

Slouching Towards Utopia?: An Economic History of the Long Twentieth Century, 1870-2016

II. Themes: From Science & Technological Cornucopia to Feminism & Gilded Ages

J. Bradford DeLong

U.C. Berkeley, NBER, WCEG

[<https://www.icloud.com/pages/08h9Afg9F8BKdTC09es15roLA>](https://www.icloud.com/pages/08h9Afg9F8BKdTC09es15roLA)

[<https://www.icloud.com/keynote/0GN9avkNRkgmxFj6b29g2j3uA>](https://www.icloud.com/keynote/0GN9avkNRkgmxFj6b29g2j3uA)

2.1. Ten Aspects

The consequences of the changes that made the Long 20th Century what it was—the industrial research lab and the associated communities of engineering practice, by the modern corporation and its powers to bureaucratically distribute and diffuse knowledge into production worldwide, and by globalization that moved hundreds of millions of people from continent to continent and brought all places cheek-by-jowl, as far as shipment of non-fragile staples was concerned—ramified far. I count ten:

The major theme, from which all the other key major themes stem from the direct consequence that was the **explosion of material wealth**: that the 1870-2016 Long 20th Century saw the material wealth of humankind explode beyond all previous imagining so that we—at least those of us who belong to the upper middle class and live in the industrial core of the world economy—are now far richer than the writers of even previous centuries' utopias could imagine.

1. **History was economic**: As a result of the economic changes that were the

explosion of wealth, the 1870-2016 Long 20th Century was the first century ever in which its history was predominantly economic history. The economy was the dominant arena of events and change, and economic changes were the driving force behind other changes, in a way never seen before in any single century.

2. **The expanding cornucopia of technological knowledge:** Enabling the enormous increase in material wealth—its essential prerequisite, in fact—was the explosion in human technological knowledge. This required not just a culture and educational system that created large numbers of scientists and engineers, and means of communication and memory so that they could stand on each others' shoulders as well as those of earlier giants, but also that the market economy be structured in a way that made it worth people's while to funnel resources to scientists and engineers so that they could do their jobs.
3. **The victory of public health:** Typical human lifespans went from 25 to 70 or more years. They did this in spite of how globalization brought new plagues and types of plagues—the 1918-1919 influenza epidemic and, just beyond our end point, the 2020 coronavirus epidemic. Enough said: that increase in life expectancy by itself meant that humanity at the end of the Long 20th Century was living in what all previous eras would have regarded as a fabulous utopia.
4. **The demographic transition:** The 1870-2016 Long 20th Century saw, we think, the approaching end of the era in which technology and biology increased human numbers: it looks like the world is headed for zero population growth at a population of roughly 10 billion in 2050. And during the Long 20th Century the population explosion that carried the earth from 1 to 7.5 billion people placed huge demographic burdens on poor countries—burdens now ebbing as the demographic transition to low fertility and extended lifespan finish their spread across the globe.
5. **The arrival of feminism:** The 1870-2016 Long 20th Century saw the substantial liberation of women from the role imposed by patriarchy enabled by biology Malthusian pressures. At the start of the Long 20th Century the typical woman spent about 20 years eating for two: pregnant or breastfeeding. At the end of the Long 20th Century the typical woman spent about 4 years. Should this be theme number one? Perhaps.
6. **American exceptionalism:**

7. **Progress toward inclusion and hierarchy attenuation:** To an extent that earlier human observers would have found hard to credit, human societies became, to a remarkable degree, much less instrumentalities for advancing the interests and comforts of men of the right background—and global society became, to a degree that would have seemed even more remarkable to human observers as of 1870, much less an instrumentality for advancing the interests and comforts of men of a white northwest-European background. Others began to count, even if it is still the case that “white males play the videogame that is society on the ‘easy’ setting”.
8. **Tyranny multipliers:** The 1870-2016 Long 20th Century’s tyrannies were more brutal and more barbaric than those of any previous century—and these tyrannies were in strange, complicated, and confused ways somehow closely related to the forces that made the explosion of wealth so great.
9. **Wealth gulfs:** The 1870-2016 Long 20th Century saw the relative economic gulf between different economies grow at an astonishingly rapid pace as the world became, relatively, a more unequal place than ever before—save possibly for the days when some East African Plains Apes knew how to make fire and others did not. It is a scandal and a disgrace that today one-quarter of the human race have lives that—save for public health—are not that distinguishable from the lives of our Agrarian Age predecessors.
10. **Disorganization, mismanagement, insecurity, and dissatisfaction:** The governments of the 1870-2016 Long 20th Century had little clue as to how to regulate the un-self-regulating market to maintain prosperity, or ensure opportunity, or produce substantial equality.

