

# **Thursday September 3 Lecture: Stagnant Incomes and the Dire Absolute Poverty of the Globe, 1800-1870**

## **Econ 115: Slouching Towards Utopia?: The Economic History of the World in the Long Twentieth Century**

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You need to understand three things to grasp the state of the world economy in 1870: that the drive to make love is one of the very strongest of all human drives, that living standards were what we would regard as very low for the bulk of humanity in the long trek between the invention of agriculture in 1870, and that the rate of technological progress back before 1870 was glacial, at best.

### **Children**

The first thing you need to understand is that one of the strongest human drives of all is the drive to make love. Before the coming of abundant and relatively reliable means of artificial birth control at the end of the nineteenth century, making love is followed almost invariably if not immediately by children—over a lifetime, lots of children. And once

humans have children that they survive and flourish becomes the most important thing for almost every parent. The survival and flourishing of your children becomes the most important thing for two reasons. The first reason is that you love them almost as much as and in some cases more than yourself. Recall Hektor's prayer for his son Astyanax (a prayer that Hera and Athene made sure that Zeus did not grant):

Zeus, grant that this my child may be, like me, first among the Trojans.  
Let him be not less excellent in strength. Let him rule Ilius with his  
might. And may the people say of him as he comes home from battle:  
"He is far better than his father!"

The second reason is that you know that if you survive into your old age you will need someone around to help take care of you. The only people likely to be willing to take care of you are your descendants. And with infant and child mortality rates of 50% and life expectancies of less than thirty years, lots of pregnancies is the only way to be reasonably sure that you will have a still-living child when you go blind and toothless.

Thus human populations—back before widespread female literacy enlarged the options open to women, back before the fall in infant mortality created the expectation that your children would survive to grow up, back before widespread artificial birth control allowed women to have the number of children they wanted and not more—tended to grow until something stopped them.

## **Living Standards**

The second thing you need to understand is that living standards were what we would regard as very low for the bulk of humanity throughout the long trek between the invention of agriculture around 8000 B.C. and 1870.

For a moment go back to ten thousand years ago, on the eve of the invention of agriculture, back when hunter-gatherers inhabited the world. Biomedically all of our hunter-gatherer ancestors appear to have been

about as healthy as we in the modern world are through early middle age—if they survived to early middle age, that is, for life expectancy at birth was twenty-five on a generous estimate. The average adult height of mesolithic—i.e., the period that ended 10,000 years ago—hunter-gatherers appears to have been about 5’8” for men and 5’5” for women, perhaps a hair less than average adult height in the rich postindustrial economies and a hair more than average adult height in the world as a whole is today. Our hunter-gatherer ancestors were, plausibly, better-nourished than we are today: even in the richest countries today diets are tilted toward high-caloric density carbohydrates—rice, wheat, corn, and potatoes—relative to nutritional requirements.

Contemporary hunter-gatherers appear to work less than the rest of us do today—spending, according to Marshall Sahlins’s survey of the anthropological literature, about 15 hours per week gathering food and about another fifteen hours a week on everything we could call “work,” including much of what in the postindustrial economies of today takes the form of in-home production. They seem to have leisured societies. As Jared Diamond quotes one of Botswana’s !Kung: “Why should we [work harder at agriculture], when there are so many mongongo nuts in the world?”

As a hunter-gatherer you lived a well-nourished, physically-strenuous life that kept you fit, and was at least moderately interesting in the day-to-day puzzles that you had to solve. Hunter-gatherers avoided the mind-numbing boredom of doing the same thing over and over again to the next row of the same crop, what Karl Marx called the “idiocy of rural life.” But there was a downside. Hunter-gatherer nutritional standards were adequate and diets were varied in large part because population densities were low and foraging territories relatively large. Population densities were low because mortality was ferocious. You got to watch your friends die, your spouse die, your comrades die, worst of all a large fraction of your children die, and then you died at a relatively young age.

How ferocious was mortality? A pre-industrial nutritionally-unstressed human population with access to the technologies of settlement—building

walls, roofs, and chimneys and weaving and sewing clothes—will roughly double in population every twenty-five years. That is what the British settlers in America did in the generations after they hit the coast from Georgia to Maine. But human hunter-gatherer populations before agriculture grew from perhaps a hundred thousand people fifty-thousand years ago to perhaps 5 million people ten-thousand years ago. That is a rate of increase of 0.01% per year: each generation sees not twice as many people as its parent generation, but rather only a quarter of a percent more—one extra person for each 400.

And even though life was not that of boring routinized repetitive labor it was not what we would call comfortable: you spent a not-small part of your life hungry, cold (or too hot), or wet.

Now jump forward again to 1870. How did living standards in 1870 compare to those ten-thousand years ago?

A reasonable view of what we think of as “material well-being” would start out by classifying basic human needs and desires as sixfold: to watch your grandchildren (or your great-nieces and nephews or your protégés) grow up, to have enough food that you are not too hungry, to have enough clothing that you are not too cold, to have enough shelter that you are not too wet, to have enough conceptual puzzles and diversions that you are not too bored, and to have enough status that you can gloat at the envy of others (at least in private). By that yardstick we in the world economy’s core today rank ahead of our hunter-gatherer ancestors on five of these six dimensions. (The sixth—relative status—is, alas!, conserved: you cannot generate it from some without taking it away from others, and so there we are stuck at an equal average level.) But back in 1870 people (with the exception once again of the literate upper classes) by and large did not do so. The upper classes of 1870 were certainly more comfortable and probably led richer and more interesting lives than the Clan of the Cave Bear did. But the illiterate peasants of the world in 1870 probably did not do so

First of all, people in 1870 had no greater life expectancy than people in 8000 BC. Life was nasty—perhaps even nastier in terms of mortality risk than among hunter-gatherers. Infant and adult mortality in agricultural and commercial societies is no lower than in hunter-gatherer ones. Mortality may well be higher for adults, because plagues and famines like dense human populations and bacteria do not care if their rapid growth kills their hosts as long as that happens only after they have found a new host to jump to. Denser human populations are much more vulnerable to plagues than scattered hunter-gatherer populations. And denser populations are denser because they are exploiting the staple grain crops on a large scale. Thus such populations are terribly vulnerable to famine, either through blight or through weather—too hot or too cold, too wet or too dry—adverse to the growth of whatever the staple happens to be

