

Revolutions of Industrialization

1750–1914

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“Industrialization is, I am afraid, going to be a curse for mankind. . . . God forbid that India should ever take to industrialism after the manner of the West. The economic imperialism of a single tiny island kingdom (England) is today [1928] keeping the world in chains. If an entire nation of 300 millions took to similar economic exploitation, it would strip the world bare like locusts. . . . Industrialization on a mass scale will necessarily lead to passive or active exploitation of the villagers. . . . The machine produces much too fast.”¹

Such were the views of the famous Indian nationalist and spiritual leader Mahatma Gandhi, who subsequently led his country to independence from British colonial rule by 1947, only to be assassinated a few months later. However, few people anywhere have agreed with India’s heroic figure. Since its beginning in Great Britain in the late eighteenth century, the idea of industrialization, if not always its reality, has been embraced in every kind of society, both for the wealth it generates and for the power it conveys. Even Gandhi’s own country, once it achieved its independence, largely abandoned its founding father’s vision of small-scale, village-based handicraft manufacturing in favor of modern industry. As the twenty-first century dawned, India was moving rapidly to develop a major high-technology industrial sector. At that time, across the river from the site in New Delhi where Gandhi was cremated in 1948, a large power plant belched black smoke.

NO ELEMENT OF EUROPE’S MODERN TRANSFORMATION HELD A GREATER SIGNIFICANCE for the history of humankind than the Industrial Revolution, which took place initially in the century and a half between 1750 and 1900. It drew on the Scientific Revolution and accompanied

Industrial Britain: The dirt, smoke, and pollution of early industrial societies are vividly conveyed in this nineteenth-century engraving of a copper foundry in Wales. (The Art Archive at Art Resource, NY)

the unfolding legacy of the French Revolution to utterly transform European society and to propel Europe into a temporary position of global dominance. Not since the breakthrough of the Agricultural Revolution some 12,000 years ago had human ways of life been so fundamentally altered. But the Industrial Revolution, unlike its agricultural predecessor, began independently in only one place, Western Europe, and more specifically Great Britain. From there, it spread much more rapidly than agriculture, though very unevenly, to achieve a worldwide presence in less than 250 years. Far more than Christianity, democracy, or capitalism, Europe's Industrial Revolution has been enthusiastically welcomed virtually everywhere.

In any long-term reckoning, the history of industrialization is very much an unfinished story. It is hard to know whether we are at the beginning of a movement leading to worldwide industrialization, stuck in the middle of a world permanently divided into rich and poor countries, or approaching the end of an environmentally unsustainable industrial era. Whatever the future holds, this chapter focuses on the early stages of an immense transformation in the global condition of humankind.

In what ways did the Industrial Revolution mark a sharp break with the past? In what ways did it continue earlier patterns?

Explaining the Industrial Revolution

The global context for this epochal economic transformation lies in a very substantial increase in human numbers from about 375 million people in 1400 to about 1 billion in the early nineteenth century. Accompanying this growth in population was an emerging energy crisis, most pronounced in Western Europe, China, and Japan, as wood and charcoal, the major industrial fuels, became scarcer and their prices rose. In short, “global energy demands began to push against the existing local and regional ecological limits.”² In broad terms, the Industrial Revolution marks a human response to that dilemma as nonrenewable fossil fuels such as coal, oil, and natural gas replaced the earlier reliance on the endlessly renewable energy sources of wind, water, wood, and the muscle power of people and animals. It was a breakthrough of unprecedented proportions that made available for human use, at least temporarily, immensely greater quantities of energy.

It also wrought, of course, a mounting impact on the environment. The massive extraction of nonrenewable raw materials to feed and to fuel industrial machinery—coal, iron ore, petroleum, and much more—altered the landscape in many places. Sewers and industrial waste emptied into rivers, turning them into poisonous cesspools. In 1858, the Thames River running through London smelled so bad that the British House of Commons had to suspend its session. Smoke from coal-fired industries and domestic use polluted the air in urban areas and sharply increased the incidence of respiratory illness. (See the chapter-opening image on p. 566.) Against these conditions a number of individuals and small groups raised their voices. Romantic poets such as William Blake and William Wordsworth inveighed against the “dark satanic mills” of industrial England and nostalgically urged a return to the “green and pleasant

A Map of Time

1712	Early steam engine in Britain
1780s	Beginning of British Industrial Revolution
1812	Locomotives first used to haul coal in England
1832	Reform Bill gave vote to middle-class men in England
1848	Karl Marx, <i>The Communist Manifesto</i>
1850s	Beginning of railroad building in Argentina, Cuba, Chile, Brazil
1861	Freeing of serfs in Russia
1864–1876	First International socialist organization in Europe
After 1865	Rapid growth of U.S. industrialization
After 1868	Take-off of Japanese industrialization
1869	Opening of transcontinental railroad across United States
1871	Unification of Germany
1889–1916	Second International socialist organization in Europe
1890s	Rapid growth of Russian industrialization
1891–1916	Building of trans-Siberian railroad
1905	Failed revolution in Russia
1910–1920	Mexican Revolution
1917	Russian Revolution

land” of an earlier time. Here were early and local signs of what became by the late twentieth century an issue of unprecedented and global proportions. For many historians, the Industrial Revolution marked a new era in both human history and the history of the planet that scientists increasingly call the Anthropocene, or the “age of man.” Increasingly, human industrial activity left a mark not only on human society but also on the ecological, atmospheric, and geological history of the earth.

More immediately and more obviously, however, access to huge new sources of energy gave rise to an enormously increased output of goods and services. In Britain, where the Industrial Revolution began, industrial output increased some fifty-fold between 1750 and 1900. It was a wholly unprecedented and previously unimaginable jump in the capacity of human societies to produce wealth. Lying behind it was a great acceleration in the rate of technological innovation, not simply this or that invention—the spinning jenny, power loom, steam engine, or cotton gin—but a “culture of innovation,” a widespread and almost obsessive belief that things could be endlessly improved.

Early signs of the technological creativity that spawned the Industrial Revolution appeared in eighteenth-century Britain, where a variety of innovations transformed cotton textile production. It was only in the nineteenth century, though, that Europeans in general and the British in particular more clearly forged ahead of the rest of the world. The great breakthrough was the coal-fired steam engine, which provided an inanimate and almost limitless source of power beyond that of wind, water, or muscle and could be used to drive any number of machines as well as locomotives and oceangoing ships. Soon the Industrial Revolution spread beyond the textile industry to iron and steel production, railroads and steamships, food processing, and construction. Later in the nineteenth century, a so-called second Industrial Revolution focused on chemicals, electricity, precision machinery, the telegraph and telephone, rubber, printing, and much more. Agriculture too was affected as mechanical reapers, chemical fertilizers, pesticides, and refrigeration transformed this most ancient of industries. Technical innovation occurred in more modest ways as well. Patents for horseshoes in the United States, for example, grew from fewer than five per year before 1840 to thirty to forty per year by the end of the century. Furthermore, industrialization soon spread beyond Britain to continental Western Europe and then, in the second half of the century, to the United States, Russia, and Japan.

In the twentieth century, the Industrial Revolution became global as a number of Asian, African, and Latin American countries developed substantial industrial sectors. Oil, natural gas, and nuclear reactions joined coal as widely available sources of energy, and new industries emerged in automobiles, airplanes, consumer durable goods, electronics, computers, and on and on. It was a cumulative process that, despite periodic ups and downs, accelerated over time. More than anything else, this continuous emergence of new techniques of production, together with the massive economic growth they made possible and the environmental impact they generated, mark the past 250 years as a distinct phase of human history.

Why Europe?

The Industrial Revolution has long been a source of great controversy among scholars. Why did it occur first in Europe? Within Europe, why did it occur earliest in Great Britain? And why did it take place in the late eighteenth and nineteenth centuries? Some explanations have sought the answer in unique and deeply rooted features of European society, history, or culture. One recent account, for example, argued that Europeans have been distinguished for several thousand years by a restless, creative, and freedom-loving culture with its roots in the aristocratic war-like societies of early Indo-European invaders.³ While not denying certain distinctive qualities of the West, many world historians have challenged views that seem to suggest that Europe alone was destined to lead the way to modern economic life. Such an approach, they argue, is not only Eurocentric and deterministic but also flies in the face of much recent research.

Historians now know that other areas of the world had experienced times of great technological and scientific flourishing. Between 750 and 1100 C.E., the Islamic world

■ Change

In what respects did the roots of the Industrial Revolution lie within Europe? In what ways did that transformation have global roots?

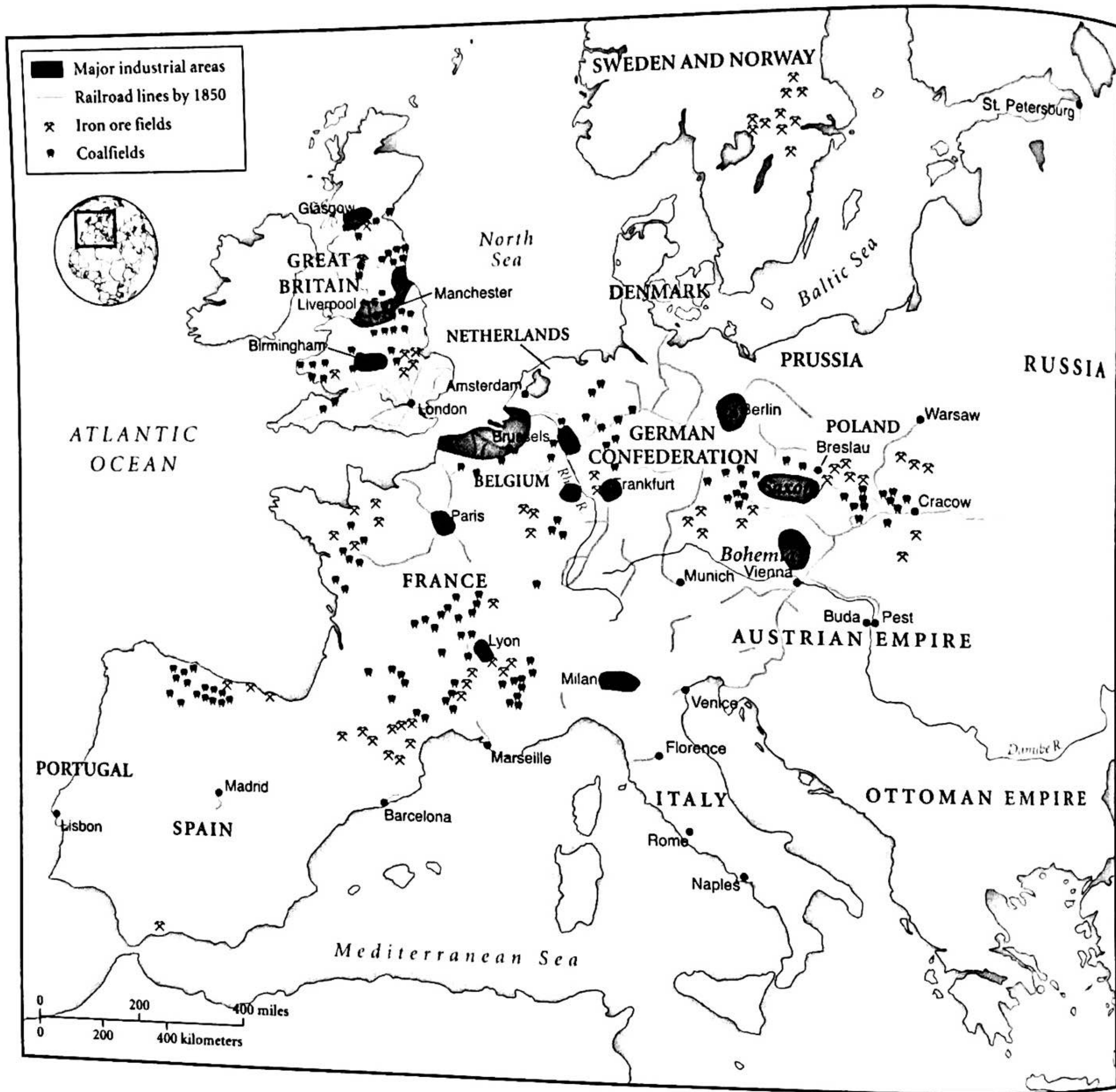
generated major advances in shipbuilding, the use of tides and falling water to generate power, papermaking, textile production, chemical technologies, water mills, clocks, and much more.⁴ India had long been the world center of cotton textile production, the first place to turn sugarcane juice into crystallized sugar, and the source of many agricultural innovations and mathematical inventions. To the Arabs of the ninth century C.E., India was a “place of marvels.”⁵ More than either of these, China was clearly the world leader in technological innovation between 700 and 1400 C.E., prompting various scholars to suggest that China was on the edge of an industrial revolution by 1200 or so. For reasons much debated among historians, all of these flowerings of technological creativity had slowed down considerably or stagnated by the early modern era, when the pace of technological change in Europe began to pick up. But their earlier achievements certainly suggest that Europe was not alone in its capacity for technological innovation.

