18: JAPAN'S VERSION OF THE FULL INDUSTRIAL REVOLUTION[1]

a. Functionally, how might one distinguish the early industrial from the pre-industrial situation and from the "first generation" full industrial revolution stage? How do the second and third generations of the full industrial revolution differ from the first generation? Characterize each of the stages of a full industrial revolution and describe how each evolves into the next.

b. Why might Japan be best characterized as having a second generation full industrial economy? Why might such a characterization be useful? Date and characterize how Japan went through each of the five stages of its full industrial revolution.

A. Industrial Revolutions in Historical Perspective

1. Growth rates, savings & investment

In discussing Song China's early industrial revolution back in chapter 11, I suggested that an early industrial economy reaches and sustains a growth rate of GDP[2] somewhere between 0.75% and 1% compounded annually. A full industrial revolution crosses the 1.5% threshold.

The above rates are absolute rather than per capita. If the population always increased as fast as or faster than those absolute rates, the per capita increase would be zero or negative, and the odds are that such an economy would remain pre-industrial or attain only crippled industrialization.

However, once an economy approaches a 1% compounded annually growth rate in absolute terms, it will likely have a per capita growth rate of not much more than half that. Population does tend to grow during the transition into an early industrial revolution, but the factors permitting that 1% absolute growth rate also encourage limits on population growth. The spontaneous population control behavior of the populace during Tokugawa times is merely a slightly exaggerated version of what happened in Song China and early industrial Europe.

During full industrialization the absolute growth rate of the economy soon greatly exceeds any likely rate of population growth, reaching low double-digit economic growth levels by the late 20th century. Population growth is rarely more than 3-4%, and within a few generations, population growth tapers off.

Using the banker's Rule of 72, a 1% rate of growth doubles national income in 72 years. So within one long-lived man's lifetime that man can perceive that significant growth has taken place. A 1.5% rate allows doubling to occur in just 48 years, from youth to middle age of an individual.

Any net economic growth must be (all other things held equal) the result of a general lowering of time preference for present as opposed to future consumption. Some significant number of people decrease their current consumption and increase their savings and hence investments. Savings are channeled through increasingly elaborate institutions—banks and other intermediaries for turning savings into investments.

This growth in the pool of savings-investment also stimulates an increase in the number of technological recipes. Old recipes are taken off the shelf. Inventors perceive that there is now a greater possibility of actually using a new recipe, and so tend to devise more of them. Technology, therefore, normally depends on the savings rate rather than the reverse.

China was the first nation to hit the early industrial revolution growth level. It did so during early to mid Song times at the beginning of the current millennium. The Low Countries (Holland, parts of Belgium) and finally England and Japan also did so in that sequence a few centuries later, more or less independently of China, the last of them starting to early industrialize by the 17th century.

As the "first generation" of the full industrial revolution began, the growth rate (powered by the ever lowering time preference) pushed up to and eventually a bit past 1.5% growth in national income compounded per annum. This was, in fact, the average growth rate later estimated by historical statisticians for the English first generation industrial revolution from c. 1720 to c. 1820. (England's per capita growth rate then is now estimated to have been 0.25-0.5%.)

The English, who were among the later of the early industrial peoples, were the first to cross the threshold into the full industrial revolution. Only England "took off" as an industrial economy during this first long generation of the world's transition into full industrialization.

Altogether, there have so far been three of these rather long "generations"—each lasting roughly a century. After England's "first generation" run to "take-off" from 1720-1820, the "second generation" ran from c. 1820 to the eve of World War I, and its participants grew at a 2-3% rate. The "third generation" began after the end of World War I (i.e. c. 1920) and will likely end sometime during the 21st century (2020 would be a nice symmetrical date), with growth rates eventually pushing beyond 10%. By 2020, industrialization will likely have spread to virtually every suitable location on this planet.

2. Market and technological factors

During the exclusively English first generation of this full industrial revolution, the market's role seems to have been much larger than the state's. Economic exchange was already widespread in early industrial revolution England.

New credit institutions—banks, new forms of true credit money, elaborate joint stock companies—appeared during the 16th and 17th centuries. These institutions transformed savings into investments ever more efficiently. Since savings became more secure and profitable, they increased significantly in quantity.

Hence the increased growth rate.

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[1] 1st dr. 10/87; 5th dr. 9/99. By Edward H. Kaplan

[2] Of course we have no meaningful statistics for any nation's GDP (Gross Domestic Product) for much before the 20th century. Nor, even if we could do more than guesstimate GDP's growth rate, could we use it to say anything meaningful about all the most important non-material aspects of life. Still, growing fast and long enough to reach the early industrial and then full industrial level allows the state taxing such an economy to grow in military power vis à vis pre-industrial states, and (if they survive industrial age wars) more people are likely to live long enough to have meaningful non-material experiences.

Hence also the lower market interest rate.[3]

So smooth was the transition between early industrial and first generation full industrial revolution England that nobody in Europe (including the English themselves) took full notice of what was going on until well after the fact. The very label "industrial revolution" for this 18th century transition out of the early industrial stage was not coined until the 1870s, nearly a century after the event.

Even the technology that students of European economic history often describe as the cause of the full industrial revolution was little changed from English technology of its early industrial stage, and novelties mostly duplicated Chinese early industrial techniques. The English either borrowed or independently reinvented Chinese techniques when they needed to.

First generation full industrial technology seemed to grow smoothly out of a wholly empirically derived early industrial and pre-industrial technology. Technology was not yet a byproduct of pure science. That came only much later, toward the end of the second generation. Instead, early industrial age science usually had its curiosity piqued by peculiarities of the spontaneously evolving new technology. Tinkering with steam engines stimulated speculation on the physics of gases rather than the reverse.

This new technology did not flow very directly from actions of the state. It appeared, bit by bit, in the marketplace, financed wholly by private savings, as, for example, was the case with many of the new double-lock canals built in England during the 18th century.

This is not to say that this evolution was incoherent. It is just that its logic appeared spontaneously from within the web of market relationships. The state did not self-consciously impose it from outside the market.

In retrospect, modern political economists like Walt Whitman Rostow have been able to detect what Rostow labels "leading sectors" of the new full industrial economy appearing within England during the 18th and early 19th centuries. These leading sectors of the economy became better developed sooner than other, "lagging," sectors. They then slowly dragged these lagging sectors into participating in a fully industrial level of productivity.

One such leading sector involved canals fitted with double canal locks. First appearing in 10th century early industrial China, these were relatively new to Europe, local canals fitted with locks first appearing in 13th century Holland. Interregional canals only began to be built late in the 17th century in France and then spread to England in the 18th century.

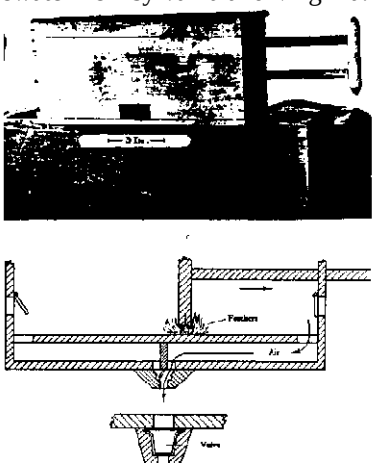
Another leading sector was textile machinery—including water powered machines for spinning cotton and weaving looms for cotton and wool. Occasionally, these machines were run by steam engines. Water-powered multiple spindle automata may well have been in occasional use in early industrial revolution China, so even this technology was not new.

The steam engine was invented, but not much used during the first generation or during the first half of the second. In the U.S., for example, it was the 1880s before steam produced more industrial horsepower than running water did.

The double-piston bellows used in China since antiquity to blast air into blast furnaces was, in the logic of its design, a steam engine run backwards. Cranking the piston back and forth pushed air through the sleeve valves in the two cylinders and into the exhaust pipe.

For some reason, however, the Chinese never thought to run this bellows backwards to convert it into a steam engine. They would have had to make the device out of metal rather than wood, generate steam under pressure in a separate boiler, and then vent the steam through the exhaust (now intake) pipe via the slide valves into the cylinders. The force the cylinders generated would be transmitted to the external levers.[4]

Yet another leading sector was iron production. The English independently reinvented the coking process first used in early industrial revolution China. They did this before the middle of the 18th century, but did not make much use of the technique before the 1780s. Until then, England got most of its cast iron from North America, where English colonists made it from local ore and wood charcoal derived from the hardwood forests of tidewater Pennsylvania and Virginia.



A Chinese piston bellows. (Joseph Needham, *Science and Civilization in China,* v. IV, pt 2, plate clxii.)

Post-Song Chinese iron making similarly lapsed back from coal-based coke to use of wood charcoal when it shifted from the fulcrum subzone to the forested hills of inland Canton in subzone C3 during Ming times. That may just show that special historical circumstances may render an old technology temporarily cheaper than a new one in the short run.

Just as the trees of Canton had to be chopped down before the hills could be terraced to become rice paddies, the trees of coastal North America had to be chopped down anyway, if there was to be room in Virginia and Pennsylvania for European-style agricultural life. It did not cost much extra to convert some of them into charcoal. Ships returning from America with holds full of tobacco needed ballast anyway, so they might as well carry blooms (amorphously shaped ingots) of pig iron to serve that purpose.

This empirical evidence would seem to suggest the truth of the point I derived earlier from the logic of economic theory. A time preference-induced change in the rate of investment, not improvements in technology, was the autonomous variable in making the transition from early to full industrial revolution.

England made that transition by either borrowing or independently reinventing some of the same technology that characterized the Chinese early industrial revolution of Song times. Sometimes it merely used more of some still usable older technology of its own, and then bought many more copies per capita of production facilities employing that technology than Song China could afford to buy.

[3] Since time preference had declined and the supply of investment funds was increasing, people must have been willing to save as much or more than before in exchange for lower premiums (interest) for postponing consumption.

[4] The piston bellows was used with the "back yard" blast furnaces during the 1958 Great Leap Forward. Miniature versions are still used by Chinese street venders of puffed rice to superheat the fires under their pressurized rice-puffers.

3. Political factors

The state played a role during the first generation, but it was an inadvertent, unconscious and often perverse one.

The Bank of England began as a nominally private institution at the end of the 17th century, just when the Osaka rice brokers were also inadvertently turning into central bankers. Only slowly, in the course of the 18th century, did the Bank of England take on significant public functions, and begin to approximate the role of a modern central bank.

Perhaps more important, the Bank was still run then by plutocrats rather than meritocrats. In 18th century England, only a few plutocrats vied for political dominance with aristocrats, even though the latter had been tamed by the 17th century revolutions. Meritocrats were still fewer in number, were not yet identified by formal written examinations, and as a consequence did not yet constitute a self-conscious branch of the ruling class.

The 18th century in England was, to be sure, a "mercantilistic" age. That is, some of the intellectuals had persuaded the statesmen that their duty was to promote the nation's wealth through policies that would favor English over foreign merchants, and thereby lead to gold and silver money accumulating in English private and public hands.

Such policies, however, merely distorted markets, but could not dominate or even seriously hobble them. Englishmen engaged in foreign trade, particularly the more remotely located English colonists, could easily evade such restrictions through smuggling. England's internal markets were already fairly free.

England's wars also stimulated industrial production, but usually inadvertently. Internal warfare destroys property and would have done no good. England did not commence its jump from the early to full industrial revolution for several generations after its mid-17th century Puritan Revolution had ended and restored internal peace.