These will be our major themes:

2.2. History Was Economic

Before the Long 20th Century, the *economic* was simply never the primary focus of the history of any single century. It was the background in front of which the history of events proceeded. And even the history of structures—changing patterns of human belief, agency, interaction, and action—moved much faster than did the history of the *economic*. The *economic* comprised patterns stable in the short and the medium run. Its changes could only be seen if you pulled the lens far back and examined things in *La Longue Duree*: in the long run.

Humanity has had a lot of history. Humanity has had history from the acquisition of language and the radiation from Africa up through the invention of writing to votes for women and nuclear weapons. In its raw form, history is events: one damned thing happening after another—and often many overlapping things happening at once. We take these damned things happening and put them in an order, using frameworks that we find to be useful to us. We thus choose the events and structures we write history about by focusing on what changes and what matters.

For example, if you are telling a story of the history of the 1500s, you are more likely than not to focus on one or more of three things:

- Martin Luther and Jean Calvin's Protestant Reformation,
- The Spanish conquest of the Americas, or
- The rise of the Shāhān-e Gūrkānī—what we in English call, for some reason, the Moghul Empire—in the Indian subcontinent.

Perhaps you add a couple more series of events that lead to structural changes: The history of Sengoku Period Japan? The expansion of the Ottoman Empire under Sultans Selim the Grim, Suleiman the Lawgiver, and Selim the Sot? The coming of the slave trade to West Africa? Or perhaps something else?. Those are the axes of the history of the 1500s: religion, expansion, conquest, and culture.

But the Long 20th Century is very different. That we now have more than 25 times the technological and organizational capabilities of our predecessors back in 1870, that as a consequence we have six times their numbers and more than 8 times their average incomes, that gulfs between rich and poor today have grown massively in the past 150 years—those facts are at the core of every single 20th Century historical process and have to take pride of place and priority in any well-written and well-thought out history of any aspect of events and structures since 1870.

2.3. Knowledge Cornucopia

Enabling and powering the enormous increase in material wealth—its essential prerequisite, in fact—has been the explosion in human technological knowledge, the creation of this explosion requiring not just scientists and engineers and means of communication, but also a market economy that made it worth people's while to funnel resources to scientists and engineers so that they could do their jobs. We, moreover, have had not just technological breakthroughs, but a breakthrough in the creation of the research laboratory—a breakthrough in that we have now routinized

the process of creating constant and successive technological breakthroughs. And we have had a breakthrough in how to deploy and diffuse technology: the creation of our large, bureaucratic, value chain-orchestrating modern corporations.

John Maynard Keynes thought that economists' excessive desire to try to quantify everything made them stupid:

Approximate statistical comparisons depending on some broad element of judgment rather than of strict calculation... may possess significance and validity within certain limits. But the proper place for such things as net real output and the general level of prices lies within the field of historical and statistical description, and their purpose should be to satisfy historical or social curiosity.... To say that net output to-day is greater, but the price-level lower, than ten years ago or one year ago, is a proposition of a similar character to the statement that Queen Victoria was a better queen but not a happier woman than Queen Elizabeth—a proposition not without meaning and not without interest, but unsuitable as material for the differential calculus. Our precision will be a mock precision if we try to use such partly vague and non-quantitative concepts as the basis of a quantitative analysis...

When I say that I calculate my index of the value H of the stock of human useful ideas about technology and organization by fitting a growth model with parameters $\alpha=0.4$ and $\gamma=3$, I am not doing real science. Yes, real scientists also calculate quantitative values for abstract things that cannot be seen. Nobody has ever seen a momentum or a kinetic energy. Yet real scientists know as much as well and as certainly as any human can know anything that the change in momentum is the force times the time over which it is applied; the change in kinetic energy is the force times the distance over which it is applied; an electron or positron absorbs or generates a photon (and a photon either splits into an electron and a positron or an electron and a positron collide and annihilate each other, producing a photon) in a process governed by the fine structure constant, which is a value estimated by experiment of $0.007297351 \pm 0.000000006$. But real scientists' laws hold exactly because they are inscribed in the deep structure of the universe: hold for all forces, all momentums, all kinetic energies, and all photon-electron-positron interactions. There is, by contrast no machine buried deep inside the earth emitting some kind of force field penetrating the universe that generates as a natural law the aggregate production function which growth economists like me like to write with parameters $\alpha=0.4$ and $\gamma=3$.

Nevertheless, I find such a framework for the value H of the stock of human useful ideas about technology and organization useful as a metaphor in organizing my

thoughts. It is yet another Wittgenstein's Ladder. I—and hopefully you—use it to gain insight. Queen Victoria does not appear to have been a much better queen than Queen Elizabeth. But, from all historical accounts, Gloriana appears to have been perhaps four times as happy as happy a woman as the Widow at Windsor. And then, later, we can pull the ladder up.

