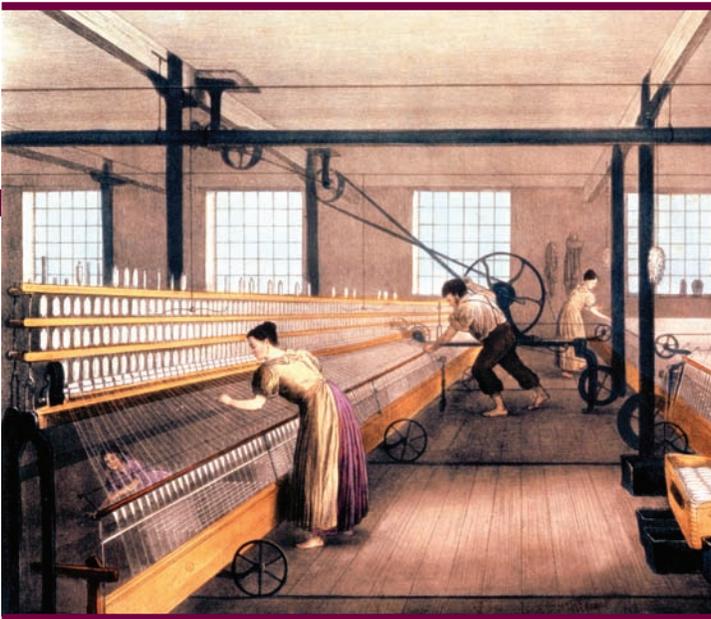


© The Print Collector/Alamy



Power looms in an English textile factory

## The Industrial Revolution and Its Impact on European Society

### CHAPTER OUTLINE AND FOCUS QUESTIONS

#### The Industrial Revolution in Great Britain

**Q** Why was Great Britain the first state to have an Industrial Revolution? Why did it happen in Britain when it did? What were the basic features of the new industrial system created by the Industrial Revolution?

#### The Spread of Industrialization

**Q** How did the Industrial Revolution spread from Great Britain to the Continent and the United States, and how did industrialization in those areas differ from British industrialization?

#### The Social Impact of the Industrial Revolution

**Q** What effects did the Industrial Revolution have on urban life, social classes, family life, and standards of living? What were working conditions like in the early decades of the Industrial Revolution, and what efforts were made to improve them?

#### CRITICAL THINKING

**Q** What role did government and trade unions play in the industrial development of the Western world? Who helped the workers the most?

**THE FRENCH REVOLUTION** dramatically and quickly altered the political structure of France, and the Napoleonic conquests spread many of the revolutionary principles in an equally rapid and stunning fashion to other parts of Europe. During the late eighteenth and early nineteenth centuries, another revolution—an industrial one—was transforming the economic and social structure of Europe, although more slowly and less dramatically.

The Industrial Revolution caused a quantum leap in industrial production. New sources of energy and power, especially coal and steam, replaced wind and water to build and run machines that dramatically decreased the use of human and animal labor and at the same time increased productivity. This in turn called for new ways of organizing human labor to maximize the benefits and profits from the new machines; factories replaced workshops and home workrooms. Many early factories were dreadful places with difficult working conditions. Reformers, appalled at these conditions, were especially critical of the treatment of married women. One reported, “We have repeatedly seen married females, in the last stage of pregnancy, slaving from morning to night beside these never-tiring machines, and when . . . they were obliged to sit down to take a moment’s ease, and being seen by the manager, were fined for the offense.” But there were also examples of well-run factories. William Cobbett described one in Manchester in 1830: “In this room, which is lighted in the most convenient and beautiful manner, there were five hundred pairs of looms at work, and five hundred persons

attending those looms; and, owing to the goodness of the masters, the whole looking healthy and well-dressed.”

During the Industrial Revolution, Europe experienced a shift from a traditional, labor-intensive economy based on farming and handicrafts to a more capital-intensive economy based on manufacturing by machines, specialized labor, and industrial factories. Although the Industrial Revolution took decades to spread, it was truly revolutionary in the way it fundamentally changed Europeans, their society, and their relationship to the rest of the world. The development of large factories encouraged mass movements of people from the countryside to urban areas, where impersonal coexistence replaced the traditional intimacy of rural life. Higher levels of productivity led to a search for new sources of raw materials, new consumption patterns, and a revolution in transportation that allowed raw materials and finished products to be moved quickly around the world. The creation of a wealthy industrial middle class and a huge industrial working class (or proletariat) substantially transformed traditional social relationships.

## The Industrial Revolution in Great Britain

**Q FOCUS QUESTIONS:** Why was Great Britain the first state to have an Industrial Revolution? Why did it happen in Britain when it did? What were the basic features of the new industrial system created by the Industrial Revolution?

Although the Industrial Revolution evolved over a long period of time, historians generally agree that it began in Britain sometime after 1750. By 1850, the Industrial Revolution had made Great Britain the wealthiest country in the world; it had also spread to the European continent and the New World. In another fifty years, both Germany and the United States would surpass Britain in industrial production.

### Origins

A number of factors or conditions coalesced in Britain to produce the first Industrial Revolution. One of these was the **agricultural revolution** of the eighteenth century. The changes in the methods of farming and stock breeding that characterized this agricultural transformation led to a significant increase in food production. British agriculture could now feed more people at lower prices with less labor. Unlike people in the rest of Europe, even ordinary British families did not have to use most of their income to buy food, giving them the potential to purchase manufactured goods. At the same time, rapid population growth in the second half of the eighteenth century provided a pool of surplus labor for the new factories of the emerging

British industry. Rural workers in cottage industries also provided a potential labor force for industrial enterprises.

**SUPPLY OF CAPITAL** Britain had a ready supply of **capital** for investment in the new industrial machines and the factories that were needed to house them. In addition to profits from trade and cottage industry, Britain possessed an effective central bank and well-developed, flexible credit facilities. Nowhere in Europe were people so accustomed to using paper instruments to facilitate capital transactions. Many early factory owners were merchants and entrepreneurs who had profited from the eighteenth-century cottage industry. Of 110 cotton-spinning mills in operation in the area known as the Midlands between 1769 and 1800, fully 62 were established by hosiers, drapers, mercers, and others involved in some fashion in the cottage textile industry.

**EARLY INDUSTRIAL ENTREPRENEURS** But capital is only part of the story. Britain had a fair number of individuals who were interested in making profits if the opportunity presented itself (see the box on p. 609). The British were a people, as one historian has said, “fascinated by wealth and commerce, collectively and individually.” No doubt the English revolutions of the seventeenth century had helped create an environment in Britain, unlike that of the absolutist states on the Continent, where political power rested in the hands of a progressive group of people who favored innovation in economic matters.

Nevertheless, these early industrial entrepreneurs faced considerable financial hazards. Fortunes were made quickly and lost just as quickly. The structure of early firms was fluid. An individual or family proprietorship was the usual mode of operation, but entrepreneurs also brought in friends to help—and just as easily jettisoned them. John Marshall, who made money in flax spinning, threw his partners out: “As they could neither of them be of any further use, I released them from the firm and took the whole upon myself.”<sup>1</sup>

**MINERAL RESOURCES** Britain had ample supplies of important mineral resources, such as coal and iron ore, needed in the manufacturing process. Britain was also small, so the resources needed to be transported only relatively short distances. In addition to nature’s provision of abundant rivers, from the mid-seventeenth century onward, both private and public investment poured into the construction of new roads, bridges, and, beginning in the 1750s and 1760s, canals. By 1780, roads, rivers, and canals linked the major industrial centers of the North, the Midlands, London, and the Atlantic. Unlike the Continental countries, Britain had no internal customs barriers to hinder domestic trade.

**ROLE OF GOVERNMENT** Britain’s government also played a significant role in the process of industrialization. Parliament contributed to the favorable business climate by providing a stable government and passing laws that

# The Traits of the British Industrial Entrepreneur

Richard Arkwright (1732–1792), inventor of a spinning frame and founder of cotton factories, was a good example of the successful entrepreneur in the early Industrial Revolution in Britain. In this selection, Edward Baines, writing in 1835, discusses the traits that explain the success of Arkwright and presumably other British entrepreneurs.



## Edward Baines, *The History of the Cotton Manufacture in Great Britain*

Richard Arkwright rose by the force of his natural talents from a very humble condition in society. He was born at Preston on the 23rd of December, 1732, of poor parents: being the youngest of thirteen children, his parents could only afford to give him an education of the humblest kind, and he was scarcely able to write. He was brought up to the trade of a barber at Kirkham and Preston, and established himself in that business at Bolton in the year 1760. Having become possessed of a chemical process for dyeing human hair, which in that day (when wigs were universal) was of considerable value, he traveled about collecting hair, and again disposing of it when dyed. In 1761, he married a wife from Leigh, and the connections he thus formed in that town are supposed to have afterwards brought him acquainted with Higgs's experiments in making spinning machines. He himself manifested a strong bent for experiments in mathematics, which he is stated to have followed with so much devotedness as to have neglected his business and injured his circumstances. His natural disposition was ardent, enterprising, and stubbornly persevering: his mind was as coarse as it was bold and active, and his manners were rough and unpleasing. . . .

The most marked traits in the character of Arkwright were his wonderful ardor, energy, and perseverance. He commonly labored in his multifarious concerns from five o'clock in the morning till nine at night; and when considerably more than fifty years of age,—feeling that the defects of his education placed him under great difficulty and inconvenience in conducting his correspondence, and in the general management of his business,—he encroached upon his sleep, in order to gain an hour each day to learn English grammar, and another hour to improve his writing and orthography [spelling]! He was impatient of whatever interfered with his favorite pursuits; and the fact is too strikingly characteristic not to be mentioned, that he separated from his wife not many years after their marriage, because she, convinced that he would starve his family [because of the impractical nature of his schemes], broke some of his experimental models of machinery. Arkwright was a severe economist of time; and, that he might not waste a moment, he generally traveled with four horses, and at a very rapid speed. His concerns in Derbyshire, Lancashire, and Scotland were so extensive and numerous, as to [show] at once his astonishing power of transacting business and his all grasping spirit. In many of these he had partners, but he generally managed in such a way, that, whoever lost, he himself was a gainer. ↗

**Q** As seen in the life of Richard Arkwright, what traits did Edward Baines think were crucial to being a successful entrepreneur? To what extent are these still considered the necessary traits for a successful entrepreneur?

protected private property. Moreover, Britain was remarkable for the freedom it provided for private enterprise. It placed fewer restrictions on private entrepreneurs than any other European state.

**MARKETS** Finally, a supply of markets gave British industrialists a ready outlet for their manufactured goods. British exports quadrupled between 1660 and 1760. In the course of its eighteenth-century wars and conquests, Great Britain had developed a vast colonial empire at the expense of its leading Continental rivals, the Dutch Republic and France. Britain also possessed a well-developed merchant marine that was able to transport goods anywhere in the world. A crucial factor in Britain's successful industrialization was the ability to produce cheaply the articles most in demand abroad. And the best markets abroad were not in Europe, where countries protected their own incipient industries, but in the Americas, Africa, and the East, where people wanted sturdy, inexpensive clothes rather than costly,

highly finished luxury items. Britain's machine-produced textiles fulfilled that demand. Nor should we overlook the British domestic market. Britain had the highest standard of living in Europe and a rapidly growing population. As Daniel Defoe noted already in 1728:

For the rest, we see their Houses and Lodgings tolerably furnished, at least stuff'd well with useful and necessary household Goods: Even those we call poor People, Journeymen, working and Pains-taking People do thus; they lye warm, live in Plenty, work hard, and know no Want. These are the People that carry off the Gross of your Consumption; 'tis for these your Markets are kept open late on Saturday nights; because they usually receive their Week's Wages late. . . . In a Word, these are the Life of our whole Commerce, and all by their Multitude: Their Numbers are not Hundreds or Thousands, or Hundreds of Thousands, but Millions; . . . by their Wages they are able to live plentifully, and it is by their expensive, generous, free way of living, that the Home Consumption is rais'd to such a Bulk, as well of our own, as of foreign Production.<sup>2</sup>

This demand from both domestic and foreign markets and the inability of the old system to fulfill it led entrepreneurs to seek and adopt the new methods of manufacturing that a series of inventions provided. In so doing, these individuals initiated the Industrial Revolution.

## Technological Changes and New Forms of Industrial Organization

In the 1770s and 1780s, the cotton textile industry took the first major step toward the Industrial Revolution with the creation of the modern factory.

**THE COTTON INDUSTRY** Already in the eighteenth century, Great Britain had surged ahead in the production of cheap cotton goods using the traditional methods of the cottage industry. The development of the flying shuttle had sped the process of weaving on a loom, enabling weavers to double their output. This caused shortages of yarn, however, until James Hargreaves's spinning jenny, perfected by 1768, enabled spinners to produce yarn in greater quantities. Richard Arkwright's water frame spinning machine, powered by water or horse, and Samuel Crompton's so-called mule, which combined aspects of the water frame and the spinning jenny, increased yarn production even more. Edmund Cartwright's power loom, invented in 1787, allowed the weaving of cloth to catch up with the spinning of yarn. Even then, early power looms were



William Radcliffe, On Power Looms (1828)

grossly inefficient, enabling home-based hand-loom weavers to continue to prosper, at least until the mid-1820s. After that, they were gradually replaced by the new machines. In 1813, there were 2,400 power looms in operation in Great Britain; they numbered 14,150 in 1820, 100,000 in 1833, and 250,000 by 1850. In the 1820s, there were still 250,000 hand-loom weavers in Britain; by 1860, only 3,000 were left.

The water frame, Crompton's mule, and power looms presented new opportunities to entrepreneurs. It was much more efficient to bring workers to the machines and organize their labor collectively in factories located next to rivers and streams, the sources of power for many of these early machines, than to leave the workers dispersed in their cottages. The concentration of labor in the new factories also brought the laborers and their families to live in the new towns that rapidly grew up around the factories.

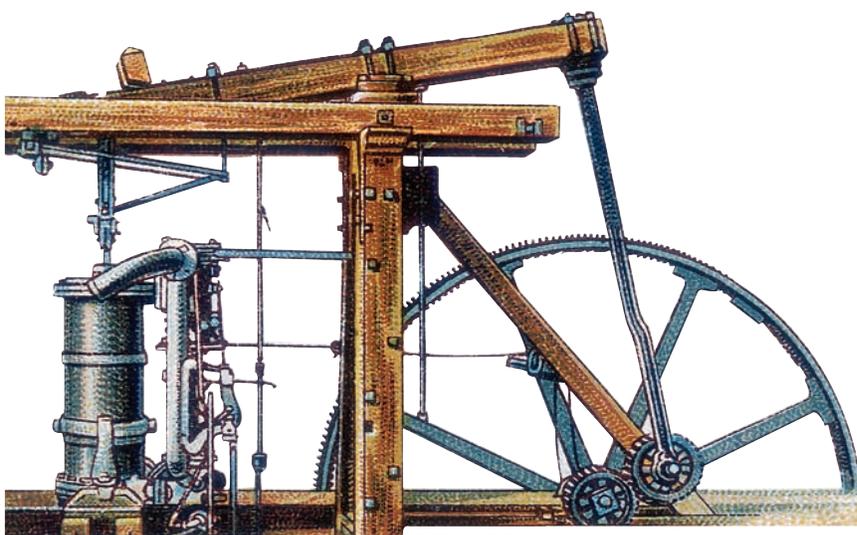
The early devices used to speed up the processes of spinning and weaving were the products of weavers and spinners—in effect, of artisan tinkers.

