

19 The New Industrial Order

1870–1900

The Englishman Sir Henry Bessemer invented a method of cheaply manufacturing large quantities of steel from iron. His egg-shaped converter spews the fire that produced the glowing steel ingots, at left.



>> An American Story

SCAMPERING THROUGH AMERICA

It was so dark that Robert Ferguson could not see his own feet. Inching along the railroad tracks, he suddenly pitched forward as the ground vanished beneath him and found himself wedged between two railroad ties, his legs dangling in the air. Ferguson, a Scot visiting America in 1866, had been in Memphis only two days earlier, ready to take the “Great Southern Mail Route” east some 850 miles to Washington.

Things had gone badly from the start. A broken river bridge not 50 miles outside Memphis had forced him to take a ferry across the river and then a bumpy 10-mile ride on a mule-drawn truck to where the track was supposed to resume—and didn’t. Disheartened, he and his

fellow travelers returned to Memphis aboard a train, only to have it derail just outside the city.

When a few passengers decided to hike the remaining distance, Ferguson tagged along. It was then that he fell between the tracks. At dawn he discovered to his horror that the tracks led onto a flimsy, high river bridge. It was then that he had fallen between the tracks and crawled to safety on the other side.

Less than 20 years later rail passengers traveled in relative luxury. T. S. Hudson, another British tourist, launched a self-proclaimed “Scamper through America” in 1882. It took him just 60 days to travel from England to San Francisco and back. He crossed the continental United States on a ticket booked by a single agent in Boston. Such speed and centralization would have been unthinkable in 1866, when, in any

case, the transcontinental railroad was still three years from completion.

Hudson’s trains had Pullman Palace cars with posh sleeping quarters, full meals, and air brakes that smoothed stops. Bridges appeared where none had been before, including a “magnificent” steel-and-stone span held up by three giant arches across the Mississippi at St. Louis. Hudson also found himself in the midst of a communications revolution. Traveling across the plains, he was struck by the number of telephone poles along the route.

What made America in the 1880s so different from the 1860s was a new industrial order. The process of industrialization had begun at least three decades before the Civil War when small factories produced light consumer goods such as clothing, shoes, and furniture. Manufacturers catered to local markets

made up mostly of farmers and merchants. After the 1850s the industrial economy matured, with larger factories, more machines, greater efficiency, and national markets.

The transformation brought pain along with the progress. Virgin forests vanished from the Pacific Northwest, the hillsides of Pennsylvania and West Virginia were pockmarked with open-pit mines, and the rivers of the Northeast grew toxic with industrial wastes. In 1882, the year Hudson scampered by rail across America, an average of 675 people were killed on the job every week. Like most Americans, workers scrambled—sometimes literally—to adjust. Change came nonetheless. Industrialization swept from Great Britain to the European continent to America. Almost overnight, the republic of merchants and small farmers turned into an industrial powerhouse. <<

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THE DEVELOPMENT OF INDUSTRIAL SYSTEMS

The new industrial order can best be understood as a web of complex industrial systems. Look, for example, at the bridge across the Mississippi that Hudson so

admired. When James B. Eads constructed its soaring arches in 1874, he needed steel, most likely made from iron ore mined in northern Michigan. Giant steam shovels scooped up the ore and loaded whole freight cars in a few strokes.

A transportation system—railroads, boats, and other carriers—moved the ore to Pittsburgh, where giant mills furnished the labor and machinery to finish the steel. The capital to create such factories came itself from a system of finance, linking investment

banks and stock markets to entrepreneurs in need of money. Only with a national network of industrial systems could the Eads bridge be built and a new age of industry arise.

Natural Resources and Industrial Technology >>

The earliest European settlers had marveled at the “merchantable commodities” of America, from the glittering silver mines of the Spanish Empire to the continent’s hardwood forests. What set the new industrial economy apart from that older America was the scale and efficiency of using resources. New technologies made it possible to employ natural riches in ways undreamed of only decades earlier.