So set our quantitative index of the global value of human knowledge H equal to a value of 1 back in year -8000, at the end of the Gatherer-Hunter and the beginning of the Agrarian Age. Then by the year 1 this value index stood 3.5. By the year 1500 the index of the value of knowledge stood at 4.75: given similar resources, because of more knowledge about how to use nature and organize humans one worker in the year 1500 could produce things of the value it would have taken 4.75 typical workers of 8000 BC to produce.

Calculating the average rate of growth of the value of the knowledge gets us a growth rate of 0.02% per year—0.5% per generation—for the entire span years from 1 to 1500. We also see an average population growth rate for the world over this time span of 0.06% per year—1.5% per generation—as increases in technological prowess were soaked up by higher populations and thus greater resource scarcity, leaving little or none to improve humanity's lot.

From 1500 to 1800 to 1870 our quantitative index H grows from 4.75 to 9 to 16—average proportional rates of annual increase in H of 0.2% per year over 1500-1800 and of 0.8% per year over 1800-1870. These are vastly greater than the 0.02% per year of 1-1500 or the 0.035% per year of 1000-1500. However, even the 0.8% per year of growth in human knowledge over 1800-1870 did little to raise human material well-being. Humans were perhaps 40% better off in 1870 on average than they had been in 1800—a growth rate of 0.48% per year. And, as John Stuart Mill had observed, little of this increase in production per worker trickled down to the working classes of Britain, and still less trickled down to the working classes of the rest of the world. Yes, technology was gaining a few steps on fecundity, but any interruption or slowdown—any failure to innovate and then diffuse more technologies of the importance of the railroad and the steam engine—and the world would be stuck in a Steampunk equilibrium at best, or in a 1500-1770 commercial society Gunpowder Empire or a pre-1500 Agrarian Poverty equilibrium if things went worse.

But, instead, after 1870 came the wealth explosion. Our 7.5 billion people today have a global value of knowledge index of 421 and an average income of 30 dollars a day—10000 dollars per capita per year. The value of knowledge about

technology and organization grew at an average rate of 2.3% per year over the Long 20th Century. And it is still growing.

That something bigtime had changed was obvious to those who lived through it. Jules Verne made a career starting in 1863 as a writer of “scientific romances” in which the advance of technology is the real protagonist. And Verne’s follower H.G. Wells continued this line of thought in a darker, grimmer mode. The fruit of the Tree of Knowledge was likely to be used ill, unless we found some way to also eat the fruit of the Tree of Good and Evil:

A walk... along the Thames Embankment from Blackfriars Bridge to Westminster... because we thought... that crescent of great buildings and steely, soft-hurrying water must needs be altogether beautiful.... We were dashed by an unanticipated refrain to this succession of magnificent things, and we did not cry, as we had meant to cry: How good it was to be alive! Along the embankment... iron seats at regular intervals... filled with crouching and drooping figures. Not a vacant place remained, not one vacant place. These were the homeless, and they had come to sleep here. Now one noted a poor old woman with a shameful battered straw hat awry over her drowsing face, now a young clerk staring before him at despair; now a filthy tramp, and now a bearded, frock-coated, collarless respectability.... 'Great God!' cried I. 'But must life always be like this? I could die, indeed, I would willingly jump into this cold and muddy river now, if by so doing I could stick a stiff dead hand through all these things in the future,—a dead commanding hand insisting with a silent irresistible gesture that this waste and failure of life should cease, and cease forever’...

John Maynard Keynes, by contrast—writing in 1919 in great fear that humanity’s technology- and organization-driven drive toward Utopia had come smash and might not be recovered—accentuated the positive:

What an extraordinary episode in the economic progress of man that age was which came to an end in August, 1914! The greater part of the population, it is true, worked hard and lived at a low standard of comfort, yet were, to all appearances, reasonably contented with this lot. But escape was possible, for any man of capacity or character at all exceeding the average, into the middle and upper classes, for whom life offered, at a low cost and with the least trouble, conveniences, comforts, and amenities beyond the compass of the richest and most powerful monarchs of other ages. The inhabitant of London could order by telephone, sipping his morning tea in bed, the various products of the whole earth, in such quantity as he might see fit, and reasonably expect their early delivery upon his doorstep; he could at the same moment and by the same means adventure his wealth in the natural resources and new enterprises of any quarter of

the world, and share, without exertion or even trouble, in their prospective fruits and advantages.... He could secure forthwith, if he wished it, cheap and comfortable means of transit to any country or climate.... He regarded this state of affairs as normal, certain, and permanent, except in the direction of further improvement, and any deviation from it as aberrant, scandalous, and avoidable...

