

9

WHY IS THAT T-SHIRT SO CHEAP?

The Origins of the Industrial Revolution

1260L



A HISTORIAN'S JOURNAL ENTRY / BY SAUL STRAUSSMAN & BRIDGETTE BYRD O'CONNOR

I know from other events we've studied that changes in the global economy do not happen overnight. In fact, there are usually several factors or conditions that must come together to make change possible.



The same can be said of the Industrial Revolution, which brought forth a massive change in how goods were produced and traded, and in how governments decided to support these economic efforts. Let's be clear, humans have been manufacturing items for a long time; however, before the Industrial Revolution began in the mid-eighteenth century, individual craftsmen and women often created products such as textiles in their homes. There were also some regions of the world that were better known for producing quality items for both the domestic and export markets. For example, Belgium was a center of woolen products during Europe's medieval period; India had a reputation for producing top-notch cotton fabrics; and China had long been the center of silk production. But what made production during the Industrial Revolution different?

Between 1750 and 1914, there was a global shift in how goods were manufactured. These changes happened to some extent all across the world from Europe to the Americas and Asia. During this 164-year period, each of these regions took a great leap forward in creating an industrial society. In their book *The Human Web*, historians J. R. and William H. McNeill argue that it was the unleashing of great quantities of energy in the forms of fossil fuels, a concentration of capital, and the shortening of trade lines through transportation innovations like canals and turnpikes (and later steamships) that helped to transform the production and distribution of goods, especially in the northern hemisphere. (230 — 33). All of these qualities — fossil fuels, money to invest in innovations, and advances in transportation — were available in Europe, the Americas, and Asia. For example, coal seams were mined in Europe, East Asia, and North America. According to the McNeills, "Song China had used [coal] on a large scale in its iron industry. London had burned coal for home heating from at least the thirteenth century." (231) The northeastern United States and central China had many waterways that provided cheap transportation between points. And throughout the sixteenth and seventeenth centuries, hundreds of galleons loaded with goods and raw materials made the journey from South America to China, providing China with plenty of capital. Yet, the Industrial Revolution began in Great Britain. Why? And why did it happen in the eighteenth and nineteenth centuries? What changed in Europe and particularly in Great Britain that created the Goldilocks Conditions for such a dramatic change in how people produced goods and services?

SUGAR PLANTATIONS AS A BLUEPRINT FOR INDUSTRIALIZATION

One change that occurred in Europe during this period was the concept of labor. The ways in which people worked changed drastically, first in the Americas and later all over the world. This can best be seen in the development of the sugar industry on the Caribbean islands and in Brazil. Sugar production was a hot, noisy, and labor-intensive industry that worked on a very strict timeline. Not only that, it required a large amount of capital investment to create the sugar plantations and mills as well as cheap labor. Historians Kenneth Pomerantz and Steven Topik make the argument that "the scale, complexity, and social organization of the sugar mills," made them the first modern factories and therefore, a blueprint for other factory systems. (227)

There were two main factors that made sugar mills unique for their time. The first was a reliance on the discipline of time. Once the sugar cane was cut it had to be processed quickly in order to prevent the cane from rotting and the loss of sugar. Remember, sugar cane was grown in hot and humid climates so that once harvested, the cane would begin to break down naturally. This meant that the sugar mills had to process the cane quickly, which meant the laborers in the mills had to work around the clock. Each step of the production process was dictated by the needs of the sugar mill in order to maximize output. The second factor was the treatment of workers, who were predominantly slaves, as being interchangeable parts within the process. This blueprint for mass production would eventually be adapted to suit a number of different industries around the world.

COTTON, COAL, COLONIES, AND CHEAP LABOR

While it is important to consider how labor changed during the Industrial Revolution, this still doesn't answer the question of how the Industrial Revolution came about and why it started in Great Britain. Great Britain did not grow sugar cane; nor did it have a large slave population. What it did have were three key features that proved to be necessary in order to transform the British economy: access to raw materials, trade routes, and cheap labor. However, Great Britain still needed something else to bring these factors together.

I can learn from the chart on global manufacturing output presented below that by 1750, Great Britain, and in fact all of Europe, were far behind Asia in terms of how many manufactured goods they produced.

Manufacturing Output: 1750

China	32.8%
India	24.5%
Europe (not including Great Britain)	21.2%
Asia (not including China and India)	12.7%
America and Africa	6.8%
Great Britain	2.0%

However, I also know that by the late eighteenth century and through the nineteenth century, Great Britain became the leader in the production and trade of manufactured goods. Clearly, Great Britain had her work cut out for her in order to catch up with Asian production.