But the subsequent expansion of the cotton industry and the ongoing demand for even more cotton goods created additional pressure for new and more complicated technology. The invention that pushed the cotton industry to even greater heights of productivity was the steam engine.

**THE STEAM ENGINE** The steam engine revolutionized the production of cotton goods and allowed the factory system to spread to other areas of production, thereby securing whole new industries. The steam engine thus ensured the triumph of the Industrial Revolution.

In the 1760s, a Scottish engineer, James Watt (1736–1819), created an engine powered by steam that could pump water from mines three times as quickly as previous engines. In 1782, Watt enlarged the possibilities of the steam engine when he developed a rotary engine that could turn a shaft and thus drive machinery. Steam power could now be applied to spinning and weaving cotton, and before long, cotton mills using steam engines were multiplying across Britain. Because steam engines were fired by coal, they did not need to be located near rivers; entrepreneurs now had greater flexibility in their choice of location.

The new boost given to cotton textile production by technological changes became readily apparent. In 1760, Britain had imported 2.5 million pounds of raw cotton, which was farmed out to cottage industries. In 1787, the British imported 22 million pounds of cotton; most of it was spun on machines, some powered by water in large mills. By 1840, fully 366 million pounds of cotton—now Britain's most important product in value—were imported. By this time, most cotton industry employees worked in factories. The cheapest labor in India could not compete in quality or quantity with Britain. British cotton goods sold everywhere in the world. And in Britain itself, cheap cotton cloth made it possible for millions of poor



**A Boulton and Watt Steam Engine.** Encouraged by his business partner, Matthew Boulton, James Watt developed the first genuine steam engine. Pictured here is a typical Boulton and Watt engine. Steam pressure in the cylinder on the left drives the beam upward and sets the flywheel in motion.

© Oxford Science Archive, Oxford/HIP/Art Resource, NY

people to wear undergarments, long a luxury of the rich, who could afford expensive linen cloth. Cotton clothing was tough, comfortable, cheap, and easily washable.

The steam engine proved indispensable. Unlike horses, the steam engine was a tireless source of power and depended for fuel on a substance—coal—that seemed unlimited in quantity. The popular saying that “steam is an Englishman” had real significance by 1850. The success of the steam engine led to a need for more coal and an expansion in coal production; between 1815 and 1850, the output of coal quadrupled. In turn, new processes using coal furthered the development of the iron industry.

**THE IRON INDUSTRY** The British iron industry was radically transformed during the Industrial Revolution. Britain had large resources of iron ore, but at the beginning of the eighteenth century, the basic process of producing iron had changed little since the Middle Ages and still depended heavily on charcoal. In the early eighteenth century, new methods of smelting iron ore to produce cast iron were devised, based on the use of coke or “courke” that was made by slowly burning coal. Coke could heat iron ore at a faster rate than charcoal, thus yielding higher amounts. Still, a better quality of iron was not possible until the 1780s, when Henry Cort developed a process called puddling in which coke was used to burn away impurities in **pig iron** (the product of smelting iron ore with coke) to produce an iron of high quality called **wrought iron**. Wrought iron, with its lower carbon content, was malleable and able to withstand strain. A boom then ensued in the British iron industry. In 1740, Britain produced 17,000 tons of iron; in the 1780s, almost 70,000 tons; by the 1840s, more than 2 million tons; and by 1852, almost 3 million tons, more than the rest of the world combined.

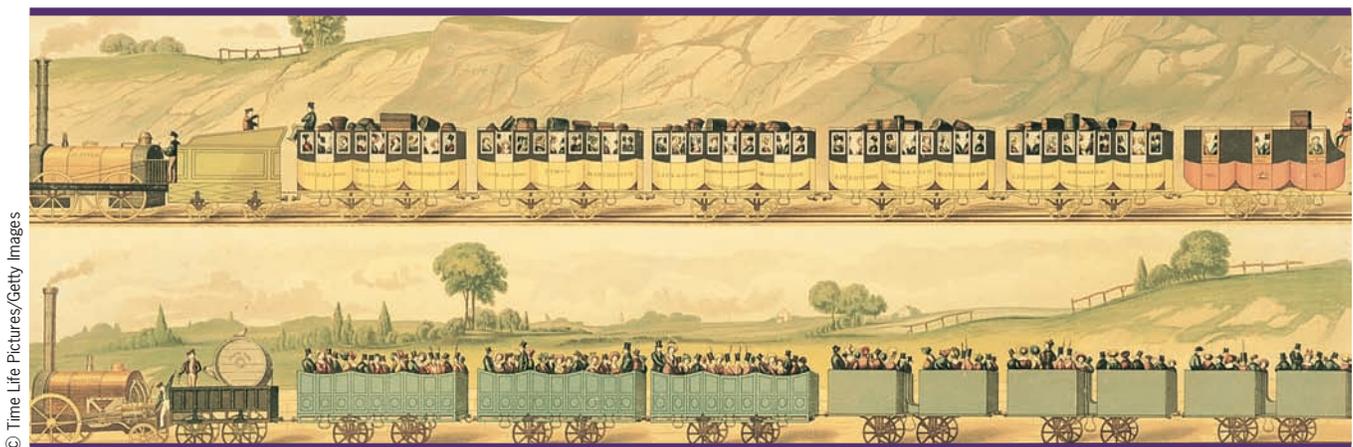
The development of the iron industry was in many ways a response to the demand for the new machines. The high-quality wrought iron produced by the Cort

process made it the most widely used metal until the production of cheaper steel in the 1860s. The growing supply of less costly metal encouraged the use of machinery in other industries, most noticeably in new means of transportation.

**A REVOLUTION IN TRANSPORTATION** The eighteenth century had witnessed an expansion of transportation facilities in Britain as entrepreneurs realized the need for more efficient means of moving resources and goods. Turnpike trusts constructed new roads, and between 1760 and 1830, a network of canals was built. But both roads and canals were soon overtaken by a new form of transportation that dazzled people with its promise. To many economic historians, railroads were the “most important single factor in promoting European economic progress in the 1830s and 1840s.” Again, Britain was the leader in the revolution.

The railways got their start in mining operations in Germany as early as 1500 and in British coal mines after 1600, where small handcarts filled with coal were pushed along parallel wooden rails. The rails reduced friction, enabling horses to haul more substantial loads. By 1700, some entrepreneurs began to replace wooden rails with cast-iron rails, and by the early nineteenth century, railways—still dependent on horsepower—were common in British mining and industrial districts. The development of the steam engine led to a radical transformation of the railways.

In 1804, Richard Trevithick (TREV-uh-thick) pioneered the first steam-powered locomotive on an industrial rail line in southern Wales. It pulled 10 tons of ore and seventy people at 5 miles per hour. Better locomotives soon followed. The engines built by George Stephenson and his son proved superior, and it was in their workshops in Newcastle-upon-Tyne that the locomotives for the first modern railways in Britain were built. George Stephenson’s *Rocket* was used on the first public railway line,



© Time Life Pictures/Getty Images

**Railroad Line from Liverpool to Manchester.** The railroad line from Liverpool to Manchester, opened in 1830, relied on steam locomotives. As is evident in this illustration, carrying passengers was the railroad’s main business. First-class passengers rode in covered cars; second- and third-class passengers, in open cars.



**MAP 20.1 The Industrial Revolution in Britain by 1850.**

The Industrial Revolution began in the mid-1700s. Increased food production, rapid population growth, higher incomes, plentiful capital, solid banking and financial institutions, an abundance of mineral resources, and easy transport all furthered the process, making Britain the world's wealthiest country by 1850.

**Q** How well did the railroad system connect important British industrial areas?

which opened in 1830, extending 32 miles from Liverpool to Manchester. *Rocket* sped along at 16 miles per hour. Within twenty years, locomotives had reached 50 miles per hour, an incredible speed to contemporary passengers. During the same period, new companies were formed to build additional railroads as the infant industry proved successful not only technically but also financially. In 1840, Britain had almost 2,000 miles of railroads; by 1850, 6,000 miles of railroad track crisscrossed much of the country (see Map 20.1).

The railroad contributed significantly to the maturing of the Industrial Revolution. The railroad's demands for coal and iron furthered the growth of those industries. British supremacy in civil and mechanical engineering, so evident after 1840, was in large part based on the skills acquired in railway building. The huge capital demands necessary for railway construction encouraged a whole new group of middle-class investors to invest their money in joint-stock companies (see "Industrialization on the Continent" later in this chapter). Railway construction created new job opportunities, especially for farm laborers and peasants, who had long been accustomed to finding work outside their local villages. Perhaps most important, a cheaper and faster means of transportation had a rippling effect on the growth of an industrial economy. By reducing the price of goods, larger markets were created; increased sales necessitated more factories and more machinery, thereby reinforcing the self-sustaining nature of the Industrial Revolution, which marked a fundamental break with the traditional European economy. The great productivity of the Industrial Revolution enabled entrepreneurs to reinvest their profits in new capital equipment, further expanding the productive capacity of the economy. Continuous, even rapid, self-sustaining economic growth came to be seen as a fundamental characteristic of the new industrial economy.

The railroad was the perfect symbol of this aspect of the Industrial Revolution. The ability to transport goods and people at dramatic speeds also provided visible confirmation of a new sense of power. When railway engineers penetrated mountains with tunnels and spanned chasms with breathtaking bridges, contemporaries experienced a sense of power over nature not felt before in Western civilization.

**THE INDUSTRIAL FACTORY** Initially the product of the cotton industry, the factory became the chief means of organizing labor for the new machines. As the workplace shifted from the artisan's shop and the peasant's cottage to the factory, the latter was not viewed as just a larger work unit. Employers hired workers who no longer owned the means of production but were simply paid wages to run the machines.

From its beginning, the factory system demanded a new type of discipline from its employees. Factory owners could not afford to let their expensive machinery stand idle. Workers were forced to work regular hours and in shifts to keep the machines producing at a steady pace for maximum output. This represented a massive adjustment for early factory laborers.

Preindustrial workers were not accustomed to a timed format. Agricultural laborers had always kept irregular hours; hectic work at harvest time might be followed by weeks of inactivity. Even in the burgeoning cottage industry of the eighteenth century, weavers and spinners who worked at home might fulfill their weekly quotas by working around the clock for two or three days and then



**Opening of the Royal Albert Bridge.** This painting by Thomas Robins shows the ceremonies attending the official opening of the Royal Albert Bridge. I. K. Brunel, one of Britain's great engineers, designed this bridge, which carried a railroad line across the Tamar River into Cornwall. As is evident in the picture, the bridge was high enough to allow ships to pass underneath.

proceeding at a leisurely pace until the next week's demands forced another work spurt.

Factory owners therefore faced a formidable task. They had to create a system of time-work discipline that would accustom employees to working regular, unvarying hours during which they performed a set number of tasks over and over again as efficiently as possible. One early industrialist said that his aim was "to make such machines of the men as cannot err." Such work, of course, tended to be repetitive and boring, and factory owners

resorted to tough methods to accomplish their goals. Factory regulations were minute and detailed (see the box on p. 614). Adult workers were fined for a wide variety of minor infractions, such as being a few minutes late for work, and dismissed for more serious misdoings, especially drunkenness. Drunkenness was viewed as particularly offensive because it set a bad example for younger workers and also courted disaster amid dangerous machinery. Employers found that dismissals and fines worked well for adult employees; in a time when



**A British Textile Factory.** The development of the factory changed the relationship between workers and employers as workers were encouraged to adjust to a new system of discipline that forced them to work regular hours under close supervision. This 1851 illustration shows women working in a British textile factory.

## Discipline in the New Factories

Workers in the new factories of the Industrial Revolution had been accustomed to a lifestyle free of overseers. Unlike the cottages, where workers spun thread and wove cloth in their own rhythm and time, the factories demanded a new, rigorous discipline geared to the requirements of the machines. This selection is taken from a set of rules for a factory in Berlin in 1844. They were typical of company rules everywhere the factory system had been established.



### Factory Rules, Foundry and Engineering Works of the Royal Overseas Trading Company, Berlin

In every large works, and in the co-ordination of any large number of workmen, good order and harmony must be looked upon as the fundamentals of success, and therefore the following rules shall be strictly observed.

1. The normal working day begins at all seasons at 6 A.M. precisely and ends, after the usual break of half an hour for breakfast, an hour for dinner and half an hour for tea, at 7 P.M., and it shall be strictly observed. . . . Workers arriving 2 minutes late shall lose half an hour's wages; whoever is more than 2 minutes late may not start work until after the next break; or at least shall lose his wages until then. Any disputes about the correct time shall be settled by the clock mounted above the gatekeeper's lodge. . . .
3. No workman, whether employed by time or piece, may leave before the end of the working day, without having first received permission from the overseer and having given his name to the gatekeeper. Omission of these two actions shall lead to a fine of ten silver groschen [pennies] payable to the sick fund.
4. Repeated irregular arrival at work shall lead to dismissal. This shall also apply to those who are found idling by an official or overseer, and refused to obey their order to resume work. . . .
6. No worker may leave his place of work otherwise than for reasons connected with his work.
7. All conversation with fellow-workers is prohibited; if any worker requires information about his work, he must turn to the overseer, or to the particular fellow-worker designated for the purpose.
8. Smoking in the workshops or in the yard is prohibited during working hours; anyone caught smoking shall be fined five silver groschen for the sick fund for every such offense. . . .
10. Natural functions must be performed at the appropriate places, and whoever is found soiling walls, fences, squares, etc., and similarly, whoever is found washing his face and hands in the workshop and not in the places assigned for the purpose, shall be fined five silver groschen for the sick fund. . . .
12. It goes without saying that all overseers and officials of the firm shall be obeyed without question, and shall be treated with due deference. Disobedience will be punished by dismissal.
13. Immediate dismissal shall also be the fate of anyone found drunk in any of the workshops. . . .
14. Every workman is obliged to report to his superiors any acts of dishonesty or embezzlement on the part of his fellow workmen. If he omits to do so, and it is shown after subsequent discovery of a misdemeanor that he knew about it at the time, he shall be liable to be taken to court as an accessory after the fact and the wage due to him shall be retained as punishment. ↗

**Q** What impact did factories have on the lives of workers? To what extent have such "rules" determined much of modern industrial life?

great population growth had produced large numbers of unskilled workers, dismissal could be disastrous. Children were less likely to understand the implications of dismissal, so they were sometimes disciplined more directly—by beating.