How did the world accomplish its further threefold leap, relative to what had taken place in the British Industrial Revolution era of 1800-1870, in the underlying fundamentals of economic growth? And how did what was originally a geographically-concentrated surge become global, albeit unevenly global? Why, instead of the British Industrial Revolution growth surge petering out and being followed by a return to the Commercial Revolution era—itself a positive historical anomaly—did the rate of human progress leap ahead at a tenfold pace? Why does one year since 1870 see the relative technological and organizational progress of three years over 1800-1870, of ten years over 1500-1800, and of a hundred years over 1-1500? Just what happened around 1870 to make this shift? And what has happened between then and today to sustain it?

I see five factors as key:

- Most important: The development of the industrial research laboratory of Edison and Tesla
- Next in importance: The diffusion of knowledge about technology—its subsequent bureaucratization and generalization in the form of our modern *corporations*.
- Globalization in goods transport, in the form of the iron-hulled screw-propelled ocean-going steamship linked to the railroad network, and subsequent developments.
- Globalization in communication, in the form of the global submarine telegraph network linked to landlines, and subsequent developments.
- The openness of the world—most important, perhaps, the open borders in migration, as one in fourteen humans changed their continent between 1870-1914. But also and closely linked to the other forms of openness that allowed transport and communications to produce globalization; that allowed research and development to diffuse throughout the world, albeit slowly; and that made the Long 20th Century the American Century.

The first greatly increased the pace of technological growth as inventors and innovators were no longer forced to be both lone wolves and to also be promoters, projectors, financiers, and managers. The second greatly increased the pace of

technological growth as knowledge ceased to be concentrated in the minds of the lucky, and diffused widely across the globe. The third and fourth created the possibility of making the world economy, for the first time, a single system: For good and ill the earnings of a rubber tapper in Brazil would be powerfully influenced by things happening continents away—by the economic growth and demand for rubber in North America and in western Europe, and by the success of the British imperial project in Malaya and the Belgian in the Congo. The last realized the possibility of an integrated world economic system, and transformed the U.S. from likely fifth fiddle to lead violin among the Long 20th Century's global powers.

That all five of these came together around 1870 is what, I think, made the tipping point. I wish that I could do more in this book to explain why they together were a tipping point, but I do not know enough to do so. I can, however, trace their consequences.

2.4. The Victory of Public Health

Typical human lifespans went from 25 to 70 or more years. They did this in spite of how globalization brought new plagues and types of plagues—the 1918-1919 influenza epidemic and, just beyond our end point, the 2020 coronavirus epidemic. Enough said: that increase in life expectancy by itself meant that humanity at the end of the Long 20th Century was living in what all previous eras would have regarded as a fabulous utopia.

2.5. Demographic Transition

John Maynard Keynes feared, in 1919, that World War I had broken this marvelous machine of economic growth and human happiness. And so he set out to try to rebuild it. (Don't laugh: he came close to doing so.) If it could not rebuild it? He feared that the world might face a reversion to some Malthusian dystopia, as any slowing in the rate of growth of innovation in technology and organization would cause innovation to once again start losing its race with fecundity.

Fecundity is mighty: all of each of our ancestors for all of the post 200 million years of the Mammalian Order had genes that drove them to successfully reproduce. And back before the Industrial Revolution, the overwhelming bulk of

humans found themselves in situations in which they turned their brains and not just their hormones to the task of ensuring reproduction. In the agrarian age, women had little social power and little literacy. Women without social power and literacy can acquire respect and social power in only one way: become the mother of six or more children, and have at least half of them survive to adulthood to be your advocates in and your contribution to society. And in societies with high infant mortality your well-being in your old age—if you survive to old age—hinges on having surviving descendants, so you had better try for many in the hope that at least one will outlive you.

But even before 1919 fecundity had started to give up the race.

Reduce infant mortality, allow women to learn to read, provide them with some social power—some rights to own property and set their own destinies and to escape from being under the thumb of husbands, fathers, uncles, or Mick Jagger and Keith Richards, allow them access to reliable means of fertility control, and humanity rapidly heads to zero population growth: most women wish to have one or two children, but only a relatively small proportion wish to have three or more. Thus humans now appear to be converging on a fertility level of two children per potential mother—or perhaps even fewer. Human population appears to be headed for a peak around 2050 of about 10 billion, provided the semi-stalled fertility transition in Africa resumes the normal pattern we have seen on the other continents.

2.6. Feminism

With the demographic transition has come the erosion of much of patriarchy.

In 1764, in Britain's Massachusetts colony, Abigail Smith was 20. She had had no formal education at all: girls weren't worth it. She married a man she had known for five years: the up-and-coming 30-year-old lawyer John Adams, future President of the United States. Children rapidly followed their marriage: Nabby (1765), John Quincy (1767), Suky (1768, died at 2), Charles (1770, died at 10), Thomas (1772), probably a miscarriage or two or three from 1774-6, then Elizabeth (1777, stillborn), then (perhaps) another miscarriage—but I suspect not. She spent five years pregnant. She was rich enough that she, perhaps, hired a wet-nurse for her children, but somebody or somebodies nursed her children for perhaps fourteen more years: some woman or women were thus eating for two for more than a full decade to raise the next generation of Adamses.