Nor did Europe enjoy any overall economic advantage as late as 1750. Over the past several decades, historians have carefully examined the economic conditions of various Eurasian societies in the eighteenth century and found “a world of surprising resemblances.” Economic indicators such as life expectancies, patterns of consumption and nutrition, wage levels, general living standards, widespread free markets, and prosperous merchant communities suggest broadly similar conditions across the major civilizations of Europe and Asia.⁶ Thus Europe had no obvious economic lead, even on the eve of the Industrial Revolution. Rather, according to one leading scholar, “there existed something of a global economic parity between the most advanced regions in the world economy.”⁷

A final reason for doubting a unique European capacity for industrial development lies in the relatively rapid spread of industrial techniques to many parts of the world over the past 250 years, a fairly short time by world history standards. Although the process has been highly uneven, industrialization has taken root, to one degree or another, in Japan, China, India, Brazil, Mexico, Indonesia, South Africa, Saudi Arabia, Thailand, South Korea, and elsewhere. Such a pattern weakens any suggestion that European culture or society was exceptionally compatible with industrial development.

Thus, while sharp debate continues, many contemporary historians are inclined to see the Industrial Revolution erupting rather quickly and quite unexpectedly between 1750 and 1850 (see Map 17.1). Two intersecting factors help to explain why this process occurred in Europe rather than elsewhere. One lies in certain patterns of Europe’s internal development that favored innovation. Its many small and highly competitive states, taking shape in the twelfth or thirteenth centuries, arguably provided an “insurance against economic and technological stagnation,” which the larger Chinese, Ottoman, or Mughal empires perhaps lacked.⁸ If so, then Western Europe’s failure to re-create the earlier unity of the Roman Empire may have acted as a stimulus to innovation.

Furthermore, the relative newness of these European states and their monarchs’ desperate need for revenue in the absence of an effective tax-collecting bureaucracy pushed European royals into an unusual alliance with their merchant classes. Small



Map 17.1 The Early Phase of Europe's Industrial Revolution

From its beginning in Great Britain, industrialization spread by 1850 across western Europe to include parts of France, Germany, Belgium, Bohemia, and Italy.

groups of merchant capitalists might be granted special privileges, monopolies, or even tax-collecting responsibilities in exchange for much-needed loans or payments to the state. It was therefore in the interest of governments to actively encourage commerce and innovation. Thus states granted charters and monopolies to private trading companies, and governments founded scientific societies and offered prizes to promote innovation. In this way, European merchants and other innovators from the fifteenth century onward gained an unusual degree of freedom from state control and in some places a higher social status than their counterparts in more established civilizations. In Venice and Holland, merchants actually controlled the state. By the eighteenth century, major Western European societies were highly commercialized and governed

by states generally supportive of private commerce. In short, they were well on their way toward capitalist economies—where buying and selling on the market was a widely established practice—before they experienced industrialization. Such internally competitive economies, coupled with a highly competitive system of rival states, arguably fostered innovation in the new civilization taking shape in Western Europe.

Europe's societies, of course, were not alone in developing market-based economies by the eighteenth century. Japan, India, and especially China were likewise highly commercialized or market driven. However, in the several centuries after 1500, Western Europe was unique in another way. That region alone "found itself at the hub of the largest and most varied network of exchange in history."⁹ Widespread contact with culturally different peoples was yet another factor that historically has generated extensive change and innovation. This new global network, largely the creation of Europeans themselves, greatly energized commerce and brought Europeans into direct contact with peoples around the world.

For example, Asia, home to the world's richest and most sophisticated societies, was the initial destination of European voyages of exploration. The German philosopher Gottfried Wilhelm Leibniz (1646-1716) encouraged Jesuit missionaries in China "not to worry so much about getting things European to the Chinese but rather about getting remarkable Chinese inventions to us."¹⁰ Inexpensive and well-made Indian textiles began to flood into Europe, causing one English observer to note: "Almost everything that used to be made of wool or silk, relating either to dress of the women or the furniture of our houses, was supplied by the Indian trade."¹¹ The competitive stimulus of these Indian cotton textiles was certainly one factor driving innovation in the British textile industry. Likewise, the popularity of Chinese porcelain and Japanese lacquerware prompted imitation and innovation in England, France, and Holland.¹² Thus competition from desirable, high-quality, and newly available Asian goods played a role in stimulating Europe's Industrial Revolution.

In the Americas, Europeans found a windfall of silver that allowed them to operate in Asian markets. They also found timber, fish, maize, potatoes, and much else to sustain a growing population. Later, slave-produced cotton supplied an emerging textile industry with its key raw material at low prices, while sugar, similarly produced with slave labor, furnished cheap calories to European workers. "Europe's Industrial Revolution," concluded historian Peter Stearns, "stemmed in great part from Europe's ability to draw disproportionately on world resources."¹³ The new societies of the Americas further offered a growing market for European machine-produced goods and generated substantial profits for European merchants and entrepreneurs. None of the other empires of the early modern era enriched their imperial heartlands so greatly or provided such a spur to technological and economic growth.

Thus the intersection of new, highly commercialized, competitive European societies with the novel global network of their own making provides a context for understanding Europe's Industrial Revolution. Commerce and cross-cultural exchange, acting in tandem, sustained the impressive technological changes of the first industrial societies.

■ Comparison

What was distinctive about Britain that may help to explain its status as the breakthrough point of the Industrial Revolution?

Why Britain?

If the Industrial Revolution was initially a Western European phenomenon generally, it clearly began in Britain in particular. The world's first Industrial Revolution unfolded spontaneously in a country that concentrated some of the more general features of European society. It was both unplanned and unexpected.

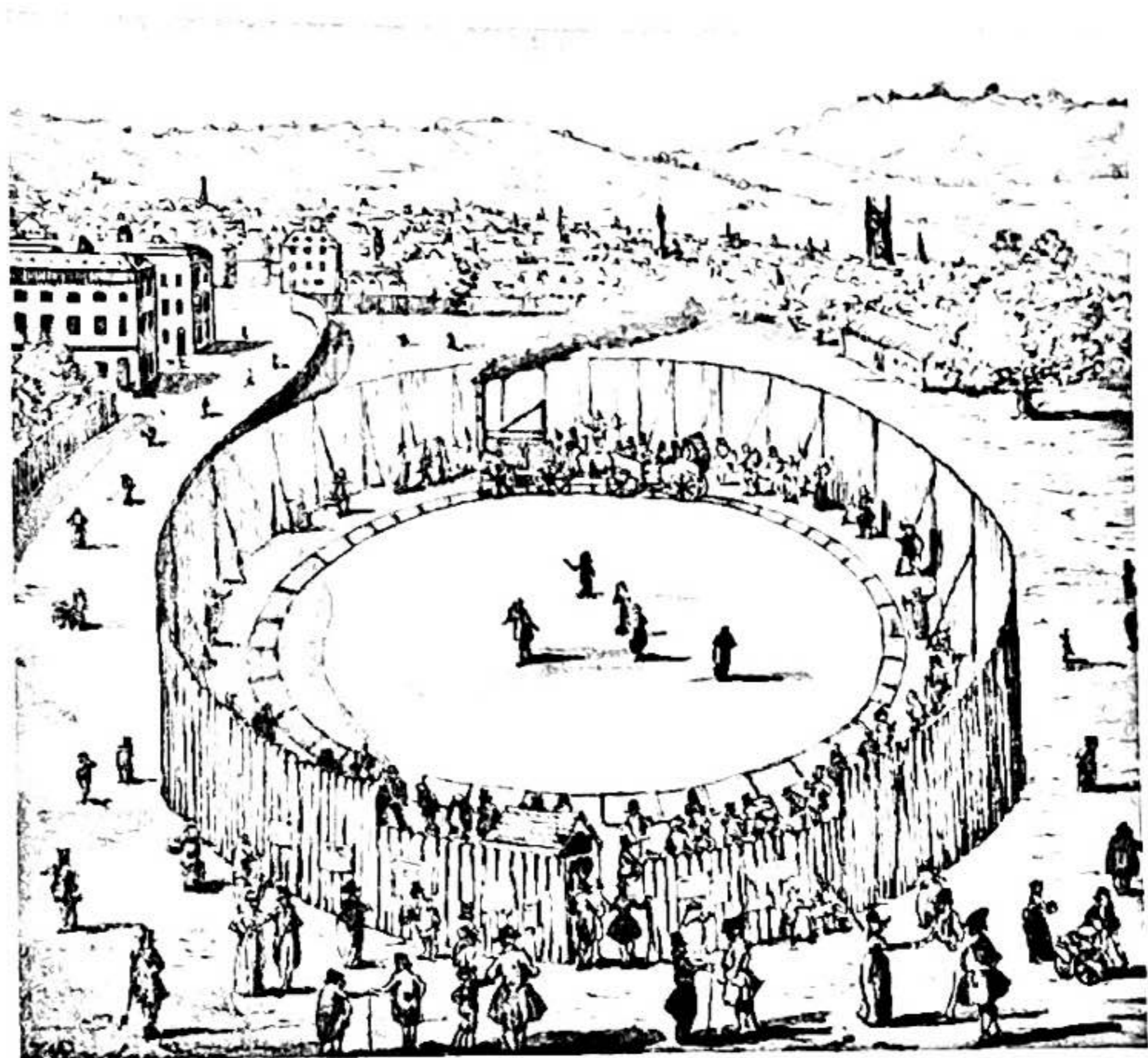
With substantial imperial possessions in the Caribbean, in North America, and, by the late eighteenth century, in India as well, Britain was the most highly commercialized of Europe's larger countries. Its landlords had long ago "enclosed" much agricultural land, pushing out the small farmers and producing for the market. A series of agricultural innovations—crop rotation, selective breeding of animals, lighter plows, higher-yielding seeds—increased agricultural output, kept food prices low, and freed up labor from the countryside. The guilds, which earlier had protected Britain's urban artisans, had largely disappeared by the eighteenth century, allowing employers to run their manufacturing enterprises as they saw fit. Coupled with a rapidly growing population, these processes ensured a ready supply of industrial workers who had few alternatives available to them. Furthermore, British aristocrats, unlike their counterparts in Europe, had long been interested in the world of business, and some took part in new mining and manufacturing enterprises. British commerce, moreover, extended around the world, its large merchant fleet protected by the Royal Navy. The wealth of empire and global commerce, however, were not themselves sufficient for spawning the Industrial Revolution, for Spain, the earliest beneficiary of American wealth, was one of the slowest industrializing European countries into the twentieth century.

