Learning Outcomes

After reading this chapter, you should be able to do the following:

LO¹ Describe and discuss the development of the Industrial Revolution in America after the Civil War, concentrating on the major industries and their leaders.

LO² Explain why the late 1800s in America have sometimes been called the “Age of Innovation.”

LO³ Describe how America’s regional and local markets merged into one truly national market, and how this influenced the consumer demand for products and services.
As the process of ensuring political, economic, and social rights of African Americans waned during the 1870s, most Americans turned their attention to another transformation brought on by the Civil War: the Industrial Revolution. During the half-century between 1865 and 1915, the United States evolved from a relative economic backwater to become the most powerful economy in the world. Industrialization played a key role in the nation’s advances, and both the Civil War and a core group of innovative, aggressive, farsighted, and opportunistic entrepreneurs were the main stimulants of growth. They embodied the optimism and inventiveness of the late nineteenth century, although they often pushed too far and engaged in practices we now see as unethical and corrupt, leaving wide gaps between the rich and the poor, between black and white, and between immigrant and native.

Like the Market Revolution of the first half of the century, the Industrial Revolution of the second half transformed the nation’s economy, its social life, and its politics. During the nineteenth century, the nation’s main energy sources shifted from human and animal power to mechanical power. Builders transitioned from using materials that one might find on the ground, such as stones and logs, to using manufactured materials, such as lumber, bricks, and steel. Smaller craft shops lost business to large specialized factories. Industrial cities grew dramatically as well, as mechanized public transportation allowed wealthier people to move away from the noisy city centers. And railroads made travel increasingly easy—even, by 1869, allowing people and goods to cross the continent speedily and safely.

During the late nineteenth century, the world that had consisted of small farms, artisans’ workshops, and small- or medium-sized factories at the beginning of the century transformed into a full-scale industrial society of large factories and polyglot urban hubs.

This chapter explores the contours of the Industrial Revolution of the second half of the nineteenth century, focusing on the industries, inventions, and actors that propelled the United States into the Industrial Age. These transformations sparked a host of challenges in the North, the South, and the West, and they directly challenged American politics at both a local and a national level. These broader changes are the subject of the following three chapters. But before we get to them, we need to understand the revolutions that brought on the Industrial Age.

**LO1 The Industrial Revolution**

The process of industrialization began well before the Civil War, and indeed, industrialization and improved communications sparked the Market Revolution during...
The Industrial Revolution can be defined as a transformation in the way goods were made and sold, as American businessmen between 1865 and 1915 used continuing technological breakthroughs and creative financing to bring greater efficiency to their businesses. The effects of this transformation were felt outside the business world, resulting in two key social transitions: (1) more and more Americans left farming to work in factories or retail, which spurred the rapid growth of cities; and (2) the American economy became dominated less by family businesses and more and more by large-scale corporate firms. Thus, many historians cite the late nineteenth century as the birth of modern industrialized America. One historian has pinpointed these years as the time when Americans physically and intellectually left behind the small, localized “island communities” that dotted the United States before the Civil War and confronted the large, polyglot nature of the American nation.

Why an Industrial Revolution in America? The Industrial Revolution had been launched in England in the 1750s, made its way over to the European continent by the early 1800s, and crossed the Atlantic well before the 1840s. But three reasons figure in its dramatic growth from 1865 to 1915 (see “The reasons why . . .” on American industrialization below).
The Basic Industries

The central industries of the Industrial Revolution were railroads, steel, and petroleum. Each had leaders who took control of their industry's development. These "captains of industry" were also sometimes called "robber barons," depending on the perspective of the observer. Through these industries, Americans created a corporate society.

Railroads

The expansion of the railroads was perhaps the one predictable development of the post–Civil War years. With the support of the federal government, between 1860 and 1915 total railroad development leapt from approximately 30,000 miles of track to more than 250,000 miles (see Map 17.1). By the eve of World War I in 1914, the national railroad network was basically complete, such that some historians say that all tracks built after 1890 were simply unnecessary. Railroads spanned the nation, making the movement of goods and products easy, cheap, and reliable.

Several ruthless and ingenious businessmen helped make all the growth possible. Leland Stanford, for example, was one of the "Big Four" captains of the railroad industry. With his partners, Collis Huntington, Charles Crocker, and Mark Hopkins, Stanford developed the railroad system in California and made the entire West easily accessible. All four were New Yorkers who had headed to California during the Gold Rush. All four were Republicans and supporters of Lincoln during the war. Knowing that the war would promote the expansion of railroads, the four invested money and energy in creating a...
Steel

The steel industry made the massive expansion of railroads possible. As early as the Middle Ages, steel had been used to make weapons. But because the process of making steel—by burning impurities out of iron ore—was laborious and expensive, artisans produced only small quantities. In the mid-1850s, English inventor Sir Henry Bessemer invented a way to convert large quantities of iron ore into steel by using extremely hot air.