Iron, for example, had been forged into steel swords as far back as the Middle Ages. In the 1850s inventors in England and America discovered a cheaper way—called the Bessemer process—to convert large quantities of iron into steel. Steel was lighter than iron, could support 20 times as much weight, and lasted 20 years instead of 3. Steel tracks soon carried most rail traffic; steel girders replaced the old cast-iron frames in buildings; steel cables supported new suspension bridges.

Industrial technology made some natural resources more valuable. New distilling methods transformed a thick, smelly liquid called *petroleum* into kerosene for lighting lamps, oil for lubricating machinery, and paraffin for making candles. Beginning in 1859, new drilling techniques began to tap vast pools of petroleum below ground. About the same time, Frenchman Étienne Lenoir constructed the first practical internal combustion engine. After 1900 new vehicles such as gasoline-powered carriages turned the oil business into a major industry.

The environmental price of industrial technology soon became evident. Coal mining, logging, and the industrial wastes of factories were only the most obvious sources of environmental degradation. Sometimes even the cure came at a cost. When engineers tried to cleanse the polluted Chicago River by reversing its flow, they succeeded only in shifting pollution to rivers downstate.

Systematic Invention >>

Industrial technology rested on invention. For sheer inventiveness, the 40 years following the Civil War have rarely been matched in American history. Between 1790 and 1860, 36,000 **patents** were registered with the government. Over the next three decades the U.S. Patent Office granted more than half a million.

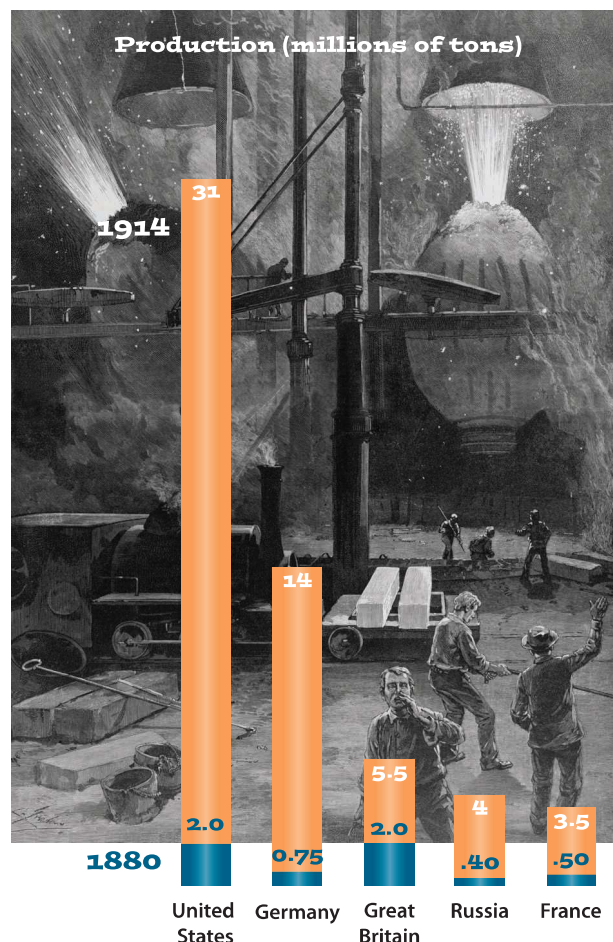
patent legal document issued by the government giving the holder exclusive rights to use, make, and sell a process, product, or device for a specified period of time.

One fact helps to account for the growth. The process of invention became systematized. Small-scale inventors were replaced by orderly

witness An Englishman Visits Pittsburgh in 1898

“I spent the day seeing the [steel] works where the Bessemer rails are turned out. . . . All nations are jumbled up here, the poor living in tenement dens or wooden shanties thrown up or dumped down (better expression) with very little reference to roads or situation. . . . It is a most chaotic city, and as yet there is no public spirit or public consciousness to make the conditions healthy. . . . It is industrial greatness with all the worst industrial abuses on the grandest scale.”