British political life encouraged commercialization and economic innovation. Its policy of religious toleration, formally established in 1688, welcomed people with technical skills regardless of their faith, whereas France's persecution of its Protestant minority had chased out some of its most skilled workers. The British government favored men of business with tariffs that kept out cheap Indian textiles, with laws that made it easy to form companies and to forbid workers' unions, with roads and canals that helped create a unified internal market, and with patent laws that served to protect the interests of inventors. Checks on royal authority—trial by jury and the growing authority of Parliament, for example—provided a freer arena for private enterprise than elsewhere in Europe.

Europe's Scientific Revolution also took a distinctive form in Great Britain in ways that fostered technological innovation.¹⁴ Whereas science on the continent was largely based on logic, deduction, and mathematical reasoning, in Britain it was much more concerned with observation, experiment, precise measurements, mechanical devices, and practical commercial applications. Discoveries about atmospheric pressure and vacuums, for example, played an important role in the invention and improvement of the steam engine. Even though most inventors were artisans or craftsmen rather than scientists, in eighteenth-century Britain they were in close contact with scientists, makers of scientific instruments, and entrepreneurs, whereas in continental

Europe these groups were largely separate. The British Royal Society, an association of “natural philosophers” (scientists) established in 1660, saw its role as one of promoting “useful knowledge.” To this end, it established “mechanics’ libraries,” published broadsheets and pamphlets on recent scientific advances, and held frequent public lectures and demonstrations. The integration of science and technology became widespread and permanent after 1850, but for a century before, it was largely a British phenomenon.

Finally, several accidents of geography and history contributed something to Britain’s Industrial Revolution. The country had a ready supply of coal and iron ore, often located close to each other and within easy reach of major industrial centers. Although Britain took part in the wars against Napoleon, the country’s island location protected it from the kind of invasions that so many continental European states experienced during the era of the French Revolution. Moreover, Britain’s relatively fluid society allowed for adjustments in the face of social changes without widespread revolution. By the time the dust settled from the immense disturbance of the French Revolution, Britain was well on its way to becoming the world’s first industrial society.



Railroads

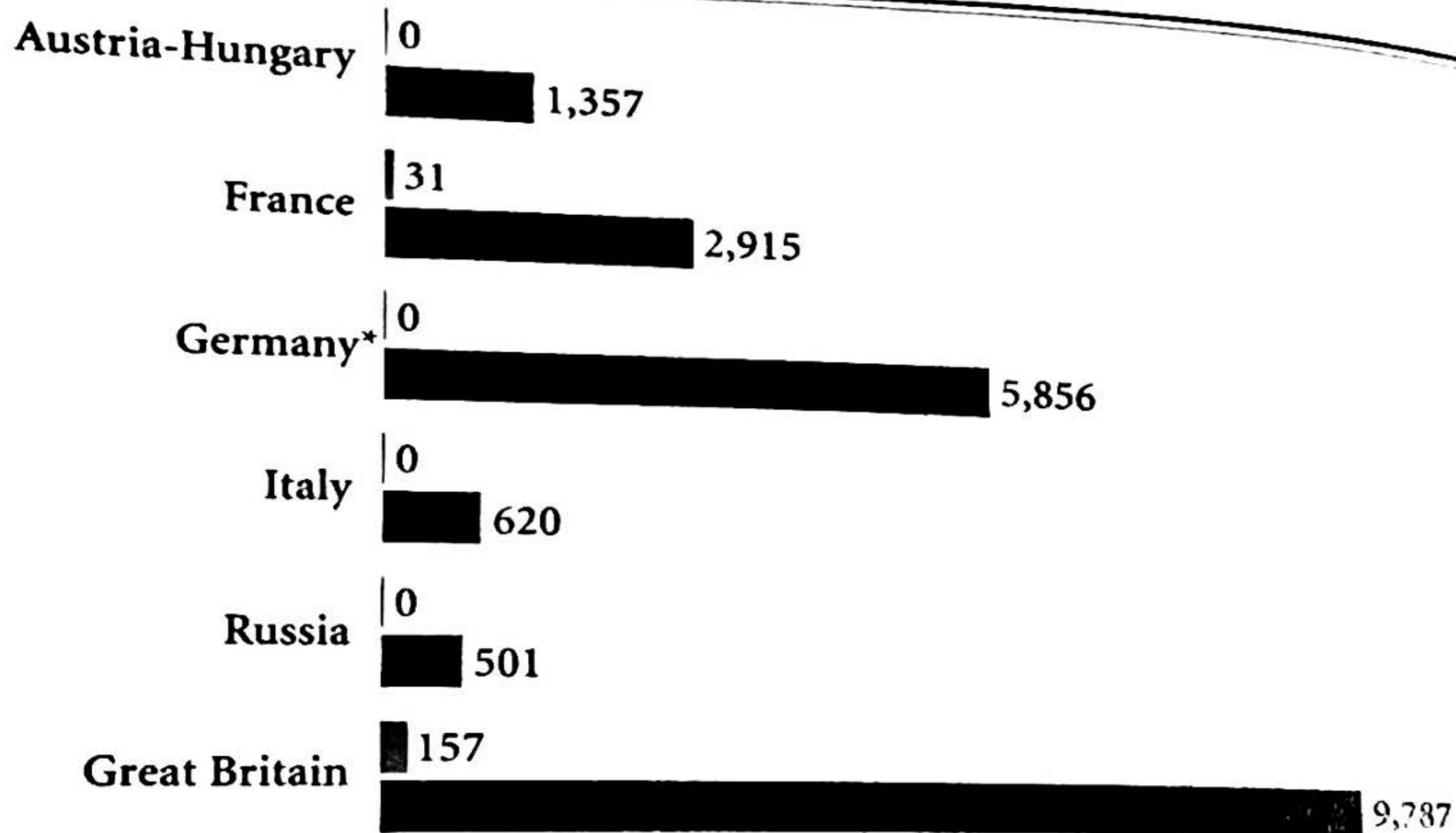
The popularity of railroads, long a symbol of the Industrial Revolution, is illustrated in this early-nineteenth-century watercolor, which shows a miniature train offered as a paid amusement for enthusiasts in London’s Euston Square. (Science Museum, London, UK/The Bridgeman Art Library)

The First Industrial Society

Wherever it took hold, the Industrial Revolution generated, within a century or less, an economic miracle, at least in comparison with earlier technologies. The British textile industry, which used 52 million pounds of cotton in 1800, consumed 588 million pounds in 1850. Britain’s output of coal soared from 5.23 million tons in 1750 to 68.4 million tons a century later.¹⁵ Railroads crisscrossed Britain and much of Europe like a giant spider web (see Map 17.1, p. 572). Most of this dramatic increase in production occurred in mining, manufacturing, and services. Thus agriculture, for millennia the overwhelmingly dominant economic sector in every civilization, shrank in relative importance. In Britain, for example, agriculture generated only 8 percent of national income in 1891 and employed fewer than 8 percent of working Britons in 1914. Accompanying this vast economic change was an epic transformation of social life. “In two centuries,” wrote one prominent historian, “daily life changed more than it had in the 7,000 years before.”¹⁶ Nowhere were the revolutionary dimensions of industrialization more apparent than in Great Britain, the world’s first industrial society.

Snapshot Measuring the Industrial Revolution¹⁷

Railroads are one useful measure of industrial development. This graph illustrates both Britain's head start and the beginning catch-up efforts of other countries.



*German states that formed a unified Germany in 1871, including Prussia but not Austria.

Railroad Lines (in kilometers)

1830

1850

most of it leased to tenant farmers, who in turn employed agricultural wage laborers to work it. Rapidly growing population and urbanization sustained a demand for food products grown on that land. For most of the nineteenth century, landowners continued to dominate the British Parliament.

As a class, however, the British aristocracy declined as a result of the Industrial Revolution, as have large landowners in every industrial society. As urban wealth became more important, landed aristocrats had to make way for the up-and-coming businessmen, manufacturers, and bankers, newly enriched by the Industrial Revolution. The aristocracy's declining political clout was demonstrated in the 1840s when high tariffs on foreign agricultural imports, designed to protect the interests of British landlords, were finally abolished. By the end of the century, landownership had largely ceased to be the basis of great wealth, and businessmen, rather than aristocrats, led the major political parties. Even so, the titled nobility of dukes, earls, viscounts, and barons retained great social prestige and considerable personal wealth. Many among them found an outlet for their energies and opportunities for status and enrichment in the vast domains of the British Empire, where they went as colonial administrators or settlers. Famously described as a "system of outdoor relief for the aristocracy," the empire provided a cushion for a declining class.

The Middle Classes

Those who benefited most conspicuously from industrialization were members of that amorphous group known as the middle class. At its upper levels, this middle class contained extremely wealthy factory and mine owners, bankers, and merchants. Such rising businessmen readily assimilated into aristocratic life, buying country houses, obtaining seats in Parliament, sending their sons to Oxford or Cambridge University, and gratefully accepting titles of nobility from Queen Victoria.

Far more numerous were the smaller businessmen, doctors, lawyers, engineers, teachers, journalists, scientists, and other professionals required in any industrial society. Such people set the tone for a distinctly middle-class society with its own values and outlooks. Politically they were liberals, favoring constitutional government, private property, free trade, and social reform within limits. Their agitation resulted in the Reform Bill of 1832, which broadened the right to vote to many men of the middle class, but not to middle-class women. Ideas of thrift and hard work, a rigid morality, and cleanliness characterized middle-class culture. The central value of that culture was "respectability," a term that combined notions of social status and virtuous behavior. Nowhere were these values more effectively displayed than in the Scotsman Samuel Smiles's famous book *Self-Help*, published in 1859. Individuals are responsible for their own destiny, Smiles argued. An hour a day devoted to self-improvement "would make an ignorant man wise in a few years." According to Smiles, this enterprising spirit was what distinguished the prosperous middle class from Britain's poor. The misery of the poorer classes was "voluntary and self-imposed—the results of idleness, thriftlessness, intemperance, and misconduct."¹⁹

■ Change

How did the Industrial Revolution transform British society?

■ Change

How did Britain's middle classes change during the nineteenth century?

Women in such middle-class families were increasingly cast as homemakers, wives, and mothers, charged with creating an emotional haven for their men and a refuge from a heartless and cutthroat capitalist world. They were also expected to be the moral centers of family life, the educators of “respectability,” and the managers of household consumption as “shopping”—a new concept in eighteenth-century Britain—became a central activity for the middle classes. An “ideology of domesticity” defined homemaking, child rearing, charitable endeavors, and “refined” activities such as embroidery, music, and drawing as the proper sphere for women, while paid employment and public sphere of life outside the home beckoned to men.

