more than Sweden, Poland more than Romania, Austria more than Germany, France more than Spain, and the United States more than Canada. (In 2016 Spain, Canada, and Portugal had no populist party legislators at all.)[43]

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How will the tension play out between the liberal, cosmopolitan, enlightenment humanism that has been sweeping the world for decades and the regressive, authoritarian, tribal populism pushing back? The major long-term forces that have carried liberalism along—mobility, connectivity, education, urbanization—are not likely to go into reverse, and neither is the pressure for equality from women and ethnic minorities.

All of these portents, to be sure, are conjectural. But one is as certain as the first half of the idiom "death and taxes." Populism is an old man's movement. As figure 20-1 shows, support for all three of its recrudescences—Trump, Brexit, and European populist parties—falls off dramatically with year of birth. (The alt-right movement, which overlaps with populism, has a youngish membership, but for all its notoriety it is an electoral nonentity, numbering perhaps 50,000 people or 0.02 percent of the American population.)[44] The age rolloff isn't surprising, since we saw in chapter 15 that in the 20th century every birth cohort has been more tolerant and liberal than the one that came before (at the same time that all the cohorts have drifted liberalward). This raises the possibility that as the Silent Generation and older Baby Boomers shuffle off this mortal coil, they will take authoritarian populism with them.

Of course the cohorts of the present say nothing about the politics of the future if people change their values as they age. Perhaps if you are a populist at twenty-five you have no heart, and if you are not a populist at forty-five you have no brain (to adapt a meme that has been said about liberals, socialists, communists, leftists, Republicans, Democrats, and revolutionists and that has been attributed to various quotation magnets, including Victor Hugo, Benjamin Disraeli, George Bernard Shaw, Georges Clemenceau, Winston Churchill, and Bob Dylan). But whoever said it (probably the 19th-century jurist Anselme Batbie, who in turn attributed it to Edmund Burke), and regardless of which belief system it's supposed to apply to, the claim about life-cycle effects on political orientation is false.[45] As we saw in chapter 15, people carry their emancipative values with them as they age rather than sliding into illiberalism. And a recent analysis of 20th-century American voters by the political scientists Yair Ghitza and Andrew Gelman has shown that Americans do not consistently vote for more conservative presidents as they age. Their voting preferences are shaped by their cumulative experience of the popularity of presidents over their life spans, with a peak of influence in the 14–24-year-old window.[46] The young voters who reject populism today are unlikely to embrace it tomorrow.

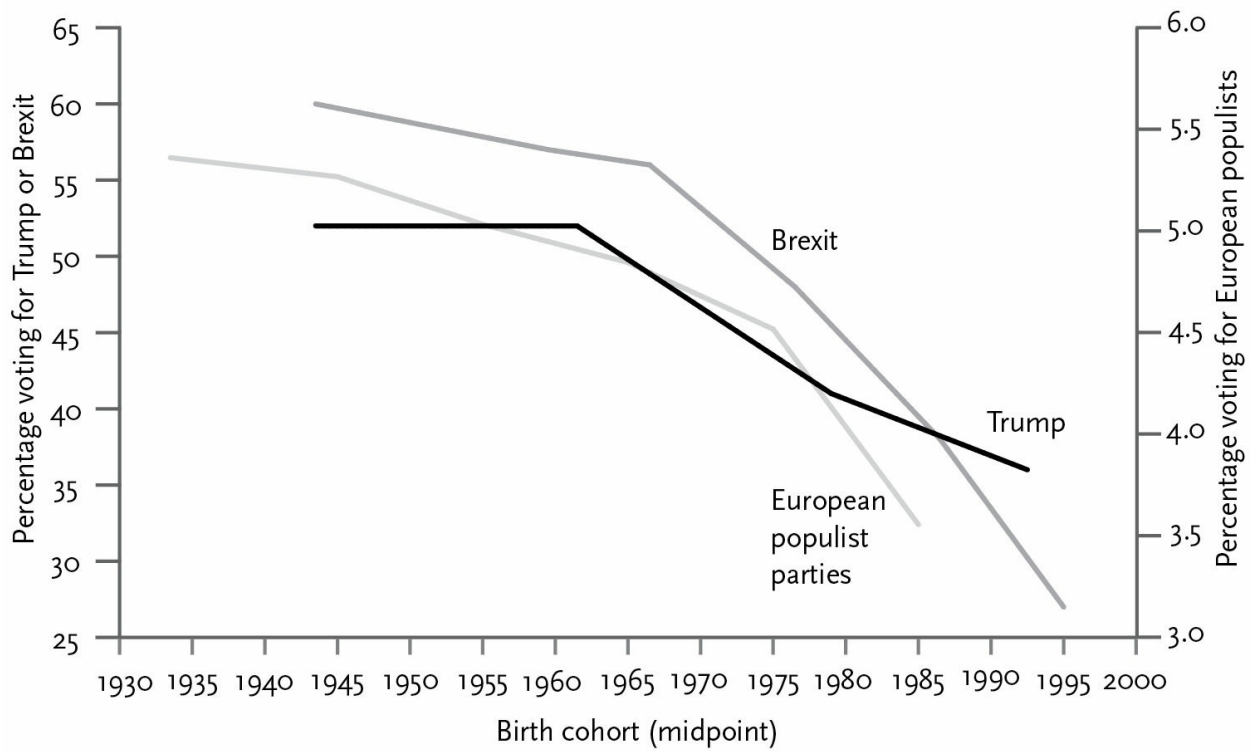

Figure 20-1: Populist support across generations, 2016

Sources: Trump: Exit polls conducted by Edison Research, *New York Times* 2016. **Brexit:** Exit polls conducted by Lord Ashcroft Polls, *BBC News Magazine*, June 24, 2016, http://www.bbc.com/news/magazine-36619342. **European populist parties (2002–2014):** Inglehart & Norris 2016, fig. 8. Data for each birth cohort are plotted at the midpoint of their range.