The efforts of factory owners in the early Industrial Revolution to impose a new set of values were frequently reinforced by the new evangelical churches. Methodism, in particular, emphasized that people "reborn in Jesus" must forgo immoderation and follow a disciplined path. Laziness and wasteful habits were sinful. The acceptance of hardship in this life paved the way for the joys of the next. Evangelical values paralleled the efforts of the new factory owners to instill laborers with their own middle-class

values of hard work, discipline, and thrift. In one crucial sense, the early industrialists proved successful. As the nineteenth century progressed, the second and third generations of workers came to view a regular working week as a natural way of life. It was, of course, an attitude that made possible Britain's incredible economic growth in that century.

### Britain's Great Exhibition of 1851

In 1851, the British organized the world's first industrial fair. It was housed at Kensington in London in the Crystal Palace, an enormous structure made entirely of glass and iron, a tribute to British engineering skills. Covering



**The Great Exhibition of 1851.** The Great Exhibition of 1851 was a symbol of the success of Great Britain, which had become the world's first industrial nation and its richest. More than 100,000 exhibits were housed in the Crystal Palace, a giant structure of cast iron and glass. The first illustration shows the front of the palace and some of its numerous visitors. The second shows the opening day ceremonies. Queen Victoria is seen at the center with her family, surrounded by visitors from all over the world. Note the large tree inside the building, providing a visible symbol of how the Industrial Revolution had supposedly achieved human domination over nature.

19 acres, the Crystal Palace contained 100,000 exhibits that showed the wide variety of products created by the Industrial Revolution. Six million people visited the fair in six months. Though most of them were Britons who had traveled to London by train, foreign visitors were also prominent. The Great Exhibition displayed Britain's wealth

to the world; it was a gigantic symbol of British success. Even trees were brought inside the Crystal Palace as a visible symbol of how the Industrial Revolution had achieved human domination over nature. Prince Albert, Queen Victoria's husband, expressed the sentiments of the age when he described the exhibition as a sign that "man is approaching

a more complete fulfillment of that great and sacred mission which he has to perform in this world . . . to conquer nature to his use.” Not content with that, he also linked British success to divine will: “In promoting [the progress of the human race], we are accomplishing the will of the great and blessed God.”<sup>3</sup>

In addition to demonstrating Britain’s enormous industrial growth, the Crystal Palace exhibition also represented British imperial power. Goods from India were a highlight of the exhibition, and the East India Company drew attention to its role in India with exhibits of cotton, tea, and flax. But it was the display of Indian silks, jewels, shawls, and an elephant canopy that captured the attention of the British press and visitors. Despite the public interest in the ornate and intricate works from India, many British commentators, such as the scientist William Whewell, were less complimentary. They characterized the Indian hand-made goods as typical of a system in which “tens of thousands” worked for a few despots. Moreover, these goods were examples of the “wasteful and ridiculous excess” of the labor-intensive production practices in the East, which could not compare to enlightened British labor practices.<sup>4</sup>

By the year of the Great Exhibition, Great Britain had become the world’s first industrial nation and its wealthiest. Britain was the “workshop, banker, and trader of the world.” It produced one-half of the world’s coal and manufactured goods; its cotton industry alone in 1851 was equal in size to the industries of all other European countries combined. The quantity of goods produced was growing at three times the rate in 1780. Britain’s certainty about its mission in the world in the nineteenth century was grounded in its incredible material success.

## The Spread of Industrialization

**Q FOCUS QUESTION:** How did the Industrial Revolution spread from Great Britain to the Continent and the United States, and how did industrialization in those areas differ from British industrialization?

Beginning first in Great Britain, industrialization spread to the Continental countries of Europe and the United States at different times and speeds during the nineteenth century. First to be industrialized on the Continent were Belgium, France, and the German states; the first in North America was the new United States. Not until after 1850 did the Industrial Revolution spread to the rest of Europe and other parts of the world.

### Industrialization on the Continent

In 1815, the Low Countries, France, and the German states were still largely agrarian. During the eighteenth century, some of the Continental countries had experienced developments similar to those of Britain. They, too,

had achieved population growth, made agricultural improvements, expanded their cottage industries, and witnessed growth in foreign trade. But whereas Britain’s economy began to move in new industrial directions in the 1770s and 1780s, Continental countries lagged behind because they did not share some of the advantages that had made Britain’s Industrial Revolution possible. Lack of good roads and problems with river transit made transportation difficult. Toll stations on important rivers and customs barriers along state boundaries increased the costs and prices of goods. Guild restrictions were also more prevalent, creating impediments that pioneer industrialists in Britain did not have to face. Finally, Continental entrepreneurs were generally less enterprising than their British counterparts and tended to adhere to traditional business attitudes, such as a dislike of competition, a high regard for family security coupled with an unwillingness to take risks in investment, and an excessive worship of thriftiness. Thus, industrialization on the Continent faced numerous hurdles, and as it proceeded in earnest after 1815, it did so along lines that were somewhat different from Britain’s.

**BORROWING TECHNIQUES AND PRACTICES** Lack of technical knowledge was initially a major obstacle to industrialization. But the Continental countries possessed an advantage here; they could simply borrow British techniques and practices. Of course, the British tried to prevent that. Until 1825, British artisans were prohibited from leaving the country; until 1842, the export of important machinery and machine parts, especially for textile production, was forbidden. Nevertheless, the British were not able to control this situation by legislation. Already by 1825, there were at least two thousand skilled British mechanics on the Continent, and British equipment was also being sold abroad, legally or illegally.

Gradually, the Continent achieved technological independence as local people learned all the skills their British teachers had to offer. By the 1840s, new generations of skilled mechanics from Belgium and France were spreading their knowledge east and south, playing the same role that the British had earlier. Even more important, however, Continental countries, especially France and the German states, began to establish a wide range of technical schools to train engineers and mechanics.

**ROLE OF GOVERNMENT** That government played an important role in this regard brings us to another difference between British and Continental industrialization. Governments in most of the Continental countries were accustomed to playing a significant role in economic affairs. Furthering the development of industrialization was a logical extension of that attitude. Hence, governments provided for the costs of technical education, awarded grants to inventors and foreign entrepreneurs, exempted foreign industrial equipment from import duties, and in some places even financed factories. Of equal if not



**MAP 20.2 The Industrialization of Europe by 1850.** Great Britain was Europe's first industrialized country; however, by the middle of the nineteenth century, several regions on the Continent, especially in Belgium, France, and the German states, had made significant advances in industrialization.

**Q** What reasons could explain why coal mining and iron industries are densely clustered in manufacturing and industrial areas?

**V** View an animated version of this map or related maps on the CourseMate website.

greater importance in the long run, governments actively bore much of the cost of building roads and canals, deepening and widening river channels, and constructing railroads. By 1850, a network of iron rails had spread across Europe, although only Germany and Belgium had completed major parts of their systems by that time (see Map 20.2).

Governments on the Continent also used **tariffs** to further industrialization. After 1815, cheap British goods flooded Continental markets. The French responded with high tariffs to protect their fledgling industries. The most systematic argument for the use of tariffs, however, was

made by a German writer, Friedrich List (FREED-rikh LIST) (1789–1846), who emigrated to America and returned to Germany as a U.S. consul. In his *National System of Political Economy*, written in 1844, List advocated a rapid and large-scale program of industrialization as the surest path to develop a nation's strength. To assure that path to industrialization, he felt that a nation must use protective tariffs. If countries followed the British policy of free trade, then cheaper British goods would inundate national markets and destroy infant industries before they had a chance to grow. Germany, he insisted, could not compete with Britain without protective tariffs.

**CENTERS OF CONTINENTAL INDUSTRIALIZATION** As noted earlier, the Industrial Revolution on the Continent occurred in three major centers between 1815 and 1850—Belgium, France, and the German states. As in Britain, cotton played an important role, although it was not as significant as heavy industry. France was the Continental leader in the manufacture of cotton goods but still lagged far behind Great Britain. In 1849, France used 64,000 tons of raw cotton, Belgium, 11,000, and Germany, 20,000, whereas Britain used 286,000 tons. Continental cotton factories were older, used less efficient machines, and had less productive labor. In general, Continental technology in the cotton industry was a generation behind Great Britain. But that is not the whole story. With its cheap coal and scarce water, Belgium gravitated toward the use of the steam engine as the major source of power and invested in the new machines. By the mid-1840s, Belgium had the most modern cotton-manufacturing system on the Continent.

The development of cotton manufacturing on the Continent and in Britain differed in two significant ways. Unlike Britain, where cotton manufacturing was mostly centered in Lancashire (in northwestern England) and the Glasgow area of Scotland, cotton mills in France, Germany, and, to a lesser degree, Belgium were dispersed through many regions. Noticeable, too, was the mixture of old and new. The old techniques of the cottage system, such as the use of hand looms, held on much longer. In the French district of Normandy, for example, in 1849, eighty-three mills were still driven by hand or animal power.

As traditional methods persisted alongside the new methods in cotton manufacturing, the new steam engine came to be used primarily in mining and metallurgy on the Continent rather than in textile manufacturing. At first, almost all of the steam engines on the Continent came from Britain; not until the 1820s was a domestic machine industry developed.

In Britain, the Industrial Revolution had been built on the cotton industry; on the Continent, the iron and coal of heavy industry led the way. As in textiles, however, heavy industry on the Continent before 1850 was a mixture of old and new. The adoption of new techniques, such as coke-smelted iron and puddling furnaces, coincided with the expansion of old-type charcoal blast furnaces. Before 1850, Germany lagged significantly behind both Belgium and France in heavy industry, and most German iron manufacturing was still based on old techniques. Not until the 1840s was coke-blast iron produced in the Rhineland. At that time, no one had yet realized the treasure of coal buried in the Ruhr valley. A German official wrote in 1852 that “it is clearly not to be expected that Germany will ever be able to reach the level of production of coal and iron currently attained in England. This is implicit in our far more limited resource endowment.” Little did he realize that although the industrial development of Continental Europe was about a generation behind Britain at midcentury, after 1850 an incredibly rapid growth in Continental industry would demonstrate that Britain was

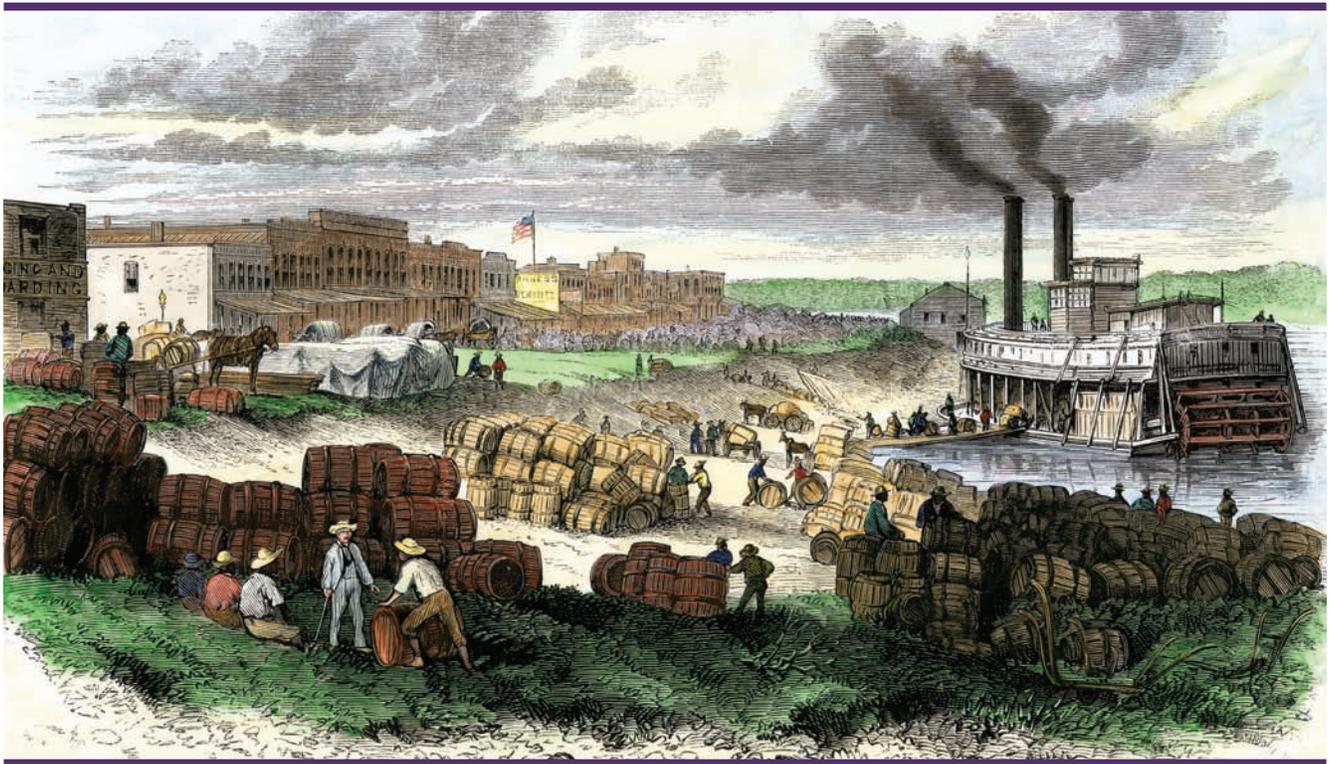
not, after all, destined to remain the world’s greatest industrial nation.

## The Industrial Revolution in the United States

In 1800, the United States was an agrarian society. There were no cities with populations of more than 100,000, and six out of every seven American workers were farmers. By 1860, however, the population had grown from 5 million to 30 million people, larger than Great Britain’s. Almost half of them lived west of the Appalachian Mountains. The number of states had more than doubled, from sixteen to thirty-four, and nine American cities had more than 100,000 in population. Only 50 percent of American workers were farmers. Between 1800 and the eve of the Civil War, the United States had experienced its own Industrial Revolution and the urbanization that accompanied it.

The initial application of machinery to production was accomplished, as in Continental Europe, by borrowing from Great Britain. A British immigrant, Samuel Slater, established the first textile factory using water-powered spinning machines in Rhode Island in 1790. By 1813, factories were being established with power looms copied from British models. Soon thereafter, however, Americans began to equal or surpass British technical inventions. The Harpers Ferry arsenal, for example, built muskets with interchangeable parts. Because all the individual parts of the muskets were identical (for example, all triggers were the same), the final product could be put together quickly and easily; this enabled Americans to avoid the more costly system in which skilled workers fitted together individual parts made separately. The so-called American system reduced costs and revolutionized production by saving labor, important to a society that had few skilled artisans.