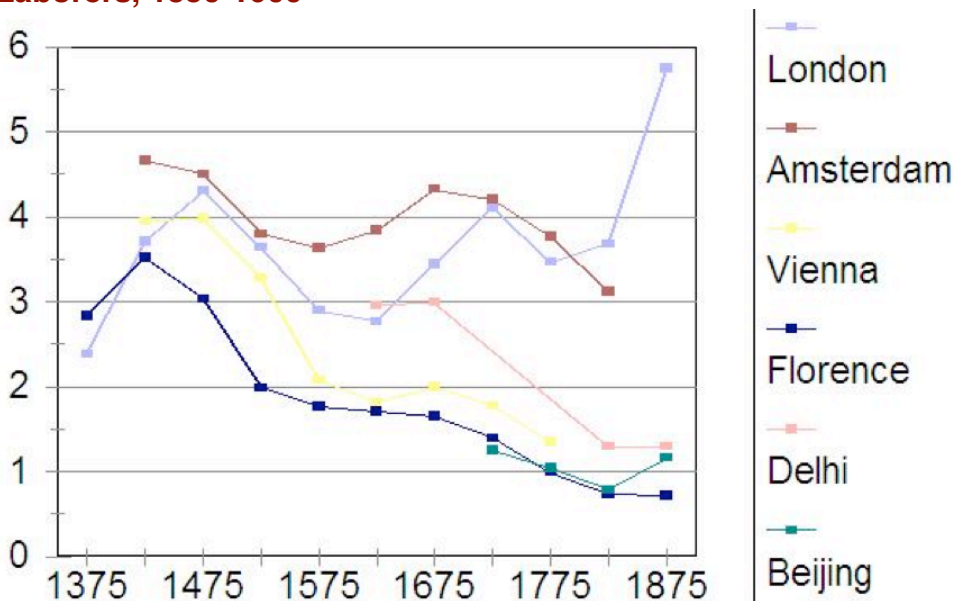
Second, in agricultural and commercial societies people's lives were brutish. An agricultural cereal-heavy diet does not contain enough iron to avoid anemia. It does not contain enough calcium to avoid tooth loss and bone weakness. Even in Berkeley, California, we today eat many, many cheap calories from staple carbohydrates. We suffer nutritional deficits and imbalances as a result. This was much more the case in the long valley between 8000 BC and 1870. Rome's legions were paid in bread and a little salt—that's what "salary" means. Add to this whatever meat they could find and whatever greens and seasonings they could gather, and you had the diet of the legionaries, collectively at least the most powerful group of men of their age. They were highly-skilled practitioners of violence. They were mean. They were also short. And they were, by what we would regard as early middle age, largely toothless.

Have we mentioned endemic hookworm, tapeworm, and other parasites yet? Or that agricultural and commercial labor likely involves heavy lifting-and-carrying labor that damages your spine? Or that the relatively high population densities create greater vulnerability to infectious diseases that debilitate even when they do not kill?

Third, in 1870 agricultural and commercial societies people were short. Average adult male heights of 5'2" (and adult female heights averaging

4'10") appear to have been the rule for humanity once we started to farm. This indicates extraordinary malnutrition by our standards. If my wife and I had fed our boy and girl a diet to produce adult heights of 5'2" and 4'10" respectively, Contra Costa Child and Protective Services would have long since come and taken my children away, and I would never have seen them again.

**Figure 7.1: Subsistence Ratios for Unskilled Urban Eurasian Laborers, 1350-1900**



Source: Robert Allen *et al.* (2009).

Robert Allen and his coauthors have compiled the scanty information we have on the wages of unskilled laborers across the big cities of Eurasia from 1350 to 1900, and plotted their resulting findings in Figure 7.1. The wages are real wages: a value of one means that an adult male laborer employed full time, full year could earn just enough to keep his family of six or so at biological subsistence—1940 calories per adult male per day,

most of it on the cheapest carbohydrate sold in that city, with only tiny amounts spent on “luxuries” (rent, wood for burning, oil, and meat). The workers of London and Amsterdam on these budgets are eating oatmeal two meals a day, the workers of Vienna are eating rye, the workers of Delhi are eating millet, the workers of Beijing are eating sorghum, and the workers of Florence are eating polenta over and over again.

There are three subtleties of interpretation involved in looking at this graph. The first is that biological subsistence is not sociological subsistence. The workers of London in 1600 did not spend 1/3 of their income on “necessities” and have two-thirds left over for luxuries, for they did not want to eat oatmeal two meals a day and in fact did not eat oatmeal two meals a day. Oats were, as famously defined by Samuel Johnson, “a grain that in England is fed to horses and in Scotland is fed to men.” The Scots had a reply — “That is the reason that England breeds such fine horses, and Scotland breeds such fine men.” But an English laborer of 1600 would have been as humiliated to be forced by penury to eat like a Scotsman — oatmeal — as a Republican member of the U.S. House of Representatives in 2003 would have been as humiliated to be forced to eat French fries. Populations with a real wage of one subsistence unit simply did not maintain their numbers across the generations because of substantial diversions of resources from what was biologically necessary to what was sociologically appropriate.

The second is that these wage level calculations assume that you could have found work all the time, which seasonal labor requirement patterns and commercial and political disruptions made chancy at best.

The third is that these are the wages that were paid to urban workers hired for the day. These are the wages of those whose connections with their employers were overwhelmingly short-term cash-nexus connections. Such people are not in general representative of society as a whole even today, and were definitely not in general representative back in the past. In rapidly-growing cities like fourteenth-century Florence, fifteenth-century Vienna, sixteenth-century Amsterdam, seventeenth-century Delhi, or eighteenth-century London, the day laborers were people from the

countryside pulled into the city by the chance to make extra bucks who sell their labor-power to employers who see opportunity and don't have enough in the way of serfs or apprentices or liegemen to handle the workload. In cities like nineteenth-century Delhi, Beijing, or Florence, the urban day laborers were people who have been pushed out of the countryside by the lack of land or a place and have washed up on the shores of the city to live by their wits or starve. Italy in 1850 was not a country in which the average person subsisted on 1600 calories of polenta per adult male equivalent per day.

That said, the pattern that Allen *et al.* paint is clear and convincing. They pick up the story in the aftermath of the Black Death of the mid-fourteenth century—the bubonic plague. With the population of Europe down by between a quarter and a half from its early fourteenth-century medieval high, larger farm sizes produced an agricultural bonanza for peasants who could (a) produce more and (b) bargain for lower feudal rents from an Earl of Pembroke desperate to have somebody working the land to pay something. Urban plague mortality had been highest. City employers were thus desperate to pay through the nose, and urban unskilled day laborers typically earned three times the biological “subsistence” family wage.

By 1600, however, Allen *et al.* find that urban unskilled day-laborer real wages are much lower. Italy and Austria have filled up with people, farm sizes are smaller, and the shift of trade from the Mediterranean to the Atlantic has advantage Amsterdam and London at the expense of Florence. Neither Florence nor Vienna was anymore a good place to be an unskilled day laborer and try to raise a family. Allen *et al.* do, however, pick up early-Moghul Delhi, which then looked a lot like London: a rapidly-growing capital city in a rich agricultural region that benefited from the global trade-war-and-conquest boom set off by the invention of the sea-going caravel and the voyages of Christopher Columbus and Vasco da Gama. And by the eighteenth century Delhi has joined Florence, Vienna—and mid-Qing Beijing—as places where the lot of a masterless man trying to raise a family was very bad indeed. And we think that this roughly tracks what was going on in the countryside as well: people were still on net moving from the countryside to Florence, Vienna, Delhi, and

Beijing, which means that the lot of a youngest son or of someone whose lineage had lost out in a dispute over land ownership out in the countryside was even worse.