In 1776 she writes a famous letter to her husband John in which she begged him to write laws providing women with legal personality in the new revolutionary country he was building:

Remember the Ladies, and be more generous and favourable.... Do not put such unlimited power into the hands of the Husbands.... Such of you as wish to be happy willingly give up the harsh title of Master for the more tender and endearing one of Friend. Why then, not put it out of the power of the vicious and the Lawless to use us with cruelty and indignity with impunity?... Regard us then as Beings placed by providence under your protection and in imitation of the Supream Being make use of that power only for our happiness...

John Adams thought this was a great joke:

I cannot but laugh.... Your letter was the first intimation that another tribe, more numerous and powerful than all the rest, were grown discontented. This is rather too coarse a compliment, but you are so saucy, I won't blot it out. Depend upon it, we know better than to repeal our masculine systems.... We have only the name of masters, and rather than give up this, which would completely subject us to the despotism of the petticoat, I hope General Washington and all our brave heroes would fight...

Read the letter entire, and you learn that Abigail Smith Adams: (1) Ran John Adams's Boston-Braintree household and property operations while he played on the political stage; (2) dealt with death and disease of children and neighbors that were omnipresent, with "our Neighbour Trot... striped of two lovely children in one week...", "Becky Peck they do not expect will live out the day...", "your Brothers youngest child lies bad with convulsion fitts..."; (3) was desperate for news of what was going on in the wider world, for "I wish you would ever write me a Letter half as long as I write you.... Where your Fleet are gone? What sort of Defence Virginia can make against our common Enemy? Whether it is so situated as to make an able Defence? Are not the Gentry Lords and the common people vassals? Are they not like the uncivilized Natives Brittain represents us to be?..."; (4) warns him to be very, very careful of the Massachusetts rebels alliance with teh slaveholders of Virginia, for "the passion for Liberty cannot be Eaquelly Strong in the Breasts of those who have been accustomed to deprive their fellow Creatures of theirs..."; (5) begs for at least some fig leaf of legal protection from abuse and brutality for her sisters; and, of course, (6) desperate concern that more of her children not join the shades in their graves: "our own little flock... My Heart trembles with anxiety for them..."

A very talented, very energetic, very capable woman, confined to a much narrower sphere of life than she could have occupied—and patronized by her husband.

Why male supremacy was so firmly established back in the Agrarian Age is something that is not obvious to me. Yes, it was very important to have surviving descendants. Yes, attaining a reasonable chance of having surviving descendants to take care of one in one's old age meant that the typical woman spent 20 years eating for two: pregnant and breastfeeding. Yes, eating for two is an enormous energy drain, especially in populations near subsistence. Yes, Agrarian Age populations were near subsistence—my great-grandmother Eleanor Lawton Carter's maxim was "have a baby, lose a tooth" as the child-to-be leached calcium out of the mother to build her or his own bones. And she was an upper-class Bostonian, born in the mid-1870s. Yes, breastfeeding kept women very close to their children, and impelled a concentration of female labor on activities that made that easy: gardening and other forms of within-and-near-the-dwelling labor, especially textiles. Yes, there were benefits to men as a group from oppressing women—especially if women could be convinced that they deserved it: "Unto the woman he said, 'I will greatly multiply thy sorrow and thy conception; in sorrow thou shalt bring forth children; and thy desire *shall be* to thy husband; and he shall rule over thee'..."

But surely even in the Agrarian Age a shift to a society with less male supremacy would have been a positive-sum change? Women as equal participants in society, rather than just chattels, classified as a little bit above slaves and cattle, can do a lot. We—optimistic—economists have a strong bias toward believing that people in groups will find ways to become, collectively, more productive and then to distribute the fruits of higher productivity in a way that makes such a more productive social order sustainable. But apparently not.

The bio-demographic underpinnings of the cultural pattern of high male supremacy began to erode even before 1870. But it was over 1870-2016 that these underpinnings dissolved utterly. Reductions in infant mortality, the advancing average age of marriage, and the increasing costs of child raising together drove a decrease in fertility. The number of years the typical woman spent eating for two fell from twenty—if she survived her childbed—down to four, as better sanitation, much better nutrition, and more knowledge about disease made many pregnancies less necessary for leaving surviving descendants, and as birth control technology made it easier to plan families. And, after exploding in the Industrial Age, rate of population growth in the industrial core slowed drastically. The population

explosion turned out to be a relatively short run thing. Human population growth rapidly headed for zero long-run population growth.