**THE NEED FOR TRANSPORTATION** Unlike Britain, the United States was a large country. The lack of a good system of internal transportation seemed to limit American economic development by making the transport of goods prohibitively expensive. This deficiency was gradually remedied by the introduction of the steamboat and the railroad as well as the construction of roads and canals. Thousands of miles of roads and canals were built linking east and west. The steamboat facilitated transportation on the Great Lakes, Atlantic coastal waters, and rivers. It was especially important to the Mississippi valley; by 1860, one thousand steamboats plied that river (see the box on p. 620). Most important of all in the development of the American transportation system was the railroad. Beginning with 100 miles in 1830, by 1860 more than 27,000 miles of railroad track covered the United States. This transportation revolution turned the United States into a single massive market for the manufactured goods of the Northeast, the early center of American industrialization.



**The Steamboat.** The steamboat was an important means of transportation for American products and markets. Steamboats like the one shown in this illustration regularly plied the Mississippi River, moving the farm products of the Midwest and the southern plantations to markets in New Orleans. After the American Civil War, railroads began to replace steamboats on many routes.

**THE LABOR FORCE** Labor for the growing number of factories came primarily from rural areas. The United States did not possess a large number of craftspeople, but it did have a rapidly expanding farm population; its size in the Northeast soon outstripped the available farmland. While some of this excess population, especially men, went west, others, mostly women, found work in the new textile and shoe factories of New England. Indeed, women made up more than 80 percent of the laboring force in the large textile factories. In Massachusetts mill towns, company boarding houses provided rooms for large numbers of young women who worked for several years before marriage. Outside Massachusetts, factory owners sought entire families, including children, to work in their mills; one mill owner ran this advertisement in a newspaper in Utica, New York: “Wanted: A few sober and industrious families of at least five children each, over the age of eight years, are wanted at the Cotton Factory in Whitestown. Widows with large families would do well to attend this notice.” When a decline in rural births threatened to dry up this labor pool in the 1830s and 1840s, European immigrants, especially poor and unskilled Irish, English, Scots, and Welsh, appeared in large numbers to replace American women and children in the factories.

Women, children, and these immigrants had one thing in common as employees: they were largely unskilled laborers. Unskilled labor pushed American industrialization into a capital-intensive pattern. Factory owners invested

heavily in machines that could produce in quantity at the hands of untrained workers. In Britain, the pace of mechanization was never as rapid because Britain’s supply of skilled artisans made it more profitable to pursue a labor-intensive economy.

By 1860, the United States was well on its way to being an industrial nation. In the Northeast, the most industrialized section of the country, per capita income was 40 percent higher than the national average. Diets, it has been argued, were better and more varied; machine-made clothing was more abundant. Industrialization did not necessarily lessen economic disparities, however. Despite a growing belief in a myth of social mobility based on equality of economic opportunity, the reality was that the richest 10 percent of the population in the cities held 70 to 80 percent of the wealth, compared to 50 percent in 1800. Nevertheless, American historians generally argue that while the rich got richer, the poor, thanks to an increase in their purchasing power, did not get poorer.

## Limiting the Spread of Industrialization in the Nonindustrialized World

Before 1870, the industrialization that had developed in western and central Europe and the United States did not extend in any significant way to the rest of the world. Even in eastern Europe, industrialization lagged far behind. Russia, for example, remained largely rural and

## "S-t-e-a-m-boat A-coming!"

Steamboats and railroads were crucial elements in a transportation revolution that enabled industrialists to expand markets by shipping goods cheaply and efficiently. At the same time, these marvels of technology aroused a sense of power and excitement that was an important aspect of the triumph of industrialization. The American novelist Mark Twain captured this sense of excitement in this selection from *Life on the Mississippi*.



### Mark Twain, *Life on the Mississippi*

After all these years I can picture that old time to myself now, just as it was then: the white town drowsing in the sunshine of a summer's morning; the streets empty, or pretty nearly so; one or two clerks sitting in front of the Water street stores, with their splint-bottomed chairs tilted back against the walls, chins on breasts, hats slouched over their faces, asleep; . . . two or three lonely little freight piles scattered about the "levee"; a pile of "skids" on the slope of the stone-paved wharf, and the fragrant town drunkard asleep in the shadow of them; . . . the great Mississippi, the majestic, the magnificent Mississippi, rolling its mile-wide along, shining in the sun; the dense forest away on the other side; the "point" above the town, and the "point" below, bounding the river glimpse and turning it into a sort of sea, and withal a very still and brilliant and lonely one. Presently a film of dark smoke appears above on those remote "points"; instantly a negro drayman, famous for his quick eye and prodigious voice, lifts up to cry, "S-t-e-a-m-boat a-coming!" and the scene changes! The town drunkard stirs, the clerks wake up, a furious clatter of drays follows, every house and store pours out a human contribution, and all in a twinkling the dead town [Hannibal, Missouri] is alive and moving. Drays, carts, men, boys, all go hurrying from many quarters to a common center, the wharf. Assembled there, the people fasten

their eyes upon the coming boat as upon a wonder they are seeing for the first time. And the boat is rather a handsome sight, too. She is long and sharp and trim and pretty; she has two tall, fancy-topped chimneys, with a gilded device of some kind swung between them; a fanciful pilot-house, all glass and "ginger bread," perched on top of the "texas" deck behind them; the paddle-boxes are gorgeous with a picture or with gilded rays above the boat's name; the boiler deck, the hurricane deck, and the texas deck are fenced and ornamented with clean white railings; there is a flag gallantly flying from the jack-staff; the furnace doors are open and the fires glaring bravely; the upper decks are black with passengers; the captain stands by the big bell, calm, imposing, the envy of all; great volumes of the blackest smoke are rolling and tumbling out of the chimneys—a husbanded grandeur created with a bit of pitch pine just before arriving at a town; the crew are grouped on the forecandle; the broad stage is run far out over the port bow, and an envied deck-hand stands picturesquely on the end of it with a coil of rope in his hand; the pent steam is screaming through the gauge-cocks; the captain lifts his hand, a bell rings, the wheels stop; then they turn back, churning the water to foam, and the steam is at rest. Then such a scramble as there is to get aboard, and to get ashore, and to take in freight and discharge freight, all at one and the same time; and such a yelling and cursing as the mates facilitate it all with! Ten minutes later the steamer is under way again, with no flag on the jack-staff and no black smoke issuing from the chimneys. After ten more minutes the town is dead again, and the town drunkard asleep by the skids once more. ☞

**Q** In what ways does Twain's description illustrate the impact of the transportation revolution on daily life in the United States?

agricultural, and its autocratic rulers kept the peasants in serfdom. There was not much of a middle class, and the tsarist regime, fearful of change, preferred to import industrial goods in return for the export of raw materials, such as grain and timber. Russia would not have its Industrial Revolution until the end of the nineteenth century.

**THE EXAMPLE OF INDIA** In other parts of the world where they had established control, newly industrialized European states pursued a deliberate policy of preventing the growth of mechanized industry. A good example is India. In the eighteenth century, India had become one of the world's greatest exporters of cotton cloth produced by hand labor. In the first half of the nineteenth century,

much of India fell under the control of the British East India Company (see Chapter 24). With British control came inexpensive British factory-produced textiles, and soon thousands of Indian spinners and hand-loom weavers were unemployed. British policy encouraged Indians to export their raw materials while buying British-made goods. Although some limited forms of industrial factories for making textiles and jute (used in making rope) were opened in India in the 1850s, a lack of local capital and the advantages given to British imports limited the growth of new manufacturing operations. India, then, provides an excellent example of how some of the rapidly industrializing nations of Europe worked to deliberately thwart the spread of the Industrial Revolution to their colonial dominions.

# The Social Impact of the Industrial Revolution

**Q** **FOCUS QUESTIONS:** What effects did the Industrial Revolution have on urban life, social classes, family life, and standards of living? What were working conditions like in the early decades of the Industrial Revolution, and what efforts were made to improve them?

Eventually, the Industrial Revolution radically altered the social life of Europe and the world. Although much of Europe remained bound by its traditional ways, already in the first half of the nineteenth century, the social impact of the Industrial Revolution was being felt, and future avenues of growth were becoming apparent. Vast changes in the number of people and where they lived were already dramatically evident.

## Population Growth

Population increases had already begun in the eighteenth century, but they accelerated dramatically in the nineteenth. They were also easier to discern because record keeping became more accurate. In the nineteenth century, governments began to take periodic censuses and systematically collect precise data on births, deaths, and marriages. In Britain, for example, the first census was taken in 1801, and a systematic registration of births, deaths, and marriages was begun in 1836. In 1750, the total European population stood at an estimated 140 million; by 1800, it had increased to 187 million and by 1850 to 266 million, almost twice its 1750 level.

This population explosion cannot be explained by a higher birthrate, for birthrates were declining after 1790. Between 1790 and 1850, Germany's birthrate dropped from 40 per 1,000 to 36.1; Great Britain's, from 35.4 to 32.6; and France's, from 32.5 to 26.7. The key to the expansion of population was the decline in death rates evident throughout Europe. Historians now believe that two major causes explain this decline. There was a drop in the number of deaths from famines, epidemics, and war. Major epidemic diseases, such as plague and smallpox, declined noticeably, although small-scale epidemics broke out now and then. The ordinary death rate also declined as a general increase in the food supply, already evident in the agricultural revolution of Britain in the late eighteenth century, spread to more areas. More food enabled a greater number of people to be better fed and therefore more resistant to disease. Famine largely disappeared from western Europe, although there were dramatic exceptions in isolated areas, Ireland being the most significant.

Although industrialization itself did not cause population growth, industrialized areas did experience a change in the composition of the population. By 1850, the proportion of the population actively involved in manufacturing, mining, or building had risen to 48 percent in Britain, 37 percent in Belgium, and 27 percent in France. But the

actual pockets of industrialization in 1850 were small and decentralized; one author characterized them as "islands in an agricultural sea."

This minimal industrialization in light of the growing population meant severe congestion in the countryside, where ever-larger numbers of people divided the same amount of land into ever-smaller plots, and also gave rise to an ever-increasing mass of landless peasants. Overpopulation, especially noticeable in parts of France, northern Spain, southern Germany, Sweden, and Ireland, magnified the already existing problem of rural poverty. In Ireland, it produced the century's greatest catastrophe.

**THE GREAT HUNGER** Ireland was one of the most oppressed areas in western Europe. The predominantly Catholic peasant population rented land from mostly absentee British Protestant landlords whose primary concern was collecting their rents. Irish peasants lived in mud hovels in desperate poverty. The cultivation of the potato, a nutritious and relatively easy food to grow that produced three times as much food per acre as grain, gave Irish peasants a basic staple that enabled them to survive and even expand in numbers. As only an acre or two of potatoes was sufficient to feed a family, Irish men and women married earlier than elsewhere and started having children earlier as well. This led to significant growth in the population. Between 1781 and 1845, the Irish population doubled from 4 million to 8 million. Probably half of this population depended on the potato for survival. In the summer of 1845, the potato crop in Ireland was struck by blight due to a fungus that turned the potatoes black. Between 1845 and 1851, the Great Famine decimated the Irish population (see the box on p. 622). More than a million died of starvation and disease, and almost 2 million emigrated to the United States and Britain. Of all the European nations, only Ireland had a declining population in the nineteenth century. But other countries, too, faced problems of dire poverty and declining standards of living as their populations exploded.

**EMIGRATION** The flight of so many Irish to America reminds us that the traditional safety valve for overpopulation has always been emigration. Between 1821 and 1850, the number of emigrants from Europe averaged about 110,000 a year. Most of these emigrants came from places like Ireland and southern Germany, where peasant life had been reduced to marginal existence. Times of agrarian crisis resulted in great waves of emigration. Bad harvests in Europe in 1846–1847 (such as the catastrophe in Ireland) produced massive numbers of emigrants. In addition to the estimated 1.6 million from Ireland, for example, 935,000 people left Germany between 1847 and 1854. More often than emigrating, however, the rural masses sought a solution to their poverty by moving to towns and cities within their own countries to find work. It should not astonish us, then, that the first half of the nineteenth century was a period of rapid urbanization.

## The Great Irish Famine

The Great Irish Famine caused by the potato blight was one of the nineteenth century's worst natural catastrophes, resulting in the decimation of the Irish population. In this selection, an Irish nationalist reported what he had witnessed in Galway in 1847.



### John Mitchel, *The Last Conquest of Ireland*

In the depth of winter we traveled to Galway, through the very center of that fertile island, and saw sights that will never wholly leave the eyes that beheld them—cowering wretches, almost naked in the savage weather, prowling in turnip-fields, and endeavoring to grub up roots which had been left, but running to hide as the mail-coach rolled by;—very large fields where small farms had been “consolidated,” showing dark bars of fresh mold running through them where the ditches had been leveled;—groups and families, sitting or wandering on the high-road, with failing steps and dim patient eyes, gazing hopelessly into infinite darkness; before

them, around them, above them, nothing but darkness and despair—parties of tall brawny men, once the flower of Meath and Galway, stalking by with a fierce but vacant scowl; as if they knew that all this ought not to be, but knew not whom to blame, saw none whom they could rend in their wrath. . . . Around those farm-houses which were still inhabited were to be seen hardly any stacks of grain; the poor-rate collector, the rent agent, the county-cess collector had carried it off; and sometimes I could see in front of the cottages little children leaning against a fence when the sun shone out—for they could not stand—their limbs fleshless, their bodies half naked, their faces bloated yet wrinkled, and of a pale greenish hue,—children who would never, it was too plain, grow up to be men and women. ➤

**Q** What was the impact of the Great Irish Famine on the Irish people and on the broader Atlantic world? How were the industrial revolutions of other nations affected by this disaster?

## The Growth of Cities

Although the Western world would not become a predominantly urban society until the twentieth century, cities and towns had already grown dramatically in the first half of the nineteenth century, a phenomenon related to industrialization. Cities had traditionally been centers for princely courts, government and military offices, churches, and commerce. By 1850, especially in Great Britain and Belgium, cities were rapidly becoming places for manufacturing and industry. With the steam engine, entrepreneurs could locate their manufacturing

plants in urban centers where they had ready access to transportation facilities and unemployed people from the country looking for work.