—Charles Phillips Trevelyan, *Letters from North America and the Pacific* (April 15, 1898)



STEEL PRODUCTION, 1880 AND 1914

While steel production jumped in western industrial nations from 1880 to 1914, it skyrocketed in the United States because of rich resources, cheap labor, and aggressive management.



▲ In 1901 Spindletop Hill, just south of Beaumont, Texas, yielded a gusher that began the modern oil industry. Known as “black gold,” oil became one of the most profitable businesses in the world, but drilling for it was dangerous, especially for workers at the wellhead. Wells could ignite, producing a deadly blast and then a fire that might last for days, as the photo shows.

“invention factories”—forerunners of expensive research labs. No one did more to bring system, order, and profitability to invention than Thomas Alva Edison. After developing a more efficient stock ticker, he set himself up as an independent inventor. For the next five years, Edison patented a new invention almost every five months.

Edison was determined to bring system and order to the process of invention. Only then could breakthroughs come in a steady and profitable stream. He moved 15 of his workers to Menlo Park, New Jersey, where in 1876 he created an “invention factory.” Like a manufacturer, Edison subdivided the work among gifted inventors, engineers, toolmakers, and others. This orderly bureaucracy soon evolved into the Edison Electric Light Company. It was soon delivering not only lightbulbs but a unified electrical power system—central stations to generate electric current, wired to users, all powering millions of small bulbs in homes and businesses—to its customers.

George Eastman revolutionized photography by making the consumer a part of his inventive system. In 1888 Eastman marketed the “Kodak” camera at the affordable price of \$25. The small black box weighed two pounds and contained a strip of celluloid film that replaced hundreds of pounds of photography equipment. After 100 snaps of the shutter, the owner simply sent the camera back to the factory and waited for the developed photos, along with a reloaded camera, to return by mail, all for \$10.

What united these innovations was the notion of rationalizing inventions—of making a systematic business out of them. By 1913 Westinghouse Electric, General Electric, U.S. Rubber Company, and other firms had set up research laboratories. And by the middle of the century, research labs had spread beyond business to the federal government, universities, trade associations, and labor unions.

Transportation and Communication >>

Abundant resources and new inventions remained worthless to industry until they could be moved to processing plants, factories, and offices. With more than 3.5 million square miles of land in the United States, distance alone was daunting. Where 100 miles of railroad track would do for shipping goods in Germany and England, 1,000 miles was necessary in America.

An efficient internal transportation network tied the country into an emerging international system. By the 1870s railroads crisscrossed the country, and steam-powered ships (introduced before the Civil War) were pushing barges down rivers and carrying passengers and freight across the oceans. Between 1870 and 1900 the value of American exports tripled. Eventually the rail and water transportation systems fused. By 1900 railroad companies owned nearly all of the country’s domestic steamship lines.

A thriving industrial nation also required effective communication. Information was a precious commodity, as essential as resources or technology to industry. In 1844 Samuel Morse succeeded in tapping out the first message over an electrical wire between cities. Communication using Morse’s code of dots and dashes became virtually instantaneous. So useful to railroads was the telegraph that they allowed poles and wires to be set along their rights-of-way in exchange for free telegraphic service. By the turn of the century a million miles of telegraph wire handled some 63 million messages a year, not to mention those flashing across underwater cables to China, Japan, Africa, and South America.

A second innovation in communication, the telephone, vastly improved on the telegraph. Alexander Graham Bell, a Scottish immigrant, was teaching the deaf when he began experimenting with ways to



⚡ Telegraph key.

transmit speech electrically. In 1876 he transmitted his famous first words to his young assistant: “Mr. Watson, come here! I want you.” No longer did messages require a telegraph office, unwieldy dots and dashes, and couriers to deliver the translated messages. Communication could be instantaneous *and* direct. Before the turn of the century the Bell-organized American Telephone and Telegraph Company combined more than 100 local companies to furnish business and government with long-distance service. The telephone patent proved to be the most valuable ever granted.