The path of within-the-household technological advance also worked to the benefit of the typical woman over 1870-2016: dishwashers, dryers, vacuum cleaners, improved chemical cleansing products, other electrical and natural gas appliances, and so on, especially clothes-washing machines—all these made the tasks of keeping the household clean, ordered, and functioning much easier. Maintaining a nineteenth century, high-fertility household was a much more than fulltime job. Maintaining a late twentieth century household could become more like a part-time job. And so much female labor that had been tied to full-time work within the household because of the backward state of household technology became a reserve that could now be used for other purposes. And, as Betty Friedan wrote in the early 1960s, women who sought something like equal status could find it only if they found “identity...in work... for which, usually, our society pays.” As long as women were confined to separate, domestic, occupations which the market did not reward with cash, it was easy for men to denigrate and minimize

I see the centrality of the *economic* and the extraordinary upward leap in prosperity as the principal news that the future will remember from the history of the Long 20th Century, and the coming of feminism as one of—a very important one of—its ramifications. But I am male. If I were female, would I see the demographic transition—the shift of the typical woman’s experience from one of eating for two for twenty years (and of having one chance in seven of dying in childbed) to eating for two for four years—and the rise of feminism as the biggest news?

2.7. Hierarchy Attenuation

It had long been the case in human society that you had much social power only if you were male, and even if you were male you had much social power only if you were in some way special: the right tribe, or the right caste, or the right lineage, or a member of the right social order, had the right kind of—and enough—property, or the right kind of—and enough—education. This had been the case since at least the days when the Man Who Saw All Things, Gilgamesh, ruled as King of Uruk because he was two-thirds god and one-third man. Doing most of the agrarian age in most heavily populated places on the earth, societies were close to their respective inequality-possibility frontiers: extract any more from the peasants and the craftsmen for war, display, and upper-class comforts, and the population becomes too hungry and poor to reproduce itself. That was how people expected it

was and would always be. Human societies would have widespread slavery—or serfdom, or concentrated land ownership with high rents—unless and until humans obtained the utopian fantasy technologies of the Golden Age. That was what Aristotle wrote: that “chief workmen would not want servants, nor masters slaves” only if:

every instrument could accomplish its own work, obeying or anticipating the will of others, like the [blacksmithing] statues of Daedalus, or the three-wheeled catering serving-carts of Hephaestus, which, says the poet: "of their own accord entered the assembly of the Gods"... the shuttle would weave and the plectrum touch the lyre without a hand to guide them...

That was true in 340 BC. That was still true when our history begins.

In 1870 it was already beginning to the case, and now it is definitely the case, that we have the autonomous robotic blacksmithing statues of master-craftsman Daedalus—and more, a thousand-fold—and also food-production food-processing, and food-distribution technology vastly outstripping the self-propelled catering carts of Hephaestus the smith-god. It was no longer a necessity to own or to have some direct or indirect dominion over slaves and near-slaves in order to be rich in material terms.

Yet inequality and its maintenance remained important social, cognitive, and psychological facts. And not just inequality produced by the unequal distribution of property that the market economic system had made absolute. There was powerful inequality based on what kind of person you were as well. In 1858, Abraham Lincoln—a politician and statesman much more committed to the dignity of labor and to the equality of humanity than most—said while campaigning on the stump:

I have no purpose to introduce political and social equality between the white and the black races. There is a physical difference between the two, which, in my judgment, will probably forever forbid their living together upon the footing of perfect equality, and inasmuch as it becomes a necessity that there must be a difference, I, as well as Judge Douglas, am in favor of the race to which I belong having the superior position.... I agree with Judge Douglas he is not my equal in many respects—certainly not in color, perhaps not in moral or intellectual endowment...

But, for Lincoln, the core meaning of his speech came after a “but”. All this was true, but. Africans and African-Americans deserved and had inalienable rights to a much better deal than they were getting:

There is no reason in the world why the negro is not entitled to all the natural rights enumerated in the Declaration of Independence, the right to life, liberty, and the pursuit of happiness.... In the right to eat the bread, without the leave of anybody else, which his own hand earns, he is my equal and the equal of Judge Douglas, and the equal of every living man...

The “promissory note”, as Martin Luther King Jr. was to put it in 1963 in his “I Have A Dream Speech”, signed by the writers of the Declaration and the Constitution was long in default when Lincoln was working to put slavery on its road to ultimate extinction. That promissory note is still in arrears today: one-half of American states have election laws carefully crafted to diminish the proportion of African-Americans who surmount the hassles imposed in order to vote. A majority of Supreme Court justices pretend to believe that these are partisan restrictions imposed by Republican Party legislators to give them an edge over the Democratic Party in the next election, rather than racist restrictions to keep Black men and women down. But in a context where Republican Party political standard-bearers like Ronald Reagan talk privately of diplomats from Tanzania as “monkeys from those African countries—damn them, they're still uncomfortable wearing shoes!” And economic-policy standard-bearers like the University of Chicago’s George Stigler writes of African-American demonstrations for political and civil rights as “growing in size and insolence”, I do not see the distinction that the Supreme Court majority is willing to draw.