London and Amsterdam are the only cities in Allen *et al.*'s dataset that managed to avoid the dismal Malthusian fate of near-starvation and escaped into mere dire poverty in the long post-Black Death Malthusian global population expansion from the fourteenth to the nineteenth century. Their workers did not have to subsist on oatmeal year-in year-out (or millet, or sorghum, or polenta) but due to the commercial-revolution expansion of the world trading economy plus a little successful imperialism could eat bread instead of oatmeal, buy beef and beer on a regular basis, wear better clothes, purchase stimulants like sugar and tea, and even—after the Protestant Reformation which made literacy a duty because reading the Bible was storing up treasure in heaven—books.

## **Why the Transition to Agriculture?**

Comparing the lifestyle of hunter-gatherers ten thousand years ago to that of illiterate peasant farmers a hundred and fifty raises an obvious question: why would people ever become farmers? Jared Diamond has called the invention of agriculture “The Worst Mistake in the History of the Human Race.” He claims that we should—even in the United States, even today—envy our hunter-gatherer ancestors. I don't buy this hyperbole: I do not, or at least I think we should not, envy them. (He does not either: Full Professors of Physiology at UCLA and of Economics at U.C. Berkeley have chosen a life far, far removed from that of our ancestors.) gathering miner's lettuce by t. But there is an important kernel of truth here that we should crack the shell to expose. Almost all of our agricultural and commercial-era ancestors between 8000 BC and 1870 or later did have good reason to envy our common pre-industrial ancestors. They had descended into a deep valley of dearth.

We understand why the transition from hunting and gathering to pre-industrial agriculture is good for those at the top of the pyramid. But why do those not at the top of the socioeconomic pyramid go along?

Most important, of course, is that the first generation to farm—or to adopt any of the many subsequent agricultural productivity-multiplying innovations—lives the life of Reilly, off the fat of the land. If you can figure out how to do it, it is good for you and your children and your children's children to farm. But a well-fed and well-nourished population multiplies. So farming population densities explode far beyond hunter-gatherer densities.

Some human populations did not pursue the agricultural road. Some settled into a halfway role as nomadic or transhumant herders following their flocks on land that was, for the time and given the available biotechnology, marginal for settled agriculture. If the herders were among those who had domesticated horses, selectively-bred horses large enough to ride, invented bows, and practiced shooting from horseback since childhood then they had little to fear from the farmers: Attila the Hun, Temujin Chingis Kahn, Sultan Alp Arslan, and Nurhachi had little fear of the farmers. But even there the widespread distribution of gunpowder eventually made the difference: Crazy Horse did not sack Chicago.

Some remained hunter-gatherers for a while. But, eventually, somebody nearby had become farmers. And the population density of the farmers grew. Hunter-gatherers rarely exceed population densities of one per square mile. Farmers on land that is good for their particular version of agricultural technology can easily support many more than a thousand in the same space. The old “forty acres and a mule” for a family of six translates into a population density of roughly 100 per square mile. When those nearby who had become farmers decided that they wanted the hunter-gatherers' land, they took it: numbers of 100-to-1 or 1000-to-1 are not easy to argue with. Those who became farmers in the end conquered and overran the hunter-gatherers because of the vastly greater population densities that agriculture made possible.

The upshot is that—unless you were part of the rich, literate upper classes—we might hypothesize that per capita standards of living and productivity levels were about the same in 1870 as they had been back in 8000 BC. Population, however, was much greater 1.1 billion in people in 1870, compared to 5 million or so back in 8000 BC. What can we deduce about the rate of improvement in technology over those nearly ten millennia?

## Total Factor Productivity Growth

The third and last thing you need to understand is that back before 1870 the rate of technological progress in the world was, by our standards, very slow.

Economists find that the broadest and most useful measure of a society's technological prowess is its degree of total factor productivity—TFP for short. TFP tells how much in the way of economically-useful output an economy produces per appropriately-weighted unit of input. For a pre-industrial economy, the rule of thumb is that—if TFP remains the same—a one-percent increase in the labor force makes possible an 0.5 percent increase in production, a one-percent increase in the stock of produced capital makes possible an 0.2 percent increase in production, and a one-percent increase in the stock of available land and other natural resources makes possible an 0.3 percent increase in production. Any increase in production over that is due to growing TFP: to an increase in human capabilities to manipulate labor and to divide and organize work. Let  $k$  (kapital) stand for the rate of increase in the stock of useful tools and buildings,  $y$  for the rate of increase in production *per capita*,  $n$  (numbers) for the rate of increase in population, and  $r$  (resources) for the rate of increase in natural resources Let  $a$  stand for the rate of increase of TFP. Note that the rate of growth of total production is equal to the rate of growth  $y$  of output per capita and the rate  $n$  of growth of population. Then our rule of thumb becomes the equation:

$$y + n = a + 0.5(n) + 0.2(k) + 0.3(r)$$

For the globe as a whole, the rate of growth  $r$  of natural resources is zero: individual civilizations can expand, but humanity as a whole cannot. And make the rough approximation that the rate of growth  $k$  of the stock of tools and buildings grows at the same rate as the growth of output as a whole,  $y + n$ . Then we can rewrite our equation as:

$$y + n = a + 0.5(n) + 0.2(y + n) + 0.3(0)$$

And we can solve for the rate of TFP growth  $a$ :

$$y + n = a + 0.5(n) + 0.2(y + n) + 0.3(0)$$

$$0.8(y) + 0.3(n) = a$$

Back 10000 years ago there were perhaps 5 million people alive on the earth. But 1800 there were 750 million. That is a growth rate of 0.05% per year—2.5% per generation, or 5% per century. We already assumed that the growth rate of per capita income  $y$  between 8000 BC and 1870 was effectively zero. Together, those tell us about the rate of TFP growth  $a$ :

$$0.8(0) + 0.3(0.05\%) = a = 0.015\%$$

Fifteen-thousandths of a percent per year.

That was the rate of growth of human technological capabilities in the nearly ten thousand years between the invention of agriculture and 1870.

Today we expect to see a hundred times that much technological change in a single year. The pace of innovation and invention that today takes twelve months took, on average before 1870, a century.

Things change a little bit, but only a little bit, if we break the 8000 BC-1870 period down. Demographers believe that there were five million people in the world in 8000 BC, 170 million in the year 1, fully 750 million by 1800, and 1.1 billion by the year 1870. Plug those population numbers into our equation above, and we get worldwide TFP growth

estimates a of 0.01% per year over 8000 BC-1, 0.02% per year over 1-1800, and 0.16% per year worldwide over 1800-1870. The first two-thirds of the nineteenth century saw human technological capabilities worldwide advance not at one-hundredth but at one-tenth of our current rate. The amount of technological progress we see in a decade no longer took a millennium, but instead only a century. That was a big difference: worldwide, the Industrial Revolution was a big deal compared to what had come before 1800. But it was not, especially, a big deal compared to what was going to come after 1870.