Mass production of steel did not take off, however, until Andrew Carnegie became interested in the industry. On a trip to England in 1872, Carnegie saw the Bessemer process at work in a steel plant, and, amazed at its efficiency, he decided to open a steel plant in the United States. Rather than artisans, he could use cheap, unskilled laborers, who were willing to learn to operate the hot, dangerous machines for low wages. By 1900, he had built the largest steel company in the world and produced more than 25 percent of the steel used in the United States. Carnegie’s steel was used in many national landmarks, including the Brooklyn Bridge.

Carnegie’s greatest contribution in the world of business was his use of vertical integration, which meant placing all aspects of steel production under his control, from the moment iron ore was extracted from mines to the time finished steel was shipped to customers. Carnegie realized that, by integrating all the processes of making and distributing steel, he could avoid working with other companies and thus increase his profits. His method worked. In 1901 Carnegie sold his company, U.S. Steel, for more than $400 million—the equivalent of $9.8 billion today.

Petroleum

In the mid-nineteenth century, petroleum use increased as both a lubricant and a source of illumination. In 1855, Professor Benjamin Silliman of Yale University discovered that kerosene, a formerly “useless” byproduct of crude oil (unrefined petroleum), was a powerful illuminant. Entrepreneurs then rushed to find greater supplies of crude oil. The Pennsylvania Rock Oil Company hired Edwin Drake, a speculator and promoter, to drill for oil in north-
western Pennsylvania. After two years of searching, on August 28, 1859, Drake successfully drilled for oil in Titusville, Pennsylvania. His find ushered in an American oil boom.

The next challenge was to figure out the best means of extracting crude oil, transporting it to refineries, packaging it, conveying it to cities and towns across the nation, and marketing the finished products. John D. Rockefeller essentially filled all of these niches. He consolidated refining operations in Cleveland, and then, by paying close attention to cost-cutting details, he ruthlessly drove down the costs of producing usable commodities. Much of Rockefeller’s success can be attributed to his pioneering efforts at horizontal integration. In essence, he took over other oil companies or worked in combination with them to control competition, lower the cost of petroleum, and, of course, maximize profits. He practiced vertical integration as well, much like Andrew Carnegie in the steel industry. But he focused more intently on limiting competition with other businesses in the same industry. His legal advisors created a unique entity called “the trust,” which acted as a board of directors for all the oil refiners. He intended to provide cheap petroleum and to make himself wealthy. He succeeded at both.

Harmful Business Practices

All this innovation came with significant costs. For most businessmen, the goal was to control the market; whatever it took to drive out competitors, they did. Thus, while several of the innovations of men like Stanford, Carnegie, and Rockefeller benefited the American population, often these men took things too far, engaging in harmful business practices, which, as we will see in the following chapters, eventually provoked a series of reforms. But those reforms would come later. First would come monopolization, manipulation, a bit of price gouging, and environmental damage.

Monopolization

In the late 1800s, Rockefeller essentially controlled the drilling, refining, and transporting of most of the nation’s petroleum. But that was not enough. He was determined to control the product’s wholesale distribution and retail marketing as well. So he established regional outlets that ruthlessly undersold well-established companies for as long as it took to drive them out of business. Rich as he was, Rockefeller could absorb short-term losses much longer than his competitors. Once he had driven his rivals out of business, he was free to charge whatever he wished for his product (although he had to keep prices relatively low to keep international competition at bay). In 1879, his Standard Oil Company controlled 90 percent of all petroleum in the country.

Rockefeller also had his way with railroads. His petroleum shipments comprised the majority of the business of several rail lines. By threatening to take his business to other competitors, he forced several railroad officials to offer him rebates on every barrel he shipped. In this way, Rockefeller paid lower railroad rates than his competitors. Rockefeller also interfered with railroad lines that carried his competitors’ products. He convinced officials that they were hurting his business whenever they shipped a competitor’s products and that they should pay him a refund for each such barrel they shipped. Such business practices tested the limits of how much freedom politicians would allow businessmen to have.

Manipulating Stock Prices

Despite Rockefeller’s ruthless tactics toward railroads, it is difficult to feel compassion for the railroad companies. The business practices of some of their leaders were particularly nasty and essentially corrupt. For example, from 1866 to 1868, in what came to be called “the Erie Railroad War,” Cornelius Vanderbilt (another captain of industry) attempted to add to his already formidable railroad empire by taking over the Erie Railroad. Vanderbilt’s plan was to buy up a majority of the Erie Railroad’s shares. The Erie’s leaders, however, gleefully printed “bogus” shares of Erie Railroad stock and flooded
the stock market with them. Vanderbilt bought and bought, but more shares kept appearing. Vanderbilt’s shares never gave him control of the company, but they did enrich the Erie leaders who were selling the bogus shares. The problem with their plan was that the Erie’s value declined on the stock market, and, within a few years, it was forced to declare bankruptcy. Such manipulation of stock prices by “inside” operators affected many industries besides the railroads.