Nevertheless, one thread of narrative over 1870-1916 is how, slowly and gradually, incompletely and imperfectly, being a male of the right tribe, the right caste, the right lineage, or a member of the right social order became less and less essential if one was to have and keep social power.

2.8. Tyrannies

Now let us turn to the shadows. The Long 20th Century has also seen bloody tyrannies were more brutal and more barbaric than those of any previous age. Twentieth-Century governments and their soldiers have killed perhaps forty million people in war: either soldiers (most of them unlucky enough to have been drafted into the mass armies of the twentieth century) or civilians killed in the course of what could be called military operations. But wars have caused only about a fifth of this century’s violent death toll. Governments and their police have

killed perhaps one hundred and sixty million people in time of peace: class enemies, race enemies, political enemies, economic enemies, imagined enemies.

Call those political leaders whose followers and supporters have slaughtered more than ten million of their fellow humans “members of the Ten-Million Club.” All pre-twentieth century history may (but may not) have seen two members of the Ten-Million Club: Genghis Khan, ruler of the twelfth century Mongols, launcher of bloody invasions of Central Asia and China, and founder of China's Yuan Dynasty; and Hong Xiuquan, the mid-nineteenth-century Chinese intellectual whose visions convinced him that he was Jesus Christ's younger brother, and who launched the Taiping Rebellion that turned south-central China into a slaughterhouse for decades. By contrast the twentieth century has seen six more join: Adolf Hitler, Chiang Kaishek, Vladimir Lenin, Joseph Stalin, Mao Zedong, and Tojo Hideki. Hitler, Stalin, and Mao have credentials that make them charter members of the Thirty Million Club as well—and perhaps the Fifty Million Club. A regime whose hands are as bloody as those of the 1965-1998 Suharto regime in Indonesia—with perhaps 300,000 communists, suspected communists, and others in the wrong place at the wrong time dead at its creation in 1965, and perhaps 150,000 inhabitants of East Timor dead since the Indonesian annexation in the mid-1970s—barely makes the twentieth century's top twenty list of civilian-massacring regimes.

What does this—bloody—political and secret police history have to do with economic history? It seems at first glance that, while deplorable, it has little to do with the story of how people produced, distributed, and consumed the commodities needed and desired for their material well-being.

But it does. First, the possibility that the secret police will knock at your door and drag you off for torture and death is a serious threat to your material well-being. Second, the shooting or starvation was often part of the government's “management” of its economy: the stick used to compel the people to perform service or labor as the government wished. The economies of the Soviet Union in the 1930s and of China in the 1960s cannot be understood without understanding how mass terror was used as a social discipline device. Third, and most extraordinary, the twentieth century is unique in that its wars, purges, massacres, and executions have been largely the result of *economic ideologies*. Before the twentieth century people slaughtered each other over theology, and people slaughtered each other over power. But only in the twentieth century have people killed each other on a large scale in disputes over the economic organization of society.

This is profoundly stupid. We all we want social mechanisms that will work in the sense of delivering prosperity, progress, and a reasonably egalitarian distribution of income. Combinations of mechanisms that fail to accomplish this should be rejected; combinations that succeed should be approved; but the key is to figure out what works and then apply it, not deduce what ought to work from first principles and then commit mass murder for it.

The last appropriate word here should be Aleksandr Solzhenitsyn's:

The imagination and inner force of Shakespeare's villains stopped short at ten or so cadavers, because they had no ideology.... It is thanks to *ideology* that it fell to the lot of the twentieth century to experience villainy on the scale of millions.

2.9. And Wealth Gulfs

Those economies relatively rich at the start of the twentieth century have by and large seen their material wealth and prosperity explode. Those nations and economies that were relatively poor have grown richer, but for the most part slowly. The relative gulf between rich and poor economies has grown steadily over the past century. Today it is larger than at any time in humanity's previous experience, or at least larger than at any time since only some tribes knew how to use fire. The gulf across which the world's rich and poor regarded each other exists in every dimension: how much people consume, whether they can read, what tools they use, and how they make their living.