Steam power and iron-making and spinning jennies and power looms and telegraph wires had made fortunes for a relatively few by 1870, but had not yet changed, in John Stuart Mill's phrase, "human destiny." Part of this failure was a matter of space and time. The world of 1870 was still much larger in terms of communication and transportation than our world is. It takes more time to cover space when your speed is low, and the century and a half from Newcomen and the century from Arkwright to 1870 was not enough for steam and iron and mechanical spinning to spread across the globe—but the world of 1870 was shrinking rapidly.. The iron-hulled steamship, the submarine telegraph cable, and the gunboat were rapidly creating a much smaller world which transport, communication, and imperial rule could cover quickly indeed. Rather more of this failure was due to the fact that individual inventions had been invented, but that invention as a process had not yet been invented—or perhaps it is better to say that it had not yet been routinized, bureaucratized, and systematized. You had the Newcomens in steam and the Arkwrights in textiles and the Wedgwoods in pottery and the Stephensons in railroads and the Isambard Kingdom Brunels in ironwrought infrastructure who were inventor-entrepreneurs in one narrow line of business and technology. You did not yet have the Thomas Alva Edisons and their industrial research labs to create the business of invention and innovation as businesses in their own right.

## The Shadow of Malthus

Now that we have established that technological progress was glacial before 1870, and especially before 1800, we can turn that around and figure out why income levels, living standards, and labor productivity levels worldwide were so stagnant from 8000 BC to 1870.

On average in the pre-industrial post-hunter-gatherer world populations grew at 0.05% per year. That is five percent in a century: for an average generation, were 105 people for every 100 people who had lived in their great-great-grandmothers' time. Yet normal human fertility with reasonable nutrition without artificial birth control will lead to roughly eight pregnancies per female. If each of their great-grandmothers had had four daughters, each of whom had four daughters, et cetera... then an average generation would not have 105 people but rather 25,600 people for every 100 alive in their great-great-grandmothers' time. Even over a span as short as a century, in the agricultural age before 1870 99.59% of the people who could have been there simply weren't. Farming population densities explode far beyond hunter-gatherer densities until something brings population growth to a halt.

What limited population growth so much in the pre-1870 agricultural world?

A number of things can restrain population growth. Perhaps celibacy and abstention from reproduction is thought of as pleasing to God. Your prospective father-in-law may tell you that you may not marry his daughter until you have a farm of your own, and he may be able to make that stick. Your older brother may tell you that you cannot bring a wife into the lineage house until the lineage has bought an extra piece of land on which to grow food.

But most often and to the greatest extent that "something" is poverty: children become too malnourished to fight off normal childhood diseases, women become too skinny to ovulate, and populations become so dense as to become giant culture dishes for endemic debilitating diseases or periodic epidemic mortal plagues, and so population growth ceases.

Generation-to-generation the population jumps up and down as the spread of agricultural techniques produces an edge in food and more children survive, as plagues and wars devastate provinces, and as bounceback takes place in the aftermath of plagues and famines that have left provinces depopulated but the survivors with large and fertile farms.

The fact that over the long run between the invention of agriculture 10000 years ago and 1800 human populations grew very slowly indeed carries the implication that at most times in most places agricultural society life was nasty and brutish and short. Technological progress would produce a few generations of relative plenty, a growth in population density to shrink the average size of farms. And then you were back on the Malthusian treadmill. The only exceptions were improvements in technology and organization that did not affect the rate of reproduction—either because the benefits were confined to the (numerically small) upper classes or because the changes came accompanied by social changes that increased mortality. Of course, social changes that increase mortality are hardly improvements in quality of life, are they?

Things were not much different in the runup to 1870. According to the estimates of Robert Allen *et al.*, in Amsterdam in Holland, in Milan in Italy, and in Beijing in China it looks as though working-class real wages were substantially lower in 1870 than they had been a century and a half before. Real wages in London in England had shared the decline of Amsterdam until early in the nineteenth century—but had then diverged and had advanced to perhaps slightly more than their 1730 level by 1870. Only Leipzig in Germany of the sample of cities studied by Allen *et al.* shows any substantial edge in prosperity in 1870 compared to 1730 (and the marked difference in stability in the Leipzig real wage series between the eighteenth and the nineteenth century casts some doubt on whether the same thing is being measured in both centuries, and thus whether we can trust the measured increase across the break in the series).

Perhaps John Stuart Mill was wrong about Leipzig in Germany: perhaps by 1870 the coming of the Industrial Revolution had substantially lightened the toil and raised the material well-being of those living in the

valley of the Elbe River. Certainly the Industrial Revolution was putting its thumb on the scales of material well-being for the inhabitants of London in England. The nineteenth-century divergence between the courses of real wages in London and those of Amsterdam just across the narrow part of the North Sea surely shows the differential imprint of the machine- and commerce-driven industrial prosperity of England. But this appears to have been able to do no more than to hold working-class material standards of living in London steady, at least compared to 1730.

## Exceptions

Now there were exceptions: exceptional eras, exceptional customs, and exceptional groups.

Exceptional eras come in two flavors. First, there are the years, the decades, and the centuries after key improvements in agriculture. The iron axe that allows for the clearing of temperate woodlands, the heavy plow that allows successful growth of grains in otherwise clayey wet soils, strains of wet rice that allow two or three crops of rice a year—if you first invest in the public works needed to flood the rice paddies—the caravel and the settlement of North America all produce times in which life for the average rural peasant, and thus for the average urban laborer as well, was relatively good.

Second, there are the years after Azrael in the form of the Bubonic Plague or something similar has visited a region, the years in which populations are much smaller than they used to, farm sizes much larger, living standards higher—and populations growing to make average farm sizes lower once again.

Exceptional customs are social arrangements that constrain human fertility and as a result keep populations from growing even when people are relatively well-fed and well-nourished. The most obvious is the European marriage pattern: the postponement of the median age of marriage for young women until their early or mid twenties, because fathers demanded

that potential husbands have prospects—ownership of a farm, a workshop, a profession, a competence—before they would let their daughters out of the household. Remember *Romeo and Juliet*? Remember the exchange between Old Capulet and Count Paris at the start of Act 1, Scene 2:

CAPULET: But saying o'er what I have said before:  
My child is yet a stranger in the world;  
She hath not seen the change of fourteen years,  
Let two more summers wither in their pride,  
Ere we may think her ripe to be a bride.

PARIS: Younger than she are happy mothers made.

CAPULET: And too soon marr'd are those so early made.  
The earth hath swallow'd all my hopes but she,  
She is the hopeful lady of my earth:  
But woo her, gentle Paris, get her heart,  
My will to her consent is but a part...