Part of the reason why Europe's manufacturing output was relatively small compared with Asia's in the mid-eighteenth century was because the Europeans did not wear cotton clothing. Most Europeans wore either woolens or cloth made from flax. This was not the case in Africa or Asia, where cotton and silk were the preferred cloths. Therefore, in order to compete in the global economy, Great Britain decided to get into the cotton business. This was not as easy as it sounds. However, the British already had a few advantages including colonies in North America, the Caribbean, and India; extensive trade routes between these colonies; and access to raw materials, in particular cotton and coal.

The majority of Great Britain's cotton would come from the American South. In fact, as late as 1861, just before the start of the American Civil War, Great Britain purchased more than half of the cotton produced in the American South. (Pomerantz and Topik, 230) However, great efforts were undertaken to purchase cotton from Egypt and India too, particularly in light of the fact that the American Civil War would disrupt trade between the United States and Great Britain, and the textile mills of Britain needed raw materials to keep functioning. Considering by this time Great Britain's exchange networks were expansive, they also had the ability to ship their manufactured cloth around the world. In fact, I can see this huge acceleration in the importation of raw cotton and the export of manufactured cotton textiles in the charts below.

Date	Raw cotton consumption in Great Britain	Exports of cotton textiles from Great Britain
1760 to 1769	3.5 million pounds	£227
1820 to 1829	166.5 million pounds	£25,605

Date	British imports of cotton piece goods from India	British exports of cotton from textiles
1772 to 1774	£697	£221
1824 to 1826	£363	£17,375

Chart taken from Cohen, Sharon. "Landscape Teaching Unit 7.1 The Industrial Revolution as a World Event 1715 – 1840 CE." World History for Us All. PDF file, 11. See also Broadberry, Stephen and Bishnupriya Gupta. "Cotton Textiles and the Great Divergence: Lancashire, India, and Shifting Competitive Advantage, 1600-1850. The Rise, Organization, and Institutional Framework of Factor Markets: Center for Economic Policy Research, Utrecht, Netherlands, 23-25 June 2005. Discussion Paper, 32-33.

When I look at these two charts, I can see that within a very short time span Great Britain went from being an importer of textiles to an exporter of textiles, and in a big way.

Another important raw material needed for the Industrial Revolution was coal. This fossil fuel would be an important driver, literally, of the Industrial Revolution. Coal would power the large-scale mechanization of the textile industry, which would ultimately propel Great Britain to be the top manufacturer of textiles. To get an idea of how important coal was to the Industrial Revolution, I can look at the following timeline of coal mined in Great Britain:

Coal mined in Great Britain (in tons)

1700	1750	1800	1850
2.7 million	4.7 million	10 million	50 million

Clearly more than cotton cloth was produced from the energy derived from all of that coal, but the textile industry was the primary beneficiary of this fuel in the early days of the Industrial Revolution. I can also deduce that a lot of factories and other industries depended on the energy being produced from the burning of 50 million tons of coal.

The third element needed for the Industrial Revolution in Great Britain was access to cheap labor. During the eighteenth century, the vast majority of British people lived and worked on farms. However, beginning in the late sixteenth century England began to privatize, or “enclose,” public lands. This enclosure movement accelerated during the eighteenth century. According to historian John Merriman, “Between 1760 and 1815, 3,600 separate parliamentary acts enclosed more than seven million acres of land, more than one-fourth of the farmlands in England.” (361) This meant that all of this land was removed from public access and taken over by private individuals. Merriman also notes that after 1760, “The poorest members of the rural community lost their age-old access to lands on which they had gleaned [collected] firewood, gathered nuts and berries, and grazed animals. Before enclosure, it was said, a ‘cottager’ was a laborer with land; after enclosure, he was a laborer without land.” (361) It was these landless laborers who would eventually become the workers of the Industrial Revolution.

OTHER FACTORS NEEDED FOR AN INDUSTRIAL REVOLUTION

Coal and cotton were the raw materials necessary for industrialization and Great Britain had access to both. They also had colonies around the world — colonies that could provide both the raw materials as well as markets for British manufactured goods. Finally, due to the late eighteenth century enclosure movement, Great Britain had a growing population of people moving from rural to urban areas in need of employment. As if these factors weren’t enough to create a revolution in manufacturing, the British had two additional reasons for industrialization: innovation and mercantilism. One innovation that many historians point to as being the catalyst for the Industrial Revolution is the invention of the steam engine in 1698 by Thomas Savery, an English engineer. The steam engine was first used to pump water out of coal mines. However, after years of improving upon the invention, it was eventually adapted and used for tugboats (1736), paddleboats (1788), steamships (1814), and railroad engines (1825). Obviously, this invention helped to advance and accelerate modes of transportation but it was also used to transform the textile industry.