Male elites in many civilizations had long established their status by detaching women from productive labor. The new wealth of the Industrial Revolution now allowed larger numbers of families to aspire to that kind of status. With her husband as “provider,” such a woman was now a “lady.” “She must not work for profit,” wrote the Englishwoman Margaretta Greg in 1853, “or engage in any occupation that money can command.”²⁰ Employing even one servant became a proud marker of such middle-class status. But the withdrawal of middle-class women from the labor force turned out to be only a temporary phenomenon. By the late nineteenth century, some middle-class women began to enter the teaching, clerical, and nursing professions, and in the second half of the twentieth century, educated middle-class women flooded into the labor force. By contrast, the withdrawal of children from productive labor into schools has proved a more enduring phenomenon as industrial economies increasingly required a more educated workforce.

As Britain’s industrial economy matured, it also gave rise to a sizable lower middle class, which included people employed in the growing service sector as clerks, salespeople, bank tellers, hotel staff, secretaries, telephone operators, police officers, and the like. By the end of the nineteenth century, this growing segment of the middle class represented about 20 percent of Britain’s population and provided new employment opportunities for women as well as men. In just twenty years (1881–1901), the number of female secretaries in Britain rose from 7,000 to 90,000. Almost all were single and expected to return to the home after marriage. Telephone operators had initially been boys or men, but by the end of the nineteenth century in both Britain and the United States that work had become a wholly female occupation. For both men and women, such employment represented a claim on membership in the larger middle class and a means of distinguishing themselves clearly from a working class tainted by manual labor.

The Industrial Middle Class

This late-nineteenth-century painting shows a prosperous French middle-class family, attended by a servant.

(Bridgeman Art Library/
SuperStock, Inc.)



The Laboring Classes

The overwhelming majority of Britain's nineteenth-century population—some 70 percent or more—were neither aristocrats nor members of the middle classes. They were manual workers in the mines, ports, factories, construction sites, workshops, and farms of an industrializing Britain. Although their conditions varied considerably and changed over time, it was the laboring classes who suffered most and benefited least from the epic transformations of the Industrial Revolution. Their efforts to accommodate, resist, protest, and change those conditions contributed much to the texture of the first industrial society.

The lives of the laboring classes were shaped primarily by the new working conditions of the industrial era. Chief among those conditions was rapid urbanization. Liverpool's population alone grew from 77,000 to 400,000 in the first half of the nineteenth century. By 1851, a majority of Britain's population lived in towns and cities, an enormous change from the overwhelmingly rural life of almost all previous civilizations. By the end of the century, London was the world's largest city, with more than 6 million inhabitants.

These cities were vastly overcrowded and smoky, with wholly inadequate sanitation, periodic epidemics, endless row houses and warehouses, few public services or open spaces, and inadequate and often polluted water supplies. This was the environment in which most urban workers lived in the first half of the nineteenth century. By 1850, the average life expectancy in England was only 39.5 years, less than it had been some three centuries earlier. Nor was there much personal contact between the rich and the poor of industrial cities. Benjamin Disraeli's novel *Sybil*, published in 1845, described these two ends of the social spectrum as "two nations between whom there is no intercourse and no sympathy; who are ignorant of each other's habits, thoughts and feelings, as if they were dwellers in different zones or inhabitants of different planets."

The industrial factories to which growing numbers of desperate people looked for employment offered a work environment far different from the artisan's shop or the tenant's farm. (See the Portrait of Ellen Johnston



DEATH'S DISPENSARY.

OPEN TO THE POOR, GRATIS, BY FELLOWSHIP OF THE PARISH.

The Urban Poor of Industrial Britain

This 1866 political cartoon shows an impoverished urban family forced to draw its drinking water from a polluted public well, while a figure of Death operates the pump. (The Granger Collection, New York)

PORTRAIT

Ellen Johnston, Factory Worker and Poet

Born around 1835 to a working-class family in an industrializing Scotland, Ellen Johnston worked in a variety of textile mills throughout her life, lived as a single mother, and most unusually became a published poet with a modest local reputation. Through her brief autobiography and her poetry, we can catch a glimpse of one working-class woman's experience during Britain's Industrial Revolution.²¹

Shortly after her birth, Ellen's father, a stonemason, decided to emigrate to America. Her mother, however, refused to join him and returned to her father's house with her young daughter, where she supported her small family as a dress-maker. Ellen remembered those early years with pleasure, wandering the area with her doll and her dog. When she was eight, her mother remarried an abusive man, who forced young Ellen into factory work a few years later. "No language can paint the suffering," she wrote about her stepfather, "which I afterwards endured from my tormentor." She repeatedly ran away from his home and entered into a love



A young British woolen factory worker in a setting similar to that in which Ellen Johnston labored. (Science and Society/Superstock)

affair that left her a single mother at age seventeen. Nonetheless, in a time of expanding literacy, Ellen read widely, calling herself a "self-taught scholar." She especially liked to read "love adventures" and developed a romantic image of herself as a "heroine of the modern style." She also began to write poetry for the "penny press," inexpensive newspapers of the region.

Ellen's troubled home life made her resistant to the emerging ideology of domesticity, which defined women's roles as tranquil homemakers, wives, and mothers, a view that was taking hold even within the working classes by the mid-nineteenth century. "Fallen women"—those who gave birth outside of marriage—were considered beyond the confines of "true womanhood" and were generally expected to withdraw from public life in disgrace. Ellen Johnston, however, was unrepentant. "I did not . . . feel inclined to die," she wrote, "when I could no longer conceal what the world falsely calls a woman's shame." Descriptions of home life in her writing are al-

above, for another view of factory work.) Long hours, low wages, and child labor were nothing new for the poor, but the routine and monotony of work, dictated by the factory whistle and the needs of machines, imposed novel and highly unwelcome conditions of labor. Also objectionable were the direct and constant supervision and the rules and fines aimed at enforcing work discipline. The ups and downs of a capitalist economy made industrial work insecure as well as onerous.

In the early decades of the nineteenth century, Britain's industrialists favored girls and young unmarried women as employees in the textile mills, for they were often willing to accept lower wages, while male owners believed them to be both docile and more suitable for repetitive tasks such as tending machines. A gendered hierarchy of labor emerged in these factories with men in supervisory and more skilled

most always negative. Referring to her aunt's marriage to an alcoholic, she wrote: "Now the dark cup of sorrow embitters thy life / To a hard hearted drunkard, ah! thou art a wife."

Johnston supported herself and her daughter by working intermittently in the textile mills of industrial Scotland, occasionally withdrawing for health reasons or to write poetry that she signed as "the factory girl." Through her poetry, Johnston made clear her awareness of the inequalities and exploitation of industrial life, writing in one poem: "It is the puir [poor] man's hard-won toil that fills the rich man's purse . . . / What care the gentry if they're well, though all the poor would die." Another poem urged unionization for boat builders and boilermakers.

In response to industrial misery, however, Johnston did not advocate for socialism or revolutionary upheaval. Rather, she implicitly called on the "master" of the mill to behave in a benevolent fashion toward his employees and to create within the factory a sense of community. At times she recited her poetry at factory-organized gatherings, sometimes toasting the owner: "May he still have wealth; may we still have health / To remain his servants of toil."

On a personal level, this "factory girl" stood up for herself, at one point taking her foreman to court to recover a week's wages when she was fired without notice.

But it was within the factory, not the family, that Johnston found emotional and personal satisfaction. In the mills, she discovered camaraderie, an emotional and spiritual home, and a status higher than that of domestic labor, which was the lot of so many young working-class women. Celebrating one of the factories where she worked, Johnston proclaimed: "I would not leave thee, dear beloved place / A crown, a sceptre, or a throne to grace, / To be a queen—the nation's flag unfurl— / A thousand times I'd be a Factory Girl!"

Johnston had hoped to make her living as a poet and thus escape the poverty to which factory wages condemned her. She did receive occasional financial support from upper-class benefactors, including a small gift from Queen Victoria, and a published collection of her work appeared in 1867. She was, however, aware that both class and gender made it difficult for her to win acceptance among middle- and upper-class members of the literary establishment, a recognition expressed in her writing. "I am so small I cannot shine / Amidst the great that read my rhyme." In 1870, only a year after the publication of the second edition of her book of poetry, she had to apply for "poor relief," and in 1874, Ellen Johnston died in a Scottish poorhouse, not yet forty years of age.

Question: How would you describe Ellen Johnston's outlook on industrial Britain?

positions, while women occupied the less skilled and "lighter" jobs that offered little opportunity for advancement. Nor were women welcome in the unions that eventually offered men some ability to shape the conditions under which they labored.

Thus, unlike their middle-class counterparts, many girls and young women of the laboring classes engaged in industrial work or found jobs as domestic servants for upper- and middle-class families to supplement meager family incomes. But after marriage, they too usually left outside paid employment because a man who could not support his wife was widely considered a failure. Within the home, however, many working-class women continued to earn money by taking in boarders, doing laundry, or sewing clothes in addition to the domestic and child-rearing responsibilities long assigned to women.

Social Protest

For workers of the laboring classes, industrial life “was a stony desert, which they had to make habitable by their own efforts.”²² Such efforts took many forms. By 1815, about 1 million workers, mostly artisans, had created a variety of “friendly societies.” With dues contributed by members, these working-class self-help groups provided insurance against sickness, a decent funeral, and an opportunity for social life in an otherwise bleak environment. Other skilled artisans, who had been displaced by machine-produced goods and forbidden to organize in legal unions, sometimes wrecked the offending machinery and burned the mills that had taken their jobs. The class consciousness of working people was such that one police informer reported that “most every creature of the lower order both in town and country are on their side.”²³

Others acted within the political arena by joining movements aimed at obtaining the vote for working-class men, a goal that was gradually achieved in the second half of the nineteenth century. When trade unions were legalized in 1824, growing numbers of factory workers joined these associations in their efforts to achieve better wages and working conditions. Initially their strikes, attempts at nationwide organization, and threat of violence made them fearful indeed to the upper classes. One British newspaper in 1834 described unions as “the most dangerous institutions that were ever permitted to take root, under shelter of law, in any country,”²⁴ although they later became rather more “respectable” organizations.

Socialist ideas of various kinds gradually spread within the working class, challenging the assumptions of a capitalist society. Robert Owen (1771–1858), a wealthy British cotton textile manufacturer, urged the creation of small industrial communities where workers and their families would be well treated. He established one such community, with a ten-hour workday, spacious housing, decent wages, and education for children, at his mill in New Lanark in Scotland.

Of more lasting significance was the socialism of Karl Marx (1818–1883). German by birth, Marx spent much of his life in England, where he witnessed the brutal conditions of Britain’s Industrial Revolution and wrote voluminously about history and economics. His probing analysis led him to the conclusion that industrial capitalism was an inherently unstable system, doomed to collapse in a revolutionary upheaval that would give birth to a classless socialist society, thus ending forever the ancient conflict between rich and poor.