**Price Gouging**

Railroads also engaged in price gouging. For example, in urban areas where demand was high, usually several railroads operated their lines. These railroads often had to provide competitive rates, and during the occasional price wars between their competitors, railroads sometimes cut prices below their own costs. To make up for these losses, railroads gouged customers in other places—usually small towns that were served by just one line. Railroad officials also increased rates for local service, provoking differences between “long haul” and “short haul” charges. For instance, farmers in the eastern Dakotas complained that it cost more to ship a bushel of wheat 400 miles to Minneapolis than it cost to send that same product to Europe, more than ten times as far. Once again, these practices would eventually motivate the government to act—but not for many decades.

**Environmental Damage**

A fourth harmful business practice concerns what the Industrial Revolution did to the environment. Drilling for petroleum damaged the soil. The development of hydraulic mining was much more damaging to the land than the mining done by miners. Burning coal gave off damaging gases. And railroad tracks cut through lands that were largely untouched by sustained human development. Most
Americans did not express deep concerns for these types of problems, but a few did. The top preservationist of the period was John Muir, the founder of the American environmental organization the Sierra Club and an influential advocate of preserving the mountain lands between California and Montana. In 1872, the federal government created the first national park, Yellowstone National Park, which comprises parts of Wyoming, Montana, and Idaho.

LO\(^2\) The Age of Innovation

In addition to the dynamic developments of business leaders, numerous technological, financial, and legal innovations powered the Industrial Revolution. Indeed, this was the era of many of America’s most far-reaching inventions and innovations.

**Technology**

Perhaps no invention had more lasting impact than the incandescent light bulb, created by Thomas Edison in 1879. After years of experimentation, Edison harnessed the power of electricity and transmitted bright light for extended periods of time. The subsequent development of huge electrical power stations made this new form of energy cheap enough to allow middle-class homeowners to purchase it and businesses to operate after dark. Development of the first electric grids spread electricity throughout cities. In addition to light bulbs, Edison also perfected the motion picture camera, the phonograph, the microphone, and more. He set up the first industrial research laboratory in the world, developed solely to invent new things. It worked. In the United States alone, Edison held 1,093 patents. He possessed more abroad.

Separately, Alexander Graham Bell’s invention in 1876 of the telephone, which also used electrical power, vastly sped up the flow of communications over long distances and enabled businesses to exchange information more efficiently. In architecture, major improvements in the design of blast furnaces allowed iron producers to manufacture stronger, more durable steel. Steel was the preferred building material of architects, who, during this era, first designed skyscrapers that reached hundreds of feet into the air. And the mechanized elevator, invented by Elisha Otis in 1853, made all these skyscrapers usable. Before the elevator, few people would rent rooms above the sixth floor. At the same time, the typewriter was invented in the 1860s and marketed by Eliphalet Remington and Sons beginning in 1873. The typewriter created a number of office jobs that opened up to women during these years. In the otherwise patriarchal business world of the nineteenth century, the typewriter helped make women earners in an industrializing economy.

Invention bred still more invention. In the seven decades before 1860, the U.S. Patent Office issued 36,000 patent licenses. During the three decades after 1860, that number of patents grew to 144,000.

**Innovative Financing, Law, and Business Practices**

To support the development of these technologies and the big businesses that marketed and distributed them, a new breed of financiers emerged. Such giants as Jay Gould and J. Pierpont Morgan specialized in forming groups of rich men (called syndicates) in order to provide huge amounts of capital to fund promising companies and start up new industries. Morgan and a handful of associates gathered investors from around the globe to underwrite and fund various investment opportunities. The advent of pooled funds allowed Morgan to broker the formation of one of the world’s first billion-dollar corporations, the Northern Securities Company.

Beginning in the mid-1800s, federal and state governments made changes in corporate law that supported these financial schemes and encouraged growth. They provided corporations with the power to acquire and merge with other businesses, thus allowing corporations to accumulate the capital required to finance big businesses. They also provided a significant layer of protection between families’ fortunes and the courts. Rather than relying on any single individual’s fortune to raise money, corporate officers were allowed to sell their stock on the open market. In that way, the investors who bought shares of the stock would become...
“part owners” of the company. In the event that a corporation was sued successfully, investors holding stock limited their liability to just the number of shares they owned. During the Industrial Revolution, the number of corporations increased dramatically, creating a sizeable number of organizations with large amounts of money that were able and willing to buy up successful smaller companies and develop a national (and even international) market.