External war usually helped at least some English industries. Given its geography, England required a highly developed naval technology to wage war against foreigners. This likely stimulated technology in general. For example, the government offered rewards for more precise mechanical clocks as aids to navigation. However these were perfected by private inventors during the 18th century, and private businesses manufactured them and less elaborate clocks and watches for sale to the general public.

Since England mainly employed its military technology abroad, it destroyed other people's capital goods much more often than its own. The technology the land armies of continental Europe used then tended to wreak havoc on the user's country's own capital goods as often as or more often than on other people's.

Hence even the violent aspects of warfare's technology tended to hurt England much less than they did its continental rivals.

B. The Second Generation of the Full Industrial Revolution

1. Absolute and population growth rates

The second generation of the industrial revolution presents a more complicated picture. This century-long "generation" ran from the close of the Napoleonic Wars after 1815 (or, if you prefer nominally economic markers, the 1819 depression, which was America's first clearly identifiable business cycle "bust") up to the post-World War I bust of 1920.

If the average absolute growth rate in general economic activity during the first generation was about 1.5%, during the second generation it rose to around 2-3% and during booms to 4% compounded annually. In some years and places absolute growth occasionally hit 6-7%.

Even a population growth rate of 3% (a very high rate, rarely sustained for even a generation) might permit per capita growth to hit a rate of 3% or more when growth was 6-7%.

Birth rates went down as people (really wives) adjusted to falling infant death rates by having fewer pregnancies to achieve the desired four or five children. Soon wives changed their minds and decided that the ideal size of a family was only two or three children.

Thanks to new public health measures, the domestication into less virulent forms of long-endemic plague germs, and some progress made in medicine after mid-century, death rates came down even faster than birth rates could fall, especially for the poor. Within a few generations, however, and quite without external intervention by the state or private do-gooders,[5] birth rates also declined to match the low death rates.

Not just one but several important countries and a few small ones began full industrialization around 1820: the United States perhaps as early as the 1780s, Germany after 1815, and (just barely) Japan after 1870, were the most important of these. England was no longer alone.

This meant that full industrial countries could begin to interrelate with each other, and not just with pre-industrial or early industrial economies. Most of these were market relationships amongst individuals, inherently a good thing, since that provided more opportunity for more people to rise on their value scales by engaging in economic exchange. Political exchange could also increase, which was not so good, since people might be tempted to despoil each other through war or economic interventionism (using the state's greater power to transfer income from the ruled to the rulers and their clients).

2. Market factors

The role of the market remained very important during the second generation, but the role of the state was also becoming more important, or at least more overt and self-conscious. A number of statesmen and writers, then and now, jumped to the conclusion that if the state did not act, nothing the market could do would lead to successful industrialization. However, the most lucid of the economists argued that it was still predominantly the market that was providing the progress, and that the state was hurting at least as much as it was helping the industrialization process.

This second generation was the golden age of free trade—trade according to market rather than political dictates. Mercan-

[5] Snooty upper-class "eugenicists" (as some of the founders of the movement now known as Planned Parenthood then called themselves) deplored this one-shot increase in the numbers and health of supposedly inferior people, and urged more intense attempts to limit their numbers.

The eugenicists, like their modern epigoni, did not realize that this "population explosion" was (as the word "explosion" itself implies) a one-shot affair. The full industrial revolution, like the Neolithic Revolution much earlier, would cause a rapid, but inherently self-limiting one-time increase in population during the "demographic transition" to an industrial society.

tilism was driven "into the closet," at least during the first half of this second generation. The most vivid and intellectually coherent ideas in the West about economic life were up through the middle of the 19th century those describing the internal, self-regulating logic of markets.

The enormous investments of the English first generation stimulated new technologies and the elaboration of old recipes. Transportation was now getting the payoff from these. Steam power became ever more efficient in the course of the 19th century for ships, and soon for railroads. As a consequence, transportation became dramatically cheaper.

Steam also became ever more common as the motive force in factories. Factories could now be placed in more convenient locations and not just near large volumes of running water. After the 1880s electricity gradually supplemented the steam engine's power. Eventually (toward the end of the second generation) the internal combustion engine came in. Coal was supplemented as the main fuel by petroleum. This began to happen long before exhaustion of coal supplies.

The individual entrepreneurships and partnerships and the unlimited liability joint stock companies of the early and first generation full industrial revolution were supplemented toward the end of the second generation by the limited liability joint stock company—the modern corporation.

This last change required passage of enabling legislation by the state, but once this was done half way through the second generation, corporations began to make for a dramatic increase in the ease and safety of transmuting savings into investments, since investors in them were limited in their liability to the value of their shares in the corporation. The rest of their personal property was not subject to confiscation by creditors of the company. Still, the individual and partner entrepreneurship remained key even during the latter half of the second generation.

New leading sectors arose. In transportation, the steamship came into its own. The steam-powered railroad was invented and perfected. In industry, large-scale iron production through the coking process finally became dominant and new (perhaps borrowed from China) techniques for making large quantities of steel cheaply also became available.

These novelties supplemented and to a degree replaced some of the leading sectors of the first generation. Canals, for example, were reduced to a secondary role by railroads and steamships. Textiles, especially cotton, however, remained a leading sector, as did coal mining.

By the latter part of the second generation, science was beginning to provide as many hints for the development of technology as it was gaining from technological novelties. However, science was still organized under individual and joint stock company research labs rather than under university or governmental auspices. The labs of the American Thomas Edison and of the German dyestuff organic chemicals corporations are conspicuous examples of private production organizations also being used for pure scientific research.

Science, and with it (by imitation) the humanities were, however, beginning to be "professionalized" by the latter half of this second generation. These private professionals helped create a larger meritocratic sector of the ruling class.

Professionalization is not necessarily quite the same thing as meritization. Professionals can sell their services in markets. Hence, the existence of these "private meritocrats" need not involve creation of public meritocrats. Still, I am myself increasingly inclined to refer to professionals as "private meritocrats," since application to them of non-market templates of merit can be enforced by states. This is tantamount to working for the state.

Private meritocracy also suggests the plausibility of public meritocracy. If your father took a private exam from a state-licensed monopoly entity to become a medical doctor, you might well be even more eager to take a frankly public exam to qualify as a bureaucrat. Both of you might legitimately think of yourselves as the same kind of professional.

There were, however, other, more directly political reasons for the growth of the meritocratic sector of the ruling class.

3. Political factors

The role of the state was becoming significantly larger as tax revenues from the full industrial sector grew, and its proprietors were becoming more conscious of their potential power than before.

In America, Alexander Hamilton, our first Secretary of the Treasury, as early as 1790, issued a "Report on Manufactures" which consciously aimed at using the power of the new federal government to actively encourage industrial development.

The First Bank of the United States, of which Hamilton was the godfather, and its successor Second Bank of the United States, were designed to be an American equivalent of the Bank of England. These central banks were to create new money, supposedly to increase investment, but also to finance ever larger and more powerful states by pyramiding private credit atop public credit—loans by banks to governments. This allowed the government and favored private investors to spend and invest more than they otherwise could until the unsustainability of the new investments caused periodical busts.

Hamilton's example was followed by Europeans like the Prussian bureaucrat, Friedrich Liszt, who spent time in America and on his return after the Napoleonic Wars organized a customs union of the northern German states under Prussian auspices. Liszt's aim was to create a customs union similar to the one the commerce clause of the American Constitution of 1787 had created for much of inhabited North America.

Such extensive states as the U.S. and the Second German Empire after 1870 themselves constituted customs unions. They could also use their larger tax revenues to finance such interventionist acts as providing subsidies for "infant" (i.e. new) industries using the new technologies. The states could also preempt the market to create what we now call the "infrastructure" of an industrial revolution—schools, public transport and various other necessary (and unnecessary) social services to provide people with the novelties of industrial age life faster than the market seemed to be doing.

However, a good case can be made that, aside from certain aspects of commercial laws which allowed limited liability for corporations, set terms for bankruptcy and otherwise smoothed the institutional paths from savings to investments, the states' interventions had more harmful than helpful effects, or that at best these interventions were redundant—that they moved people in directions they were already taking or would soon take anyway by way of the market.

For example, the high tariffs favored by most statists (and which were used

against outsiders by customs unions had either mischievous or trivial effects. To the extent that high tariffs actually priced otherwise cheaper foreign goods out of a market, the potential domestic consumers of those goods were hurt. Many of these consumers were actually producers. They imported goods to use as components of the goods they produced themselves. In such cases, the harm to consumption was compounded by banning these foreign producer goods.

The effects of even high tariffs could also be trivial, particularly for more remote people like the Americans and Japanese. The cost of sea transportation remained high enough through the 1880s so that high transport costs limited imports far more than tariffs could.

The Japanese were forbidden high tariffs under the unequal treaties after the 1860s, but went through the beginning stages of their full industrial revolution anyway. But so too did the United States and Germany a little earlier, both of which had high tariffs. Germany and America often could not raise piece-rate tariffs faster than foreign industrialization could lower prices.

Some argue that government-stimulated credit money was needed to stimulate industrialization. In principle, however, an economy does not need additional money once there is enough money in place to render its use convenient. Any further increase in the money supply merely tends to raise prices, and bank-induced money increases cause both inflation and the business cycle. Only those privileged folk who regularly get the new money first, before prices rise, benefit permanently from it, and even they may suffer during the busts following booms.

Anyway, the market was already providing more than enough extra commodity money, which does not cause business cycles. The gold supply shot up, particularly after the 1890s when new sources of gold ore were discovered and new and cheaper technologies for refining such ores became available. Gold production has gone up more than ten- fold since the 1890s and is still increasing.

So it may not even have been necessary to have central banks. The U.S. managed to take off and mature its industrialization between 1837 (when Andrew Jackson closed down the Second Bank of the United States) and 1913 (when the Federal Reserve System opened up) without a central bank.

Later theorists, most conspicuously the 20th century's most notorious interventionist economist, John Maynard Keynes, and economic historians like Alexander Gerschenkron have begged the question of the state's role. They have argued that *because* the state was active the state must have been both important and effective.

By the latter years of the second generation, the wealth produced in the market enabled politicians who taxed it, such as the shrewd English Tory and would-be aristocrat Disraeli, the German aristocrat Bismarck, and eventually the American aristocrat Franklin Roosevelt, to begin to substantially raise the power of the state. Their overt motive was one of *noblesse oblige*—the obligation of the nobility to relieve the poverty of the masses.

And yet the market was already putting massive amounts of new goods into the hands of even very poor people. Almost all the new technology produced goods and services for mass consumption rather than luxury goods: cotton clothing (not silk), iron pots and pans, railroads and steamships to move poor people cheaply across and between continents so that they might seek out the highest available wages.

It was part of this mass-owned wealth that the states appropriated from the mass of the people so as to relieve the poverty of these same people. The academic consensus and material determinist explanations for increased statism would, therefore, both seem to be flawed. Industrialization was not impoverishing the masses. Nor was it depriving them of wider opportunities. Why, then, the increase in state power during the second (and, as we will see, the third) generation of full industrialization?

Ideational determinist historians suspect that the West's aristocrats and the growing Western meritocracy joined in an anti-plutocrat alliance to maximize their joint power. This is just what happened in early modern China. (See chapter 10.)

Even if the "welfare states" did not really increase welfare, the rulers argued they had to put into place "social security" so as to calm the subjective insecurities at the social and psychological levels caused by the great changes that industrialization was bringing.