In his writings, the combined impact of Europe’s industrial, political, and scientific revolutions found expression. Industrialization created both the social conditions against which Marx protested so bitterly and the enormous wealth he felt would make socialism possible. The French Revolution, still a living memory in Marx’s youth, provided evidence that grand upheavals, giving rise to new societies, had in fact taken place and could do so again. Moreover, Marx regarded himself as a scientist, discovering the laws of social development in much the same fashion as Newton discovered the laws of motion. His was therefore a “scientific socialism,” embedded

■ Change

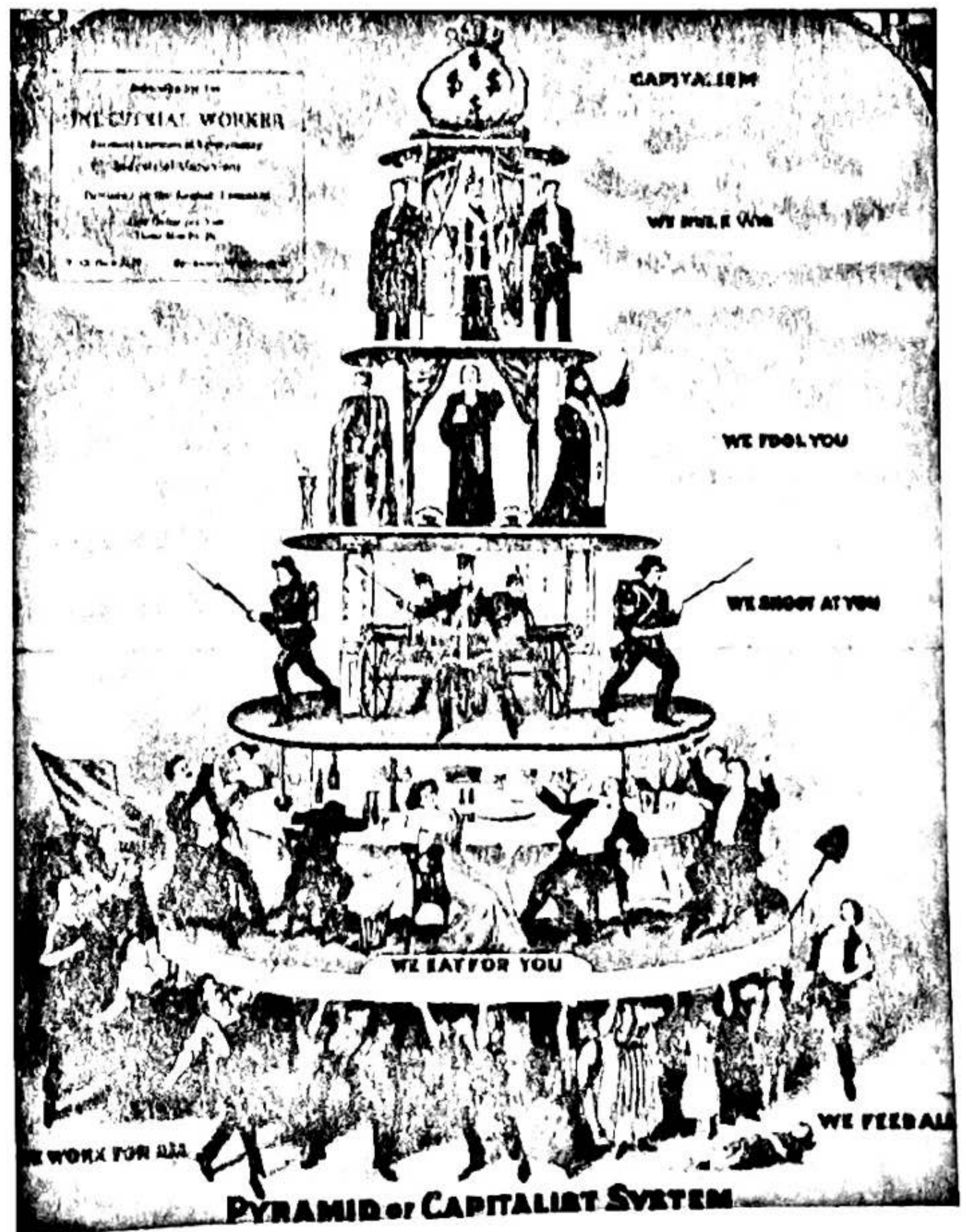
How did Karl Marx understand the Industrial Revolution? In what ways did his ideas have an impact in the industrializing world of the nineteenth century?

in these laws of historical change; revolution was a certainty and the socialist future inevitable.

It was a grand, compelling, prophetic, utopian vision of human freedom and community — and it inspired socialist movements of workers and intellectuals amid the grim harshness of Europe’s industrialization in the second half of the nineteenth century. Socialists established political parties in most European states and linked them together in international organizations as well. These parties recruited members, contested elections as they gained the right to vote, agitated for reforms, and in some cases plotted revolution.

In the later decades of the nineteenth century, such ideas echoed among more radical trade unionists and some middle-class intellectuals in Britain, and even more so in a rapidly industrializing Germany and elsewhere. By then, however, the British working-class movement was not overtly revolutionary. When a working-class political party, the Labour Party, was established in the 1890s, it advocated a reformist program and a peaceful democratic transition to socialism, largely rejecting the class struggle and revolutionary emphasis of classical Marxism. Generally known as “social democracy,” this approach to socialism was especially prominent in Germany during the late nineteenth century and spread more widely in the twentieth century when it came into conflict with the more violent and revolutionary movements calling themselves “communist.”

Improving material conditions during the second half of the nineteenth century helped to move the working-class movement in Britain, Germany, and elsewhere away from a revolutionary posture. Marx had expected industrial capitalist societies to polarize into a small wealthy class and a huge and increasingly impoverished proletariat. However, standing between “the captains of industry” and the workers was a sizable middle and lower middle class, constituting perhaps 30 percent of the population, most of whom were not really wealthy but were immensely proud that they were not manual laborers. Marx had not foreseen the development of this intermediate social group, nor had he imagined that workers could better their standard of living within a capitalist framework. But they did. Wages rose under pressure from unions; cheap imported food improved working-class diets; infant mortality rates fell; and shops and chain stores catering to working-class



The Socialist Outlook

This 1911 poster was first published in the newspaper of the Industrial Workers of the World, a radical American trade union organization. It illustrates a socialist perspective on capitalist societies. At the bottom of the pyramid, supporting the entire social edifice, are the workers, while above them are arrayed the various oppressive layers of the social hierarchy: the bourgeoisie, the police and militias, religious figures, and state officials. (From *Pyramid of Capitalist System*, issued by Nedelkovich, Brashick and Kuharich, Cleveland (International Publishing Co., 1911)/Library of Congress)

families multiplied. As English male workers gradually obtained the right to vote, politicians had an incentive to legislate in their favor, by abolishing child labor, regulating factory conditions, and even, in 1911, inaugurating a system of relief for the unemployed. Sanitary reform considerably cleaned up the “filth and stink” of early nineteenth-century cities, and urban parks made a modest appearance. Contrary to Marx’s expectations, capitalist societies demonstrated some capacity for reform.

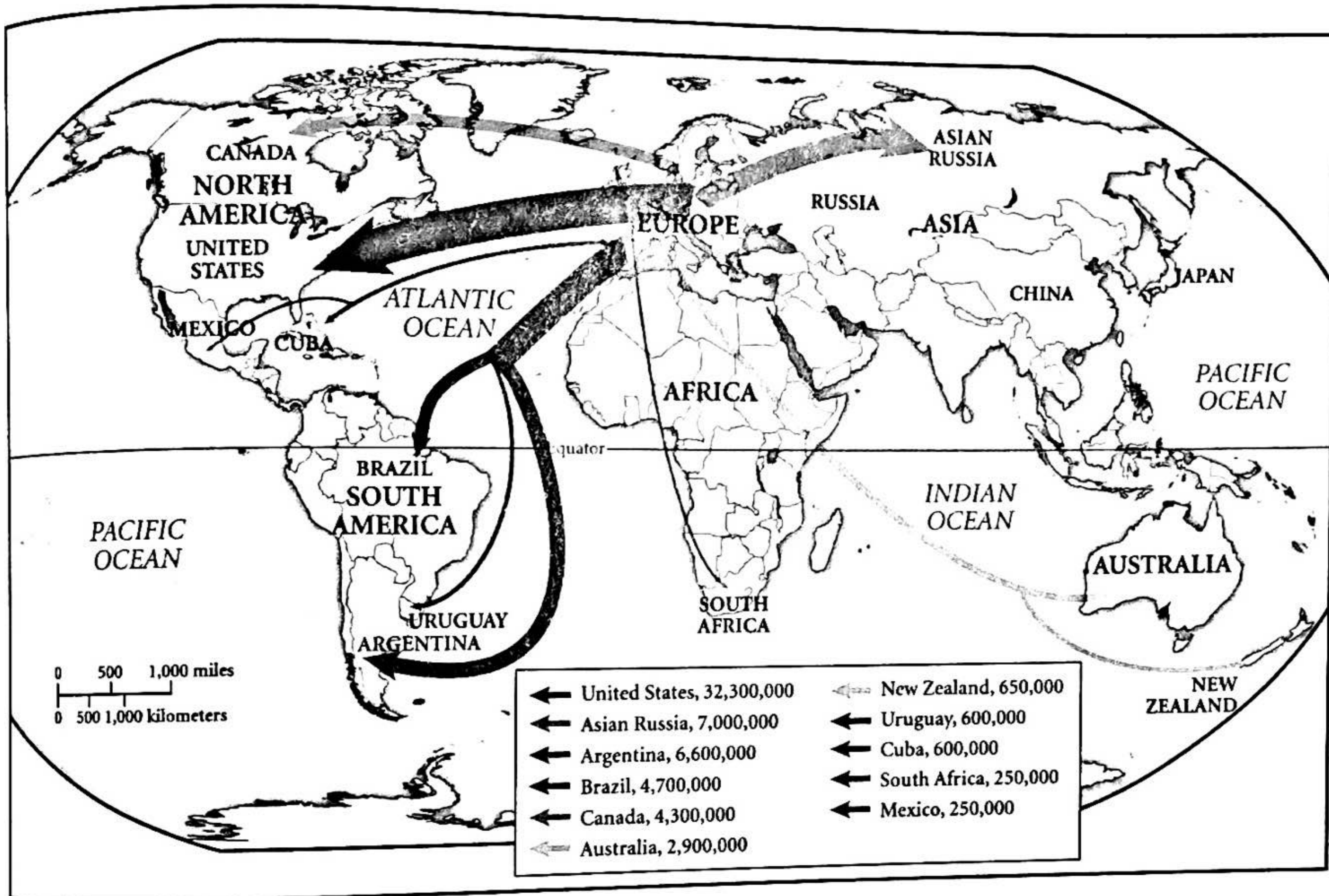
Further eroding working-class radicalism was a growing sense of nationalism, which bound workers in particular countries to their middle-class employers and compatriots, offsetting to some extent the economic and social antagonism between them. When World War I broke out, the “workers of the world,” far from uniting against their bourgeois enemies as Marx had urged them, instead set off to slaughter one another in enormous numbers on the battlefields of Europe. National loyalty had trumped class loyalty.

Nonetheless, as the twentieth century dawned, industrial Britain was hardly a stable or contented society. Immense inequalities still separated the classes. Some 40 percent of the working class continued to live in conditions then described as “poverty.” A mounting wave of strikes from 1910 to 1913 testified to the intensity of class conflict. The Labour Party was becoming a major force in Parliament. Some socialists and some feminists were becoming radicalized. “Wisps of violence hung in the English air,” wrote Eric Hobsbawm, “symptoms of a crisis in economy and society, which the [country’s] self-confident opulence . . . could not quite conceal.”²⁵ The world’s first industrial society remained dissatisfied and conflicted.

It was also a society in economic decline relative to industrial newcomers such as Germany and the United States. Britain paid a price for its early lead, for its businessmen became committed to machinery that became obsolete as the century progressed. Latecomers invested in more modern equipment and in various ways had surpassed the British by the early twentieth century.