During this era, entrepreneurs also experimented with innovative business practices that allowed them to expand rapidly. For one, they streamlined operations. As businesses became larger, managers could not personally supervise all facets of their operations. So entrepreneurs established a hierarchy of managers and supervisors to coordinate schedules, keep track of shipments, and analyze the costs of each facet of the business. This development had two results: (1) It allowed corporations to control shops across a broad stretch of the nation, often centralizing control in one of the growing cities of the Midwest, such as Chicago; and (2) it created a class of managers that would figure prominently in the rapidly expanding middle class.

The National Market:
Creating Consumer Demand

By the late nineteenth century, with railroads spanning the nation and the process of replaceable parts making more and more goods available to a consuming public, the entire American nation became a marketplace. As wise businessmen capitalized on this development, they helped create the modern consumer culture.

Advertising

One significant development in this regard was a revolution in advertising. Before the Industrial Revolution, businessmen notified people about the availability of goods simply by printing announcements in local newspapers or in leaflets handed out to customers. Because their companies served mostly a local market, such advertising techniques were effective. As the consumer economy evolved after the Civil War, however, businesses began to market goods more aggressively and across numerous regions. In newspapers, multiple-column, even full-page advertisements began to replace the single-column notices of earlier years. Celebrities were featured wearing watches or hats. The number of advertising agencies expanded rapidly. Billboards and placards sprouted up everywhere.

National Brands

Along similar lines, the first advertising agencies began rudimentary marketing surveys to identify potential consumers’ preferences, and then applied the results to the marketing of individual products. For example, buying biscuits in the late nineteenth century was often problematic because they were stored in open containers; usually they became stale before they were bought. The National Biscuit Company (Nabisco) test-marketed a rather ordinary biscuit that had one difference from typical biscuits—a new, sealed package. Soon, consumers across the country demanded the product. The combination of technological and transportation innovations allowed the creation of truly national brands.

Stores and Mail Order

Chain stores quickly followed. Essentially, chains began when successful storeowners decided to
reach more customers by opening branches in separate locations. Large chain stores had the advantage of being able to negotiate lower wholesale prices because they could purchase items in bulk; often they passed on a portion of their savings to consumers in the form of lower prices. One of the largest grocery chains was the Atlantic and Pacific Tea Company, known as A&P. Frank W. Woolworth devised another type of chain based on the idea of selling lots of inexpensive goods at cheap, fixed prices. His Woolworth outlets were originally called “five and tens,” meaning that almost all of the goods were priced at either a nickel or a dime. The growth of his stores was phenomenal. In 1859, Woolworth founded his first store; by 1915 he and his partners controlled around six hundred outlets.

The emergence of advertising and national chain stores helped create a consumer culture in the nation’s cities. The wide availability of consumer goods prompted some entrepreneurs to open department stores, which quickly became the greatest symbol of the emerging desire for consumption. In ornate window displays, such as New York’s Macy’s (founded 1858) and Philadelphia’s Wanamaker’s (1877), a large selection of items dazzled passersby. The stores also provided employment to thousands of urban Americans, especially women.

Chain retail stores appealed to city and town dwellers, but to reach rural customers, farsighted entrepreneurs used catalogues. In 1872, Aaron Montgomery Ward set up a mail order business. Beginning with a single-page list of items, he expanded his lists until his catalogue was heavier than many magazines. Richard W. Sears and Alvah C. Roebuck were comparative latecomers to the mail order business, but they offered Ward stiff competition. By the late 1890s, the Sears catalogue numbered more than five hundred pages. Next to the family Bible, it was one of the few “books” considered indispensable by farm families.

And in the end . . .

Between 1865 and the early 1900s, the American economy was transformed from one run by family shops and small factories to one generally controlled by large corporations. As these corporations consolidated their business practices, they helped improve access to food, material wealth, and new technologies. They also helped expand large urban centers, especially in the North, and pushed their innovations into the West and the South, creating what looked like the first national consumer culture to many Americans, where Nabisco crackers could be found in most American grocery stores and where the Sears catalogue could be found in all regions of the country.

Many of the inventions of the late nineteenth century did not seem particularly transformative to contemporaries. The New York Times reporter covering the 1882 story of Edison’s first large-scale light bulb test, in New York City, passively described the test as “in every way satisfactory.” He did not recognize the electric light bulb as something all that different from the gas bulbs that had illuminated the city before. But what the reporter missed was that the bulb required a grid of electrical power that could be extended for miles. He missed the fact that electric automation would lead to widespread electrification and spark hundreds of other inventions.

The inventions of the Industrial Age and the expansion of corporate America would influence the nation differently, depending on where one lived. In the North, they would transform society by inspiring the arrival of millions of immigrants and creating an urban society, along with a reactionary politics, as working-class laborers sought to make the government more responsive to their needs in the budding labor movement. It is these transitions in the North that we turn to next.

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