In 1800, Great Britain had one major city, London, with a population of one million, and six cities between 50,000 and 100,000. Fifty years later, London's population had swelled to 2,363,000, and there were nine cities over 100,000 and eighteen cities with populations between 50,000 and 100,000. All together, these twenty-eight cities accounted for 5.7 million residents, or one-fifth of the total British population. When the populations of cities under 50,000 are added to this total, we realize that more



© Oxford Science Archive, Oxford/HIP/Art Resource, NY

**A New Industrial Town.** Cities and towns grew dramatically in Britain in the first half of the nineteenth century, largely as a result of industrialization. Pictured here is Saltair, a model textile factory and town founded near Bradford by Titus Salt in 1851. To facilitate the transportation of goods, the town was built on the Leeds and Liverpool canals.

than 50 percent of the British population lived in towns and cities by 1850. Britain was forced to become a food importer rather than an exporter as the number of people involved in agriculture declined to 20 percent of the population.

Urban populations also grew on the Continent, but less dramatically. Paris had 547,000 inhabitants in 1800, but only two other French cities had populations of 100,000: Lyons and Marseilles. In 1851, Paris had grown to a million while Lyons and Marseilles were still under 200,000. German and Austrian lands had only three cities with more than 100,000 inhabitants (Vienna had 247,000) in 1800; fifty years later, there were only five, but Vienna had grown to 440,000. As these figures show, urbanization did not proceed as rapidly here as in Britain; of course, neither had industrialization. Even in Belgium, the most heavily industrialized country on the Continent, almost 50 percent of the male workforce was still engaged in agriculture at midcentury.

### URBAN LIVING CONDITIONS IN THE EARLY INDUSTRIAL REVOLUTION

The dramatic growth of cities in the first half of the nineteenth century produced miserable living conditions for many of the inhabitants. Of course, this had been true for centuries for many people in European cities, but the rapid urbanization associated with the Industrial Revolution intensified the problems and made these wretched conditions all the more apparent. Wealthy, middle-class inhabitants, as usual, insulated themselves as best they could, often living in suburbs or the outer ring of the city, where they could have individual houses and gardens. In the inner ring of the city stood the small row houses, some with gardens, of the artisans and the lower middle class. Finally, located in the center of most industrial towns were the row houses of the industrial workers (see *Images of Everyday Life* on p. 624). This report on working-class housing in the British city of Birmingham in 1843 gives an idea of the conditions they faced:

The courts [of working-class row houses] are extremely numerous; . . . a very large portion of the poorer classes of the inhabitants reside in them. . . . The courts vary in the number of the houses which they contain, from four to twenty, and most of these houses are three stories high, and built, as it is termed, back to back. There is a wash-house, an ash-pit, and a privy at the end, or on one side of the court, and not unfrequently one or more pigsties and heaps of manure. Generally speaking, the privies in the old courts are in a most filthy condition. Many which we have inspected were in a state which renders it impossible for us to conceive how they could be used; they were without doors and overflowing with filth.<sup>5</sup>

Rooms were not large and were frequently overcrowded, as this government report of 1838 revealed: “I entered several of the tenements. In one of them, on the ground floor, I found six persons occupying a very small room, two in bed, ill with fever. In the room above this were two more persons in one bed ill with fever.”<sup>6</sup> Another report said, “There were 63 families where there were at least five

persons to one bed; and there were some in which even six were packed in one bed, lying at the top and bottom—children and adults.”<sup>7</sup>

Sanitary conditions in these towns were appalling. Due to the lack of municipal direction, city streets were often used as sewers and open drains: “In the center of this street is a gutter, into which potato parings, the refuse of animal and vegetable matters of all kinds, the dirty water from the washing of clothes and of the houses, are all poured, and there they stagnate and putrefy.”<sup>8</sup> Unable to deal with human excrement, cities in the new industrial era smelled horrible and were extraordinarily unhealthy. The burning of coal blackened towns and cities with soot, as Charles Dickens described in one of his novels: “A long suburb of red brick houses—some with patches of garden ground, where coal-dust and factory smoke darkened the shrinking leaves, and coarse rank flowers; and where the struggling vegetation sickened and sank under the hot breath of kiln and furnace.”<sup>9</sup> Towns and cities were fundamentally death traps. As deaths outnumbered births in most large cities in the first half of the nineteenth century, only a constant influx of people from the countryside kept them alive and growing.

Adding to the deterioration of urban life was the adulteration of food. Consumers were defrauded in a variety of ways: alum was added to make bread look white and hence more expensive; beer and milk were watered down; and red lead, despite its poisonous qualities, was substituted for pepper. The government refused to intervene; a parliamentary committee stated that “more benefit is likely to result from the effects of a free competition . . . than can be expected to result from any regulations.” It was not until 1875 that an effective food and drug act was passed in Britain.

Our knowledge of the pathetic conditions in the early industrial cities is largely derived from an abundance of social investigations. Such investigations began in France in the 1820s. In Britain, the Poor Law Commission produced detailed reports. The investigators were often struck by the physically and morally debilitating effects of urban industrial life on the poor. They observed, for example, that young working-class men were considerably shorter and scrawnier than the sons of middle-class families and much more subject to disease. They were especially alarmed by what they considered the moral consequences of such living conditions: prostitution, crime, and sexual immorality, all of which they saw as effects of living in such squalor.

**URBAN REFORMERS** To many of the well-to-do, this situation presented a clear danger to society. Were not these masses of workers, sunk in crime, disease, and immorality, a potential threat to their own well-being? Might not the masses be organized and used by unscrupulous demagogues to overthrow the established order? One of the most eloquent British reformers of the 1830s and 1840s, James Kay-Shuttleworth, described them as “volcanic elements, by whose explosive violence the

## Living Conditions of London's Poor

Although some environmental hazards existed before industrialization, others intensified in early industrial Britain, with a dramatic impact on living conditions. Burning coal filled the air with ash and soot, metal smelting gave off pungent fumes, and industrial plants belched clouds of smoke from the fires stoked in the steam engines. Water pollution was another problem as slaughterhouses dumped their refuse into the streams and human waste found its way there as well due to a

lack of proper sewerage. Consequently, working-class tenants in London found themselves living in crowded rooms surrounded by filth and putrid smells. Many of the houses for the poor were built back to back, leaving little room for sanitation. Despite efforts to improve conditions, the plight of London's workers remained dire. In 1869, an English writer, Blanchard Jerrold, commissioned the French illustrator Gustave Doré to create illustrations for a guide to London called *London: A Pilgrimage*. The book was published in 1872 with Doré's illustrations accompanying Jerrold's textual descriptions of the living conditions of London's poor. Doré's most haunting images are of tenement housing and its inhabitants in areas such as Whitechapel. In the first illustration, Doré shows a London slum district overshadowed by rail viaducts. The second image depicts an open air market on Drury Lane, where men, women, and children are attempting to sell their wares. In the image at the right, children in ragged clothes play in the street.

© British Museum, London/Art Resource, NY



Bibliothèque des Arts Decoratifs, Paris/© Archives Charmet/The Bridgeman Art Library



© The Art Archive/John Meek

structure of society may be destroyed.” Another observer spoke more contemptuously in 1850:

They live precisely like brutes, to gratify . . . the appetites of their uncultivated bodies, and then die, to go they have never thought, cared, or wondered whither. . . . Brought up in the darkness of barbarism, they have no idea that it is possible for them to attain any higher condition; they are not even sentient enough to desire to change their situation. . . . They eat, drink, breed, work and die; and . . . the richer and more intelligent classes are obliged to guard them with police.<sup>10</sup>

Some observers were less arrogant, however, and wondered if the workers should be held responsible for their fate.

One of the best of a new breed of urban reformers was Edwin Chadwick (1800–1890). With a background in law, Chadwick became obsessed with eliminating the poverty and squalor of the metropolitan areas. He became a civil servant and was soon appointed to a number of government investigatory commissions. As secretary of the Poor Law Commission, he initiated a passionate search for detailed facts about the living conditions of the working classes. After three years of investigation, Chadwick summarized the results in his *Report on the Condition of the Labouring Population of Great Britain*, published in 1842. In it, he concluded that “the various forms of epidemic, endemic, and other disease” were directly caused by the “atmospheric impurities produced by decomposing animal and vegetable substances, by damp and filth, and close overcrowded dwellings [prevailing] amongst the population in every part of the kingdom.” Such conditions, he argued, could be eliminated. As to the means: “The primary and most important measures, and at the same time the most practicable, and within the recognized province of public administration, are drainage, the removal of all refuse of habitations, streets, and roads, and the improvement of the supplies of water.”<sup>11</sup> In other words, Chadwick was advocating a system of modern sanitary reforms consisting of efficient sewers and a supply of piped water. Six years after his report and largely due to his efforts, Britain’s first Public Health Act created the National Board of Health, empowered to form local boards that would establish modern sanitary systems.

Many middle-class citizens were quite willing to support the public health reforms of men like Chadwick because of their fear of **cholera**. Outbreaks of this deadly disease had ravaged Europe in the early 1830s and late 1840s and were especially rampant in the overcrowded cities. As city authorities and wealthier residents became convinced that filthy conditions helped spread the disease, they began to support the call for new public health measures.

## New Social Classes: The Industrial Middle Class

The rise of industrial capitalism produced a new middle-class group. The bourgeoisie or middle class was not new; it had existed since the emergence of cities in the Middle Ages. Originally, the bourgeoisie was the burgher or town

dweller, active as a merchant, official, artisan, lawyer, or scholar, who enjoyed a special set of rights from the charter of the town. As wealthy townspeople bought land, the original meaning of the word *bourgeois* became lost, and the term came to include people involved in commerce, industry, and banking as well as professionals, such as lawyers, teachers, physicians, and government officials at various levels. At the lower end of the economic scale were master craftspeople and shopkeepers.

**THE NEW INDUSTRIAL ENTREPRENEURS** Lest we make the industrial middle class too much of an abstraction, we need to look at who the new industrial entrepreneurs actually were. These were the people who constructed the factories, purchased the machines, and figured out where the markets were (see the box on p. 626). Their qualities included resourcefulness, single-mindedness, resolution, initiative, vision, ambition, and often, of course, greed. As Jedediah Strutt, the cotton manufacturer, said, the “getting of money . . . is the main business of the life of men.”

But this was not an easy task. The early industrial entrepreneurs were called on to superintend an enormous array of functions that are handled today by teams of managers; they raised capital, determined markets, set company objectives, organized the factory and its labor, and trained supervisors who could act for them. The opportunities for making money were great, but the risks were also tremendous. The cotton trade, for example, which was so important to the early Industrial Revolution, was intensely competitive. Only through constant expansion could one feel secure, so early entrepreneurs re-invested most of their initial profits. Fear of bankruptcy was constant, especially among small firms. Furthermore, most early industrial enterprises were small. Even by the 1840s, only 10 percent of British industrial firms employed more than five thousand workers; 43 percent had fewer than one hundred. As entrepreneurs went bankrupt, new people could enter the race for profits, especially since the initial outlay required was not gigantic. In 1816, only one mill in five in the important industrial city of Manchester was in the hands of its original owner.

The new industrial entrepreneurs were from incredibly diverse social origins. Many of the most successful came from a mercantile background. Three London merchants, for example, founded a successful ironworks in Wales that owned eight steam engines and employed five thousand men. In Britain, land and domestic industry were often interdependent. Joshua Fielden, for example, acquired sufficient capital to establish a factory by running a family sheep farm while working looms in the farmhouse. Intelligent, clever, and ambitious apprentices who had learned their trades well could also strike it rich. William Radcliffe’s family engaged in agriculture and spinning and weaving at home; he learned quickly how to succeed:

Availing myself of the improvements that came out while I was in my teens . . . with my little savings and a practical knowledge of every process from the cotton bag to the piece of cloth . . . I was

## Attitudes of the Industrial Middle Class in Britain and Japan

In the nineteenth century, a new industrial middle class in Great Britain took the lead in creating the Industrial Revolution. Japan did not begin to industrialize until after 1870. There, too, an industrial middle class emerged, although there were important differences in the attitudes of business leaders in Britain and Japan. Some of these differences can be seen in these documents. The first is an excerpt from the book *Self-Help*, first published in 1859, by Samuel Smiles, who espoused the belief that people succeed through “individual industry, energy, and upright-ness.” The other two selections are by Shibuzawa Eiichi, a Japanese industrialist who supervised textile factories. Although he began his business career in 1873, he did not write his autobiography, the source of his first excerpt, until 1927.



### Samuel Smiles, *Self-Help*

“Heaven helps those who help themselves” is a well-worn maxim, embodying in a small compass the results of vast human experience. The spirit of self-help is the root of all genuine growth in the individual; and, exhibited in the lives of many, it constitutes the true source of national vigor and strength. Help from without is often enfeebling in its effects, but help from within invariably invigorates. Whatever is done for men or classes, to a certain extent takes away the stimulus and necessity of doing for themselves; and where men are subjected to overguidance and overgovernment, the inevitable tendency is to render them comparatively helpless. . . .

National progress is the sum of individual industry, energy, and uprightness, as national decay is of individual idleness, selfishness, and vice. What we are accustomed to decry as great social evils, will, for the most part, be found to be only the outgrowth of our own perverted life; and though we may endeavor to cut them down and extirpate them by means of law, they will only spring up again with fresh luxuriance in some other form, unless the individual conditions of human life and character are radically improved. If this view be correct, then it follows that the highest patriotism and philanthropy consist, not so much in altering laws and modifying institutions as in helping and stimulating men to elevate and improve themselves by their own free and independent action as individuals. . . .

Many popular books have been written for the purpose of communicating to the public the grand secret of

making money. But there is no secret whatever about it, as the proverbs of every nation abundantly testify. . . . “A penny saved is a penny gained.”—“Diligence is the mother of good-luck.”—“No pains, no gains.”—“No sweat, no sweet.”—“Sloth, the Key of poverty.”—“Work, and thou shalt have.”—“He who will not work, neither shall he eat.”—“The world his, who has patience and industry.”

### Shibuzawa Eiichi, *Autobiography*

I . . . felt that it was necessary to raise the social standing of those who engaged in commerce and industry. By way of setting an example, I began studying and practicing the teachings of the *Analects* of Confucius. It contains teachings first enunciated more than twenty-four hundred years ago. Yet it supplies the ultimate in practical ethics for all of us to follow in our daily living. It has many golden rules for businessmen. For example, there is a saying: “Wealth and respect are what men desire, but unless a right way is followed, they cannot be obtained; poverty and lowly position are what men despise, but unless a right way is found, one cannot leave that status once reaching it.” It shows very clearly how a businessman must act in this world.

### Shibuzawa Eiichi on Progress

One must beware of the tendency of some to argue that it is through individualism or egoism that the State and society can progress most rapidly. They claim that under individualism, each individual competes with the others, and progress results from this competition. But this is to see merely the advantages and ignore the disadvantages, and I cannot support such a theory. Society exists, and a State has been founded. Although people desire to rise to positions of wealth and honor, the social order and the tranquility of the State will be disrupted if this is done egoistically. Men should not do battle in competition with their fellow men. Therefore, I believe that in order to get along together in society and serve the State, we must by all means abandon this idea of independence and self-reliance and reject egoism completely. ☞

**Q** What are the major similarities and differences between the attitudes toward business of Samuel Smiles and Shibuzawa Eiichi? How do you explain the differences, and what are their implications?

ready to commence business for myself and by the year 1789 I was well established and employed many hands both in spinning and weaving as a master manufacturer.<sup>12</sup>

By 1801, Radcliffe was operating a factory employing a thousand workers.