Finance Capital >> As industry grew, so did the demand for investment capital—the money spent on land, buildings, and machinery. The need for capital was great especially because so many new industrial systems were being put into place at once. Each often required enormous start-up costs. Industrial processes involving so many expensive systems could not take shape until someone raised the money to finance them.

For the first three-quarters of the nineteenth century, investment capital had come mostly from the savings of firms. In the last half of the century, “capital deepening”—a process essential for industrialization—took place. Simply put, as national wealth increased, people began to save and invest more of their money.

<< A young Alexander Graham Bell with an early version of his “speaking telegraph.”

This meant that more funds could be lent to companies seeking to start up or expand.

Savings and investment grew more attractive with the development of a complex network of financial institutions. Commercial and savings banks, investment houses, and insurance companies gave savers

new opportunities to channel money to industry. The New York **Stock Exchange**, in existence since 1792, linked eager investors with money-hungry firms.

stock exchange market at which shares of ownership in corporations are bought and sold.

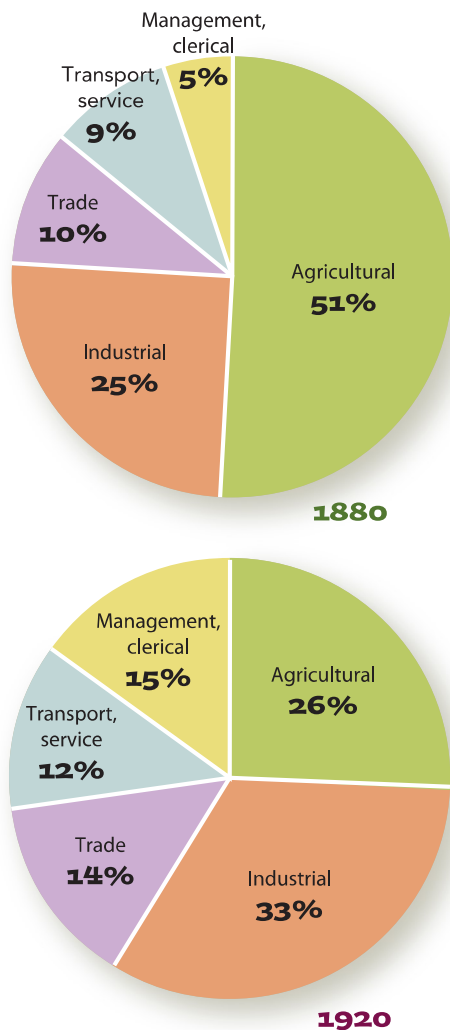
The Corporation >> For those business leaders with the skill to knit the industrial pieces together, large profits awaited. This was the era of the notorious “robber baron.” And to be sure, sheer ruthlessness went a long way in the fortune-building game. “Law? Who cares about law!” railroad magnate Cornelius Vanderbilt once boasted. “Hain’t I got the power?”

To survive over the long term, business leaders could not depend on ruthlessness alone. They needed ingenuity, an eye for detail, and the gift of foresight. The growing scale of enterprise and need for capital, for example, led them to adapt an old device, the corporation, to new needs.

The corporation had several advantages over traditional forms of ownership: the single owner and the partnership. A corporation could raise large sums quickly by selling “stock certificates,” or shares in its business. It could also outlive its owners (or stockholders), because it required no legal reorganization if one died. It limited liability, since owners were no longer personally responsible for corporate debts. And it separated owners from day-to-day management of the company. Professional managers could now operate complex businesses. So clear were these benefits that before the turn of the century, corporations were making two-thirds of all manufactured products in the United States.

An International Pool of Labor >> No new industrial order could have been created without an abundant pool of labor. In 1860 it took about 4.3 million workers to run all the factories, mills, and shops in the United States. By 1900 there were approximately 20 million industrial workers in America.

