**The Industrial Revolution**

Industrial Revolution, in modern history, the [process](http://www.britannica.com/EBchecked/topic/287204/industrialization" \o "process) of change from an agrarian, handicraft economy to one dominated by [industry](http://www.britannica.com/EBchecked/topic/287256/industry) and [machine](http://www.britannica.com/EBchecked/topic/354611/machine) manufacture. This process began in England in the 18th century and from there spread to other parts of the world. Although used earlier by French writers, the term Industrial Revolution was first popularized by the English economic historian [Arnold Toynbee](http://www.britannica.com/EBchecked/topic/601308/Arnold-Toynbee" \o "Arnold Toynbee) (1852–83) to describe England’s economic development from 1760 to 1840. Since Toynbee’s time the term has been more broadly applied.

The main features involved in the Industrial Revolution were technological, socioeconomic, and cultural. The [technological](http://www.britannica.com/EBchecked/topic/1350805/history-of-technology" \o "technological) changes included the following: (1) the use of new basic materials, chiefly iron and [steel](http://www.britannica.com/EBchecked/topic/564627/steel), (2) the use of new energy sources, including both fuels and [motive power](http://www.britannica.com/EBchecked/topic/394240/motive-power), such as [coal](http://www.britannica.com/EBchecked/topic/122863/coal), the [steam engine](http://www.britannica.com/EBchecked/topic/564472/steam-engine), electricity, [petroleum](http://www.britannica.com/EBchecked/topic/454269/petroleum), and the [internal-combustion engine](http://www.britannica.com/EBchecked/topic/290504/internal-combustion-engine), (3) the [invention](http://www.britannica.com/EBchecked/topic/292272/invention) of new machines, such as the [spinning jenny](http://www.britannica.com/EBchecked/topic/560162/spinning-jenny) and the [power loom](http://www.britannica.com/EBchecked/topic/473338/power-loom) that permitted increased production with a smaller expenditure of human energy, (4) a new organization of work known as the [factory system](http://www.britannica.com/EBchecked/topic/689674/factory-system), which entailed increased [division of labour](http://www.britannica.com/EBchecked/topic/326831/division-of-labour) and specialization of function, (5) important developments in transportation and communication, including the steam locomotive, steamship, automobile, airplane, telegraph, and radio, and (6) the increasing application of science to industry. These technological changes made possible a tremendously increased use of natural resources and the [mass production](http://www.britannica.com/EBchecked/topic/368270/mass-production) of manufactured goods.

There were also many new developments in nonindustrial spheres, including the following: (1) agricultural improvements that made possible the provision of food for a larger nonagricultural population, (2) economic changes that resulted in a wider distribution of wealth, the decline of land as a source of wealth in the face of rising industrial production, and increased [international trade](http://www.britannica.com/EBchecked/topic/291349/international-trade), (3) political changes reflecting the shift in economic power, as well as new state policies corresponding to the needs of an industrialized [society](http://www.britannica.com/EBchecked/topic/551813/society), (4) sweeping social changes, including the growth of cities, the development of working-class movements, and the emergence of new patterns of authority, and (5) cultural transformations of a broad order. The worker acquired new and distinctive skills, and his relation to his task shifted; instead of being a craftsman working with [hand tools](http://www.britannica.com/EBchecked/topic/254115/hand-tool), he became a machine operator, subject to [factory](http://www.britannica.com/EBchecked/topic/200052/factory) discipline. Finally, there was a psychological change: man’s confidence in his ability to use resources and to master nature was heightened.

**The First Industrial Revolution.**

In the period 1760 to 1830 the Industrial Revolution was largely confined to [Britain](http://www.britannica.com/EBchecked/topic/616032/history-of-United-Kingdom" \o "Britain). Aware of their head start, the British forbade the export of machinery, skilled workers, and [manufacturing](http://www.britannica.com/EBchecked/topic/849534/manufacturing) techniques. The British monopoly could not last forever, especially since some Britons saw profitable industrial opportunities abroad, while continental European businessmen sought to lure British know-how to their countries. Two Englishmen, [William](http://www.britannica.com/EBchecked/topic/123681/William-Cockerill" \o "William) and [John Cockerill](http://www.britannica.com/EBchecked/topic/123678/John-Cockerill" \o "John Cockerill), brought the Industrial Revolution to [Belgium](http://www.britannica.com/EBchecked/topic/59268/Belgium" \o "Belgium) by developing [machine shops](http://www.britannica.com/EBchecked/topic/354660/machine-shop) at Liège (*c.* 1807), and Belgium became the first country in continental [Europe](http://www.britannica.com/EBchecked/topic/195686/Europe) to be transformed economically. Like its English progenitor, the Belgian Industrial Revolution centred in iron, coal, and textiles.

[France](http://www.britannica.com/EBchecked/topic/216231/history-of-France" \o "France) was more slowly and less thoroughly industrialized than either Britain or Belgium. While Britain was establishing its industrial leadership, France was immersed in its Revolution, and the uncertain political situation discouraged large investments in industrial innovations. By 1848 France had become an industrial power, but, despite great growth under the Second Empire, it remained behind England.

Other European countries lagged far behind. Their [bourgeoisie](http://www.britannica.com/EBchecked/topic/75834/bourgeoisie) lacked the wealth, power, and opportunities of their British, French, and Belgian counterparts. Political conditions in the other nations also hindered industrial expansion. [Germany](http://www.britannica.com/EBchecked/topic/231545/history-of-Germany" \o "Germany), for example, despite vast resources of coal and iron, did not begin its industrial expansion until after national unity was achieved in 1870. Once begun, Germany’s industrial production grew so rapidly that by the turn of the century that nation was outproducing Britain in steel and had become the world leader in the [chemical industries](http://www.britannica.com/EBchecked/topic/108720/chemical-industry). The rise of U.S. industrial power in the 19th and 20th centuries also far outstripped European efforts. And Japan too joined the Industrial Revolution with striking success.

The eastern European countries were behind early in the 20th century. It was not until the five-year plans that the [Soviet Union](http://www.britannica.com/EBchecked/topic/614785/Union-of-Soviet-Socialist-Republics" \o "Soviet Union) became a major industrial power, telescoping into a few decades the [industrialization](http://www.britannica.com/EBchecked/topic/287204/industrialization) that had taken a century and a half in Britain. The mid-20th century witnessed the spread of the Industrial Revolution into hitherto nonindustrialized areas such as [China](http://www.britannica.com/EBchecked/topic/111803/China) and India.