Lady Capulet has different ideas. And so, soon thereafter in Shakespeare's play, does Juliet. But the drag exercised on female age of marriage by powerful patriarchal fathers who think they know better than their daughters what is good for them was (a) a social force making for older ages at marriage, (b) fewer pregnancies at a given state of nutrition and real income, (c) as a result a somewhat richer society, (d) much heartbreak among the young, and (e) most of great European literature and tragedy. In Asia, you have a similar institution with the lineage family. If in Europe it was the father telling the suitor that "you cannot marry my daughter until you can support her in the style *I* want her to be accustomed to," in Asia it was the older brother and lineage head telling his brothers, sons, and nephews that "you cannot bring a wife into this house until we have more resources."

And, worldwide, there was the exposure of daughters unwanted by the father.

Thomas Robert Malthus was the grimmest of the early economists, admitting—or was it boasting?—that his theory "of human life has a

melancholy hue,” but, Malthus went on, he believed “that he has drawn these dark tints from a conviction that they are really in the picture, and not from a jaundiced eye or an inherent spleen of disposition...”

Technological progress and human invention, Malthus thought, was too small to be worth noticing. Average product per capita would fall with increasing population, as more and more people tried to work the same land and as those who did break new land found the new land increasingly unappetizing for farming. Therefore, Malthus argued, population would inevitably reach an equilibrium in which numbers were kept from expanding further by either a *positive check* or a *preventative check*. The positive check was plague, malnutrition, famine, social breakdown, and venereal disease—“poverty and vice.” The preventative check was superior: the delay of marriage, the prohibition of extramarital intercourse, the sobersides refusal to have intercourse if the house was already full of children—the path of virtue. But, humans being weak, they would only follow the path of virtue if society channeled them that way. Good societies that were not always on the edge of famine, plague, and malnutrition, Malthus thought, were societies in which people listened to and obeyed their priests, feared hell (especially as a punishment for sexual transgressions), and respected their fathers as knowing what was best for them and hence did not run off to Gretna Green as teenagers.

To Malthus at the start of the nineteenth century, therefore, a good society was orthodox, monarchical, and patriarchal: one that respected throne, altar, and (male) parent. The radicals and freethinkers of the eighteenth century like Voltaire or Rousseau or David Hume or Adam Smith or the Marquis de Condorcet or the couple of William Godwin and Mary Wollstonecraft were, Malthus thought, public enemies. Their doctrines of free thought, free speech, and free love would inevitably undermine the respect for and obedience to throne, altar, and father on which the preventative check relied. Nature would then wreak vengeance via the positive check. Only social hierarchy could support morality. And only conventional morality could reduce the depth of poverty from abject destitution to mere want. to which the principle of population, Malthus thought, condemned humanity.

Exceptional groups are the upper and to a lesser extent the middle classes—and there are usually some upper classes since the invention of agriculture. Exceptional groups are the *noblesse* and the *bourgeoisie*, the nobility and the townspeople, the (military and priestly) upper and the (mercantile and craftmaking) middle classes. Jared Diamond points out that such privileged classes are really only possible after the invention of agriculture:

Besides malnutrition, starvation, and epidemic diseases, farming helped bring another curse upon humanity: deep class divisions. Hunter-gatherers have little or no stored food, and no concentrated food sources, like an orchard or a herd of cows: they live off the wild plants and animals they obtain each day. Therefore, there can be no kings, no class of social parasites who grow fat on food seized from others. Only in a farming population could a healthy, non-producing élite set itself above the disease-ridden masses. Skeletons from Greek tombs at Mycenae c. 1500 B. C. suggest that royals enjoyed a better diet than commoners, since the royal skeletons were two or three inches taller and had better teeth (on the average, one instead of six cavities or missing teeth)...

Before the invention of agriculture it is almost surely not good to be the king. You can use your status to pick the best of things, but the amount of things you have is limited to what you can personally carry. And if your exactions become too onerous the people can simply leave for the hills. But once a population becomes agricultural, people cannot leave for the hills. Hunting and gathering in the hills cannot support the population densities of agriculture in the irrigated plains, so departure means death for overwhelming numbers and also the loss of all of the value of the labor that has gone into ploughing and sowing and weeding. Agriculture opens a new career path: that of a specialist in systematic violence directed against other humans who makes threats to induce them to give you a third of their crop—or else.

A parasitic caste or class existing by virtue of their organized ability to take a substantial share of the agricultural (and craftwork) producers' crops becomes the rule soon after the coming of agriculture. Such castes

and classes live better albeit more dangerously than the peasants. (If they didn't live better, after all, why accept the extra danger?)

A parasitic caste or class existing by virtue of their organized ability to threaten violence and then take a substantial share of the agricultural (and craftwork) producers' crops becomes the rule soon after the coming of agriculture. Such castes and classes live better albeit more dangerously than the peasants. (If they didn't live better, after all, why accept the extra danger?) They live more dangerously because, after all, if they do not their numbers grow until they, once again, are at the Malthusian margin--and what good is being a noble if you have to live like a peasant? Whatever social system they evolve will break down unless it (a) keeps their numbers low enough to maintain an edge in standard-of-living, (b) keeps their lifestyle focused enough that they maintain their edge in violence, (c) keeps their numbers high enough that with their edge in violence they can maintain control, (d) keeps their numbers and their skill high enough to avoid being conquered by neighboring similar groups of thugs-with-spears, and (e) keeps their exactions low enough that they are not destroyed by revolting peasants with nothing to lose anyway. Upper-class social systems that accomplish those five goals tend to be terrifyingly stable in human history since the invention of agriculture. And whenever such a system does collapse another replacement almost invariably soon grows up in its place.

We see the effects of technological progress over the millennia before 1870 in the numbers of humanity as a whole, but also in the standard of living of the upper classes. To be a slave of Marcus Tullius Cicero in 76 BC was probably a lot like being a slave of Thomas Jefferson in 1776. The heavy plow and the horse collar allowed Monticello to feed a greater population density than Tusculum. But Jefferson's life was not all that much like Cicero's. 1800 years of technological progress largely tuned to elite consumption made themselves felt: bigger and better horses, carriages with springs, more interesting intoxicants, superior furniture, better heating technologies, superior artificial lighting systems, et cetera. The only edge I can see is that Cicero had access to superior Roman bathing technologies that had been lost in the Dark Ages. And there are

the two overwhelmingly important differences: printing (and the fact that Jefferson had an extra 1800 years' worth of people to read who had joined the human conversation), and coffee.

How important were these exceptions? How much should we value the fact that Thomas Jefferson lived better than Marcus Tullius Cicero given that their slaves lived about equally well? It probably depends--a lot--on whether you identify yourself with Jefferson and Cicero on the one hand or with their slaves on the other. And how much should we value sheer numbers--the fact that the human population early in the nineteenth century was probably some five times or so its 70 BC level? (That is an unresolved issue in utilitarian philosophy.)