In part, the United States relied on a vast global network to fill its need for workers. In Europe as well as Latin America, Asia, Africa, and the Middle East, seasonal migrations provided a rich source of workers for many nations, including the United States. Mechanization, poverty, oppression, and ambition pushed many



OCCUPATIONAL DISTRIBUTION, 1880 AND 1920

Between 1880 and 1920, management and industrial work—employing white- and blue-collar workers—grew at the expense of farmwork.

of these rural laborers from farms into industrial cities and to other continents once steamships cut travel time across the Atlantic to about a week by the 1880s.

Between 1870 and 1890 more than 8 million immigrants arrived in the United States, another 14 million by 1914. Some came from Asia and Latin America, but most came from Europe and settled in industrial cities. Like migratory laborers elsewhere, they hoped to find work, fatten their purses, and go home. According to one estimate, between 25 and 60 percent of all immigrants returned to their homelands from the United States during these years.

Immigrants relied on well-defined migration chains of friends and family. A brother might find work with other Slavs in the mines of Pennsylvania; or the

daughter of Greek parents, in a New England textile mill filled with relatives. Labor contractors also served as a funnel to industry. Tough and savvy immigrants themselves, they met newcomers at the docks and train stations with contracts. Among Italians they were known as *padrones*; among Mexicans, as *enganchistas*. By 1900 they controlled two-thirds of the labor in New York.

A massive migration of rural Americans—some 11 million between 1865 and 1920—provided a home-grown source of labor. Driven from the farm by machines or bad times or just following dreams of a new life, they moved first to small, then to larger cities. Most lacked the skills for high-paying work. But they spoke English, and many could read and write. In iron and steel cities as well as in coal-mining towns, the better industrial jobs and supervisory positions went to them. Others found work in retail stores or offices and slowly entered the new urban middle class of white-collar workers.

Most African Americans continued to work the fields of the South. About 300,000 moved to northern cities between 1870 and 1910. Like the new immigrants, they were trying to escape discrimination and follow opportunity. One by one they brought their families. Discrimination still dogged them, but they found employment. Usually they worked in low-paying jobs as day laborers or laundresses and domestic servants. Black entrepreneurship also thrived as black-owned businesses served growing black communities.

Mexicans, too, came in search of jobs, mainly in agriculture but also in industry. They helped to build the transcontinental railroad. After the turn of the century, a small number turned farther north for jobs in the tanneries, meatpacking plants, foundries, and rail yards of Chicago and other midwestern industrial cities.

✓ REVIEW

What factors led to the development of industrial systems?

RAILROADS: AMERICA'S FIRST BIG BUSINESS

In 1882, the year T. S. Hudson scampered across America, clocks in New York and Boston were 11 minutes 45 seconds apart. Stations often had several clocks showing the time on different rail lines, along with one displaying “local mean time.” In 1883, without consulting anyone, the railroad companies divided

the country into four time zones an hour apart to clean up this inefficient mess. Congress did not get around to making the division official until 1916.