Perhaps so (though the ruling classes seem to have been nuttier than the masses), but the pre-industrial aristocracy and the non-industrial new meritocracy did very well for themselves by doing psychic good for the masses. Bismarck's and Disraeli's and the U.S.'s two Roosevelts' and their meritocratic fellow travelers' real intent was, of course, also to keep themselves in power and pelf.

Unfortunately, some gaps in the logical structure of the ideas of the 19th century classical free market economists seemed to leave room in principle for such interventions. It was not until the 20th century that the accumulated work of Austrian (and a few Swedish and American) economists which would undermine the claims of interventionism was synthesized and amplified by Ludwig von Mises and Murray N. Rothbard.

Mises exposed and corrected the pro-interventionist errors of the classical economists in his first book, *The Theory of Money and Credit*, published in 1912. In that work, and in his *Human Action* (1949), Mises synthesized and further added to the work of his predecessors in economic and political theory. He definitively demonstrated the role of banks in creating the business cycle and showed the general theoretical bankruptcy of what he called "interventionism"—the argument that the state can successfully intervene in the market to create and maintain a socially wholesome and secure industrialization. Rothbard amplified Mises' insights from an American perspective and revolutionized monopoly theory by showing that only states can create sustained monopolies; market monopolies being only transient.

Eventually, during the last third of the third generation of the full industrial revolution, Mises' ideas have at last began to be noticed by statesmen. Such a lag is not unusual. Adam Smith published *The Wealth of Nations* in 1776, but his ideas did not begin to take full hold until the second quarter of the 19th century.

C. The Full Industrial Revolution's Third Generation

1. Growth rates & economic minimal pairs

We are now more than two-thirds the way through what I label the third genera-

tion of the full industrial revolution. This began in the aftermath of World War I. Presumably (if it too lasts about a century) it will end some time during the second quarter of the 21st century, with all except a few peculiarly hellholish areas of our planet having undergone some degree of industrialization.

The absolute growth rate of economies making the transition into full industrialization during this stage approaches and often actually is in low double digits—10% or more compounded annually. This gives a very high real per capita growth rate even in countries which still have high rates of population increase. This is because even when the decline in their birth rates has not yet caught up with the decline in their death rates, the resulting population growth rate is almost never higher than 2 or 3 percent.

The nations that began industrializing during the second generation have, of course, long since leveled off in the rate of growth of both their economies and their populations, and have even spontaneously achieved birth rates that fall below the level that would maintain the size of their populations over the long run. In these countries, lowered birth rates have finally more than caught up with declining death rates.

In nations that started to industrialize during the third generation, the birth rates (though they have already begun to decline) will likely remain for some time above their rapidly declining death rates. Interventionists (mostly associated with the UN) have been advising such countries to do stupid things, like slowing down urbanization, that will actually slow their industrialization and hence slow down the decline in their birth rates.

This is just one example of the great increase in tension between state intervention and markets during the third generation. In many countries state intervention has until recently been virtually total. Large sectors of the market in some countries were violently extinguished, so that direct commands completely replaced even market interventions. In such places the state for a time became the sole source of activity used to create wealth.

Of course in some third generation countries, markets were permitted to continue to develop, and in recent years the number of such countries has increased. Part of the reason for this is that international markets have grown to enormous size. For many commodities these markets have grown too big to either be successively intervened upon or (short of atomic war) destroyed by the total intervention of one or a few states. Another reason is the collapse of all but a handful of the regimes of total intervention.

Until 1989 most people believed it was an open question whether market or intervention was destined to become the dominant factor in economic life. There seemed to be three possible choices:

1) The total replacement of the market by the state everywhere,

2) habitual but not total state intervention in the market, and

3) a market largely unconstrained by state interventions, though the state continues to exist so as to provide peace and a lawful framework for the market.

Material determinists expected the first alternative to become dominant. The academic consensus leaned toward the second alternative, but also found the first attractive. Only the ideational determinists expected the third alternative to win out, but they could not predict when. Since 1989 the first alternative seems to have lost out altogether and the second to have become doubtful. Few in the academic consensus have, however, as yet seriously considered the third possibility.

Long before 1989, some interesting correlations became possible for the enterprising economic historian of the third generation to make and use to choose among these three alternatives. Several nations that used to be unified were split apart, with one part being subject to a regime of total intervention and another part being largely open to market forces. As both parts attempted to industrialize, they could be compared as economic "minimal pairs," culturally very close but differing in the degree of intervention in the market their rulers imposed.

We have minimal pairs over time, like Imperial Russia during the last generation before World War I (when Russia's run toward takeoff began) compared with the Soviet Union since World War I. We have pairs over space like China since 1949 vs. Taiwan, Hong Kong and Singapore since 1949. We can also compare North Korea since the early 1950s with South Korea during the same period.

There are also somewhat messier situations, like those of Brazil and Mexico. These countries have unquestionably moved across the threshold into a full industrial revolution during this third generation, but under decidedly mixed state and market auspices, with the governments of some practicing more intervention than others, or more intervention at some times than at other times.

This comparative method of examining time-space pairs suggests that mildly interventionist and fully market economies have done overwhelmingly better than have purely statist economies, and that more fully market economies tend to have done better than heavily interventionist ones.

Though such evidence has accumulated over much of the third generation, it has not yet been widely accepted by either the academic or the governmental sector of the meritocracy here or elsewhere, even since 1989. Perhaps this is because it is against the interests of meritocrats to notice evidence that their services may be less extensively needed than they think.

Ordinary people have, all during this century, demonstrated their convictions by the motions of their feet rather than their tongues or pen-laden hands. They have invariably fled interventionist states for states they could reach with active market sectors. Hong Kong's population doubled during the early 20th century when China turned ever more interventionist, and went up nearly three-fold soon after China turned purely statist. Almost all of the increase in Hong Kong's population after 1949 was from refugees fleeing China proper. Similar statements can be made about Taiwan, South Korea and movements of refugees from Central and Eastern Europe since 1920 and 1945.

2. Market factors

The market sector has become so enormous in the course of this third generation that even academic consensus meritocrats have increasingly come to admit that markets have been growing even faster than states.

The resulting loss of state control has now become especially evident in the case of international trade, which by the late '80s almost entirely escaped the control of the individual governments of the world. Not even informal or formal consortia of governments operating through their central banks and finance ministries have been able to control even their own fiat moneys' exchange rates for very long. Depending on whether you are cheering

for state or market, this undoubted fact may or may not strike you as wholesome.

The escape of the market from the state has also been occurring within national markets. High civilized states have always been dependent on markets because they derive increasing proportions of their revenues from markets as both their markets and cultures develop.

Ideational determinist economic theory argues that markets are inherently too complicated for consciously exerted controls to be able to do more than hobble or wreck them. That is why the interventions recommended by the *Guan Zi* so rarely worked even during ancient times. Hence it is not surprising that even in the 1930s, when Russia's economy was still relatively simple, Stalin had to permit an underground wholesale level market economy to grow up to supply his centrally coordinated second generation-style factories with appropriate raw materials and semi- processed goods in a timely fashion.

During the third generation, however, technology has grown so complicated that it becomes ever harder to even imagine coordinating its use through intervention. For example, in the course of this third generation, petroleum definitively replaced coal as the leading sector among artificial sources of energy. Petroleum made possible the internal combustion engine. That in turn made possible the automobile and the consequent atomization of transportation. As a consequence, the state can no longer even tell precisely where anyone is, much less what they are making or doing. It has lost them in the flow and jam of traffic.

There are predictions that some form of atomic power will significantly supplement and perhaps ultimately replace petroleum before the end of this third generation, much as petroleum's later dominance was foreshadowed during the latter decades of the second generation. It will be interesting to see if that makes possible recentralization or if some new atomic technology will atomize atomic energy as much as petroleum has non-atomic sources of energy.

My guess is that if atomic energy does produce such a recentralizing tendency, it will not be very widely adopted, if only because people do not trust the state enough to trust it with atomic power stations. Solar power, if it proves practical, will undoubtedly encourage this trend toward market decentralization.

Also, as the economic journalist George Gilder has observed, even produced things have become more ephemeral during the third generation. This ephemeralization has been going on since Paleolithic times. It has just become more visible lately. In the course of just the Paleolithic era, the amount of cutting edge obtainable from a pound of stone increased by fifty-fold. During the most recent generation of full industrialization, heavy iron and steel have increasingly given way to light metals and plastics and ceramics. Mechanical linkages within machines are being increasingly supplemented and often replaced altogether by miniature electronic linkages.

And of course there is the enormous surprise of the computer, which nobody predicted. If you read the old science fiction of the '20s and '30s, you know that all of the automata celebrated therein are mechanical men with mechanical linkages, that walk around. None of them are electronic brains with no apparent moving parts sitting on people's desks, which is what we have actually gotten. The chief applications of the computer: word-processing, modems, faxes and copying machines have already made it virtually impossible for states to control communications or the movements of capital.

3. Political factors

Nevertheless, the state has also become extremely powerful and more than occasionally downright diabolical (in the literal sense of that word) in what it has tried to do during the third generation.

Still, even during the predominantly statist first half of this third generation, in some places at least, the state did not overwhelm the market. In many places industrialization got under way in much the same fashion as it did during the second generation. To be sure, the state intervened, and the academic consensus scholars defended such interventions, but most of the actual work was still being done by the men of the market.

Even in interventionist environments, substantially or at least partly plutocratic wings of the ruling classes continued to develop. For such places, Japan's experience may serve as a model. In other places—the totalitarian socialist and heavily interventionist states, such as those of the Soviet bloc, China, and much of Africa—where an overwhelmingly statist industrialization was attempted, Japan's experience provided no guide.

Up until the 1950s the tendency was to argue that the state was at least as important and perhaps more important than the market in encouraging industrialization. Perhaps this was largely because the state's actions are more obvious and easier to document. Even the best historians and political scientists and economists are to some extent the slaves of their documentary sources. Also, most of them work for states and prefer or find it less risky and more profitable to celebrate the powers of their employers.

In part, imperfect dissemination of knowledge about how markets work is a consequence of the rather greater difficulty in understanding markets. Markets look chaotic, even though they may be spontaneously following an internal logic. Tracing that internal logic is one of the most demanding tasks of the age.[6]

The state's role has also often been celebrated because the statist economies seemed up through the 1950s to be doing well. We now know that this impression mostly rested on false documents issued by these states. Good economists understood all along that these false documents were inherently implausible, but good economists were (and still are) rare.

By the latter years of the century, at least some of Ludwig von Mises' and Murray Rothbard's insights have become accepted as parts of academic consensus economic theory. Even such hitherto popular forms of intervention as state-to-state foreign aid have been debunked in the writings of Peter T. Bauer. Bauer demonstrates that foreign aid actually discourages industrialization by diverting potential savings in the donor nations into taxes instead of keeping savings in private hands which might send some of it off to genuinely invest in the recipient nations.

Instead, this revenue is handed over to ruling classes in both developed donor and undeveloped recipient nations. The rulers use these funds to deepen their control over markets, and to increase their own consumption of goods and services rather than to save and invest.

Nor does foreign aid's absence hurt development. During the second genera-

[6] You can, however, get an introduction to that logic for six credits of History 300 independent study, doable one or more credits at a time. See the author of these words for the details.

tion, after all, industrialization spread to places like America, Germany and Japan in the absence of foreign aid by governments. During the third generation, the nations receiving the least foreign aid developed the fastest.