Aristotle was one of those who had no doubt that it was the heights achieved by humanity rather than the average that mattered, and that steep inequality was both inevitable and desirable. After all it was, Aristotle wrote, impossible to have a society in which there were people with the leisure and education to love wisdom without also having many slaves. And that would be true unless we magically had instruments like “the statues of Daedalus, or the tripods of Hephaestus” such that “the shuttle would weave and the plectrum touch the lyre without a hand to guide them.” Then “chief workmen would not want servants, nor masters slaves.” We today are in the utopian case that Aristotle dismissed. But back in 1870 the world was not. It was that era—the poor, Malthusian era—that was what began to come to an end in 1870. But in 1870 it is going strong.

## **Global Leadership**

Thus most interesting thing is not that the world was poor in 1870: the world had always been poor since the invention of agriculture. The interesting things were that a part of the world was just starting to become rich, and which part was becoming rich. The first of these—the timing of the start of the Great Transformation—is beyond my knowledge and this book’s scope. The second of these, however, is worth a few words. The

technological and organizational edge of human civilization in 1870 was the North Atlantic, and that was distinctly odd.

Two thousand years before, people would have laughed at the idea. Gaius Julius Caesar classified the Britons as the stupidest people he had ever conquered, and Marcus Tullius Cicero warned friends not to buy Britons because they were too stupid to make good slaves—and ugly too. One thousand years before—in 800, say—the technological and civilizational cutting edges of humanity were to be found in the Caliph Haroun al-Rashid’s capital of Baghdad and the Tang Dynasty Emperor De Zong’s Chang’an rather than London or Bristol of Manchester or New York or Washington or Cleveland. Even three-hundred years before—in 1570—it would have taken a very sharp-eyed observer indeed to believe that northwest Europe was about to get its act together in a way that the Turkish Ottoman civilization around Constantinople, the Moghul Indian civilization around Delhi, and the Ming Chinese civilization around Beijing could not.

By 1870, however, the power and technology gradients across world civilizations were very clear. Real wages in England in 1870 were beginning to be substantially higher than past averages from the Middle Ages. Real wages in China and India remained extremely low by any standard. Travelers from western Europe to Asia in the 1600s and before had been impressed back then not just by the scale of the empires and the luxurious wealth of their rulers but by the rest of the economy as well. The scale of operations, the prosperity and industry of the merchant classes, the good order of the people, and the absence of extraordinary poverty among the masses frequently struck European observers as worthy of comment as striking contrasts with back home. But by the 1800s this was no longer true. Travelers’ reports then focused as much on mass poverty and near-starvation as on high-craft and high-culture luxury. Assessments of the wealth of the court took on a sinister “orientalist” cast—a cruel corrupt ruling elite that simply did not care about the welfare of the people—when viewed against the background of the poverty of the masses.

## What Had Happened to China?

The coming of the technology gradient favoring western Europe was indeed remarkably late. Before 1800 or so there was very little that European traders could offer to sell that Chinese consumers would wish to buy. For more than two thousand years China had been one of the leading, if not the leading civilization on the planet. It was not that the average standard of living was higher in China: Malthusian population pressures roughly equalized standards of living around the world. But China had a higher population density because more efficient technologies allowed a given plot of arable land to generate more food, better craftwork in most industries, a larger class of literati interested in high culture, and--quite probably--a higher standard of living for the landed and ruling elite.

Before 1800 European trade for Chinese goods was by and large trade of silver for China-made luxuries. And the transfer of technology flowed from east to west: it is still unclear to what degree the European development of items like gunpowder, printing, the compass, and noodles owed to the Chinese example. It is clear that all of these were known in China before they were known in Europe.

In the Tang Dynasty years before and the Sung Dynasty years after the year 1000, China had been the most progressive and innovative civilization in the world: innovative technologically, organizationally, and militarily. Its population—60 million? 80 million? 100 million?—was one of the most rapidly growing and best-fed populations in the world, thanks to the development of strains of rice that could be wet-planted, irrigated, and produce three crops a year in the fertile soil of China from the Yangtze basin south. China then led the world in non-agricultural technologies as well. At the start of the seventeenth century the British savant, politician, and bureaucrat Francis Bacon had marvelled at three inventions that he said had utterly transformed Europe: gunpowder, printing, and the compass. China had developed all three, and had developed all three before 1000.

China in the twelfth century at its pre-industrial apogee produced more iron and saw a greater share of agricultural production sold on markets than Britain would produce and market in the eighteenth. Zheng He's mid-fifteenth century voyages of exploration sailed four times as far with twenty times as many sailors as Columbus, and could land ten times as many soldiers at Dar es Salaam and Trincomalee as Cortez would land at Vera Cruz. China had long had the capability of launching its own "voyages of discovery." Its governments had chosen not to, with that one exception. Zheng He's fleet reached Zanzibar, and touched Africa, bringing back a giraffe. Annoyed at their treatment by a Sri Lankan king, they captured him and brought him back to China to make his apology to the emperor. But the political balance in the Ming court changed, the follow-up expeditions were cancelled, and the exploration program abandoned.

China led the world in political organization as well. No other ruler's writ ran a third as far or has even a third as large a chance of being obeyed as that of China's emperor. Tang Dynasty cavalry has skirmished with Persians on the shores of the Aral Sea. The Sung Dynasty river navy was the only military force to even temporarily stymie Ghengis Khan's Mongols before his descendants took to fighting each other rather than expanding the empire. No pre-industrial central government anywhere ever managed to match the reach, extent, and power of the landlord-scholar-bureaucracy mode of domination invented under the Tang and developed under the Sung. The Sung Dynasty capital, Hangzhou, was before the Mongol conquest the largest city in the world—larger than Baghdad or Constantinople or Cordova or Delhi—with perhaps half a million inhabitants: the closest thing to an economic, cultural, and political capital the twelfth-century world had.

After 1800 British merchants did discover one commodity besides silver that Indian producers could supply and that Chinese consumers were eager to buy: opium. By the end of the 1830s the Chinese government was beginning to worry about the consequences of opium addiction on the country, and the exchange of European silver for Chinese goods had turned around: the bulk of the China trade was the exchange of Chinese

silver for Indian-grown opium. The Chinese government attempted to suppress the opium trade and opium smuggling. The result was the 1839-1842 "Opium War," in which the British fleet intervened on the side of free trade, the sale of opium, and drug addiction. The British Empire acquired the then nearly barren island of Hong Kong as a base, European influence was established in a substantial number of "treaty ports" along the Chinese coast, and the division of China not into European colonies but into regions in the "spheres of influence" of different European powers began.