How might one counter the populist threat to Enlightenment values? Economic insecurity is not the driver, so the strategies of reducing income inequality and of talking to laid-off steelworkers and trying to feel their pain, however praiseworthy, will probably be ineffective. Cultural backlash does seem to be a driver, so avoiding needlessly polarizing rhetoric, symbolism, and identity politics might help to recruit, or at least not repel, voters who are not sure which team they belong to (more on this in chapter 21). Since populist movements have achieved an influence beyond their numbers, fixing electoral irregularities such as gerrymandering and forms of disproportionate representation which overweight rural areas (such as the US Electoral College) would help. So would journalistic coverage that tied candidates' reputations to their record of accuracy and coherence rather than to trivial gaffes and scandals. Part of the problem, over the long term, will dissipate with urbanization: you can't keep them down on the farm. And part will dissipate with demographics. As has been said about science, sometimes society advances funeral by funeral.[47]

Still, a puzzle in the rise of authoritarian populism is why a shocking proportion of the sectors of the population whose interests were most endangered by the outcome of the elections, such as younger Britons with Brexit, and African Americans, Latinos, and American millennials with Trump, stayed home on election day.[48] This brings us back to a major theme of this book, and to my own small prescription for strengthening the current of Enlightenment humanism against the latest counter-Enlightenment backlash.

I believe that the media and intelligentsia were complicit in populists' depiction of modern Western nations as so unjust and dysfunctional that nothing short of a radical lurch could improve them. "Charge the cockpit or you die!" shrieked a conservative essayist, comparing the country to the hijacked flight on 9/11 that was brought down by a passenger mutiny.[49] "I'd rather see the empire burn to the ground under Trump, opening up at least the possibility of radical change, than cruise on autopilot under Clinton," flamed a left-wing advocate of "the politics of arson."[50] Even moderate editorialists in mainstream newspapers commonly depict the country as a hellhole of racism, inequality, terrorism, social pathology, and failing institutions.[51]

The problem with dystopian rhetoric is that if people believe that the country is a flaming dumpster, they will be receptive to the perennial appeal of demagogues: "What do you have to lose?" If the media and intellectuals instead put events into statistical and historical context, they could help answer that question. Radical regimes from Nazi Germany and Maoist China to contemporary Venezuela and Turkey show that people have a tremendous amount to lose when charismatic authoritarians responding to a "crisis" trample over democratic norms and institutions and command their countries by the force of their personalities.

A liberal democracy is a precious achievement. Until the messiah comes, it will always have problems, but it's better to solve those problems than to start a conflagration and hope that something better arises from the ashes and bones. By failing to take note of the gifts of modernity, social critics poison voters against responsible custodians and incremental reformers who can consolidate the tremendous progress we have enjoyed and strengthen the conditions that will bring us more.

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The challenge in making the case for modernity is that when one's nose is inches from the news, optimism can seem naïve, or in the pundits' favorite new cliché about elites, "out of touch." Yet in a world outside of hero myths, the only kind of progress we can have is a kind that is easy to miss while we are living through it. As the philosopher Isaiah Berlin pointed out, the ideal of a perfectly just, equal, free, healthy, and harmonious society, which liberal democracies never measure up to, is a dangerous fantasy. People are not clones in a monoculture, so what satisfies one will frustrate another, and the only way they can end up equal is if they are treated unequally. Moreover, among the perquisites of freedom is the freedom of people to screw up their own lives. Liberal democracies can make progress, but only against a constant backdrop of messy compromise and constant reform:

> The children have obtained what their parents and grandparents longed for—greater freedom, greater material welfare, a juster society; but the old ills are forgotten, and the children face new problems, brought about by the very solutions of the old ones, and these, even if they can in turn be solved, generate new situations, and with them new requirements—and so on, forever—and unpredictably.[52]

Such is the nature of progress. Pulling us forward are ingenuity, sympathy, and benign institutions. Pushing us back are the darker sides of human nature and the Second Law of Thermodynamics. Kevin Kelly explains how this dialectic can nonetheless result in forward motion:

> Ever since the Enlightenment and the invention of science, we've managed to create a tiny bit more than we've destroyed each year. But that few percent positive difference is compounded over decades into what we might call civilization. . . . [Progress] is a self-cloaking action seen only in retrospect. Which is why I tell people that my great optimism of the future is rooted in history.[53]

We don't have a catchy name for a constructive agenda that reconciles long-term gains with short-term setbacks, historical currents with human agency. "Optimism" is not quite right, because a belief that things will always get better is no more rational than the belief that things will always get worse. Kelly offers "protopia," the *pro-* from *progress* and *process*. Others have suggested "pessimistic hopefulness," "opti-realism," and "radical incrementalism."[54] My favorite comes from Hans Rosling, who, when asked whether he was an optimist, replied, "I am not an optimist. I'm a very serious possibilist."[55]