D. The Stages Of An Industrial Revolution

A particular national economy will go through each of the five stages discussed below, though the form a particular stage will take depends on which "generation" of the industrial revolution an economy is in when it hits that particular stage of its development. There has been a tendency to collapse or shorten, and perhaps occasionally to all but skip one or more of the stages during the third generation.

1. Preconditions for takeoff

The first stage of the full industrialization process is to achieve the preconditions for industrial "takeoff" (in W.W. Rostow's memorable metaphor).

The key precondition is to have had an early industrial revolution. Japan had one, as did several countries in Europe (and through these the United States). So too did China, but apparently one sufficiently hobbled by internal circumstances and China's sheer size that the onset of its full industrial revolution was delayed for a century or two compared to England's.

The big problem for would-be third generation industrializers is how to telescope or ideally how to skip this stage entirely, since few of the so-called "Third World" countries enjoyed an early industrial revolution before or even during their periods of colonial subjugation.

Some of us think that access to other people's industrial economies through free foreign trade can do the trick; that such countries can import an industrial revolution through the international marketplace. Third World countries all have at least rudimentary markets, sometimes even organized into efficient hub and spoke networks.

Often, however, women dominate these markets because marketing is considered a low status activity. Men ignore markets, and hence internal markets do not develop sufficiently to mesh with external markets. Some observers think that once markets become high status in Third World countries, men will, at least during the transition period, push women out of them. (Anyone who can persuade First World feminists of the above should qualify for a Nobel Prize.)

Third World market-led growth is also hindered by the fact that the Western imperialists created a post-colonial ruling class which was predominantly meritocratic. Imperialists also preserved vestiges of pre-colonial aristocracies in many places. Mixed meritocratic and aristocratic ruling classes (the Qing Dynasty Chinese mix) are not very likely to favor free internal trade lest it lead to political competition from plutocrats.[7]

For these reasons and because they deny the efficacy of markets in any case, many academics have favored statist solutions for telescoping or skipping over the early industrial stage. During the last decade or so, this position has begun to fall out of favor, largely because of the apparent failure of large-scale interventions as well as of all attempts to completely replace the market with commands.

Time will tell (and may already have told) which view is more nearly correct for the third generation, but the historical evidence is unambiguous for the first two generations: Only economies that had undergone market-dominated early industrial revolutions beforehand came close to or crossed the threshold to the takeoff point of full industrial revolutions between c. 1720 and 1920.

2. The run to "takeoff"

The second stage is when what Walt Rostow has called the run to "takeoff" occurs. "Takeoff" is a metaphor. It is intended to evoke in a reader's mind an image of an economy in the shape of an airplane. As this airplane gains the preconditions for takeoff by trundling up to the point on the airport runway where it will start its run toward takeoff, and even during its acceleration down the runway it seems clumsy, behaving far less gainly as a land vehicle than would a car or even a bicycle.

But then, as takeoff speed is reached, quite suddenly, everything changes. The thumping and jostling transmitted from the tarmac through the wheels stops as the wheels and the airplane to which they are attached rise into the air. The airplane has taken off.

Rostow imagines something dimly analogous to this happening to an economy. Instead of wings to provide lift, an economy employs "leading sectors" (another of Rostow's labels). During the run to takeoff these leading sectors begin to widen and deepen their influence, and ultimately drag the rest of the economy up along with them into the fully industrial stage.

A real airplane's wings may carry even a witchdoctor or a samurai into the air. Similarly, these economic leading sectors may not literally modernize the other sectors, but merely integrate them, unchanged, as elements of traditional/ early modernity into the market relations that the leading sectors have transformed by their own presence.

Just as the airplane has to achieve a certain rate of speed—takeoff velocity—to get off the ground, an economy has to achieve a requisitely high level of compounded annual growth in GDP so as to achieve industrial takeoff. This may take a generation or two.

This run to takeoff stage stimulates a great deal of interesting new activity within a country. It also induces a certain amount of insecurity because of the fear of the novelties it introduces. However, at this stage nothing very serious usually goes wrong. The new activities and institutions do not yet bulk large enough to cause an absolute increase in the amount of trouble in enough places all at once to upset all or even much of society.

So far, at least, all runs to takeoff have been successful. All economies which have made the attempt, have at least "gotten off the ground," though some have careened around the market/airport at treetop level for decades at a time after having taken off.

That, for example, happened to Argentina and Chile among the interventionist economies, and also to the Soviet Union and to China, the most conspicuous of the former socialist economies. The low altitudes of the Argentinean and Chilean takeoffs are often ascribed to their remoteness from world markets. I would blame it on their governments' interventionism. The problems of the post-takeoff socialist economies was usually ascribed to their youth. Since when they matured, they collapsed, I would blame their earlier

[7] Joyce Cary's novel, *Mr. Johnson*, beautifully illustrates these points for West Africa, as does Bruce Beresford's faithful movie version of the novel.

weakness on the inherent defects of socialism.

3. The run from takeoff to maturation

The worst problems arise during the third stage, the run from takeoff to maturation. This is normally the time of troubles for any industrializing economy, socialist, interventionist, or unfettered market. Sometimes the taken off economy fails to achieve a secure altitude, as happens with the socialist and extreme interventionist economies. The market economies have no problem of attaining altitude—i.e. of attaining a high growth rate—but business cycles originating from interventions their markets may cause their growth rates to suffer wide swings up and down into negative levels.

Non-economic sectors of a market society may also turn unstable. Even without intervention, each of the new economic sectors will, one after the other, bulk ever larger. Such massive and rapid change either frightens or over the short run actually hurts large numbers of people. Even though free trade enriches more people than isolation does, it also drags what may have been an isolated community out into the world where it confronts and is frightened by other irrefrangible interests.

England's run from takeoff to maturation stage began during the teens of the 19th century, and was essentially complete by the 1860s. Charles Dickens wrote most of his novels between the '40s and early '70s, but he normally set them in the teens '20s and '30s, just before or at the beginning of this third stage. The contrast between the new industrial world and the many elements surviving from early industrial and pre-industrial England was most dramatic or comic (or both) then. Would Mr. Pickwick have been quite as funny wearing the baggy pants of the third stage as he was stuffed into the gaiters of the second stage?

In real life, as in Dickens's novels, such troubles often provide the occasions for excessive and usually economically perverse acts of statist intervention. Such interventions only make the situation worse. If statesmen do not realize that it is their interventions that are causing most of the trouble, they may well use these intervention-caused troubles to justify still more interventions, and thereby compound the mischief they do.

Fortunately, growth normally (though not always) outpaces the sense of insecurity growth engenders. There came a point when most Englishmen could afford to buy Dickens' novels and look back on the rough side of the run toward maturation with nostalgia. Other countries, Japan included, have had somewhat rougher passages to full industrial maturation.

4. The post-maturation decades

Still, most countries so far have shown signs of either getting through to or have actually gotten into the fourth stage, the several "happy decades" of the post-maturation stage.

"Maturation" is as subjective a word as "takeoff." If we were to keep up the aeronautical imagery, we would use the phrase "achievement of cruising altitude and speed" instead of "maturation." Maturation would resemble the point in a flight when the seatbelts and "no smoking" signs blink off, the plane quits surging alarmingly through air pockets, the engines quiet down, people relax, light up (or used to), and begin to hear the happy tinkle of glasses as the stewardesses prepare their first distribution of free drinks. Except for a few hopeless phobics, everyone relaxes and starts to enjoy the flight.

In economic terms, these post-maturation decades comprise two to four decades of high growth, stable population size and (along with the happiness that accompanies the first blush of general prosperity) increasing complacency.

The growth *rate* throttles down. But because so substantial a base has been achieved, adding a smaller *proportion* of that large base to the total each year translates into a much larger *absolute* and per capita increase in wealth than did the larger proportion of the smaller base during the preceding higher growth rate stages.

England was in its post-maturation decades during the 1850s, '60s, '70s and '80s. Those were the years when the English began to brag that the sun never set upon the British Empire, and Englishmen achieved all over the world a well-deserved reputation for being obnoxious that they have never quite outgrown since.

The United States enjoyed post-maturation from around 1890 to 1930. Americans managed to become almost as repellent to their fellow men then as the English had earlier. Japan has been post-mature since the late 1950s, with similar effects on their behavior and reputation. When the Chinese hit this stage c. 2010, we may not notice it, since the Chinese have always (often with some justification) felt superior to everyone else and are usually polite about it.

5. The hypo-industrial stage and its invisible, overt & chronic substages

"Hypo" means "under," or "less than." This fifth stage is one that in some key respects falls back from the intensity of the industrialization of the preceding two stages. During this stage the danger arises that three linked shifts will occur to so intense a degree that they will undermine the potential for rapid growth achieved earlier. These are

1) the preference for leisure growing at the expense of willingness to labor,

2) the impulse to consume overcoming the propensity to save, and

3) the impulse to gain transfer payments from government offsets the willingness to risk going to market to at least earn one's keep and perhaps enjoy unexpected additional wealth.

It is this third impulse that opens up the possibility of yielding to the first two impulses for most people. Government pensions and medical care lower the propensity to save and willingness to labor.

Some countries have already penetrated to the hypo-industrial stage, and so far none has gone beyond it.

England, the earliest fully industrialized country, may have become hypo-industrial before the turn of the century, and may (or may not) only recently have finally transcended hypo-industrial feebleness. The United States probably became hypo-industrial by 1930, Germany by 1970, Japan during the 1990s.

At first this stage merely accelerates the trend toward a reduced growth rate that began during the fourth stage. A high rate is no longer needed to produce an ever larger absolute or per capita increase in the quantity and quality of goods and services. Prosperity begins to provide the opportunity to give up some additional labor for some additional leisure without sacrifice of actual goods. It becomes possible to consume a higher proportion of

income without reducing the absolute quantity of savings. Indeed, during the fourth stage, the quantity of both consumption and savings can still increase substantially, so big has the base become.

However, during this fifth stage this trend continues and accelerates to such an extent that the quantity of real savings per capita and hence actual consumption later on begins to visibly taper off. The work ethic also begins to suffer and eventually honesty and respect for property decline.

For a few more decades, during what may be labeled the invisible first substage of hypo-industrialization, the economy seems to have attained a permanently high plateau of wealth. It is, however, merely coasting up hill. England hit this point by no later than 1890, the US by 1930. Japan may have just reached it at the beginning of the 1990s.

Eventually, a faint odor of decay begins to waft off the economy. The continued shift toward leisure and consumption comes to be judged by contemporaries at home and abroad as pathological. The second, overt, substage of hypo-industrialization has begun. Now that the crisis has become overt, all begin to discuss what might be done to remedy the situation. England hit that point during the decade after World War I. The United States hit it some time during the late 1950s or early '60s.

Finally, during the third, chronic, substage, despair becomes general. It seems nothing can be done about the problem. Whole classes of people may actually start becoming poorer.

England hit this chronic substage during after 1945. The United States may have reached it around 1990 (perhaps masked by the '90s boom). Germany and the Netherlands may have just reached it at the end of the '90s. Japan probably still has a half century to go before its hypo-industrialization turns chronic. The socialist economies appear to have telescoped preceding stages, virtually skipping post-maturation, to hit hypo-industrialization by the 1970s.