By the second half of the nineteenth century China's relative apogee was three-quarters of a millennium past, and the government and the people were in crisis. The people were in crisis because they were more than three times as numerous as their predecessors at the pre-industrial apogee, because they were ruled by a rapacious landed aristocracy, and because progress in agriculture and industry to counterbalance rising population had been nearly absent for most of the second millennium. In 1100 the Chinese people were rich, or at least as rich as pre-industrial peasant societies get. At the start of the second millennium development of new types of crops and new strains of rice had greatly boosted agricultural productivity and triggered the centuries-long spread of China's heartland from the Yellow River to the Yangtze and further south, to Hunan and Guangzhou. But by the second half of the nineteenth century Malthus was having his revenge. China had filled up, with more than 300 million people, which left average farm size less than third of what they had been three quarters of a millennium before, the bulk of peasant families were close to the edge. It is virtually certain that the average Chinese peasant family in the second half of the nineteenth century had less food than its predecessors in the twelfth: think of 1300 calories per person per day as a rough guess.

The technological dynamism and organizational relative edge that China had possessed in the twelfth century was gone as well. Chinese producers still had substantial technological edges in limited industrial segments: high end silk textiles, high-end porcelain, tea. But there had been little internally-driven technological progress in any industry for more than half

a millennium. And the bureaucracy that in 1150 had looked efficient and powerful compared to a Europe--a place where no king would even think of asking an Earl of Pembroke to explain anything—by 1870 looked corrupt and incapable.

Why this 750 year relative stagnation is a great mystery. There are many potential suspects to take the blame as the root cause of China's long, long relative stagnation.

Perhaps the root problem was that emperors, grand secretaries, and landlords feared their own generals more than they feared their neighbors' soldiers. European kings, ministers, and landlords sought a strong military to protect them and theirs against the next William the Conqueror or Friedrich II or Francois I or Napoleon. In China there was little to fear from outside the empire as long as the Mongols were kept divided, but a great deal to be feared inside the empire from your own generals--men like the ninth-century An Lu-Shan or the seventeenth-century Three Feudatories. Thus the military-industrial-metallurgy-innovation complex that drove so much of pre-industrial and early-industrial European technological progress was absent.

Perhaps the root problem was that with triple-cropping rice strains the wet-rice fields were too fertile, the governmental bureaucracy too effective, and the avenues of establishment-oriented upward mobility to the striving and aggressive too open. After making a little money the logical next step was to buy some land. Because the land was rich, because labor was plentiful and cheap, and because the empire was (most of the time) strong internally, one could live well after turning one's wealth into land. One could also easily make the important social contacts to pave the way for one's children to advance further. And one's children could do the most important thing needed for upward mobility: study the Confucian classics and do well on the examinations: first the local shengyan, then the regional juren, and then the national jinshi. Those who had successfully written their eight-legged essays and made proper allusions to and use of the Confucian classics would then join the landlord-scholar-bureaucrat aristocracy that ruled China and profited from

the empire. In the process of preparing for the examinations and mastering the material needed to do well on them, they would acquire the habits of thought and values of a Confucian aristocrat landlord-scholar-bureaucrat. Entrepreneurial drive and talent was thus molded into an orthodox Confucian-aristocratic pattern and harnessed to the service of the regime and of the landlord class: good for the rents of the landlords, good for the stability of the government, but possibly very bad indeed for the long-run development of technology and organization. Carlson (1957) quotes an imperial edict of 1724 condemning mining as a potential source of disorder and treason:

[M]iners are easy to recruit but hard to disband. If mining is left to the initiative of merchants there will be danger of crowds assembling and harboring treachery...

Perhaps the root problem was the absence of a new world rich in resources to exploit and helpless because of technological backwardness, or the lesser weight attached to instrumental rationality as a mode of thought, or the absence of dissenting hidey-holes for ideological unconformity, or the fact that the merchants and hand-manufacturers of China's cities were governed by landlords appointed by the central government rather than governing themselves, or that large muscled animals like oxen and horses turned out to be powerful productive multipliers for temperate rain-irrigated wheat-based agricultural but not for sub-tropical paddy-irrigated rice-based agriculture, or some combination of these, or any of a host of other possibilities over which historians will struggle inconclusively (but thoughtfully and fruitfully) for the rest of time.

Perhaps there were many root problems.

Whatever the cause, the result was China's extraordinary relative stagnation through much of the second millennium. The country and region that had been the world's leader—culturally, economically, organizationally—in 1200 was poor, economically backward, and organizationally decrepit by 1870.

The poverty struck eighteenth-century British moral philosopher Adam Smith hard, for in his view China had been for a long time "the richest... most fertile, best cultivated, most industrious, and most populous" country in which even landless peasants were relatively rich: "the wages of labour had ever been more than sufficient to... enable him to bring up a family." Smith had a theory as to why the China he saw in his day—the late eighteenth century—had become poor. Because China would not trade with outsiders and so learn and adapt their ideas, it was bound to stagnate: "a country which neglects or despises foreign commerce... cannot transact the... business which it might do with different laws and institutions." A stagnant economy, Smith thought, was headed for desperate poverty through a Malthusian population crisis. Population would continue to grow while the economy did not. Without technological progress and with increasing population "competition... would soon reduce [wages] to this lowest rate which is consistent with common humanity." At that lowest rate of wages, children would be so malnourished as to be easy prey to disease and women's body fat levels would be so low that ovulation was hit-or-miss.

By 1870 it looked like that Malthusian crisis had arrived. The more than 300 million people of late nineteenth-century China had no mechanized farm machinery and no industry-produced nitrogen fertilizers. They were crowded into the wet, arable eastern slice of what is "China" on today's maps, with the median family of 6 farming perhaps 4 acres at a time when the Radical Republicans were still hoping to somehow find 40 acres plus a mule for each family of American ex-slaves. Average adult height was, we think, significantly under five feet.

Thus the first iron-hulled ocean-going steamships called on a country where the government and the economy were in crisis for four reasons: The first reason is that China's government in the late nineteenth century was the ethnically Manchurian Qing Dynasty, and the Qing Dynasty was weak because it had always been weak. It had seized power in the mid-seventeenth century. An ethnic clan of non-proper-Chinese military adventurers from beyond the Great Wall, from Manchuria, struck at the moment when the previous Ming Dynasty was paralyzed by peasant

revolts and hamstrung by a run of bad emperors and more-than-usually-corrupt bureaucrats. The Manchu were unified because they were not Han Chinese: what Manchu prince or mercenary could expect to long survive a victory by any alternative faction? The Manchu were weak because they were not Han Chinese: how many of the 300 million Chinese would give how much loyalty to a ruling dynasty in which the top places were reserved for others?

It was the classic problem of colonial rule. The Manchus tried to solve it by (a) presenting themselves as ideal Confucian sage-kings (presenting themselves as more righteous Confucian rulers than Kung-Fu-Tze himself), (b) giving the landlords through which they ruled free rein throughout central and southern China (curbing rapacious landlords in the interest of protecting the Old Hundred names of China was not on the Qing Dynasty agenda, ever), and (c) opposing all change for change threatened to cause instability and the Qing Dynasty knew that it was unstable already.

