

The Industrial Revolution

BY DEIRDRE NANSEN MCCLOSKEY

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The industrial revolution, a term under dispute but hard to avoid, was the economic transformation beginning in northwestern Europe in, it appears, the 18th century, accelerating in the 19th century, and spreading worldwide—with many diversions for war and socialism—in the 20th. Such an industrial revolution was the cause in the world today of much of what is different from earlier times: poor people who are rich by historical standards, ordinary people in charge of their own politics, women with jobs outside the home, children educated into their 20s, retirees living into their 80s, universal literacy, and the flowering of the arts and sciences.



BEFORE THE REVOLUTION

The heart of the matter is fifteen. Fifteen, or more, is the factor by which real income per head nowadays exceeds that around 1700 in Britain and in other countries that have experienced modern economic growth. ¹ Economic historians have discovered since the 1960s that the average participant in the British economy in 2000 was fifteen times better supplied with food and clothing and housing and education than her remote ancestors. If ones ancestors lived in Finland, the factor is more like 29, the average Finn in 1700 being not a great deal better off in material terms than the average African at the time. If ones ancestors lived in the Netherlands it is only a factor of 10 or so, since in 1700 the Netherlands was the richest (and the most free and bourgeois) country in the world, 70 percent better off than the soon-to-be United Kingdom. If in Japan, the factor since 1700 is fully 35. ² If South Korea, the factor merely in the past half-century, since 1953, when income per head, despite access to some modern technology, was about what it had been in Europe 450 years before, is almost 18, crammed into a four decades instead of, as in the British case, stretched out over two centuries.

The fact is not controversial in rough outline, though its magnitude is not something that people suspicious of capitalism know on their pulse. If you ask the average reader of *The Nation* magazine how much better off in material ease the average American was in the time of the first President Clinton as against the time of President Monroe he will venture a figure such as 50 percent or even 200 percent—not, as is the case, 2100 percent, a factor of nearly 22, which is the history.

The gigantic enrichment of all who allow capitalism and the bourgeois virtues to work—the average person as well as the captain of industry—is one argument in favor of them. The enrichment is so to speak a practical justification for the sin of being neither soldier nor saint. You may reply, and truly, that money isn't everything. But as Samuel Johnson replied, "When I was running about this town a very poor fellow, I was a great arguer for the advantages of poverty; but I was, at the same time, very sorry to be poor." ³ Or you may ask the inhabitants of India (average per capita income in 2007 in U.S. purchasing-power corrected dollars of \$4,720) or China (\$9,700) whether they would like an American per capita income (\$47,700). Or you can note the direction of permanent migration.

Britain was first. Britain was also first in the study of economics, from the political arithmeticians of the seventeenth century through David Hume, Adam Smith, T. R. Malthus, David Ricardo, John Stuart Mill, and the British masters of the subject in the early 20th century. "The bourgeoisie," wrote Marx and Engels in 1848, "during its rule of scarce one hundred years has created more massive and colossal productive forces than have all the preceding generations together." ⁴ It was a prescient remark. But the classical economists from Adam Smith to Marx and Mill were writing before the upsurge in real wages of British and Belgian and American working people in the last third of the 19th century, and long, long before the explosion of world income in the 20th century. They imagined a moderate rise of income per person, perhaps at the most by a factor of two or three, such as might conceivably be achieved by Scotland's highlands becoming similar to capital-rich Holland (Smith's view) or by manufacturers in Manchester

stealing savings from their workers (Marx's view) or by the savings generated from globalization being invested in European factories (John Stuart Mill's view). But the classical economists were mistaken.

Why did the economy do so very much better than the classical economists believed?

The answer is new thoughts, what the economic historian Joel Mokyr calls the "industrial enlightenment."

⁵ What made the modern world was, proximally, innovation in machines and organizations, such as the spinning jenny and the insurance company, and innovation in politics and society, such as the American constitution and the British middle class.

Of course, if you think up a waterpower-driven spinning machine you need some savings to bring the thought to fruition. But another of the discoveries by economic historians is that the savings required in England's heroic age of mechanization were modest indeed, nothing like the massive "original accumulation of capital" that Marxist theory posits. Early cotton factories were not capital-intensive. The source of the industrial investment required was short-term loans on inventories and loans from relatives—not savings ripped in great chunks from other parts of the economy.

The classical and Marxist idea that capital begets capital, "endlessly," is hard to shake. It has recently revived a little even among economists, in the form of so-called "new growth theory," an attempt to what the development economist William Easterly calls "capital fundamentalism" a mathematically spiffed-up form. You see capital fundamentalism in all the stage theories from Smith to Marx to Walt Rostow. "Accumulation, accumulation," wrote Marx, "That is the law and the prophets." The economic historians have discovered that it is not.

One trouble is that savings and urbanization and state power to expropriate and the other physical-capital accumulations that are supposed to explain modern economic growth have existed on a large scale since the Sumerians. Yet modern economic growth, that wholly unprecedented factor in the high teens, is a phenomenon of the past two centuries alone. Something happened in the 18th century that prepared for a temporary but shocking "great divergence" of the European economies from those of the rest of the world. ⁶

Changes in aggregate rates of saving drove nothing of consequence. No unusual Weberian ethic of high thriftiness or Marxian anti-ethic of forceful expropriation started economic growth. East Anglian Puritans learned from their Dutch neighbors and co-religionists how to be thrifty in order to be godly, to work hard in order, as John Winthrop put it, "to entertain each other in brotherly affection." ⁷ That's fine, but it is not what caused industrialization—as indeed one can see from the failure of industrialization even in the Protestant and prosperous parts of the Low Countries, or for that matter in East Anglia itself. The habits of thriftiness and luxury and profit, and the routines of exploitation, are humanly ordinary, and largely unchanging. Modern economic growth depends on ingenuity in crafting gadgets.