We are not sure what happens over the long run to hypo-industrial countries. Can they ultimately return to the happiness of stage four? Or must they continue to fall further back at least relative to other mature or maturing industrial economies? Some chronic hypo-industrial economies (the socialist states) may even shrink in absolute terms. Even having to endure the humiliation of seeing others shoot ahead of you is hard to take for a once all-powerful mature, full industrial culture.

However, thanks to novel technology, even the English are better off now than they ever were. But even under Margaret Thatcher England never recovered from hypo-industrialism. Given the events since 1990, it seems likely that the Reagan years represented just a transient remission in hypo-industrialization like Thatcherite England.

Japan may have only recently entered the first, invisible, substage of hypo-industrialization. Its four years of flat growth since 1991 and fears of runs on its virtually bankrupt banking system may seem all too visible, but if precedent is any guide, Japanese morale will soon recover and give them another couple of decades before they enter the overt stage.

Generations & Stages of the Full Industrial Revolution By Selected Countries

Gen.	Country/Countries			
I	England			
	1720-Stg 2	U.S.		
II	1820--Stg 3	Stg 2	Japan	
	1860-Stg 4	Stg 3	Stg 2	
	1900-Stg 5	Stg 4	Stg 3	S.Korea
III	1930	Stg 5		Stg 2
	1960		Stg 4	Stg 3
	1990		Stg 5	Stg 4

Since a number of national economies are now entering one substage or another of hypo-industrialization, the crisis of the economy likely has or soon will become linked to the general crisis of civilization.

E. The Japanese Industrial Revolution: Preconditions for Takeoff

We are now in a position to recognize and plug some of the key data of the Japanese industrial revolution into at least the first four of the five stages of a full industrial revolution of the second generation as I outlined these stages at the end of the preceding section.

Japan enjoyed a relatively high growth rate as it jumped off from a fairly massive early industrial base. It continued to use many of its early industrial techniques, but on a much more massive scale.

Japan also had a much more self-consciously active state than existed in England during the first generation. Consequently, even the early Meiji state caused substantial distortion of the market, setting the stage for grievous political mischief during the post-takeoff stage.

The first stage, achieving the preconditions for an industrial takeoff, is a story I have already told in chapter 16, on Japan's economic development during Tokugawa times. Here I need only link Tokugawa's early industrial economy more explicitly to the subsequent run to takeoff.

1. The Japanese version of the joint stock company

Institutionally, the *ie* or trading house, was already functioning much like a joint stock company of the western sort well before the end of the Tokugawa period. All it needed to become a modern corporation was passage during the 1870s of a corporation law limiting stockholders' liability.

Like the modern corporation, the Tokugawa period *ie* was already being run as a permanent entity rather than as a personal proprietorship, though more in imitation of a fief than for economic reasons. The would-be plutocrats who founded and built these firms during Tokugawa times normally emulated their political betters.

Despite its pseudo-feudal aura, the *ie*'s administration became somewhat impersonal and rather more rational, or at least a bit less dependent on the performance of one individual, just as the historical sociologists like Max Weber have told us properly capitalistic enterprises should be. A firm was run by hired managers on behalf of owners who tended to become increasingly inactive. These managers often even enjoyed what amounted to a measure of ownership in the firm. Some of these *ie* were, therefore, already almost fully modern in functional terms.

Once limited liability corporate law was in place early in Meiji times, the *ie* were ready to function not only within the domestic economy, but internationally, as vendors of silk and tea, and as importers of new techniques from the West.

The method of "putting out" which the great *ie* engaged in the silk trade had carried on during most of the Tokugawa period, allowed these firms to enforce the kind and degree of quality controls over their Tokugawa period cottage industry subcontractors that would still be neces-

sary after Tokugawa times for producing full industrial revolution types of goods, especially for export.

The old *ie* were also ready to serve as models for new firms, like Mitsubishi, founded during early Meiji times to engage in fully industrial activities .

2. Urbanization

Tokugawa Japan was already highly urbanized. If you look at a population density map of Japan at the end of Tokugawa times, the pattern of black dots symbolizing urban centers has the same dumbbell shape as it now does. The upper right hand bell of the dumbbell is in the Kanto Plain and the lower left hand bell is in the Kansai Plain. The rather twisty bar of the dumbbell is the Tokaido highway stretching along the southern coast of Honshu between the two. The only difference is that there are not as many black dots during Tokugawa as for Meiji times during which population nearly doubled.

A cheap Inland Sea water transportation route already connected the two bells, with its foci at the great seaport of Osaka at the foot of the Kansai and along Edo Bay at the mouth of several of the main rivers of the Kanto.

Much regional specialization already existed in the urban areas, based on traditions and monopoly privileges that had been granted to one or another *za* in the course of the Tokugawa period.

Japan, as much as any of the world's other early industrial cultures, was already a highly schooled country. In the big cities and even in the many small towns a very high functional literacy rate for all the key functions of an early industrial society was already present.

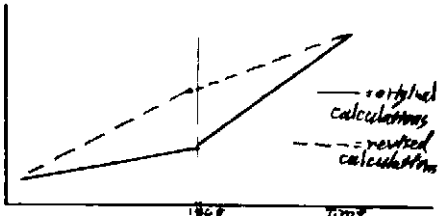
Outsiders have often assumed that the peculiar Japanese hybrid writing system should have been an obstacle to higher rates of literacy. It did not, however, keep half the men from functional literacy. This was better than two-thirds the way toward the normal 70-75% literacy rate for a full industrial revolution, at least for men. Despite continuing discrimination against them, female literacy rates grew more rapidly than male rates during and after the Meiji years.

And so the big city, small town and rural middle class and even many respectable laborers were were sufficiently literate as to be ready to staff a full industrial revolution run toward takeoff.

3. Agriculture

The Tokugawa early industrial revolution had been accompanied by an agricultural revolution. The resulting mature commercialized agriculture was by late Tokugawa times producing goods in quantities much greater than economic historians used to think.

For all practical purposes, as of 1868, Japanese agriculture was already producing farm goods at rates that we used to associate with the first part of the run toward takeoff stage of a full industrial revolution. This was not noticed because the pioneering Japanese historical statisticians apparently did not make a sufficient allowance for Tokugawa farmers underreporting of agricultural production so as to avoid taxes.



The late Tokugawa base period was producing at a higher rate than was originally thought. Figures for the 1890s are accurate and need not be changed. Hence the rate of growth during the 1870s and '80s turns out to have been lower than we once believed. That does not take away from the accomplishments of the run toward takeoff stage so much as it shows how precociously well-developed Japanese early modern agriculture was even before the run toward takeoff began.

The growth rate in agriculture declined during early Meiji from the Tokugawa level because the interventionist government bled resources out of agriculture. It did so for two main reasons:

1) to underwrite the state-subsidized portions of the modern urban sector and

2) to pay for the creation of Japan's earliest version of the modern warfare state.

A warfare state constantly mobilizes a substantial proportion of its society's resources to make or threaten war against other states. Many ancient states often made war, but they could rarely mobilize more than a fraction of their societies' resources for more than a short time to do so. The warfare state was something new, something that could not have become at all common before the full industrial revolution greatly increased the quantity of wealth available for mobilization.

Second generation industrial revolution nations seem to have kidded themselves into believing they needed to create a warfare state first so as to be able to industrialize at all. At the earliest stage of industrialization agriculture was the only available candidate for exploitation to pay for this warfare state.

Tokugawa Japan was buffered from such pressures by the *sakoku* policy. Its direct military expenditures were trivial. Meiji Japan, however, apparently felt it had to bleed its highly productive agricultural sector more than did most second generation industrializers in order to hurriedly construct a warfare state of its own to meet the international pressures it was no longer insulated against after 1868.

Agriculture eventually outgrew the problems of supporting these military non-agricultural sectors, and in fits and starts after 1912 grew at a more respectable rate through 1945. This was partly because many of the market-driven non-agricultural sectors also became increasingly capable of supporting the warfare state while still growing themselves.

After 1945 a big boom in rural productivity occurred, thanks to the new agricultural chemistry and biology and to certain aspects of the land reform of the post-World War II era.

I should note here that this relatively optimistic view of post-1912 agriculture is by no means as yet the consensus among Japanese economic historians. On the other side it must also be conceded that most Japanese farmers were not particularly well off until after the 1946-7 land reform. Increasing numbers left the land after 1868 as much to escape rural poverty as to seek their fortunes in urban industry. A number of agricultural riots broke out during early Meiji times, but rural unrest tapered off thereafter, which might suggest that conditions eased, even though most farmers were still not prosperous.

But what do we mean when we talk of prosperity? The word "prosperity" can be stretched to cover a number of situations. Japanese living standards ought not to be compared with Western standards before Japan reached a stage of development commensurate with that of the West. Meiji era Japanese farmers were not all that much worse off than Japanese city dwellers. People normally leave the land during full industrialization. They often riot at the mere prospect of having to do so, even

if moving to town will eventually make them more prosperous.

After all, during the late 19th century in America, did not America's rural Populists also urge farmers to raise "less corn and more hell?" Yet we now know that most American farmers were pretty well off by the 1890s. Only those on the marginal lands of the high plains were in serious economic trouble for objective climatic, soil fertility and geographic reasons.

Meiji farmers seem to have likewise mostly survived the intervention-induced reduction in the profitability of their land, and also managed to endure the psychocultural pressures of the run to takeoff.

F. Japan's Run to Industrial "Takeoff,"

1. Infrastructure: Education, Money & Banking

a. education

The second stage, the run to industrial takeoff, was overtly initiated by the Meiji officials in the 1870s. Japan's takeoff occurred sometime during the first decade of this century. The government had done whatever it could, perhaps more than was possible, to achieve this result.

During the 1870s, the new government engaged in serious infrastructure building: Its new Ministry of Education set up a public school system, inserting a secondary level of education between the already existing private primary and quasi-public tertiary levels.

The government abolished the old private primary schools and built new state-owned primary schools that fed a small portion of their pupils into a much smaller number of secondary schools. When necessary, the police conscripted the primary and secondary level students out of the old *terakoya* and marched them at gunpoint into the new public schools. The larger numbers of teachers required for the new schools came from a broader social base.

The officials also sent for foreign advisers—Americans and Russians and Germans—and put them to work reorganizing the school curricula. At the tertiary level, they took over the old Tokugawa Confucian College, renamed it the Tokyo Imperial University, and hired a bunch of German professors to reorganize it into a Japanese simulacrum of a German state university.

Summarized into a few paragraphs, that all sounds rather awful, and it was. But it was also not so different from what the American public schools and state and private universities were doing more gently at the same time. America's public schools were only a generation old when the Meiji Restoration got under way. Most American state universities were organized at roughly the same time as the Japanese state universities, and also with German advice.

Americans had been going over to Germany for their tertiary educations since the middle of the 19th century (some of the first students being Civil War draft dodgers). These scholars returned home after the shooting stopped to set up new universities like Johns Hopkins and reorganize old style seminaries like Harvard into simulacra of German state universities. Many of their first students were the sons of German immigrants of the preceding generation.

The Japanese were responding to the same sorts of stimuli during these same decades. Harvard stopped being little more than a seminary for Unitarian preachers not long before Tokyo Imperial University stopped being a kind of Neo-Confucian seminary.