In the mid-1700s the first steam-powered spinning jenny (the machine that turns raw cotton into thread) was created. This machine could produce as much thread in three hours as an expert spinner could produce in 50 hours by hand, and for a lot less money.

Then in 1785 the first steam-powered loom was invented. At first it made a coarse fabric that was not really wanted by many people, but that would soon change, and quickly. By 1797, there were more than 900 cotton mills operating in Great Britain and by 1835, more than 106,000 steam-powered looms.

To relate the advancement in steam-powered loom activity to the price of goods and labor, two pieces of information stand out. The first is that between 1800 and 1835 the wages of hand-loom weavers had dropped by 60 percent. When I look at the increase in steam-powered looms in operation, I can infer that these machines (and there were a lot of them) could produce textiles a lot faster than a weaver working by hand. The second is the cost of fabric. In the same time period, the price for a piece of fabric dropped from 40 shillings to 5 shillings, which meant that textiles were being produced faster and cheaper than ever before due to this revolution in fuel, machines, and labor.

This information supports the statistics in the charts, which show that Great Britain’s exports increased rather dramatically during this time period while its imports from Asia (India) declined. However, the game changer for Great Britain in quashing global competition was mercantilism. The economic philosophy of mercantilism was quite popular during this time period and the main premise of it was to create a favorable balance of trade that benefited the home country. This meant that a nation should export more than it imported in order to make sure there was more gold and silver in the treasury (basically a nation’s savings account).

Mercantilism was an economic philosophy used mainly in Europe from the sixteenth to the late eighteenth century. Governments wanted to make as much money as they could through trade and therefore placed a lot of restrictions on foreign imports while also promoting domestic businesses. For example, the British Parliament promoted local businesses by establishing strict rules about what foreign goods could come into the country, and they did this by raising taxes on imported goods that might compete with local producers. They also put restrictions on their colonies, forcing them to only trade with British suppliers and thus creating a monopoly. These policies finally came to an end not long after the publication of Adam Smith’s The Wealth of Nations in 1776. Smith opposed mercantilist policies and believed markets that operated on capitalist principles were more efficient and successful.

Great Britain achieved this economic goal by imposing tariffs (taxes) on imported fabrics from India. These protective tariffs made Indian imported fabrics more expensive and they were kept in place until British manufacturers could match the quality and cost

of imported Indian textiles. Once British factories achieved this goal, then the tariffs could be reduced or eliminated, but by then the damage to the Indian textile industry was already done.

THE INDUSTRIAL REVOLUTION GOES GLOBAL

As I noted above, the conditions for the Industrial Revolution existed in a number of regions but it was in Britain where they first coalesced. It seems as if the Goldilocks Conditions were just right for Britain to transform its economy to an industrial system. However, that competitive advantage would only last for a relatively short time. The Industrial Revolution brought forth advances in transportation and communication, which meant that ideas spread at an accelerated rate during this period. Consequently, other countries picked up on what Great Britain was doing and began to transform their own economies. In the United States, New England became the early center of the textile trade due to its access to cheap energy, good transportation, and ready capital. The same is true for Germany and parts of Asia, with Japan becoming one of the mightiest industrial powers. By the dawn of the twentieth century, the balance of power had shifted from the traditional agrarian civilizations that had reigned for thousands of years to those nations that could industrialize the fastest.

Working Bibliography & Notes

Broadberry, Stephen and Bishnupriya Gupta. "Cotton Textiles and the Great Divergence: Lancashire, India, and Shifting Competitive Advantage, 1600 — 1850. The Rise, Organization, and Institutional Framework of Factor Markets: Center for Economic Policy Research, Utrecht, Netherlands, 23 — 25 June 2005. Discussion Paper.

Chapman, Anne and Bill Foreman. "Big Era Seven Panorama Teaching Unit The Modern Revolution 1750 — 1914 CE." *World History for Us All*. PDF file.

Cohen, Sharon. "Landscape Teaching Unit 7.1 The Industrial Revolution as a World Event 1715 — 1840 CE." *World History for Us All*. PDF file.

McNeill, J.R. and McNeill, W. *The Human Web: A Bird's-Eye View of World History*. New York: W.H. Norton & Co., 2003. Print.

Pomerantz, Kenneth and Steven Topik. *The World That Trade Made*. Armonk, NY: M. E. Sharpe, 2006. Print.

Cover image: Pollution from copper factories in Cornwall, England during the Industrial Revolution. Engraving from History of England by Rollins, 1887, private collection. Courtesy of Leemage/Corbis.

This short journal entry is an example of how historians go about exploring important questions and looking at new information. They use a mixture of historical documents and the writings of other historians to inform their thinking. All sources are listed in the working bibliography.