Members of dissenting religious minorities were often prominent among the early industrial leaders of Britain. The Darbys and Lloyds, who were iron manufacturers; the Barclays and Lloyds, who were bankers; and the Trumans and Perkins, who were brewers, were all Quakers. These were expensive trades and depended on the financial support that coreligionists in religious minorities provided for each other. Most historians believe that a major reason members of these religious minorities were so prominent in business was that they lacked other opportunities. Legally excluded from many public offices, they directed their ambitions into the new industrial capitalism.

It is interesting to note that in Britain in particular, aristocrats also became entrepreneurs. The Lambtons in Northumberland, the Curwens in Cumberland, the Norfolks in Yorkshire, and the Dudleys in Staffordshire all invested in mining enterprises. This close relationship between land and industry helped Britain assume the leadership role in the early Industrial Revolution.

**SIGNIFICANCE OF THE INDUSTRIAL ENTREPRENEURS** By 1850, in Britain at least, the kind of traditional entrepreneurship that had created the Industrial Revolution was declining and was being replaced by a new business aristocracy. This new generation of entrepreneurs stemmed from the professional and industrial middle classes, especially as sons inherited the successful businesses established by their fathers. It must not be forgotten, however, that even after 1850, a large number of small businesses existed in Britain, and some were still being founded by people from humble backgrounds. Indeed, the age of large-scale corporate capitalism did not begin until the 1890s (see Chapter 23).

Increasingly, the new industrial entrepreneurs—the bankers and owners of factories and mines—came to amass much wealth and play an important role alongside the traditional landed elites of their societies. The Industrial Revolution began at a time when the preindustrial agrarian world was still largely dominated by landed elites. As the new bourgeois bought great estates and acquired social respectability, they also sought political power, and in the course of the nineteenth century, their wealthiest members would merge with those old elites.

## New Social Classes: Workers in the Industrial Age

At the same time that the members of the industrial middle class were seeking to reduce the barriers between themselves and the landed elite, they also were trying to separate themselves from the laboring classes below them. The working class was actually a mixture of groups in the

first half of the nineteenth century. Factory workers would eventually form an industrial proletariat, but in the first half of the century, they did not constitute a majority of the working class in any major city, even in Britain. According to the 1851 census in Britain, there were 1.8 million agricultural laborers and 1 million domestic servants but only 811,000 workers in the cotton and woolen industries. And one-third of these were still working in small workshops or at home.

In the cities, artisans or craftspeople remained the largest group of urban workers during the first half of the nineteenth century. They worked in numerous small industries, such as shoemaking, glovemaking, bookbinding, printing, and bricklaying. Some craftspeople, especially those employed in such luxury trades as coach building and clock making, formed a kind of aristocracy of labor and earned higher wages than others. Artisans were not factory workers; they were traditionally organized in guilds, where they passed on their skills to apprentices. But guilds were increasingly losing their power, especially in industrialized countries. Fearful of losing out to the new factories that could produce goods more cheaply, artisans tended to support movements against industrialization. Industrialists welcomed the decline of skilled craftspeople, as one perceptive old tailor realized in telling his life story:

It is upwards of 30 years since I first went to work at the tailoring trade in London. . . . I continued working for the honorable trade and belonging to the Society [for tailors] for about 15 years. My weekly earnings then averaged £1 16s. a week while I was at work, and for several years I was seldom out of work. . . . No one could have been happier than I was. . . . But then, with my sight defective. . . I could get no employment at the honorable trade, and that was the ruin of me entirely; for working there, of course, I got “scratched” from the trade society, and so lost all hope of being provided for by them in my helplessness. The workshop. . . was about seven feet square, and so low, that as you [sat] on the floor you could touch the ceiling with the tip of your finger. In this place seven of us worked. [The master] paid little more than half the regular wages, and employed such men as myself—only those who couldn’t get anything better to do. . . . I don’t think my wages there averaged above 12s. a week. . . . I am convinced I lost my eyesight by working in that cheap shop. . . . It is by the ruin of such men as me that these masters are enabled to undersell the better shops. . . . That’s the way, sir, the cheap clothes is produced, by making blind beggars of the workmen, like myself, and throwing us on [the benevolence of] the parish [church] in our old age.<sup>13</sup>

Servants also formed another large group of urban workers, especially in major cities like London and Paris. Many were women from the countryside who became utterly dependent on their upper- and middle-class employers.

**WORKING CONDITIONS FOR THE INDUSTRIAL WORKING CLASS** Workers in the new industrial factories also faced wretched working conditions. We have already observed the psychological traumas workers experienced

# Child Labor: Discipline in the Textile Mills

Child labor was not new, but in the early Industrial Revolution, it was exploited more systematically. These selections are taken from the Report of Sadler's Committee, a report that was commissioned by the government in 1832 to inquire into the condition of child factory workers.



## Keeping the Children Awake

It is a very frequent thing at Mr. Marshall's [at Shrewsbury] where the least children were employed (for there were plenty working at six years of age), for Mr. Horseman to start the mill earlier in the morning than he formerly did; and provided a child should be drowsy, the overlooker walks round the room with a stick in his hand, and he touches that child on the shoulder, and says, "Come here." In a corner of the room there is an iron cistern; it is filled with water; he takes this boy, and takes him up by the legs, and dips him over head in the cistern, and sends him to work for the remainder of the day. . . .

What means were taken to keep the children to their work?—Sometimes they would tap them over the head, or nip them over the nose, or give them a pinch of snuff, or throw water in their faces, or pull them off where they were, and job them about to keep them waking.

## The Sadistic Overlooker

Samuel Downe, age 29, factory worker living near Leeds; at the age of about ten began work at Mr. Marshall's mills at Shrewsbury, where the customary hours when

work was brisk were generally 5 A.M. to 8 P.M., sometimes from 5:30 A.M. to 8 or 9.

What means were taken to keep the children awake and vigilant, especially at the termination of such a day's labor as you have described?—There was generally a blow or a box, or a tap with a strap, or sometimes the hand.

Have you yourself been strapped?—Yes, most severely, till I could not bear to sit upon a chair without having pillows, and through that I left. I was strapped both on my own legs, and then I was put upon a man's back, and then strapped and buckled with two straps to an iron pillar, and flogged, and all by one overlooker; after that he took a piece of tow, and twisted it in the shape of a cord, and put it in my mouth, and tied it behind my head.

He gagged you?—Yes; and then he orders me to run round a part of the machinery where he was overlooker, and he stood at one end, and every time I came there he struck me with a stick, which I believe was an ash plant, and which he generally carried in his hand, and sometimes he hit me, and sometimes he did not; and one of the men in the room came and begged me off, and that he let me go, and not beat me any more, and consequently he did.

You have been beaten with extraordinary severity?—Yes, I was beaten so that I had not power to cry at all, or hardly speak at one time. What age were you at that time?—Between 10 and 11. ❧

**Q** What kind of working conditions did children face in the textile mills during the early Industrial Revolution? Why were they beaten?

from their employers' efforts to break old preindustrial work patterns and create a well-disciplined labor force. But what were the physical conditions of the factories?

Unquestionably, in the early decades of the Industrial Revolution, "places of work," as early factories were called, were dreadful. Work hours ranged from twelve to sixteen hours a day, six days a week, with a half hour for lunch and for dinner. There was no security of employment and no minimum wage. The worst conditions were in the cotton mills, where temperatures were especially debilitating. One report noted that "in the cotton-spinning work, these creatures are kept, fourteen hours in each day, locked up, summer and winter, in a heat of from eighty to eighty-four degrees." Mills were also dirty, dusty, and unhealthy:

Not only is there not a breath of sweet air in these truly infernal scenes, but . . . there is the abominable and pernicious stink of the gas to assist in the murderous effects of the heat. In addition to the noxious effluvia of the gas, mixed with the steam, there are the dust, and what is called cotton-flyings

or fuz, which the unfortunate creatures have to inhale; and . . . the notorious fact is that well constituted men are rendered old and past labor at forty years of age, and that children are rendered decrepit and deformed, and thousands upon thousands of them slaughtered by consumptions [lung diseases], before they arrive at the age of sixteen.<sup>14</sup>

Thus ran a report on working conditions in the cotton industry in 1824.

Conditions in the coal mines were also harsh. The introduction of steam power meant only that steam-powered engines mechanically lifted coal to the top. Inside the mines, men still bore the burden of digging the coal out while horses, mules, women, and children hauled coal carts on rails to the lift. Dangers abounded in coal mines; cave-ins, explosions, and gas fumes (called "bad air") were a way of life. The cramped conditions—tunnels often did not exceed 3 or 4 feet in height—and constant dampness in the mines resulted in deformed bodies and ruined lungs.

## Child Labor: The Mines

After examining conditions in British coal mines, a government official commented that “the hardest labor in the worst room in the worst-conducted factory is less hard, less cruel and less demoralizing than the labor in the best of coal-mines.” Yet it was not until 1842 that legislation was passed eliminating the labor of boys under ten from the mines. This selection is taken from a government report on the mines in Lancashire.



### The Black Holes of Worsley

Examination of Thomas Gibson and George Bryan, witnesses from the coal mines at Worsley:

Have you worked from a boy in a coal mine?—(Both) Yes.

What had you to do then?—Thrutching the basket and drawing. It is done by little boys; one draws the basket and the other pushes it behind. Is that hard labor?—Yes, very hard labor.

For how many hours a day did you work?—Nearly nine hours regularly; sometimes twelve; I have worked about thirteen. We used to go in at six in the morning, and took a bit of bread and cheese in our pocket, and stopped two or three minutes; and some days nothing at all to eat.

How was it that sometimes you had nothing to eat?—We were over-burdened. I had only a mother, and she had nothing to give me. I was sometimes half starved. . . .

Do they work in the same way now exactly?—Yes, they do; they have nothing more than a bit of bread and

cheese in their pocket, and sometimes can't eat it all, owing to the dust and damp and badness of air; and sometimes it is as hot as an oven; sometimes I have seen it so hot as to melt a candle.

What are the usual wages of a boy of eight?—They used to get 3d or 4d a day. Now a man's wages is divided into eight eighths; and when a boy is eight years old he gets one of those eighths; at eleven, two eighths; at thirteen, three eighths; at fifteen, four eighths; at twenty, man's wages.

What are the wages of a man?—About 15s if he is in full employment, but often not more than 10s, and out of that he has to get his tools and candles. He consumes about four candles in nine hours' work, in some places six; 6d per pound, and twenty-four candles to the pound.

Were you ever beaten as a child?—Yes, many a score of times; both kicks and thumps.

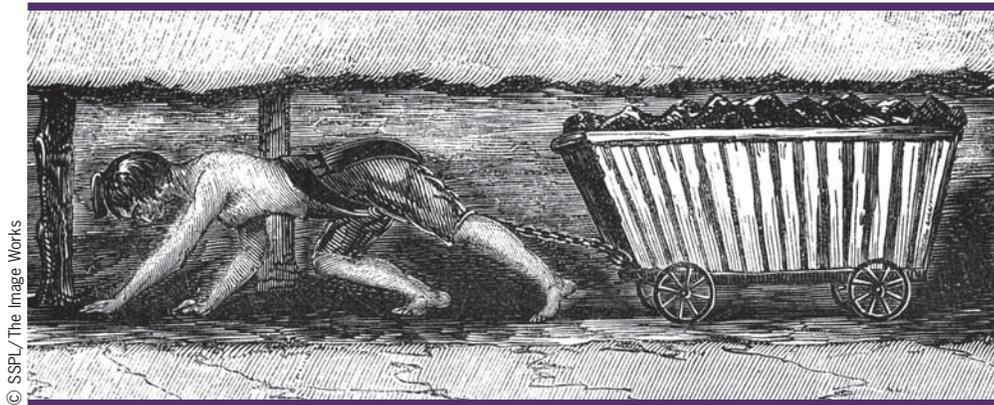
Are many girls employed in the pits?—Yes, a vast of those. They do the same kind of work as the boys till they get about 14 years of age, when they get the wages of half a man, and never get more, and continue at the same work for many years.

Did they ever fight together?—Yes, many days together. Both boys and girls; sometimes they are very loving with one another. ↩

**Q** What kind of working conditions did children face in the mines during the early Industrial Revolution? Why did entrepreneurs permit such conditions and such treatment of children?

Both children and women were employed in large numbers in early factories and mines. Children had been an important part of the family economy in preindustrial times, working in the fields or carding and spinning wool at home with the growth of the cottage industry. In the Industrial Revolution, however, child labor was exploited more than ever and in a considerably more systematic fashion (see the boxes on pp. 628–629). The owners of cotton factories appreciated certain features of child labor. Children had an especially delicate touch as spinners of cotton. Their smaller size made it easier for them to crawl under machines to gather loose cotton. Moreover, children were more easily broken to factory work. Above all, children represented a cheap supply of labor. In 1821, just about half of the British population was under twenty years of age. Hence, children made up a particularly abundant supply of labor, and they were paid only about one-sixth to one-third of what a man was paid. In the cotton factories in 1838, children under eighteen made up 29 percent of the total workforce; children as young as seven worked twelve to fifteen hours per day, six days a week, in cotton mills.

Especially terrible in the early Industrial Revolution was the use of so-called pauper apprentices. These were orphans or children abandoned by their parents who had wound up in the care of local parishes. To save on their upkeep, parish officials found it convenient to apprentice them to factory owners looking for a cheap source of labor. These children worked long hours under strict discipline and received inadequate food and recreation; many became deformed from being kept too long in contorted positions. Although economic liberals and some industrialists were against all state intervention in economic matters, Parliament eventually remedied some of the worst ills of child abuse in factories and mines (see “Efforts at Change: Reformers and Government” later in this chapter). The legislation of the 1830s and 1840s, however, primarily affected child labor in textile factories and mines. It did not touch the use of children in small workshops or the nonfactory trades that were not protected. As these trades were in competition with the new factories, conditions there were often even worse. Pottery works, for example, were not investigated until the 1860s, when it



© SSPL/The Image Works



© SSPL/The Image Works

**Women and Children in the Mines.** Women and children were often employed in the factories and mines of the early nineteenth century. These illustrations are from the Report of the Children's Employment Commission in Great Britain in 1842. The top image shows a woman dragging a cart loaded with coal. The image below shows a boy walking backwards in a mine, pulling a cart also filled with coal. Both images show the trying conditions under which both women and children worked in the early Industrial Revolution. In 1842, the Coal Mines Act forbade the use of boys younger than ten and women in the mines.

was found that 17 percent of the workers were under eleven years of age. One investigator reported what he found:

The boys were kept in constant motion throughout the day, each carrying from thirty to fifty dozen of molds into the stoves, and remaining... long enough to take the dried earthenware away. The distance thus run by a boy in the course of a day... was estimated at seven miles. From the very nature of this exhausting occupation children were rendered pale, weak and unhealthy. In the depth of winter, with the thermometer in the open air sometimes below zero, boys, with little clothing but rags, might be seen running to and fro on errands or to their dinners with the perspiration on their foreheads, "after laboring for hours like little slaves." The inevitable result of such transitions of temperature were consumption, asthma and acute inflammation.<sup>15</sup>

Little wonder that child labor legislation enacted in 1864 included pottery works.