This educational infrastructure provided an intellectual and social framework onto which a fully industrial economy could entwine itself. However, one might also argue that, left to its own devices, the market for educational services would have spontaneously exfoliated in response to the changing market stimuli of the run toward takeoff. It might have done at least as good a job more cheaply, and without the necessity to conscript little children. Still, one must concede that however perverse the way it did the job, the Meiji Era state also performed that function.

b. money & banking

The government in Japan also extended its infrastructure-building more directly into the marketplace.

It promulgated a modern banking law and established a central bank during the early 1870s. This put Japan ahead of the Americans who had been doing without a central bank since Andrew Jackson strangled the Second Bank of the United States in 1837. The National Banking Act of Civil War times only partially filled the resulting vacuum until the Federal Reserve system was established in 1913 as a multi-part central bank.

And yet America completed its takeoff and subsequent run toward maturation during the last half of the 19th century quite satisfactorily without a proper central bank. To be sure, however, the Western European nations developed almost as rapidly while becoming as badly infested with central banks as Japan.

In Japan, as in Europe, new banks were chartered as nominally private satellites of the public central bank. The new banks also helped finish off the old Osaka banks. The Osaka banks were so intimately tied to the Tokugawa that they had already lost most of their viability.

Most of the capital of the old Osaka banks was tied up in loans to the daimyo. The government used the new banking system, which could create bank money out of thin air under government stimulus, to rapidly inflate and hence cheapen the money supply during the 1870s. The government had previously assumed the daimyos' debts to the Osaka banks. It paid off these debts with this cheap bank money. This so drastically reduced the old banks' real capital that they could not compete with the new banks, and most of them soon had to close their doors.

Because most of this large new supply of money entered the government's hands first, the authorities could spend some of it to pay off the feudal stipends owed to the samurai class. The Meiji government had taken over these obligations from the daimyo at the beginning of the '70s when the monetary unit was still relatively valuable, but paid the samurai off during the latter years of the decade with drastically depreciated money.

c. pilot plants & Hokkaido boondogles

The government also used this cheap money to buy, abroad and at home, the capital goods and labor to construct numerous "pilot plants" designed to introduce various Western technologies into Japan. It hoped to artificially accelerate the appearance in Japan of what 19th century Western interventionists called "infant industries," particularly in fields relevant to building a modern army and navy.

These scale model factories had to be owned outright by the government because

1) Japan's market was not yet ready for them, and so no private investor would or could build them, and

2) pilot plants are normally too small to enjoy sufficient economies of scale to make them viable in the market.

The government did not build full-size plants because it wanted to start many projects, and so could not afford, even with cheap money, to build many of them to full size.

Most of the goods these industries produced were suspiciously congruent with the needs of the emerging Japanese warfare state: The government bought a modern textile plant to make woolen cloth. Why wool in a country already well supplied with much more pleasant to wear silken, cotton and linen textiles? Every proper European army then outfitted its conscript soldiers with woolen uniforms. Japan had just created its own conscript army. So the government determined to supply it with Japanese-made woolen uniforms.

The government also bought a miniature integrated iron and steel complex of the new sort so as to produce modern weapons out of these high grade steels. As it turned out, the pilot plant could not produce enough such steels soon enough, or cheaply enough to build many warships. Since the authorities wanted a modern navy right away, they had no choice but to contract out its building abroad. Most of the Japanese navy of Meiji times was built in English and Dutch shipyards.

The government also established a small shipping line to get Japan into the lucrative steamship trade between Japan and China, and between Japan, Europe and the Western Hemisphere.

In addition, the Meiji rulers put a number of government-financed infrastructure projects into development in Hokkaido, including some pilot plants, to make sure the northernmost island was fully enough Japanified as to keep it out of Russian hands.

By the 1870s, Hokkaido was the last significant piece of land still up for grabs in northeastern Asia. The Russians had just backed out of Alaska, having sold it to the Americans during the late 1860s. The Japanese government feared the Russians would now turn to Hokkaido as a conveniently located consolation prize. As it turned out, Russia was kept busy by the big chunk of northeastern Manchuria it had recently bit off from China, something the Japanese authorities did not anticipate.

d. Japan's first modern depression & business scandal

Unfortunately, but inevitably, by 1879 the bills for all this intervention came due. Japan was now a part of the world economy. During the 1870s the world was in the midst of its last great burst of multilateral free trade before lapsing into the protectionist doldrums that preceded (and probably contributed to) the coming of World War I.

Gold was still the dominant commodity-money used in international multilateral trade. Even England's money, the strongest currency thanks to England's lead in industrialization, was tied to gold. Because the Meiji government so greatly increased its quantity during the '70s, the Japanese yen had depreciated so much relative to both gold and the British pound sterling that foreigners grew reluctant to pay inflated prices in yen.

This faced the Japanese government with the prospect that its wholesale money creation would cause the loss of a large part of their countrymen's foreign trade, since Japanese goods were now overpriced to foreigners in terms of gold.

Since "floating" exchange rates were not considered proper under the rules of the international monetary game then, this loss of foreign sales could only be avoided if the government used the central bank to shrink the money supply. It had to reduce drastically the quantity of yen in circulation and so increase the value of the remainder, thereby reducing Japanese prices. The central bank did just that during 1879-81.

The result was Japan's first modern depression, but (as was normally the case during the 19th century) the bust was quickly gotten through, because not only did the value of the yen rise, but people in the market were prepared to quickly adjust to that rise by reducing their prices, including wages, by enough to keep their real values from increasing. This kept prices and wages low enough so that unemployment of both labor and capital was minimized.

The Hokkaido Scandal broke out in 1880-81, toward the end of this depression. The new opposition parties revealed that the Satcho Clique dominating the government had been giving fat contracts to their friends to build the various projects and pilot plants in Hokkaido, and had then sold off many of these projects to their friends at highly favorable prices when the government had to cut back on expenditures during the depression.

The government bluffed its way through both the depression and the Hokkaido Scandal. Since the depression was short, it was easily weathered. As for the scandal, recall that the government had only recently won a civil war against some of its own ex-samurai from Satsuma. It used the reputation it gained from that victory to bluff out the unarmed opposition parties.

Simultaneously the government retrenched, cutting back drastically on expenditures at the expense of the Japanese workers and entrepreneurs who lost jobs and government contracts. These people paid the price of lower wages and profits for neutralizing the consequences of the government's earlier inflation. This deflation also had some politically stabilizing effects: it completed the ruin of the military aristocracy that the preceding inflation had begun.

2. The market sector

Fiscal retrenchment required the selling off of the pilot plants. Naturally, middle class-run firms, new and old, their proprietors all friends or would-be friends of the Satcho Clique, stood ready to buy them, letting the government gain some political profit even from the depression.

Some of the old *ie* had quickly made the transition to becoming *sogo shosha*—trading companies—engaged in such activities as the international silk trade. This earned much foreign exchange, and they or others who borrowed these funds from the new banks they founded then used that foreign exchange to buy needed and useful Western goods.

For example, entrepreneurs bought machinery abroad to make matches, a recently developed Western industrial product. Everyone in Japan wanted to use matches once they saw the first imported "locofocos," as they were called.

There was no need to protect an "infant" match industry or to set up a government financed pilot plant for making matches. A market for them appeared spontaneously, and one which could be supplied by some capitalist making a modest expenditure to acquire foreign match-making machines, install them, and make

sure his workers learned how to run them. The entrepreneur could make back the cost of the machinery very quickly because everyone in Japan almost immediately gave up banging steel against flint in favor of using matches.

If the entrepreneur lacked capital to buy the machinery, he could hire laborers to make matches by hand methods. Because wages were low, his costs might not be too much higher than they would have been using machines. Matches made by hand were demanded almost as much as machine-made ones. Some economic historians call this the "transitional" sector of the full industrial economy. (If the transitional match factory was poorly ventilated, you might even call it a sweatshop!)

An early Meiji *jinrikkisha.* (Smith, p. 292.)

Other capitalists bought bicycles abroad, or at least bicycle wheels, and sold these wheels to the fellows who had just invented the *jinrikkisha* 人力車—rickshaw in pidgin English—which combined a Japanese wickerwork coach for the customer to sit in with two Western bicycle wheels on hubs fitted with modern bearings.

The resulting hybrid vehicle was light enough to be pulled by a man rather than a horse. This was a more economical vehicle to build than a bicycle, since only the expensive wheels and hubs needed to be bought abroad. It was also more economical to operate than the device it replaced, the palanquin or sedan chair, which had to be carried by two to four or more bearers.

Almost as cheaply assembled in Japan as the traditional sedan chair, and with a single, still cheap Japanese laborer hired to pull the thing, this contraption may look backward and old fashioned now, but it was a new and highly efficient form of urban transportation during the last quarter of the 19th century in Japan, and up through the mid-20th century elsewhere in East Asia.

The rickshaw spread all over Asia. You may have thought it was Chinese because it became and remained so widely used for so long in China, but its name reveals its Japanese origins. Only during the last generation have rickshaws been replaced in Southeast Asia by pedicabs, and then by motorized pedicabs.

Imported bicycles also sold tolerably well. By the turn of the century, some Japanese firms were even assembling whole bicycles from Japanese-made spare parts (wheels, hubs, frames, etc.). Old-fashioned blacksmith shops were fabricating replacements for broken parts on bicycles using early industrial techniques because foreign spare parts were too expensive for most bicycle owners.

This procedure may sound very quaint and "Japanesey," but it is precisely the sort of system that Henry Ford pioneered for mass production of automobiles at about the same time: to use lots of subcontractors minimized the final assembler's capital costs. These included costs of design and inventory, as well as the cost of the capital to pay for the time required for manufacturing subassemblies before the final assembly of automobiles could begin. This hybrid modern full industrial technique appeared in Japan at approximately the same time as it did in the West. In both places it was evoked almost purely by the logic of the market.

The market also produced a beer brewing industry by mid Meiji times, using brewing equipment imported from Germany. During the third and fourth stages of full industrialization, beer ("cold goods" in the jargon of the Japanese booze business) all but overwhelmed sake (called "warm goods" because served heated). Only during the luxury-loving fifth stage, as part of the turn toward leisure and consumption, has nostalgia redirected demand back toward warm goods.

Before long a cotton textile industry using imported modern spinning and weaving machinery also grew up, largely without state subsidy. The ready to wear clothing trade arose altogether spontaneously, so cheap were the sewing machines which were the only modern tools needed by the women who provided the modest wage earning labor.

The "unequal treaties," with their tariff limit of 5 percent by value, which the western powers had imposed on Japan at the end of Tokugawa, did not hurt production, even of modern goods. It allowed entrepreneurs to buy machinery or subassemblies (like bicycle wheels and bearings) cheaply abroad, and obliged them to keep their own costs down since they could not count on high tariffs levied on foreign cotton cloth to place a floor under the prices they could charge. Admittedly, cheap labor made this easier.

Home manufacture of Western-style dresses. (Smith, p. 277.)

These and many other new industries were begun with little or no intervention by the state. The common denominator among all of these goods was that

1) the new products were so inherently useful, or at least desirable for more subjective reasons, that a large Japanese market for them appeared almost instantly, and

2) the capital goods to produce them were easily purchased abroad at prices low enough to enable these capital expenditures to be earned back quickly once production commenced. Either that or labor at low wages could be substituted for some or all of the capital goods. Both of these factors served to attract large numbers of entrepreneurs into these fields without state subsidies.

We should not exaggerate the role of such novelties from the West. Most goods produced by the unfettered market sector in Japan during Meiji times would not have surprised some reawakened Tokugawa era Rip van Winkle, except for the much larger quantities of them required to supply the rapidly growing population. The technology for unreeling silk cocoons was unchanged. The scale of operations merely increased. Food, furniture and

houses remained virtually unchanged.