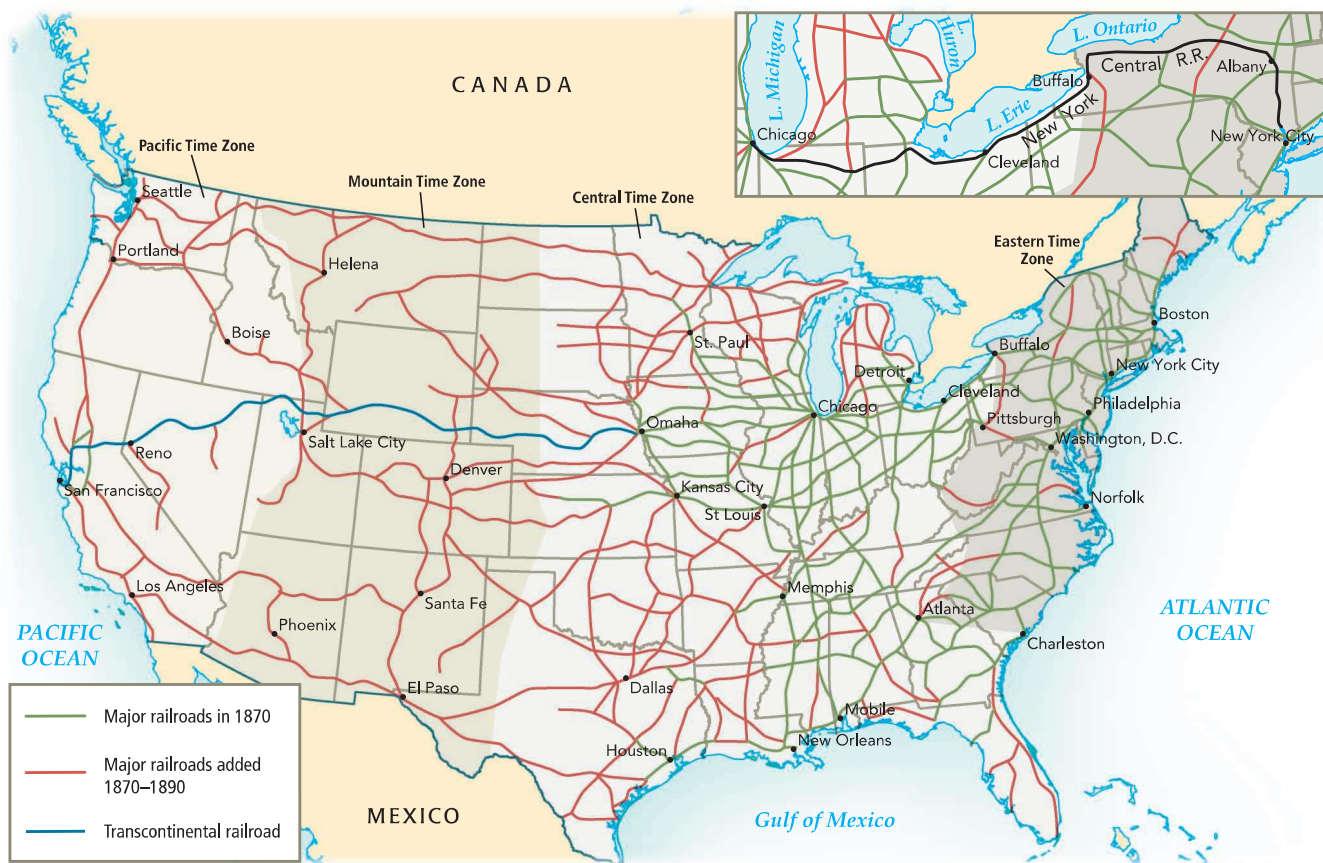
At the center of the new industrial systems lay the railroads, moving people and freight, spreading communications, reinventing time, tying the nation together. Railroads also stimulated economic growth, simply because they required so many resources to build—coal, wood, glass, rubber, brass, and, by the 1880s, 75 percent of all U.S. steel. By lowering transportation costs railroads allowed manufacturers to reduce prices, attract more buyers, and increase business. Perhaps most important, as America's first big business they created techniques of modern management, soon adopted by other companies.

A Managerial Revolution >> To the men who ran them, railroads provided a challenge in organization and finance. In the 1850s one of the largest industrial enterprises in America, the Pepperell textile mills of Maine, employed about 800 workers. By the early

1880s the Pennsylvania Railroad had nearly 50,000 people on its payroll. From paying workers to setting schedules and rates to determining costs and profits, everything required a level of coordination unknown in earlier businesses.

The so-called trunk lines devised new systems of management. Scores of early companies had serviced local networks of cities and communities, often with fewer than 50 miles of track. During the 1850s longer trunk lines emerged east of the Mississippi to connect the shorter branches, or “feeder” lines. By the outbreak of the Civil War, with four great trunk lines under a single management, railroads linked the eastern seaboard with the Great Lakes and western rivers.