Europeans in Motion

Europe’s industrial revolution prompted a massive migratory process that uprooted many millions, setting them in motion both internally and around the globe. Within Europe itself, the movement of men, women, and families from the countryside to the cities involved half or more of the region’s people by the mid-nineteenth century. More significant for world history was the exodus between 1815 and 1939 of fully 20 percent of Europe’s population, some 50 to 55 million people, who left home for the Americas, Australia, New Zealand, South Africa, and elsewhere (see Map 17.2). They were pushed by a rapidly growing population, poverty, and the displacement of peasant farming and artisan manufacturing. And they were pulled abroad by the enormous demand for labor overseas, the ready availability of land in some places, and the relatively cheap transportation of railroads and steamships. But not all found a satisfactory life in their new homes, and perhaps 7 million returned to Europe.²⁶



Map 17.2
European Migration
in the Industrial Age

The Industrial Revolution not only transformed European society, but it also scattered millions of Europeans to the far corners of the world.

This huge process had a transformative global impact, temporarily increasing Europe's share of the world's population and scattering Europeans around the world. In 1800, less than 1 percent of the total world population consisted of overseas Europeans and their descendants; by 1930, they represented 11 percent.²⁷ In particular regions, the impact was profound. Australia and New Zealand became settler colonies, outposts of European civilization in the South Pacific that overwhelmed their native populations. Smaller numbers found their way to South Africa, Kenya, Rhodesia, Algeria, and elsewhere, where they injected a sharp racial divide into those colonized territories.

But it was the Americas that felt the brunt of this huge movement of people. Latin America received about 20 percent of the European migratory stream, mostly from Italy, Spain, and Portugal, with Argentina and Brazil accounting for some 80 percent of those immigrants. Considered "white," they enhanced the social weight of the European element in those countries and thus enjoyed economic advantages over the mixed-race, Indian, and African populations.

In several ways the immigrant experience in the United States was distinctive. It was far larger and more diverse than elsewhere, with some 30 million newcomers arriving from all over Europe between 1820 and 1930. Furthermore, the United States offered affordable land to many and industrial jobs to many more, neither of which

was widely available in Latin America. And the United States was unique in turning the immigrant experience into a national myth—that of the melting pot. Despite this ideology of assimilation, the earlier immigrants, mostly Protestants from Britain and Germany, were anything but welcoming to those who arrived later as Catholics and Jews from Southern and Eastern Europe. The newcomers were seen as distinctly inferior, even “un-American,” and blamed for crime, labor unrest, and socialist ideas.

In the vast domains of the Russian Empire, a parallel process of European migration likewise unfolded. After the freeing of the serfs in 1861, some 10 million or more Russians and Ukrainians migrated to Siberia where they soon overwhelmed the native population of the region. By the end of the century, native Siberians totaled only 10 percent of the population. The availability of land, the prospect of greater freedom from tsarist restrictions and from the exploitation of aristocratic landowners, and the construction of the trans-Siberian railroad—all of this facilitated the continued Europeanization of Siberia. As in the United States, the Russian government encouraged and aided this process, hoping to forestall Chinese pressures in the region and relieve growing population pressures in the more densely settled western lands of the empire.

Variations on a Theme: Industrialization in the United States and Russia

Not for long was the Industrial Revolution confined to Britain. It soon spread to continental Western Europe, and by the end of the nineteenth century, it was well under way in the United States, Russia, and Japan. The globalization of industrialization had begun. Everywhere it took hold, industrialization bore a range of broadly similar outcomes. New technologies and sources of energy generated vast increases in production and spawned an unprecedented urbanization as well. Class structures changed as aristocrats, artisans, and peasants declined as classes, while the middle classes and a factory working class grew in numbers and social prominence. Middle-class women generally withdrew from paid labor altogether, and their working-class counterparts sought to do so after marriage. Working women usually received lower wages than their male counterparts, had difficulty joining unions, and were accused of taking jobs from men. Working-class frustration and anger gave rise to trade unions and socialist movements, injecting a new element of social conflict into industrial societies.

Nevertheless, different histories, cultures, and societies ensured that the Industrial Revolution unfolded variously in the diverse countries in which it became established. Differences in the pace and timing of industrialization, the size and shape of major industries, the role of the state, the political expression of social conflict, and many other factors have made this process rich in comparative possibilities. French industrialization, for example, occurred more slowly and perhaps less disruptively than did that of Britain. Germany focused initially on heavy industry—iron, steel, and coal—rather than on the textile industry with which Britain had begun. Moreover, German industrialization was far more highly concentrated in huge companies called

cartels, and it generated a rather more militant and Marxist-oriented labor movement than in Britain.

Nowhere were the variations in the industrializing process more apparent than in those two vast countries that lay on the periphery of Europe. To the west across the Atlantic Ocean was the United States, a young, vigorous, democratic, expanding country, populated largely by people of European descent, along with a substantial number of slaves of African origin. To the east was Russia, with its Eastern Orthodox Christianity, an autocratic tsar, a huge population of serfs, and an empire stretching across all of northern Asia. In the 1830s, the French observer Alexis de Tocqueville famously commented on these two emerging giants in his book *Democracy in America*:

The Anglo-American relies upon personal interest to accomplish his ends and gives free scope to the unguided strength and common sense of the people; the Russian centers all the authority of society in a single arm. . . . Their starting-point is different and their courses are not the same; yet each of them seems marked out by the will of Heaven to sway the destinies of half the globe.

By the early twentieth century, his prediction seemed to be coming true. Industrialization had turned the United States into a major global power and in Russia had spawned an enormous revolutionary upheaval that made that country the first outpost of global communism.

The United States: Industrialization without Socialism

American industrialization began in the textile factories of New England during the 1820s but grew explosively in the half century following the Civil War (1861–1865) (see Map 17.3). The country's huge size, the ready availability of natural resources, its expanding domestic market, and its relative political stability combined to make the United States the world's leading industrial power by 1914. At that time, it produced 36 percent of the world's manufactured goods, compared to 16 percent for Germany, 14 percent for Great Britain, and 6 percent for France. Furthermore, U.S. industrialization was closely linked to that of Europe. About one-third of the capital investment that financed its remarkable growth came from British, French, and German capitalists. But unlike Latin America, which also received much foreign investment, the United States was able to use those funds to generate an independent Industrial Revolution of its own.

As in other second-wave industrializing countries, the U.S. government played an important role, though less directly than in Germany or Japan. Tax breaks, huge grants of public land to the railroad companies, laws enabling the easy formation of corporations, and the absence of much overt regulation of industry all fostered the rise of very large business enterprises. The U.S. Steel Corporation, for example, by 1901 had an annual budget three times the size of the federal government. In this respect, the United States followed the pattern of Germany but differed from that of France and Britain, where family businesses still predominated.

■ **Comparison**

What were the differences between industrialization in the United States and that in Russia?



Map 17.3 The Industrial United States in 1900

By the early twentieth century, manufacturing industries were largely in the Northeast and Midwest, whereas mining operations were more widely scattered across the country.

■ Explanation

Why did Marxist socialism not take root in the United States?

The United States also pioneered techniques of mass production, using interchangeable parts, the assembly line, and “scientific management” to produce for a mass market. The nation’s advertising agencies, Sears Roebuck’s and Montgomery Ward’s mail-order catalogs, and urban department stores generated a middle-class “culture of consumption.” When the industrialist Henry Ford in the early twentieth century began producing the Model T at a price that many ordinary people could afford, he famously declared: “I am going to democratize the automobile.” More so than in Europe, with its aristocratic traditions, self-made American industrialists of fabulous wealth such as Henry Ford, Andrew Carnegie, and John D. Rockefeller became cultural heroes, widely admired as models of what anyone could achieve with daring and hard work in a land of endless opportunity.

Nevertheless, well before the first Model T rolled off the assembly line, serious social divisions of a kind common to European industrial societies mounted. Preindustrial America had boasted of a relative social equality, quite unlike that of Europe, but by the end of the nineteenth century, a widening gap separated the classes. In

Carnegie's Homestead steel plant near Pittsburgh, employees worked every day except Christmas and the Fourth of July, often for twelve hours a day. In Manhattan, where millions of European immigrants disembarked, many lived in five- or six-story buildings with four families and two toilets on each floor. In every large city, such conditions prevailed close by the mansions of elite neighborhoods. To some, the contrast was a betrayal of American ideals, while others saw it as a natural outcome of competition and "the survival of the fittest."

As elsewhere, such conditions generated much labor protest, the formation of unions, and strikes, sometimes leading to violence. In 1877, when the eastern railroads announced a 10 percent wage cut for their workers, strikers disrupted rail service across the eastern half of the country, smashed equipment, and rioted. Both state militias and federal troops were called out to put down the movement. Class consciousness and class conflict were intense in the industrial America of the late nineteenth and early twentieth centuries.

Unlike many European countries, however, no major political party emerged in the United States to represent the interests of the working class. Nor did the ideas of socialism, and especially Marxism, appeal to American workers nearly as much as they did to European laborers. At its high point, the Socialist Party of America garnered just 6 percent of the vote for its presidential candidate in the 1912 election, whereas socialists at the time held more seats in Germany's Parliament than any other party. Even in the depths of the Great Depression of the 1930s, no major socialist movement emerged to champion American workers. How might we explain this distinctive feature of American industrial development?

One answer lies in the relative conservatism of major American union organizations, especially the American Federation of Labor. Its focus on skilled workers excluded the more radical unskilled laborers, and its refusal to align with any party limited its influence in the political arena. Furthermore, massive immigration from Europe, beginning in the 1840s, created a very diverse industrial labor force on top of the country's sharp racial divide. This diversity contrasted sharply with the more homogeneous populations of many European countries. Catholics and Protestants; whites and blacks; English, Irish, Germans, Slavs, Jews, and Italians—such differences undermined the class solidarity of American workers, making it far more difficult to sustain class-oriented political parties and a socialist labor movement. Moreover, the country's remarkable economic growth generated on average a higher standard of living for American workers than their European counterparts experienced. Land was cheaper, and home ownership was more available. Workers with property generally found socialism less attractive than those without. By 1910, a particularly large group of white-collar workers in sales, services, and offices outnumbered factory laborers. Their middle-class aspirations further diluted impulses toward radicalism.

But political challenges to the abuses of capitalist industrialization did arise. In the 1890s, among small farmers in the U.S. South, West, and Midwest, "populists" railed against banks, industrialists, monopolies, the existing money system, and both

major political parties, all of which they thought were dominated by the corporate interests of the eastern elites. More successful, especially in the early twentieth century, were the Progressives, who pushed for specific reforms, such as wages-and-hours legislation, better sanitation standards, antitrust laws, and greater governmental intervention in the economy. Socialism, however, came to be defined as fundamentally “un-American” in a country that so valued individualism and so feared “big government.” It was a distinctive feature of the American response to industrialization.

Russia: Industrialization and Revolution

As a setting for the Industrial Revolution, it would be hard to imagine two more different environments than the United States and Russia. If the United States was the Western world’s most exuberant democracy during the nineteenth century, Russia remained the sole outpost of absolute monarchy, in which the state exercised far greater control over individuals and society than anywhere in the Western world.

At the beginning of the twentieth century, Russia still had no national parliament, no legal political parties, and no nationwide elections. The tsar, answerable to God alone, ruled unchecked. Furthermore, Russian society was dominated by a titled nobility of various ranks. Its upper levels included great landowners, who furnished the state with military officers and leading government officials. Until 1861, most Russians were peasant serfs, bound to the estates of their masters, subject to sale, greatly exploited, and largely at the mercy of their owners. A vast cultural gulf separated these two classes. Many nobles were highly Westernized, some speaking French better than Russian, whereas their serfs were steeped in a backwoods Orthodox Christianity that incorporated pre-Christian spirits, spells, curses, and magic.