This worked as a political strategy: the Qing Dynasty had a run of 250 years, and the last Qing emperor still sat a throne—albeit as a puppet of the Japanese army—in 1945. But it meant that the kind of national and nationalist appeals that those who in Japan spoke for the Emperor Meiji or that Mongkut and Chulalongkorn used to try to preserve the independence of Thailand were impossible for China's late nineteenth-century government. You cannot rally a people against foreign colonialists with the slogan "revere the emperor and expel the barbarians!" when for more than 200 years the emperor has defined himself as a barbarian.

Even in the days of its peak strength, the Qing Dynasty found it wise to tolerate dominant currents of thought that viewed its coming to power as a tragedy and its rule as profoundly illegitimate. Jonathan Spence's *In Search of Modern China* notes the performances at the court of the Kangxi emperor, the first strong and long-lived Qing dynasty emperor, of "The Peach-Blossom Fan" by Kong Shangren—an author still loyal to the previous Ming Dynasty, and hostile to the idea that a scholar-official could win honor by helping the Manchu conquerors rule China: "[A]t the play's

end, with the Ming resistance in ruins, the lovers agree to take monastic vows... the surviving virtuous officials retreat deep into the mountains to escape a summons from the Qing that they take up office.”

The second reason that China in the late nineteenth century was that Confucian landlord-bureaucrat-scholar aristocracy through which the Qing Dynasty ruled was not only potentially disloyal but trained to be incapable. As long as the Mongols were kept divided through bribes and the ruling dynasty uncorrupt, no Chinese emperor faced any outside existential military threat. Internal disorder was the main worry. So the central government had discouraged military skill among its bureaucrats and notables since the Tang dynasty rebellion of An Lushan, and discouraged any liking for change--a potential cause of disorder--since the first Ming dynasty emperor had expelled the Mongol descendants of Genghis Khan in the fourteenth century.

Seventeenth-century China was well aware of growing European technological developments. It was “Peach-Blossom Fan” author land andlord-scholar-bureaucratic notable Kong Shangren who wrote:

White glass from across the Western Seas Is imported through Macao:  
Fashioned into lenses big as coins, They encompass the eyes in a  
double frame. I put them on--it suddenly becomes clear; I can see the  
very tips of things! And read fine print by the dim-lit window Just like  
in my youth.

Yet neither Kong Shangren nor any of his relatives and descendants ever thought that the optical glass business was worth studying or researching or entering or even financing. It was simply not the kind of thing that a Confucian gentleman would do. One consequence of this lamentable uncuriosity was extraordinary ignorance about the outside world. During the first Opium War of 1840 the staff of High Commissioner Lin, the Qing plenipotentiary on the spot in Canton, appears to have debated whether an embargo of ginseng exports might be enough all on its own to win the war for China—the British, they had heard somewhere, needed ginseng as a dietary supplement to have regular bowel movements, and would die without it.

The third reason China's government was in crisis was that the people were in crisis. As I noted above, China's population was on the downswing of a Malthusian population cycle. Compared to the aftermath of the great wave of agricultural technological development nearly a millennium before, the threefold growth in population meant that yields per person low, farms small, and peasants poor--hence malnourished, and with relatively little energy. Population growth also meant larger clans of landlords to be fed off the rents. Combined with an alien ruling dynasty that feels weak and threatened by its own upper class and tells its bureaucrats that it is justice when the landlords win, this means that the peasants have very little to lose. Thus peasant revolts—like those that everyone remembered had brought down dynasties before—burned through China in the mid-nineteenth century.

The greatest was the Taiping Rebellion of 1850-1864 that ravaged central China for fifteen years, aided by the fact that the imperial court feared successful generals (as potential usurpers) at least as much as it feared the rebels. There were enough landless and other desperate peasants that perhaps ten million joined Hong Xiuquan, who had hoped to become a bureaucrat-scholar-landlord but failed the shengyan examinations several times. He then visions that convinced him that he was the younger brother of Jesus Christ. The Manchu banner-armies proved useless when Hong proclaimed the “Heavenly Kingdom of Great Peace,” and promised his followers not only the Kingdom of Heaven in the hereafter (where he would reign alongside his elder brother Jesus Christ) but that land would be equally divided after all the landlords were killed down here--meaning a roughly fifty percent increase in median peasant standards of living. And Hong Xiuquan supplemented his brand of theocratic landlord-free authoritarian communism with anti-Manchu nationalism: "Ever since the Manchus poisoned China... the poison of corruption has defiled the emperor's throne..." 1300 calories per day versus 2000 plus God on your side plus revenge against the oppressive landlords plus the expulsion of the barbarian Manchus.

The fifteen-year march of the Taiping through south-central China and reign from Nanjing had echoes not just of previous peasant rebellions (like the one that had given the Manchus their opening in the 1640s at the end of the Ming dynasty) but of what Mao Zedong and company would do from 1925 to 1945. Move into a village, get the peasants' hands dirty by having them kill a couple of landlords, divide up the land so all the small peasants are much richer, point out that if the landlord-backed authorities return they will all be in big trouble, and ask for volunteers to join the army and come along to the next village.

The Taiping prohibited opium, foot-binding, prostitution, and female servitude. They instituted equal shares for all, vaccination, low taxes, and encouraged tea and silk exports. Hugh Deane quotes American missionary E.C. Bridgeman's report that the Taiping "appear[ed] like a new race of warriors... well-clad, well-fed, and well-provided for... content and in high spirits, as if sure of success," and asserts that twentieth century Communist leaders like Mao Zedong, Zhu Te, and Peng Dehau drew inspiration from the stories of the Taiping heroes that they had grown up with in Hunan, Sichuan, and Nanjing.

Outside observers like Karl Marx were impressed enough that they thought that the World Revolution was starting in the late 1850s in China, and that the last moments of the Chinese empire had come. But competent local landlords organized pickup militias, some of which grew into competent--but non-Manchu--battalions and brigades. The merchants and bankers of Shanghai and other ports in contact with and profiting from European trade were desperate for help and knew how to draw on European military-technological competence. The thirty year-old Frederick Ward Townsend—with, Deane reports, two years' experience as a military cadet in Norwich, Vermont followed by service as a Texas Ranger, a Mexican army drill instructor, and in the Crimean War—organized an army on the British Indian sepoy model: officers from Europe and America, rifles and carbines and cannon supplied by the British government, high pay, and river mobility through steampower. The Qing court heard such good things about his army from Li Hongzhang, their commander on the spot, that they named Ward's army “The

Undefeatables.” Ward was killed at Ningbo in 1862, but his successor the British General Charles “Chinese” Gordon's army proved equally capable.

Perhaps 10 million people, 3% of China's population, died in the war. The Taiping were crushed in 1864. China's political revolution was postponed for half a century, and the Qing Dynasty continued to rule until 1911.

With China thus *hors de combat*, the world that in 1870 the submarine telegraph cable and the iron-hulled ocean-going screw-propeller steamship was about to make small would be a western European-dominated world for quite a while.

11,052 words