The operations of large lines spawned a new managerial elite, beneath owners but with wide authority over daily operations. Daniel McCallum, superintendent of the New York and Erie in the 1850s, laid the foundation for this system by drawing up the first table of organization for an American company. A tree trunk with roots represented the president and board



MAP 19.1: RAILROADS, 1870–1890

By 1890 the railroad network stretched from one end of the country to the other, with more miles of track than in all of Europe combined. New York City and Chicago, linked by the New York Central trunk line, became the new commercial axis.

What was the western terminus of the New York Central Railroad?

of directors; five branches constituted the main operating divisions; leaves stood for the local agents, train crews, and others. Information moved up and down the trunk so that managers could get reports to and from the separate parts.

These managerial techniques soon spread to other industries. Local superintendents were responsible for daily activities. Central offices served as corporate nerve centers, housing divisions for purchases, production, transportation, sales, and accounting. A new class of middle managers ran them and imposed new order on business operations. Executives, managers, and workers were being taught to operate in increasingly precise and coordinated ways.

Competition and Consolidation >> While managers made operations more systematic, the fierce struggle among railroad companies to dominate the industry was anything but precise and rational. In the 1870s and 1880s the pain of railroad competition began to tell.

The most savage and costly competition came over the prices charged for shipping goods. Managers lowered prices, or “rates,” for freight that was shipped in bulk, on long hauls, or on return routes, since the cars were empty any way. They used “rebates”—secret discounts to preferred customers—to drop prices below the posted rates of competitors and then recouped the losses by overcharging small shippers like farmers. When the economy plunged or a weak line sought to improve its position, rate or price wars broke out. By 1880, 65 lines had declared bankruptcy.

Consolidation worked better than competition. During the 1870s railroads created regional federations to pool traffic, set prices, and divide profits among members. Without the force of law, however, these regional federations failed. Members broke ranks by cutting prices in hopes of quick gain. In the end, rate wars died down only when weaker lines failed or stronger ones bought up competitors.

The Challenge of Finance >> Earlier in the nineteenth century many railroads relied on state governments for financial backing. They also looked to counties, cities, and towns for bonds and other forms of aid. People took stock in exchange for land or labor, particularly those living near the ends of rail lines who stood to gain most from construction. In the 1850s and 1860s western promoters went to Washington for federal assistance. Congress loaned \$65 million to six western railroads and granted some 131 million acres of land.

Federal aid helped to build only part of the nation’s railroads. Most of the money came from private investors. The New York Stock Exchange expanded rapidly as railroad corporations began to trade their stocks

there. Large investment banks developed financial networks to track down money at home and abroad. By 1898 a third of the assets of American life insurance companies had gone into railroads, while Europeans owned nearly a third of all American railroad securities.

Because investment bankers played such large roles in funding railroads, they found themselves advising companies about their business affairs. If a company fell into bankruptcy, bankers sometimes served as the “receivers” who oversaw the property until financial health returned. By absorbing smaller lines into larger ones, eliminating rebates, and stabilizing rates, the bankers helped to reduce competition and impose order and centralization on railroads and other corporations. In the process, they often gained control of the companies they advised.

By 1900 the new industrial systems had transformed American railroads. Some 200,000 miles of track were in operation, 80 percent of it owned by only six groups of railroads. Time zones allowed for coordinated schedules; standardized track permitted easy cross-country freighting. Soon passengers were traveling 16 billion miles a year. To that traffic could be added farm goods, raw materials, and factory-finished products. Everything moved with new regularity that allowed businesses to plan and prosper.

REVIEW

How did the railroads contribute to the rise of big business?

THE GROWTH OF BIG BUSINESS

In 1865, near the end of the Civil War, 26-year-old John D. Rockefeller sat blank-faced in the office of his Cleveland oil refinery, about to conclude the biggest deal of his life. Rockefeller’s business was thriving, but he had fallen out with his partner over how quickly to expand. Rockefeller was eager to grow fast; his partner was not. They dissolved their partnership and agreed to bid for the company. Bidding opened at \$500, rocketed to \$72,500, and abruptly stopped. “The business is yours,” said the partner. The men shook hands, and a thin smile crept across Rockefeller’s angular face.