A further difference between Russia and the United States lay in the source of social and economic change. In the United States, such change bubbled up from society as free farmers, workers, and businessmen sought new opportunities and operated in a political system that gave them varying degrees of expression. In autocratic Russia, change was far more often initiated by the state itself, in its continuing efforts to catch up with the more powerful and innovative states of Europe. This kind of “transformation from above” found an early expression in the reign of Peter the Great (r. 1689–1725). (See Chapter 13, p. 446.) Such state-directed change continued in the nineteenth century with the freeing of the serfs in 1861, an action stimulated by military defeat at the hands of British and French forces in the Crimean War (1854–1856). To many thoughtful Russians, serfdom seemed incompatible with modern civilization and held back the country’s overall development, as did its economic and industrial backwardness. Thus, beginning in the 1860s, Russia began a program of industrial development, which was more heavily directed by the state than was the case in Western Europe or the United States.

By the 1890s, Russia’s Industrial Revolution was launched and growing rapidly. It focused particularly on railroads and heavy industry and was fueled by a substantial amount of foreign investment. By 1900, Russia ranked fourth in the world in

■ Change

What factors contributed to the making of a revolutionary situation in Russia by the beginning of the twentieth century?

steel production and had major industries in coal, textiles, and oil. Its industrial enterprises, still modest in comparison to those of Europe, were concentrated in a few major cities—Moscow, St. Petersburg, and Kiev, for example—and took place in factories far larger than in most of Western Europe.

All of this contributed to the explosive social outcomes of Russian industrialization. A growing middle class of businessmen and professionals increasingly took shape. As modern and educated people, many in the middle class objected strongly to the deep conservatism of tsarist Russia and sought a greater role in political life,

but they were also dependent on the state for contracts and jobs and for suppressing the growing radicalism of the workers, which they greatly feared. Although factory workers constituted only about 5 percent of Russia's total population, they quickly developed a radical class consciousness, based on harsh conditions and the absence of any legal outlet for their grievances. As in Western Europe, millions flocked to the new centers of industrial development. By 1897, over 70 percent of the population in Moscow and St. Petersburg were recent migrants from the rural areas. Their conditions of life resembled those of industrial migrants in New York or Berlin. One observer wrote that "people live in impossible condition: filth, stench, suffocating heat. They lie down together barely a few feet apart; there is no division between the sexes and adults sleep with children."²⁸ Until 1897, a thirteen-hour working day was common, while ruthless discipline and overt disrespect from supervisors created resentment. In the absence of legal unions or political parties, these grievances often erupted in the form of large-scale strikes.

In these conditions, a small but growing number of educated Russians found in Marxist socialism a way of understanding the changes they witnessed daily as well as hope for the future in a revolutionary upheaval of workers. In 1898, they created an illegal Russian Social-Democratic Labor Party and quickly became involved in workers' education, union organizing, and, eventually, revolutionary action. By the early twentieth century, the strains of rapid change and the state's continued intransigence had reached the bursting point, and in 1905, following its defeat in a naval war with Japan, Russia erupted in spontaneous insurrection. (See Map 17.4) Workers in Moscow and St. Petersburg went on strike and created their own representative councils, called soviets. Peasant uprisings, student demonstrations, revolts of non-Russian nationalities, and mutinies in the military all contributed to the upheaval. Recently formed political parties, representing intellectuals of various persuasions, came out into the open.



Russian Serfdom

This nineteenth-century cartoon by the French artist Gustave Doré shows Russian noblemen gambling with tied bundles of stiff serfs. Serfdom was not finally abolished in Russia until 1861. (The Granger Collection, New York)



Map 17.4 Industrialization and Revolution in Russia
Only in Russia did industrialization lead to violent revolutionary upheavals, both in 1905 and more successfully in 1917.

trade unions, and spread their messages among workers and peasants. Particularly in the cities, these revolutionary parties had an impact. They provided a language through which workers could express their grievances; they created links among workers from different factories; and they furnished leaders who were able to act when the revolutionary moment arrived.

World War I provided that moment. The enormous hardships of that war, coupled with the immense social tensions of industrialization within a still autocratic political system, sparked the Russian Revolution of 1917 (see Chapter 21). That massive upheaval quickly brought to power the most radical of the socialist groups operating in the country—the Bolsheviks, led by the charismatic Vladimir Ilyich Ulyanov, better known as Lenin. Only in Russia was industrialization associated with violent social revolution. This was the most distinctive feature of Russia's modern historical development. And only in Russia was a socialist political party, inspired by the teachings of Karl Marx, able to seize power, thus launching the modern world's first socialist society, with enormous implications for the twentieth century.

What was common to industrialization everywhere, and in what ways did it vary from place to place?

The 1905 revolution, though brutally suppressed, forced the tsar's regime to make more substantial reforms than it had ever contemplated. It granted a constitution, legalized both trade unions and political parties, and permitted the election of a national assembly, called the Duma. Censorship was eased, and plans were under way for universal primary education. Industrial development likewise continued at a rapid rate, so that by 1914 Russia stood fifth in the world in terms of overall output. But in the first half of that year, some 1,250,000 workers, representing about 40 percent of the entire industrial workforce, went out on strike.

Thus the tsar's limited political reforms, which had been granted with great reluctance and were often reversed in practice, failed to tame working-class radicalism or to bring social stability to Russia. In Russian political life, the people generally, and even the middle class, had only a very limited voice. Representatives of even the privileged classes had become so alienated by the government's intransigence that many felt revolution was inevitable. Various revolutionary groups, many of them socialist, published pamphlets and newspapers, organized

The Industrial Revolution and Latin America in the Nineteenth Century

Beyond the world of Europe and North America, only Japan underwent a major industrial transformation during the nineteenth century, part of that country's overall response to the threat of European aggression. (See Chapter 19, pp. 660-61, for a more detailed examination of Japan's industrialization.) Elsewhere—in colonial India, Egypt, the Ottoman Empire, China, and Latin America—very modest experiments in modern industry were undertaken, but nowhere did they drive the kind of major social transformation that had taken place in Britain, Europe, North America, and Japan. However, even in societies that did not experience their own Industrial Revolution, the profound impact of European and North American industrialization was hard to avoid. Such was the case in Latin America during the nineteenth century.

After Independence in Latin America

The struggle for independence in Latin America had lasted far longer and proved far more destructive than in North America. Decimated populations, diminished herds of livestock, flooded or closed silver mines, abandoned farms, shrinking international trade and investment capital, and empty national treasuries—these were among the conditions under which Latin American countries greeted independence. Furthermore, the four major administrative units (vice-royalties) of Spanish America ultimately dissolved into eighteen separate countries, and regional revolts wracked Brazil in the early decades of its independent life. A number of international wars in the post-independence century likewise shook these new nations. Peru and Bolivia briefly united and then broke apart in a bitter conflict (1836-1839); Mexico lost huge territories to the United States (1846-1848); and an alliance of Argentina, Brazil, and Uruguay went to war with Paraguay (1864-1870) in a conflict that devastated Paraguay's small population.

Within these new countries, political life was turbulent and unstable. Conservatives favored centralized authority and sought to maintain the social status quo of the colonial era in alliance with the Catholic Church, which at independence owned perhaps half of all productive land. Their often bitter opponents were liberals, who attacked the Church in the name of Enlightenment values, sought at least modest social reforms, and preferred federalism. In many countries, conflicts between these factions, often violent, enabled military strongmen known as *caudillos* (kaw-DEE-yos) to achieve power as defenders of order and property, although they too succeeded one another with great frequency. One of them, Antonio López de Santa Anna of Mexico, was president of his country at least nine separate times between 1833 and 1855. Constitutions too replaced one another with bewildering speed. Bolivia had ten constitutions during the nineteenth century, while Ecuador and Peru each had eight. Social life did not change fundamentally in the aftermath of independence. As in Europe and North America, women remained disenfranchised and wholly outside of formal political life. Slavery, it is true, was abolished in most of Latin America by

midcentury, although it persisted in both Brazil and Cuba until the late 1880s. Most of the legal distinctions among various racial categories also disappeared, and all free people were considered, at least officially, equal citizens. Nevertheless, productive economic resources such as businesses, ranches, and plantations remained overwhelmingly in the hands of creole white men, who were culturally oriented toward Europe. The military provided an avenue of mobility for a few skilled and ambitious mestizo men, some of whom subsequently became caudillos. Other mixed-race men and women found a place in a small middle class as teachers, shopkeepers, or artisans. The vast majority—blacks, Indians, and many mixed-race people of both sexes—remained impoverished, working small subsistence farms or laboring in the mines or on the *haciendas* (ah-see-EHN-duhz) (plantations) of the well-to-do. Only rarely did the poor and dispossessed actively rebel against their social betters. One such case was the Caste War of Yucatán (1847–1901), a prolonged struggle of the Maya people of Mexico, aimed at cleansing their land of European and mestizo intruders.

Facing the World Economy

■ Connection

In what ways and with what impact was Latin America linked to the global economy of the nineteenth century?

During the second half of the nineteenth century, a measure of political consolidation took hold in Latin America, and countries such as Mexico, Peru, and Argentina entered periods of greater stability. At the same time, Latin America as a whole became more closely integrated into a world economy driven by the industrialization of Western Europe and North America. The new technology of the steamship cut the sailing time between Britain and Argentina almost in half, while the underwater telegraph instantly brought the latest news and fashions of Europe to Latin America.

The most significant economic outcome of this growing integration was a rapid growth of Latin American exports to the industrializing countries, which now needed the food products, raw materials, and markets of these new nations. Latin American landowners, businessmen, and governments proved eager to supply those needs, and in the sixty years or so after 1850, an export boom increased the value of Latin American goods sold abroad by a factor of ten.

Mexico continued to produce large amounts of silver, supplying more than half the world's new supply until 1860. Now added to the list of raw materials flowing out of Latin America were copper from Chile, a metal that the growing electrical industry required; tin from Bolivia, which met the mounting demand for tin cans; and nitrates from Chile and guano (bird droppings) from Peru, both of which were used for fertilizer. Wild rubber from the Amazon rain forest was in great demand for bicycle and automobile tires, as was sisal from Mexico, used to make binder twine for the proliferating mechanical harvesters of North America. Bananas from Central America, beef from Argentina, cacao from Ecuador, coffee from Brazil and Guatemala, and sugar from Cuba also found eager markets in the rapidly growing and increasingly prosperous world of industrializing countries. In return for these primary products, Latin Americans imported the textiles, machinery, tools, weapons, and luxury goods of Europe and the United States (see Map 17.5).



Map 17.5 Latin America and the World, 1825-1935
 During the nineteenth and early twentieth centuries, Latin American countries interacted with the industrializing world via investment, trade, immigration, and military intervention from the United States.

Accompanying this burgeoning commerce was large-scale investment of European capital in Latin America, \$10 billion alone between 1870 and 1919. Most of this capital came from Great Britain, which invested more in Argentina in the late nineteenth century than in its colony of India, although France, Germany, Italy, and the United States also contributed to this substantial financial transfer. By 1910, U.S.

business interests controlled 40 percent of Mexican property and produced half of its oil. Much of this capital was used to build railroads, largely to funnel Latin American exports to the coast, where they were shipped to overseas markets. Mexico had only 390 miles of railroad in 1876; it had 15,000 miles in 1910. By 1915, Argentina, with 22,000 miles of railroad, had more track per person than the United States.

Becoming like Europe?

To the economic elites of Latin America, intent on making their countries resemble Europe or the United States, all of this was progress. In some respects, they were surely right. Economies were growing, producing more than ever before. The population also was burgeoning; it increased from about 30 million in 1850 to more than 77 million in 1912 as public health measures (such as safe drinking water, inoculations, sewers, and campaigns to eliminate mosquitoes that carried yellow fever) brought down death rates.