The gadgets mechanical and social appear to have depended in turn on free societies, at any rate when the gadgets need to be invented first, not merely borrowed as the USSR and the People's Republic of China were able to do. Such innovations of the 18th and 19th centuries in Europe and its offshoots came ultimately out of a change in what the blessed Adam Smith called "moral sentiment." That is, they came out of a change in the *rhetoric* of the economy. Honest invention and hopeful revolution came to be spoken of as honorable, as they had not been before, and the seven principal virtues of pagan and Christian Europe were recycled as bourgeois. Holiness in 1300 was earned by prayers and charitable works, not by buying low and selling high. The blessed were "poor of the faith," as the heretical Albigensians in southern France put it, that is, rich people like St. Francis of Assisi who *chose* poverty. ⁸ And still in Shakespeare's time a claim of "virtue" for working in a market was spoken of as flatly ridiculous. Secular gentlemen earned virtue by nobility, not by bargaining. The very name of "gentleman" in 1600 meant someone who attended the Cadiz Raid or attended Hampden Court, engaging in nothing so demeaning as actual work.

The wave of gadgets, material and political, in short, came out of an ethical and rhetorical tsunami around 1700 in the North Sea. This was unique in world history, and the change had stupendous economic consequences. A change in the superstructure determined a change in the base.

Away from northwestern Europe and its offshoots c. 1848 the economic virtues were still not respectable, at any rate in the opinion of the dominant classes. Right up to the Meiji Restoration of 1867, after which things in Japan changed with lightning speed, leading opinion scorned the merchant. In Confucian cultures more widely the merchant was ranked as the lowest of the classes: in Japan, for example, the daimyo, the samurai, the peasant, the craftsman, the merchant. A merchant in Japan and China and Korea was not a "gentleman," to use the European word, and had no honor. Likewise everywhere from the caves onward. And likewise, too, c. 1600 in England.

Why, then, did 1600-1776 in England witness what Joseph Schumpeter called the coming of a "business dominated civilization"? Two things happened 1600-1776, and the more so 1776-the present. The

material methods of production were transformed. And the social position of the bourgeoisie was raised. The two were connected, as mutual cause and effect. If the social position of the bourgeoisie had not been raised, aristocrats and their governments would have crushed innovation, by regulation or by tax, as they had always done. And the *bourgeois gentilhomme* himself would not have turned inventor.

And yet if the material methods of production had not therefore been transformed, the social position of the bourgeoisie would not have continued to rise. Without honor to the bourgeoisie, no modern economic growth. (This last is in essence a thesis of the late Milton Friedman). Without modern economic growth, no honor to the bourgeoisie. (This last is in essence a thesis of the economist Benjamin Friedman.) The two Friedmans capture the essence of freed men, and women and slaves and queers and colonial people and all the others freed by the development of bourgeois virtues. The causes were freedom, the scientific revolution—not in its direct technological effects, which were postponed largely until the 20th century—and bourgeois virtue.

What we can show very clearly is that the usual suspects do not work. The slave trade, colonial exploitation, overseas trade, rising thrift, improved racial stock—no such material cause works to explain the modern world. We must recur—as other economic historians like Mokyr are recurring—to ideas, the ideas about steam engines and the ideas about the standing of bourgeois people who make the steam engines and the ideas about liberty that allow the ideas to change. The change in ideas arose perhaps from the turmoil of 17th-century Europe experimenting with democratic church government and getting along without kings. It certainly arose with the printing press and the difficulty of keeping Dutch presses from publishing scurrilous works in all languages. It arose also from the medieval intellectual heritage of Europe, free universities and wandering scholars. In short, it was free people who innovated and kept their just rewards.

Notes

1. For the international comparisons Maddison 1991, 2001; for Crafts 1985.[Back](#)
2. Maddison 2001, p. 264, Table B-21.[Back](#)
3. Boswell, *Life*, 1763, *Aetat.* 54, Everyman ed., I, p. 273. [Back](#)
4. Marx, *Communist Manifesto*, 1948, p. 59. [Back](#)
5. McCloskey, "Industrial Revolution," 1981. [Back](#)
6. Pomeranz, *Great Divergence*, 2001. [Back](#)
7. Winthrop quoted in Innes, "Puritanism and Capitalism," 1994, p. 106.[Back](#)
8. Le Roy Ladurie 1978 (1980), p. 337.[Back](#)

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16. McCloskey, Deirdre N. 1981. "The Industrial Revolution, 1780-1860: A Survey." Chapter 6 in Roderick Floud and Deirdre McCloskey eds., *The Economic History of Britain, 1700-Present* (1981), Vol. 1, pp. 103-127. Cambridge: Cambridge University Press.
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Deirdre N. McCloskey is Distinguished Professor of Economics, History, English, and Communication at the University of Illinois at Chicago;
and Professor of Economic History, Gothenburg University, Sweden

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Prudentia



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The Industrial Revolution was pretty much the birth of everything. Before it happened there was no point in actually existing and so most people ended their life before it got to the complicated stages. Anyone who deemed existence worth the effort was quickly discovered and boiled alive in a pot of potatoes. And then in 1825, after a particularly steamy portion of boiling-everyone-alive history, some Cannibals and Nintendo got together and decided to make some changes. The Industrial Revolution was The Industrial Revolution was a period between the late 18th Century and early 20th Century, which saw rapid growth in mechanisation, industrial production and change in society. Two stages of Industrial Revolution. The second stage of Industrial Revolution (1870-1914) – New technologies of electricity, development of petrol engine, oil, and greater use of cheap steel. Key features of the Industrial Revolution. Population shift – moving from rural agriculture to work in factories in cities.