3. Mid to late Meiji: a warfare state and a market economy

a. the warfare state & economy

Most of the real increase in wealth during the run toward takeoff must be ascribed to these unsubsidized men of the market, most of whose goods were of the traditional sort. Prestige, however, and notice by academic consensus economic historians attached more to those men of the market who collaborated with and were subsidized by the new warfare state, and who made conspicuously westernized goods. These more privileged *chonin* had turned themselves into what they liked to call *jitsugyoka*—gentlemen of business, or (in my jargon) plutocrats, for the most part dominated by rather than dominating the state.

The founder of the Mitusbishi house, for example, deliberately patterned his new firm (only founded in the late 1870s) on the old *ie* surviving from Tokugawa times. He said the goal of his firm was the same as that of the feudal houses on which the Tokugawa business firms had originally patterned their organizations: to serve the imperial house and the order of Heaven which it re-presented onto earth. (Naturally he did not put it quite that way!) He too, he insisted, was a samurai. It was just that he no longer happened to wear the two swords. He had, however, the same goal as the samurai: glory for emperor and state.

In short, he had bought into the whole Neo-Shintoist line about the goals of ruling class behavior. Only the means were to be new: success in world markets (with a little bit of help from one's friends in the government) would finance restoration of the ancient glories.

Mitsubishi was happy at the beginning of the 1880s to take over the pilot project to run a shipping line from Yokohama to Shanghai. All it wanted in exchange was to receive a monopoly license from the Satcho Clique to control that route. This entitled them to at least try to charge more to both Japanese and some foreign shippers from Yokohama than would have been possible if the police power of the state had not excluded all competition from that route.

A large-scale silk filature. (Smith, p. 126.)

We cannot tell what Japanese shippers would have done with the money they would have saved absent this monopoly. There is, however, at least a presumption that such tricks as this monopoly license diverted some of their wealth from what might have been higher and better uses for it. Under the unequal treaties' terms, foreign firms could go around the monopoly.

These unknowable or imperfectly guessable alternatives are what economists call the "opportunity costs" of such Faustian bargains with a warfare state. The sources can only tell us that the monopoly helped Mitsubishi grow into a great multi-part group of companies engaged in modern industry. The academic consensus soft-pedals the fact that this conglomerate in turn helped foster the growth of the Japanese warfare state.

In other words, I am suggesting that you at least remain skeptical about the supposed good effects of the alliance during mid and late Meiji times between the new warfare state and the upper ranks of the *chonin* as these townsmen finally turned themselves into plutocrats.[8]

This still primitive Japanese warfare state of the run toward takeoff stage was nevertheless already pointing toward the 1894 and 1904 wars of imperial expansion. The warfare state's proprietors, the Satcho Clique, were merely too prudent to start such imperial wars in the '70s and '80s, before they were ready. The sweetheart deals made with these *jitsugyoka* were intended to create the material clout to wage these later wars.

This process of forming alliances between state and the highest levels of the participants in the market also sounds very much like the co-optation of each new group of plutocrats to reach the top of *chonin* society carried out during early industrialization by the Tokugawa state.

There was, however, one big difference between the old Tokugawa and the new Meiji collaboration between state and market, and this at least mitigated the new situation. Japan was no longer isolated from the rest of the world market. Indeed, it had become inextricably entangled with the world trading community. The unequal treaties signed in the 1860s and not rewritten until 1894 (with full tariff autonomy postponed until the first decade of this century) barred Japan from engaging in serious acts of protectionism.

b. the modern market sector

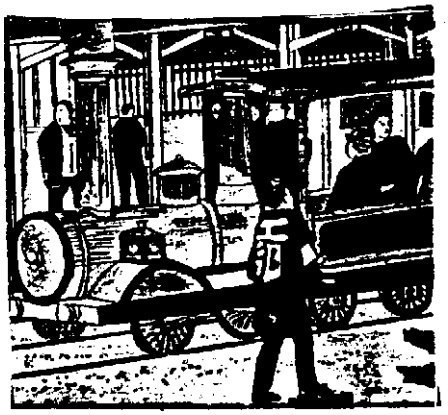
These treaties limited the tariff rate Japan could charge to no more than 5% ad valorem—a tariff for revenue purposes only. This set limits to the monopoly powers that the Meiji state could in actual fact grant to the privileged sector of the townsman class since it could not put high tariffs on their foreign competitors.

Absent such tariffs, many would-be monopolies could be gotten around by Japanese or foreigners living in Japan buying cheaper foreign goods. Hence the would-be monopolists usually could not charge the full monopoly prices they might otherwise have hoped for.

Only when the unequal treaties were made more equal after the turn of the century, could such protective tariffs and other measures (including the outright exclusion of successful foreign firms from the Japanese economy) at last begin to be used to protect supposedly "infant" industries.

By then, however, Japan's takeoff had occurred. Those hitherto unprotected infant industries had nevertheless grown up to a lustily selfish adolescence. Though they presumably no longer needed the protection, they had become strong enough without it to insist on protection thereafter anyway.

[8] You might also extend this skepticism to contemporary schemes for use of the state to subsidize companies engaged in supposedly more wholesome projects like cleaning up the environment. In the late 19th century, most Westerners believed their new empires would make themselves and their subjects much healthier, wealthier and wiser. They did not. There are equal grounds for skepticism about the effects of environmental interventionism.



The first Japanese railroad, Tokyo to Yokohama. (Smith, p. 265.)

Railroads, for example, though highly capital intensive, were also highly profitable. Private capital was easily found to build them, though the state built the less profitable ones itself. Once it was free to practice interventionism, the late Meiji era government bought out all the private railroads. It was not until three-quarters of a century later that the government sold them off again, though it had to swallow up the enormous debt the railroads had run up in public hands.

c. the transitional sector

Even after the turn toward intervention deepened, much of Japan's economic life still went on not in the "modern" (i.e. western-inspired, capital intensive) section of the market, whether subsidized or free, but in that section of the economy where traditional methods still predominated. This was true even well into the next stage, the run from takeoff to maturation. Indeed until quite recently, most people still lived in traditional houses, sat upon tatami mats, drank sake, ate rice, pickled vegetables and raw fish, and wore clothing only marginally changed in style from traditional forms.

All of these traditional things had to be made or grown and then most of them had to be marketed. The majority of those working in the market devoted themselves to making these goods by mostly early industrial methods. Hence they could only earn low early modern wages.

There were also all of the modern things, like bicycles, that could be made by subcontractors at least partly by traditional methods. These might also be counted at least in part as belonging to the economy's traditional sector. However, since modern goods or goods for sale to other full industrial countries were involved, I prefer the label "transitional sector" for these trades.

At least during the periods of transition into a full industrial economy—the second and third stages—wages in this transitional sector tended to be almost as low as those of the traditional sector. But because its productivity was higher than the traditional sector's, Japanese consumers could enjoy somewhat lower prices overall than would otherwise have been possible. These low prices also allowed transitional sector producers to begin exporting even modern types of industrial goods produced by traditional methods to the far more developed western nations much earlier than might be expected.

The traditional and transitional economies also grew, and (partly because of the latter's links to the modern sector) they grew faster than the population did, even though the population went from 30 million in the 1860s to over 60 million people in the 1920s.

This meant that, in traditional terms at least, living standards were improving despite Japan's "population explosion." Actually, production in the traditional and transitional sectors could not have increased without the increased numbers of workers the population explosion made available. A more modest population growth would have hobbled industrialization.

G. Japan's Run From Takeoff To Industrial Maturation

1. Warfare state, market, and liberal imperialism

The next stage, the run from takeoff to industrial maturation, ran from c. 1904 to c. 1955. It came up against many more and more serious obstacles. The full industrial sector of Japan's economy bulked ever larger, and could inconvenience and damage many more people as its novelties disrupted their habitual ways of earning a living and consuming goods. Some obstacles were not economic, but rather political and psychological. These obstacles could not be entirely overcome by anything done just in the marketplace.

The biggest players in the modern sector of the economy became bigger, but remained in a compromising alliance with an increasingly successful warfare state after 1904.

Even worse, the era of world-wide free trade was drawing to a close after the mid-1890s. The American McKinley Tariff of 1890 was the first American tariff to really have a significant economic effect. (The effects of earlier tariffs were lost in the real costs still imposed by inefficient transportation before triple-expansion seagoing steam engines appeared during the 1880s and by the chronic tendency of unit prices of industrial goods to fall faster than political factors hindering tariff increases could be overcome.)

Even the hitherto free-trader English had turned hypoindustrial and began to give "imperial preference" in trade to their own colonies by the turn of the century. The Germans were never free traders, but now bulked larger as a maturing industrial economy, and so their protectionism mattered more.

By the 1890s, Japan too began to take up the burden of empire. One is tempted to call this the Yellow Man's Burden, since Japan assured itself that it was bullying China and Korea for their own good, just as the Europeans felt when they were bullying Asians and Africans. The Kaiser, who coined the term "White Man's Burden," referred to the Japanese as the "Yellow Peril." The more polite Japanese did not call him the "White Peril," though that would have been a valid label too.

Historians sometimes give such would-be do-gooding imperialism the oxymoronic label of "liberal imperialism." Japan was becoming one of the liberal imperialist states at a time when the other liberal empires were losing at first their economic liberalism and then (after World Wars I and II) their empires.

Japan was also freed to practice protectionism itself once it had allied with England in 1902 and gained the leverage to induce the other imperial powers to rewrite the unequal treaties.

World War I finished off the job of killing real free trade, along with the true gold standard, of which only a simulacrum could be revived during the '20s. Even this simulacrum of free trade was abandoned during the Great Depression.

The waning of free trade in the early years of the century seemed to require that Japan keep its empire, and (as it turned out) to expand it, if only to keep secure its own potential to practice "imperial preference" with its colonies.

This meant that the warfare state had to drain still more of Japan's savings into taxes to launch increasingly lunatic schemes to preserve that empire through expanding it. Much of the remaining scarce private investment capital also had to be diverted away from Japan into the ever-expanding empire, thereby slowing Japan's own industrial maturation, delaying it by a decade or two. Still worse was the anguish of all the widows and their mothers-in-law during that decade or two.

2. The Great Depression and the fascist state

During the '20s, the Western powers only pretended to restore free trade. The Great Depression, which these manipulations helped cause, ended even the simulacrum of free trade after 1929.

The Japanese were more frightened by the Depression than their objective economic situation required. It was their empire, not their economy, that was overextended. Unfortunately, they reacted as any energetic neurotic might do: they redoubled their efforts along the same lines that had gotten them into trouble in the first place. At home they slipped into a kind of generic fascism. Abroad they escalated the growth of the empire that was beggaring them.

Nevertheless, Japan was, of the industrial powers, the least badly affected by the Great Depression. Japan's flexible downward prices, particularly in the cost of labor in the transitional zone between the modern and traditional sectors of its economy, meant that market pressures could force wages and prices down soon enough and far enough so that Japan could recover sooner than any other country from the unemployment and declining production caused by the Great Depression.

By 1934, Japan was essentially out of trouble in economic terms. Hoover's and Roosevelt's (the Tweedledum and Tweedledee of American interventionist politics in the 1930s) price and wage maintenance policies were keeping American unemployment high and production low.