Urbanization also proceeded rapidly. By the early twentieth century, wrote one scholar, “Latin American cities lost their colonial cobblestones, white-plastered walls, and red-tiled roofs. They became modern metropolises, comparable to urban giants anywhere. Streetcars swayed, telephones jangled, and silent movies flickered from

■ Comparison

Did Latin America follow or diverge from the historical path of Europe during the nineteenth century?

Snapshot The Industrial Revolution and the Global Divide²⁹

During the nineteenth century, the Industrial Revolution generated an enormous and unprecedented economic division in the world, as measured by the share of manufacturing output. What patterns can you see in this table?

SHARE OF TOTAL WORLD MANUFACTURING OUTPUT (PERCENT)

	1750	1800	1860	1880	1900
Europe as a Whole	23.2	28.1	53.2	61.3	62.0
UNITED KINGDOM	1.9	4.3	19.9	22.9	18.5
FRANCE	4.0	4.2	7.9	7.8	6.8
GERMANY	2.9	3.5	4.9	8.5	13.2
RUSSIA	5.0	5.6	7.0	7.6	8.8
United States	0.1	0.8	7.2	14.7	23.6
Japan	3.8	3.5	2.6	2.4	2.4
The Rest of the World	73.0	67.7	36.6	20.9	11.0
CHINA	32.8	33.3	19.7	12.5	6.2
SOUTH ASIA (INDIA/PAKISTAN)	24.5	19.7	8.6	2.8	1.7

Montevideo and Santiago to Mexico City and Havana."³⁰ Buenos Aires, Argentina's metropolitan center, boasted 750,000 people in 1900 and billed itself the "Paris of South America." There the educated elite, just like the English, drank tea in the afternoon, while discussing European literature, philosophy, and fashion, usually in French.

To become more like Europe, Latin America sought to attract more Europeans. Because civilization, progress, and modernity apparently derived from Europe, many Latin American countries actively sought to increase their "white" populations by deliberately recruiting impoverished Europeans with the promise, mostly unfulfilled, of a new and prosperous life in the New World. Argentina received the largest wave of European immigrants (some 2.5 million between 1870 and 1915), mostly from Spain and Italy. Brazil and Uruguay likewise attracted substantial numbers of European newcomers.

Only a quite modest segment of Latin American society saw any great benefits from the export boom and all that followed from it. Upper-class landowners certainly gained as exports flourished and their property values soared. Middle-class urban dwellers—merchants, office workers, lawyers, and other professionals—also grew in numbers and prosperity as their skills proved valuable in a modernizing society. As a percentage of the total population, however, these were narrow elites. In Mexico in the mid-1890s, for example, the landowning upper class made up no more than 1 percent and the middle classes perhaps 8 percent of the population. Everyone else was lower-class, and most of them were impoverished.³¹

A new but quite small segment of this vast lower class emerged among urban workers who labored in the railroads, ports, mines, and a few factories. They organized themselves initially in a variety of mutual aid societies, but by the end of the nineteenth century, they were creating unions and engaging in strikes. To authoritarian governments interested in stability and progress, such activity was highly provocative and threatening, and they acted harshly to crush or repress unions and strikes. In 1906, the Mexican dictator Porfirio Díaz invited the Arizona Rangers to suppress a strike at Cananea near the U.S. border, an action that resulted in dozens of deaths. The following year in the Chilean city of Iquique, more than 1,000 men, women, and children were slaughtered by police when nitrate miners protested their wages and working conditions.

The vast majority of the lower class lived in rural areas, where they suffered the most and benefited the least from the export boom. Government attacks on communal landholding and peasant indebtedness to wealthy landowners combined to push many farmers off their land or into remote and poor areas where they could barely make a living. Many wound up as dependent laborers or peons on the haciendas of the wealthy, where their wages were often too meager to support a family. Thus women and children, who had earlier remained at home to tend the family plot, were required to join their menfolk as field laborers. Many immigrant Italian farmworkers in Argentina and Brazil were unable to acquire their own farms, as they had expected, and so drifted into the growing cities or returned to Italy.

Although local protests and violence were frequent, only in Mexico did these vast inequalities erupt into a nationwide revolution. There, in the early twentieth century, middle-class reformers joined with workers and peasants to overthrow the long dictatorship of Porfirio Díaz (1876–1911). What followed was a decade of bloody conflict (1910–1920) that cost Mexico some 1 million lives, or roughly 10 percent of the population. Huge peasant armies under charismatic leaders such as Pancho Villa and Emiliano Zapata helped oust Díaz. Intent on seizing land and redistributing it to the peasants, they then went on to attack many of Mexico's large haciendas. But unlike the later Russian and Chinese revolutions, in which the most radical elements seized state power, Villa and Zapata proved unable to do so on a long-term basis, in part because they were hobbled by factionalism and focused on local or regional issues. Despite this limitation and its own internal conflicts, the Mexican Revolution transformed the country. When the dust settled, Mexico had a new constitution (1917) that proclaimed universal male suffrage; provided for the redistribution of land; stripped the Catholic Church of any role in public education and forbade it to own land; announced unheard-of rights for workers, such as a minimum wage and an eight-hour workday; and placed restrictions on foreign ownership of property. Much of Mexico's history in the twentieth century involved working out the implications of these nationalist and reformist changes. The revolution's direct influence, however, was largely limited to Mexico itself and a few places in Central America and the Andes, but without the wider international impact of the Russian and Chinese upheavals.

Perhaps the most significant outcome of the export boom lay in what did *not* happen, for nowhere in Latin America did it jump-start a thorough Industrial Revolution, despite a few factories that processed foods or manufactured textiles, clothing, and building materials. The reasons are many. A social structure that relegated some 90 percent of its population to an impoverished lower class generated only a very small market for manufactured goods. Moreover, economically powerful groups such as landowners and cattlemen benefited greatly from exporting agricultural products and had little incentive to invest in manufacturing. Domestic manufacturing enterprises could only have competed with cheaper and higher-quality foreign goods if they had been protected for a time by high tariffs. But Latin American political leaders had thoroughly embraced the popular European doctrine of prosperity through free trade, and many governments depended on taxing imports to fill their treasuries.

The Mexican Revolution

Women were active participants in the Mexican Revolution. They prepared food, nursed the wounded, washed clothes, and at times served as soldiers on the battlefield, as illustrated in this cover image from a French magazine in 1913. (© Archivo Iconografico, S.A./Corbis)



Instead of its own Industrial Revolution, Latin Americans developed a form of economic growth that was largely financed by capital from abroad and dependent on European and North American prosperity and decisions. Brazil experienced this kind of dependence when its booming rubber industry suddenly collapsed in 1910–1911, after seeds from the wild rubber tree had been illegally exported to Britain and were used to start competing and cheaper rubber plantations in Malaysia.

Later critics saw this “dependent development” as a new form of colonialism, expressed in the power exercised by foreign investors. The influence of the U.S.-owned United Fruit Company in Central America was a case in point. Allied with large landowners and compliant politicians, the company pressured the governments of these “banana republics” to maintain conditions favorable to U.S. business. This indirect or behind-the-scenes imperialism was supplemented by repeated U.S. military intervention in support of American corporate interests in Cuba, Haiti, the Dominican Republic, Nicaragua, and Mexico. The United States also controlled the Panama Canal and acquired Puerto Rico as a territory in the aftermath of the Spanish-American War (see Map 17.5, p. 595).

Thus, despite Latin America’s domination by people of European descent and its close ties to the industrializing countries of the Atlantic world, that region’s historical trajectory in the nineteenth century diverged considerably from that of Europe and North America.

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Reflections: History and Horse Races

Historians and students of history seem endlessly fascinated by “firsts”—the first breakthrough to agriculture, the first domestication of horses, the first civilization, the first use of gunpowder, the first printing press, and so on. Each of these firsts presents a problem of explanation: why did it occur in some particular time and place rather than somewhere else or at some other time? Such questions have assumed historical significance because “first achievements” represent something new in the human journey and because many of them conveyed unusual power, wealth, status, or influence on their creators.

Nonetheless, the focus on firsts can be misleading as well. Those who accomplished something first may see themselves as generally superior to those who embraced that innovation later. Historians too can sometimes adopt a winners-and-losers mentality, inviting a view of history as a horse race toward some finish line of accomplishment. Most first achievements in history, however, were not the result of intentional efforts but rather were the unexpected outcome of converging circumstances.

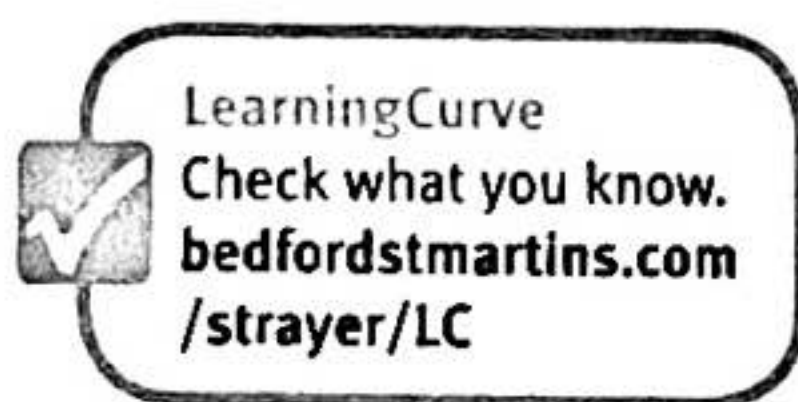
The Industrial Revolution is a case in point. Understanding the European beginnings of this immense breakthrough is certainly justified by its pervasive global consequences and its global spread over the past several centuries. In terms of human ability to dominate the natural environment and to extract wealth from it, the Industrial Revolution marks a decisive turning point in the history of our species. But Europeans’ attempts to explain their Industrial Revolution have at times stated or

implied their own unique genius. In the nineteenth century, many Europeans saw their technological mastery as a sure sign of their cultural and racial superiority as they came to use “machines as the measure of men.”³² In pondering the “why Europe?” question, historians too have sometimes sought an answer in some distinct or even superior feature of European civilization.

In emphasizing the unexpectedness of the first Industrial Revolution, and the global context within which it occurred, world historians have attempted to avoid a “history as horse race” outlook. Clearly the first industrial breakthrough in Britain was not a self-conscious effort to win a race; it was the surprising outcome of countless decisions by many people to further their own interests. Subsequently, however, other societies and their governments quite deliberately tried to catch up, seeking the wealth and power that the Industrial Revolution promised.

The rapid spread of industrialization across the planet, though highly uneven, may diminish the importance of the “why Europe?” issue. Just as no one views agriculture as a Middle Eastern phenomenon, even though it occurred first in that region, it seems likely that industrialization will be seen increasingly as a global process rather than one uniquely associated with Europe. If industrial society proves to be a sustainable future for humankind—and this is presently an open question—historians of the future may well be more interested in the pattern of its global spread and in efforts to cope with its social and environmental consequences than with its origins in Western Europe.

Second Thoughts



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Big Picture Questions

1. What did humankind gain from the Industrial Revolution, and what did it lose?
2. In what ways might the Industrial Revolution be understood as a global rather than simply a European phenomenon?
3. How might you situate the Industrial Revolution in the long history of humankind? How do you think the material covered in this chapter will be viewed 50, 100, or 200 years into the future?
4. **Looking Back:** How did the Industrial Revolution interact with the Scientific Revolution and the French Revolution to generate Europe's modern transformation?