This glass can be viewed either as half empty or as half full. It is half empty because we live today in the most unequal world ever. It is half full because most of the world has already made the transition to sustained economic growth; most people live in economies that (while far poorer than the leading-edge post-industrial nations of the world's economic core) have successfully climbed onto the escalator of economic growth and thus the escalator to modernity. The economic transformation of most of the world is less than a century behind the of the leading-edge economies—only an eyeblink behind, at least from the millennial perspective. However, the millennial perspective is one that human beings can adopt only when contemplating the long-dead past—not when thinking about their present or their children's future.

On the other hand, one-tenth of humanity not made the transition to economic growth, and has not climbed onto the escalator to modernity at all. The median

inhabitant of Africa has access to modern public health and to a village cell phone. But do they have higher real incomes than did their predecessors of two generations ago? It is not obvious that the answer is “yes”.

From an economist’s point of view, the existence, persistence, and increasing size of large gaps in productivity levels and living standards across nations seems bizarre. And more: it is a scandal, and a crime.

2.10. Economic Policy Mismanagement

The management of economies by governments in the twentieth century was at best inept. And, as we have seen over 2007-2018, little if anything has been learned about how to regulate the un-self-regulating market in order to maintain prosperity, or ensure opportunity, or produce substantial equality. The problems of economic policy in the modern age are, speaking very broadly, twofold: the problem of managing “fictitious commodities”, and the problem of managing “aggregate demand”.

By “fictitious commodities” Austro-Jewish historian Karl Polanyi meant this: People believe that they have rights to a stable community and to the place in it they believe they deserve, to a level of income consonant with how hard they work and who they are, and to a stable economic environment in which they can do their job. The problem is that market economies recognize only property rights. And the only property rights that are worth anything are those that help you make things for which the current batch of rich people have a serious jones.

Thus in a market economy everything, everything must pass a profitability test. Would it be more profitable to move you out of your neighborhood and move a different group of people in? The market economy will make it happen. Are your skills those that are, by mischance, currently in excess supply in the global marketplace? Your income will drop to zero. Has some rootless cosmopolite financier thousands of miles away decided that a higher rate of profit can be made by pulling the plug on the productive value chain you participate in and standing up something else hundreds or more miles away? Your job and the firm you work for will dry up and blow away.

People then call on society and the government to protect them—to vindicate their Polanyian rights, to keep the market economy from treating the *land* they live on,

their *labor* applied to production, and the *finance* that keeps it all running as mere commodities to be shifted willy-nilly to their most profitable use as the creative-destruction processes of the market economy slouch forward. And if society, polity, and government do not respond, people will find a way to make a different society, polity, and government that people are willing to promise them will vindicate their Polanyian rights, and treat the “fictitious commodities” as what they really are: the fabric of people’s lives.

By “stabilizing aggregate demand” we mean avoiding the *grand mal* seizures of the economic mechanism like 2008-9. The share of 25-54 year-olds—too old to be in school in mass, and too young to be retired in mass—suddenly full by five full percentage points, and still has not returned to its pre-2008 level. It is the government’s job to stop this, and to fix it when it happens.

Plus there is more: the management of growth and the management of distribution are things that need to be undertaken at the government level as well.

But governments have done an at best mixed job at vindicating Polanyian rights, managing aggregate demand, managing growth, and managing distribution. Plus the twentieth century has seen the century-long economic disaster of communism, and the quarter-century-long disaster of fascism.

Some of mismanagement is because twentieth century economists did not know what to prescribe: the history of economic policy reads like alchemy, not chemistry. Often proposed remedies made economic problems worse. Many times one current generation’s proposed solutions to problems turn out to lay the groundwork for the next generation’s problems. And it is not always the case that larger problems are replaced by smaller ones over time.

Economists do know a lot. But there are many economists who will not tell you what they know. Why did America’s professional Republican economists pledge that enactment of the late 2017 Trump-McConnell-Ryan tax cut was likely to boost investment in America by \$800 billion dollars in 2018, again in 2019, and so on out to the future when they knew it was highly unlikely to do any such thing? To fuzz the issue, and allow newspapers and TV journalists to say “economists disagree”.

Moreover, often politicians did not like to follow their economists’ advice—or at least decide to seek for a more complaisant set of economists who would give advice that would be more politically pleasing and palatable to follow.

Some of it is simply that while it may be true that those who do not remember the past are condemned to repeat it, this aphorism does not stress the fact that that means that the rest of us are condemned to repeat it with them.

2.10. Other Themes

There are other themes as well: shifts in the distribution of relative wealth and economic power from rich to middle-class and back again, advances and retreats of effective political democracy; the waves of social democracy and fascism and neoliberalism and *laissez-faire* and really-existing socialism and state capitalism with national characteristics sloshing back and forth across the world; and the Great Depression, in one sense the defining moment of the economic history of the Long 20th Century, and its half-echo in the Great Recession that came at the long 20th century's end, to name three.

We are narrative-loving animals: creatures that love stories. So it is time to stop sketching themes and start telling the stories.