Unfortunately, the Japanese were too nervous to notice this. Some of this nervousness was justified. Some of Japan's foreign markets were indeed being threatened by foreign protectionists, and some of these same protectionist powers were simultaneously insisting that Japan give up its empire while they retained their own colonies.

3. Advantages and disadvantages of a dual economy

The large-scale firms of the modern sector of the dual economy remained in cahoots with the warfare state. The so-called traditional sector still produced sake to take people's minds off the Great Depression and tatami mats to sit on while they drank their sake, but also provided most of the subcontractors who were evolving the transitional sector.

This partly traditional but gradually modernizing transitional sector of the market economy was working so well that you could make a very good case that Japan was on the edge of industrial maturation by the end of the '30s. All it needed was a little more investment capital and another decade or so of time.

It would get neither. That investment capital continued to be drained directly and indirectly via taxes and misdirected investments to the empire. The empire brought inevitable conflict with China and America. Instead of industrial maturation, Japan got World War II.

During 1944-1945, the American submarine fleet and Army Air Force rapidly depreciated the urban capital structure of the Japanese economy by cutting it off from foreign raw materials, by blowing it up or at least by blowing the roofs off the buildings housing the machines and covering them with debris. More important, the hearts of the Japanese were being broken and their political ambitions were being chastened for at least another two generations.

H. Japan's Industrial Maturation Decades

1. Myth of the Occupation

With defeat and loss of the empire, the proprietors of the warfare state and their fellow travelers in the market all had to come home from the empire and begin to earn their livings in the domestic marketplace.

The Americans occupied Japan immediately after the surrender. The conventional wisdom holds that the ensuing Occupation, which lasted in name until 1952, was an unambiguously good thing, and should be given full credit for the industrial maturation achieved by c. 1955.

It is true that thanks to the American Occupation the New Deal was brought to Japan. Since many Americans still believe that the New Deal saved American capitalism during the '30s, it is equally plausible for them to give its postwar Japanese reincarnation credit for Japan's industrial maturation by the mid-'50s.

The American version of anti-trust laws was visited upon the Japanese. The multi-activity groups of firms into which the *ie* had evolved—called *zaibatsu*, or "financial cliques" by those who disapproved of them—were to be broken up.

The Americans also gave land reform to Japan. Agricultural land was divided up evenly among the families of tenants. The Occupation government then inflated the Japanese currency so that landlords were paid off with much cheaper paper money, worth several hundred times less than when the land confiscated from them was evaluated in monetary terms just a few years before.

Then, the conventional account goes, the Americans fought the Korean War and put out many lucrative contracts to Japanese firms to supply the American armies in Korea.

All of these things, we are told, allowed the Japanese to finally mature their industrial revolution by the mid to late 1950s.

Nevertheless, the Japanese of the late '50s and early '60s remained fairly poor. American New Deal internationalism supposedly delivered another stimulus to their economy after 1965 by going to war in Vietnam and giving the Japanese many more supply contracts.

Finally, Japan began to become truly rich. All of this thanks to the Americans, and their Occupation and their two Asian wars.

2. The end of empire and return of free trade

The conventional story summarized in the preceding section is really not all that plausible. Isn't it strange that it only took ten years for most of these good things to happen? Why were the Americans so generous? Isn't it more likely that all of the things that happened during the run toward maturation from c. 1900 to c. 1937, when the war in East Asia hotted

up, had more to do with the maturation of the Japanese economy than the mere ten years after 1945?

After the Japanese lost the war and their empire, they had no choice but to divert their savings and good work habits solely to industries within the home islands. They could no longer invest in Korean dams or Taiwanese power stations. They could only dispose of their savings by building such infrastructure at home.

The Occupation's anti-monopoly laws had by 1948 all been allowed to become dead letters. The Occupiers discovered they were endangering the Japanese economy at a time when a prosperous and peaceful Japan was needed because the Cold War with Russia was heating up as a result of Russian pressure on Turkey, the Greek civil war, the Berlin Blockade and the Communist takeover of Czechoslovakia.

More thoughtful economists among the Occupiers also noticed that all sorts of new firms and medium-old firms in Japan were already making end runs around any of the supposed monopolists who were complacent enough to rest on their oars.

Matsushita, for example, better known as Panasonic in this part of the world, had been around since 1919, but now began to do many new things with electrical equipment. Sony, founded soon after the war, began to break even newer ground by licensing the American-invented transistor. The market was apparently doing a better job of destroying monopolies than anti-monopoly laws could have done.

As these new firms perfected old contraptions and invented new ones, they found they could sell their goods tolerably freely elsewhere in the world. Even more important, Japan could buy capital goods (steel, machinery, etc.) from the Americans in even greater quantities than the goods they sold abroad, with the difference financed by American banks and investors. As a consequence, Japan could specialize in what it did best, and buy goods in which others had a comparative advantage. The resulting unfavorable balance of trade, which lasted until 1965 with the Americans, was covered by a variety of credit arrangements which represented net American investments in the Japanese economy.

The Occupation's land reform turned out very well in social terms. But its economic results were mixed. The reform divided up the land into such small parcels that it stimulated putting lots of capital (including artificial fertilizers and chemical biocides) into each parcel in order to get the maximum production out of it. It also chased all the younger sons off the land and into towns, where they took up work in factories, and thanks to their numbers, at very modest wages.

Fortunately, there were lots of factory jobs opening up in town thanks to the autonomous maturation of the urban industrial economy. There were jobs for these ex-farmers to be chased into as they came off the farm. Some of these new factories even produced the fertilizers and biocides used by the remaining farmers.

On the bad side, the remaining farmers were still so hemmed in by the small sizes of their holdings that their costs remained high and they had to be protected from international competition by grant of a colossal monopoly license from the government via a government rice-marketing authority. These new rural fat cats were able to charge Japanese consumers very high prices for agricultural products thanks to the defacto monopolies these licenses granted to them by the marketing authority. These rural privileges foreshadowed the restoration of a larger range of similar privileges to others nearly a decade after the end of the Occupation.

As for American contracts with Japanese producers during the Korean and Vietnam wars, they had a modest positive effect on the Japanese economy, but could hardly have matured it all by the themselves.

Whatever the reasons, the Japanese economy recovered from the worst of the wartime losses by the beginning of the 1950s, barely five years after the war had ended. In another five years, by 1955-56, the elusive goal of economic maturation was finally achieved.

Like so many historian's generalizations, this judgment that maturity had been won by the mid-'50s was only evident to people on the scene well after the fact. The Japanese of the late '50s still felt poor and insecure. In fact they *were* poor by contemporary American standards! Their recent history, including the ambiguous ending of the Korean War, gave them no reason to feel secure.

It was only their future that ratified this judgment. By the end of the 1950s, the Japanese were running a trade surplus with Southeast Asia, despite that region's bad memories of the last stages of the expansion of Japan's empire into their territories during World War II. (See chapter 20.)

By the mid-1960s Japan was running a trade surplus with the Americans too. For some time the Americans thought that was a fluke, an accidental result of American war expenditures in Japan during the Vietnam War. We now know better: That trade surplus was the first clear sign that Japan's post-maturation decades were under way.

3. The return of protectionism

Another sign of post-maturation was the return of protectionism. Some people (the American scholar Chalmers Johnson for one) argue that postwar protectionism was the source of Japan's increasing economic success, and that MITI—the Ministry of International Trade and Industry and the Finance Ministry exerting control over the Bank of Japan, by directing investment to one sector rather than to another within the economy. were actually orchestrating the Japanese postwar economic "miracle."

Critics of Johnson say that MITI was nothing new. It was just traditional dull-normal Meiji and post-Meiji Japanese interventionism making bumbling and occasionally corrupt mistakes, just as the Tokugawa and Meiji and fascist period states had done. Fortunately, MITI's critics say, the men of the market could, under the freer conditions of the Occupation and the first post-Occupation decade, make end runs around such a bureau.

When MITI told Sony not to bother doing anything with the transistor that they had licensed from Bell Labs during the 1950s, Sony did not have to pay attention to them, and as a consequence revolutionized consumer electronics.

MITI also told Toyota and Nissan at the beginning of the 1960s to forget about expanding automobile production, and advised Honda not to add autos to their motorcycle production line. Japan, MITI concluded, could never have a big automobile industry because it could never have a big enough domestic market to buffer uncertain foreign sales.

As you may have noticed, Toyota and Nissan and Honda did not pay attention to this advice. They (or rather the laggardly Ministry of Transportation) created the world's biggest traffic jams in Tokyo when in fact they did develop an enor-

mous domestic market for automobiles after the late '60s and during the '70s and '80s.

True, MITI was normally careful not to suggest economically imprudent acts to Japanese industry. It did not suggest cutting out Japan's extensive imports of American steel and other industrial semi-finished products during the '50s. It understood that Japan could not yet replace these imports with domestic production. In effect MITI sometimes correctly guessed what the market required.

By the 1960s, however, protectionism was becoming economically possible thanks to the maturation of Japan's industrial economy, and MITI could not resist the resulting greater opportunities to intervene. For example, MITI advised the buildup of the Japanese steel industry behind a new wall of protectionism. It thereby encouraged the building of redundant steel mills during the '60s and '70s. These had to be closed down in the '80s when the world glut of steel capacity became evident even to the world's state planners who had caused that glut by encouraging state and private capital to be pumped into unneeded steel mills as the world began to replace steel with aluminum and fiberglass.

Unfortunately, protectionism also began to seem socially, and hence politically, prudent during the '60s. When college students began in the Spring of 1960 to riot against renewal of the post-Occupation military alliance with the Americans, Japanese politicians feared this might foreshadow a return to the instability of the late '20s and early '30s. Their impulse, as earlier, was to appease the instigators of this potential instability.

Conservative politicians noticed that they could now afford to create a seemingly secure job market for these discontented youths through protecting the domestic market for the goods and services these youths would help produce once they stopped rioting, graduated and went to work. Grateful for such "compensation," these students might reciprocate by voting for these conservative politicians instead of for socialists.

And so Japan's second reversion to protectionism began, the first having occurred with the end of the unequal treaties soon after the turn of the century. Just as the first wave of protectionism was not the cause of takeoff, but rather was made possible by it, this renewed protectionism was not the cause of Japan's industrial maturation, but rather a contingent consequence of that maturation.

4. Onset of Japan's hypo-industrial stage

MITI, the instrument for initiating much of this protectionism, may not, therefore, have been the harbinger of Japan's maturation as an industrial power, but of the later hypo-industrial stage which in the 1989 revision of this chapter I guessed might lie just over the horizon for Japan. I now think hypoindustrialization began just before the surprisingly long recession of 1991. (Changes in stage of industrialization seem to be marked by exceptionally severe and extended busts. Japan's 1991-99 seems to correspond to the United States' 1929-1939.)

MITI was the creator of many of the new monopoly license privileges that the Japanese now find so difficult to overturn or work around now that the rapid growth of the post-maturity decades has ended.

This judgment that hypo-industrialization's first invisible stage has begun, involves predicting the future as much as evaluating the present, at neither of which are historians any better than "futurologists" and other charlatans. So far, at least, this prediction has worn better than the assurances of the naive Japanophiles that postwar Japan had stumbled on a mode of intervention guaranteeing permanent prosperity.

It may be that the Japanese will prove more successful than their Euro-American predecessors in transcending the onset of this sad fifth stage of their industrial revolution. That, however, is a question to be considered later. EHK