By 1830, women and children made up two-thirds of the cotton industry's labor. As the number of children employed declined under the Factory Act of 1833, however, their places were taken by women, who came to dominate the labor forces of the early factories. Women made up 50 percent of the labor force in textile (cotton and woolen) factories before 1870. They were mostly unskilled labor and were paid half or less of what men received. Excessive working hours for women were outlawed in 1844, but only in textile factories and mines; not until 1867 were they outlawed in craft workshops.

The employment of children and women in large part represents a continuation of a preindustrial kinship pattern. The cottage industry had always involved the efforts of the entire family, and it seemed perfectly natural to continue this pattern. Men migrating from the countryside to industrial towns and cities took their wives and children with them into the factory or into the mines. Of 136 employees in Robert Peel's factory at Bury in 1801, 95 were members of the same twenty-six families. The impetus for this family work often came from the family itself. The factory owner Jedediah Strutt was opposed to child labor under age ten but was forced by parents to take children as young as seven.

The employment of large numbers of women in factories did not significantly transform female working patterns, as was once assumed. Studies of urban households in France and Britain, for example, have revealed that throughout the nineteenth century, traditional types of female labor still predominated in the women's work world. In 1851, fully 40 percent of the female workforce in Britain consisted of domestic servants. In France, the largest group of female workers, 40 percent, worked in agriculture. In addition, only 20 percent of female workers in Britain labored in factories, and only 10 percent did so in France. Regional and local studies have also found that most of the workers were single women. Few married women worked outside the home.

The factory acts that limited the work hours of children and women also began to break up the traditional

kinship pattern of work and led to a new pattern based on a separation of work and home. Men came to be regarded as responsible for the primary work obligations as women assumed daily control of the family and performed low-paying jobs such as laundry work that could be done in the home. Domestic industry made it possible for women to continue their contributions to family survival.

Historians have also reminded us that if the treatment of children in the mines and factories seems particularly cruel and harsh, contemporary treatment of children in general was often brutal. Beatings, for example, had long been regarded, even by dedicated churchmen and churchwomen, as the best way to discipline children.

The problem of poverty among the working classes was also addressed in Britain by government action in the form of the Poor Law Act of 1834, which established workhouses where jobless poor people were forced to live. The intent of this policy, based on the assumption that the poor were responsible for their own pitiful conditions, was “to make the workhouses as like prisons as possible . . . to establish therein a discipline so severe and repulsive as to make them a terror to the poor.” Within a few years, despite sporadic opposition, more than 200,000 poor people were locked up in workhouses, where family members were separated, forced to live in dormitories, given work assignments, and fed dreadful food. Children were often recruited from parish workhouses as cheap labor in factories.

## Standards of Living

One of the most heated debates on the Industrial Revolution concerns the standard of living. Most historians assume that in the long run, the Industrial Revolution improved living standards dramatically in the form of higher per capita incomes and greater consumer choices. But did the first generation of industrial workers experience a decline in their living standards and suffer unnecessarily? Some historians have argued that early industrialization required huge profits to be reinvested in new and ever more expensive equipment; thus, to make the requisite profits, industrialists had to keep wages low. Others have questioned that argument, pointing out that initial investments in early machinery were not necessarily large, nor did they need to be. What certainly did occur in the first half of the nineteenth century was a widening gap between rich and poor. One estimate, based on income tax returns in Britain, is that the wealthiest 1 percent of the population increased its share of the national product from 25 percent in 1801 to 35 percent in 1848.

Wages, prices, and consumption patterns are some of the criteria used for measuring the standard of living. Between 1780 and 1850, as far as we can determine from the available evidence, both wages and prices fluctuated widely. Most historians believe that during the Napoleonic

wars, the increase in prices outstripped wages. Between 1815 and 1830, a drop in prices was accompanied by a slight increase in wages. From 1830 to the late 1840s, real wages seem to have improved, although regional variations make generalizations difficult.

When we look at consumption patterns, we find, on the one hand, that in Britain in 1850, tea, sugar, and coffee were still semiluxuries consumed primarily by the upper and middle classes and better-off artisans. Meat consumption per capita was less in 1840 than in 1780. On the other hand, a mass market had developed in the cheap cotton goods so important to the Industrial Revolution. As a final note on the issue of the standard of living, some historians who take a positive view of the early Industrial Revolution have questioned what would have happened to Britain’s growing population without the Industrial Revolution. Would it have gone the way of Ireland’s in the Great Hunger of the mid-nineteenth century? No one really knows.

No doubt the periodic crises of overproduction that haunted industrialization from its beginnings caused even further economic hardship. Short-term economic depressions brought high unemployment and increased social tensions. Unemployment figures could be astronomical. During one of these economic depressions in 1842, for example, 60 percent of the factory employees in Bolton were laid off. Cyclical depressions were particularly devastating in towns whose prosperity rested on one industry.

Overall we can say that some evidence exists for an increase in real wages for the working classes between 1790 and 1850, especially in the 1840s. But can standards of living be assessed only in terms of prices, wages, and consumption patterns? No doubt those meant little to people who faced dreadful housing, adulterated food, public health hazards, and the physical and psychological traumas of work life. The real gainers in the early Industrial Revolution were members of the middle class—and some skilled workers whose jobs were not eliminated by the new machines. But industrial workers themselves would have to wait until the second half of the nineteenth century to reap the benefits of industrialization.

## Efforts at Change: The Workers

Before long, workers looked to the formation of labor organizations to gain decent wages and working conditions. The British government, reacting against the radicalism of the French revolutionary working classes, had passed the Combination Acts in 1799 and 1800 outlawing associations of workers. The legislation failed to prevent the formation of **trade unions**, however. Similar to the craft societies of earlier times, these new associations were formed by skilled workers in a number of new industries, including the cotton spinners, ironworkers, coal miners, and shipwrights. These unions served two purposes. One was to preserve their own workers’ position by limiting entry into their trade; the other was to gain

benefits from the employers. These early trade unions had limited goals. They favored a working-class struggle against employers, but only to win improvements for the members of their own trades.

**THE TRADE UNION MOVEMENT** Some trade unions were even willing to strike to attain their goals. Bitter strikes were carried out by hand-loom weavers in Glasgow in 1813, cotton spinners in Manchester in 1818, and miners in Northumberland and Durham in 1810. Such blatant illegal activity caused Parliament to repeal the Combination Acts in 1824, accepting the argument of some members that the acts themselves had so alienated workers that they had formed unions. Unions were now tolerated, but other legislation enabled authorities to keep close watch over their activities.

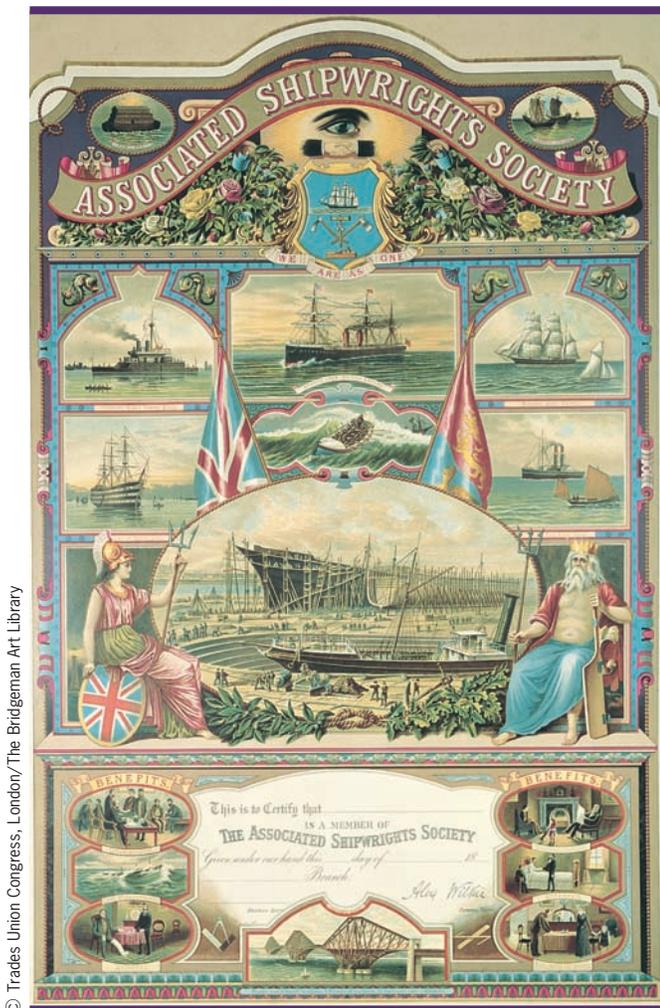
In the 1820s and 1830s, the union movement began to focus on the creation of national unions. One of the leaders in this effort was a well-known cotton magnate

and social reformer, Robert Owen (1771–1858). Owen came to believe in the creation of voluntary associations that would demonstrate to others the benefits of cooperative rather than competitive living (see Chapter 21). Although Owen’s program was not directed specifically to trade unionists, his ideas had great appeal to some of their leaders. Under Owen’s direction, plans emerged for the Grand National Consolidated Trades Union, which was formed in February 1834. As a national federation of trade unions, its primary purpose was to coordinate a general strike for the eight-hour working day. Rhetoric, however, soon outpaced reality, and by the summer of that year, the lack of real working-class support led to the federation’s total collapse, and the union movement reverted to trade unions for individual crafts. The largest and most successful of these unions was the Amalgamated Society of Engineers, formed in 1850. Its provision of generous unemployment benefits in return for a small weekly payment was precisely the kind of practical gains these trade unions sought. Larger goals would have to wait.

**LUDDITES** Trade unionism was not the only type of collective action by workers in the early decades of the Industrial Revolution. The Luddites were skilled craftspeople in the Midlands and northern England who in 1812 attacked the machines that they believed threatened their livelihoods. These attacks failed to stop the industrial mechanization of Britain and have been viewed as utterly naive. Some historians, however, have also seen them as an intense eruption of feeling against unrestrained industrial capitalism. The inability of 12,000 troops to find the culprits provides stunning evidence of the local support they received in their areas.

**CHARTISM** A much more meaningful expression of the attempts of British workers to improve their condition developed in the movement known as Chartism—the “first important political movement of working men organized during the nineteenth century.” Its aim was to achieve political democracy. Chartism took its name from the People’s Charter, a document drawn up in 1838 by the London Working Men’s Association. The charter demanded universal male suffrage, payment for members of Parliament, the elimination of property qualifications for members of Parliament, and annual sessions of Parliament. Women, too, joined in the movement. Chartist groups in many large towns often had female sections. Although some women were quite active in the movement, they were fighting to win political rights for their husbands, not for themselves, as the Chartist platform did not include the right to vote for women.

Two national petitions incorporating the Chartist demands gained millions of signatures and were presented to Parliament in 1839 and 1842. Chartism attempted to encourage change through peaceful, constitutional means, although there was an underlying threat of force, as is evident in the Chartist slogan, “Peacefully if we can, forcibly if



© Trades Union Congress, London/The Bridgeman Art Library

**A Trade Union Membership Card.** Skilled workers in a number of new industries formed trade unions in an attempt to gain higher wages, better working conditions, and special benefits. The scenes at the bottom of this membership card for the Associated Shipwrights Society illustrate some of the medical and social benefits it provided for its members.

we must.” In 1842, Chartist activists organized a general strike on behalf of their goals, but it had little success.

Despite the pressures exerted by the Chartists, both national petitions were rejected by the members of Parliament, who were not at all ready for political democracy. As one member said, universal male suffrage would be “fatal to all the purposes for which government exists” and was “utterly incompatible with the very existence of civilization.” After 1848, Chartism as a movement had largely played itself out. It had never really posed a serious threat to the British establishment, but it had not been a total failure either. Its true significance stemmed from its ability to arouse and organize millions of working-class men and women, to give them a sense of working-class consciousness that they had not really possessed before. This political education of working people was important to the ultimate acceptance of all the points of the People’s Charter in the future.

## Efforts at Change: Reformers and Government

Efforts to improve the worst conditions of the industrial factory system also came from outside the ranks of the working classes. From its beginning, the Industrial Revolution had drawn much criticism. Romantic poets like William Wordsworth (see Chapter 21) decried the destruction of the natural world:

*I grieve, when on the darker side  
Of this great change I look; and there behold  
Such outrage done to nature as compels  
The indignant power to justify herself.*

Reform-minded individuals, be they factory owners who felt twinges of conscience or social reformers in Parliament, campaigned against the evils of the industrial factory, especially condemning the abuse of children. One

hoped for the day “that these little ones should once more see the rising and setting of the sun.”

**GOVERNMENT ACTION** As it became apparent that the increase in wealth generated by the Industrial Revolution was accompanied by ever-increasing numbers of poor people, more and more efforts were made to document and deal with the problems. As reports from civic-minded citizens and parliamentary commissions intensified and demonstrated the extent of poverty, degradation, and suffering, the reform efforts began to succeed.

Their first success was a series of factory acts passed between 1802 and 1819 that limited labor for children between the ages of nine and sixteen to twelve hours a day; the employment of children under nine years old was forbidden. Moreover, the laws stipulated that children were to receive instruction in reading and arithmetic during working hours. But these acts applied only to cotton mills, not to factories or mines where some of the worst abuses were taking place. Just as important, no provision was made for enforcing the acts through a system of inspection.

In the reform-minded decades of the 1830s and 1840s, new legislation was passed. The Factory Act of 1833 strengthened earlier labor legislation. All textile factories were now included. Children between the ages of nine and thirteen could work only eight hours a day; those between thirteen and eighteen, twelve hours. Factory inspectors were appointed with the power to fine those who broke the law. Another piece of legislation in 1833 required that children between nine and thirteen have at least two hours of elementary education during the working day. In 1847, the Ten Hours Act reduced the workday for children between thirteen and eighteen to ten hours. Women were also now included in the ten-hour limit. In 1842, the Coal Mines Act eliminated the employment of boys under ten and women in mines. Eventually, men too would benefit from the move to restrict factory hours.

## CHAPTER SUMMARY

The Industrial Revolution was one of the major forces of change in the nineteenth century as it led Western civilization into the machine-dependent modern world. It



began in Britain, which had an agricultural revolution that increased the quantity of food-stuffs, a population increase that created a supply of labor, capital for investment, a good supply of coal and iron ore, and a transportation revolution that created a system of canals, roads, and bridges. As the world’s leading colonial power, Britain also had access to overseas markets. The cotton industry led the way as new

machines such as the spinning jenny and power loom enabled the British to produce cheap cotton goods. Most important was the steam engine, which led to factories and a system of steam-powered railroads that moved people and goods efficiently. The Great Exhibition of 1851 in London showed the world the achievements of Britain’s Industrial Revolution. Industrialization also spread to the Continent, and by 1860, the United States was also well along that road. In the non-Western world, industrial development was much slower, in large part because European colonial powers deliberately pursued a policy of preventing the growth of mechanized industry, thus keeping the colonies as purchasers of industrial products.

The Industrial Revolution also transformed the social world of Europe. The creation of an industrial proletariat produced a whole new force for change. The work environment, especially in the new factories and mines, was dreadful, characterized by long hours, unsafe conditions,



monotonous labor, and the use of child labor. Eventually, laws were passed to improve working conditions, especially for women and children. Labor unions were

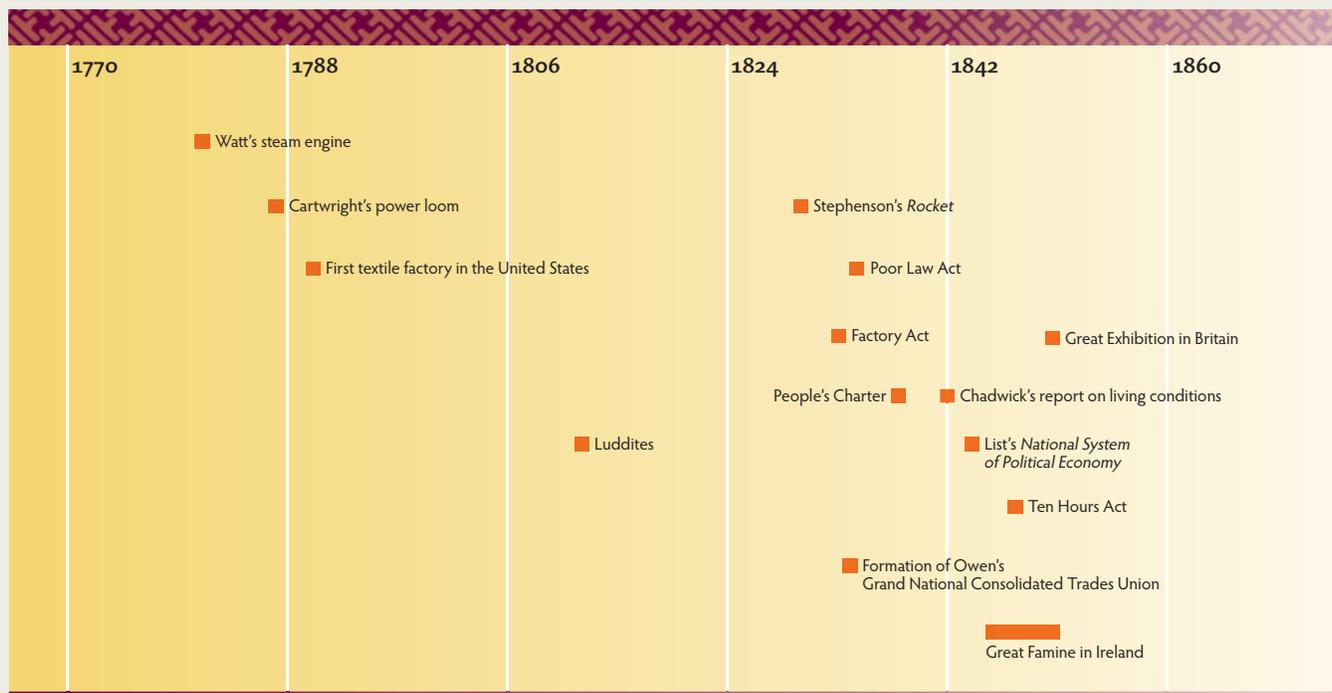
also formed to improve wages and conditions but met with limited success. Workers sometimes protested by destroying the factories and machines, as did the Luddites. The Chartist movement petitioned Parliament, calling for the right to vote and other reforms, but the members of Parliament refused their demands. The development of a wealthy industrial middle class presented a challenge to the long-term hegemony of landed wealth. Though that

wealth had been threatened by the fortunes of commerce, it had never been overturned. But the new bourgeoisie became more demanding, as we shall see in the next chapter.

The Industrial Revolution seemed to prove to Europeans the underlying assumption of the Scientific Revolution of the seventeenth century—that human beings were capable of dominating nature. By rationally manipulating the material environment for human benefit, people could attain new levels of material prosperity and produce machines not dreamed of in their wildest imaginings. Lost in the excitement of the Industrial Revolution were the voices that pointed to the dehumanization of the workforce and the alienation from one's work, one's associates, oneself, and the natural world.



## CHAPTER TIMELINE



## CHAPTER REVIEW

### Upon Reflection

Q What made the factory system possible, and why was it such an important part of the early industrial system? What impact did it have on the lives of workers?

Q How are changes in population growth and the increase in urbanization related to the Industrial Revolution?

Q What efforts did workers make to ameliorate the harsh working conditions of the early Industrial Revolution?

### Key Terms

- agricultural revolution** (p. 608)
- capital** (p. 608)
- pig iron** (p. 611)
- wrought iron** (p. 611)
- tariffs** (p. 617)
- cholera** (p. 625)
- trade unions** (p. 631)

## Suggestions for Further Reading

**GENERAL WORKS** The well-written work by **D. Landes**, *The Unbound Prometheus: Technological Change and Industrial Development in Western Europe from 1750 to the Present* (Cambridge, 1969), is a good introduction to the Industrial Revolution, but see also **J. Horn**, *The Industrial Revolution* (Westport, Conn., 2007), and **D. Fisher**, *The Industrial Revolution* (New York, 1992). On the “makers” of the Industrial Revolution, see **G. Weightman**, *The Industrial Revolutionaries: The Making of the Modern World, 1776–1914* (New York, 2007). For a broader perspective, see **P. Stearns**, *The Industrial Revolution in World History* (Boulder, Colo., 1993). On the Industrial Revolution in Britain, see **K. Morgan**, *The Birth of Industrial Britain: Social Change, 1750–1850* (New York, 2004); **P. Mathias**, *The First Industrial Nation: An Economic History of Britain, 1700–1914*, 3rd ed. (New York, 2001); and **R. Brown**, *Society and Economy in Modern Britain, 1700–1850* (London, 1991). On the Crystal Palace, see **J. A. Auerbach**, *The Great Exhibition of 1851: A Nation on Display* (New Haven, Conn., 1999), and **L. Kriegel**, *Grand Designs: Labor, Empire, and the Museum in Victorian Culture* (Durham, N.C., 2007). On the spread of industrialization to the Continent, see **T. Kemp**, *Industrialization in Nineteenth-Century Europe*, 2nd ed. (London, 1985).

**INDUSTRIALIZATION IN THE UNITED STATES** The early industrialization of the United States is examined in **B. Hindle** and **S. Lubar**, *Engines of Change: The American Industrial Revolution, 1790–1860* (Washington, D.C., 1986). On the economic ties between Great Britain and the United States, see **D. Jeremy**, *Transatlantic Industrial Revolution: The Diffusion of Textile Technology Between Britain and America, 1790–1830* (Cambridge, Mass., 1981).

**SOCIAL IMPACT OF INDUSTRIALIZATION** For an examination of urban growth, see the classic work of **A. F. Weber**, *The Growth*

*of Cities in the Nineteenth Century: A Study in Statistics* (Ithaca, N.Y., 1963); **J. G. Williamson**, *Coping with City Growth During the British Industrial Revolution* (Cambridge, 2002); and **L. D. Schwarz**, *London in the Age of Industrialization* (New York, 1992). **C. Kinealy**, *A Death-Dealing Famine: The Great Hunger in Ireland* (Chicago, 1997), is a good account of the great Irish tragedy, but see also **J. S. Donnelly**, *The Great Irish Potato Famine* (London, 2001). Many of the works cited here have much information on the social impact of the Industrial Revolution, but additional material is available in **F. Crouzet**, *The First Industrialists: The Problems of Origins* (Cambridge, 1985), on British entrepreneurs; **J. Merriman**, *The Margins of City Life* (New York, 1991), on French cities; **P. Pilbeam**, *The Middle Classes in Europe, 1789–1914* (Basingstoke, England, 1990); and **T. Koditschek**, *Class Formation and Urban Industrial Society* (New York, 1990). **G. Himmelfarb**, *The Idea of Poverty: England in the Early Industrial Age* (New York, 1984), traces the concepts of poverty and the poor from the mid-eighteenth century to the mid-nineteenth century. **M. J. Maynes**, *Taking the Hard Road* (Chapel Hill, N.C., 1995), offers a glimpse into the lives of workers. A classic work on female labor patterns is **L. A. Tilly** and **J. W. Scott**, *Women, Work, and Family* (New York, 1978). See also **J. Lown**, *Women and Industrialization: Gender at Work in Nineteenth-Century England* (Minneapolis, Minn., 1990); **J. Rendall**, *Women in an Industrializing Society: England, 1750–1880* (Oxford, 2002); and **K. Honeyman**, *Women, Gender, and Industrialization in England, 1700–1870* (New York, 2000). ↗



Visit the CourseMate website at [www.cengagebrain.com](http://www.cengagebrain.com) for additional study tools and review materials for this chapter.

## AP\* REVIEW QUESTIONS FOR CHAPTER 20

1. “As they could neither of them be of any further use, I released them from the firm and took the whole upon myself.” This statement most likely describes which group of people?
  - (A) socialists
  - (B) industrial entrepreneurs
  - (C) Marxists
  - (D) English nobles
  - (E) new urban workers
2. The Industrial Revolution began in England for all of the following reasons EXCEPT
  - (A) it had many navigable rivers allowing for easy transportation of goods.
  - (B) it had readily available capital as a result of a strong economy and an effective banking system.
  - (C) it had a mobile population free from traditional servitudes.
  - (D) it had support from the government in the form of parliamentary legislation.
  - (E) it had a larger population than other European countries.
3. An important factor that led to the Industrial Revolution in Great Britain was
  - (A) the agricultural revolution.
  - (B) the French Revolution.
  - (C) the growth of the urban population.
  - (D) Britain’s increased colonial holdings in North America.
  - (E) the influence of the Enlightenment thinkers.
4. The legislation that had the greatest impact in limiting child labor in England’s factories was
  - (A) the Factory Act of 1833.
  - (B) the Reform Act of 1832.
  - (C) the Ten Hours Act of 1847.
  - (D) the Coal Mines Act of 1842.
  - (E) the Trade Union Act of 1824.
5. Though their movement ultimately failed, the Chartists attempted to achieve
  - (A) an expansion of the franchise and political equality for women.
  - (B) effective reform in the area of child labor.
  - (C) social justice for those losing land to the enclosure movements.
  - (D) equality amongst workers in the industrial system.
  - (E) universal suffrage and payment for members of Parliament.
6. The First Industrial Revolution was concentrated mainly in the areas of
  - (A) gas lamps, coal production, and shipping.
  - (B) textiles, steam engines, and iron.
  - (C) petroleum, steel, and automobiles.
  - (D) farm equipment, railroads, and electricity.
  - (E) crop fertilizers, textiles, and heavy industry.
7. The eighteenth-century population explosion is mainly attributed to
  - (A) an increase in the birthrate after 1750.
  - (B) the rise of industrial production, which put less physical stress on workers.
  - (C) the end of the potato blight and the Great Irish Famine.
  - (D) a decline in the death rate due to greater food production and fewer wars.
  - (E) widespread inoculation against disease and cleaner cities.
8. The industrial workers of the mid-nineteenth century were often
  - (A) skilled men working in new factory towns.
  - (B) women who were paid half or less of what men received.
  - (C) unskilled, uneducated children.
  - (D) immigrants fleeing oppressive regimes in the countries of their birth.
  - (E) isolated colonists in the New World.
9. James Kay-Shuttleworth and Edwin Chadwick were reformers concerned with
  - (A) eradicating the Luddites from society.
  - (B) the emergence of new wealthy classes that rivaled the power of England’s nobles.
  - (C) the unsanitary and miserable living conditions of the working class that could potentially lead to violence.
  - (D) the resurgence of the bubonic plague in crowded industrial cities.
  - (E) increasing political representation of the working class in England.
10. The Combination Acts in England were enacted in an attempt to
  - (A) suppress workers’ trade unions.
  - (B) prohibit trade with the Ottoman Empire.
  - (C) prevent women from taking jobs that traditionally belonged to men.
  - (D) limit Irish immigration into England or France.
  - (E) prevent the establishment of secular schools.

11. The English laws that allowed common lands to be partitioned and sold off were known as the
- (A) Factory Acts.
  - (B) English poor laws.
  - (C) enclosure acts.
  - (D) industrialization acts.
  - (E) property laws.
12. Which statement best describes continental Europe's experience in the Industrial Revolution?
- (A) Great Britain's output of coal and iron was surpassed by the United States by the early nineteenth century.
  - (B) Though eastern Europe was late to industrialize, its textile output rivaled western Europe's by 1870.
  - (C) Whereas industrialization in Great Britain was based on textile production, on the Continent the iron and coal of heavy industry played the leading role.
  - (D) India, under the guiding hand of Great Britain, was able to rival British cotton production and thus became Great Britain's greatest competitor in textiles.
  - (E) Spain and Portugal united with Italy to create a Southern Industrial League that focused on building railroads and steam engines.
13. The Great Exhibition of 1851 was designed to
- (A) showcase British military superiority.
  - (B) promote nationalism in England.
  - (C) serve as a haven for intellectuals.
  - (D) promote the social welfare of British citizens.
  - (E) illustrate the industrial might and technological capabilities of Great Britain.
14. Which of the following best exemplifies urban living conditions in the early nineteenth century?
- (A) There was a sharp decline in diseases as doctors and medical care became more readily accessible to the masses.
  - (B) Governments played a proactive role in improving living conditions by upholding strict standards in housing and imposing steep fines on abusers.
  - (C) Urban living space was at a premium as the population continued to increase.
  - (D) Urban families enjoyed the rise of theater districts and readily available outdoor entertainment.
  - (E) Due to the great number of churches found in urban centers, urbanites tended to be more religious than those living in the countryside.