Twenty years later, Rockefeller’s Standard Oil Company controlled 90 percent of the nation’s refining capacity and an empire that stretched well beyond Cleveland. Trains swept Standard executives to New York, Philadelphia, and other eastern cities. It was a fitting form of transportation for Rockefeller’s

company, because railroads were the key to his oil empire. They pioneered the big business systems on which he was building. And they carried his oil products for discounted rates, giving him the edge to squeeze out rivals.

Strategies of Growth >> First a bedeviling business riddle had to be solved: how to grow and still control the ravages of competition? In Michigan in the 1860s, salt producers found themselves fighting for their existence. The presence of too many salt makers had begun an endless round of price-cutting that was driving everyone out of business. Seeing salvation in combination, they drew together in the nation's first pool. In 1869 they formed the Michigan Salt Association. They voluntarily agreed to allocate production, divide markets, and set prices—at double the previous rate.

consumer goods products such as food and clothing that fill the needs and wants of individuals.

horizontal combination strategy of business growth (sometimes referred to as "horizontal integration") that attempts to stifle competition by combining more than one firm involved in the same level of production, transportation, or distribution into a single firm.

Salt processing and other industries that specialized in **consumer goods** had low start-up costs, so they were often plagued by competition. **Horizontal combination**—joining together loosely with rivals that offered the same goods or services—had saved Michigan salt producers. By the 1880s there was a whiskey pool, a cordage pool,

and countless rail and other pools. Such informal pools ultimately proved to be unenforceable and therefore unsatisfactory. (After 1890 they were also considered illegal restraints on trade.) But other forms of horizontal growth, such as formal mergers, spread in the wake of an economic panic in the 1890s.

Some makers of consumer products worried less about direct competition and concentrated on boosting efficiency and sales. They adopted a vertical-growth strategy in which one company gained control of two or more stages of a business. Take Gustavus Swift, a New England butcher, for example. Swift moved to Chicago in the mid-1870s, aware of the demand for fresh beef in the East. He acquired new refrigerated railcars to ship meat from western slaughterhouses and a network of ice-cooled warehouses in eastern cities to store it. By 1885 he had created the first national meatpacking enterprise, Swift and Company.

Swift moved upward, closer to consumers, by putting together a fleet of wagons to distribute his beef to retailers. He moved down toward raw materials, extending and coordinating the purchase of cattle at the Chicago stockyards. By the 1890s Swift and Company was a fully integrated, vertically organized corporation operating on a nationwide scale.

Vertical growth generally moved producers of consumer goods closer to the marketplace in search of high-volume sales. The Singer Sewing Machine Company and the McCormick Harvesting Machine Company created their own retail sales arms. Manufacturers began furnishing ordinary consumers with technical information, credit, and repair services. Advertising expenditures grew, to some \$90 million by 1900, in an effort to identify markets, shape buying habits, and increase sales.

Carnegie Integrates Steel >> Industrialization encouraged vertical integration in heavy industry but more often in the opposite direction, toward reliable sources of raw materials. These firms made products for big users such as railroads and factory builders. Their markets were easily identified and changed little. For them, success lay in securing limited raw materials and in holding down costs.

Andrew Carnegie led the way in steel. A Scottish immigrant, he worked his way up from bobbin boy to expert telegrapher to superintendent of the Pennsylvania Railroad's western division at the age of 24.



^ Andrew Carnegie around 1868. A decade later, a world tour he took tempered his attitude toward the social Darwinist view that evolution had produced the superiority of Western technology and ideas. "Go and see for yourself how greatly we are bound by prejudices, how checkered and uncertain are many of our own advances," he told friends. "No nation has all that is best."



^ Carnegie steel furnaces, Braddock, Pennsylvania, on the banks of the Monongahela River were opened in 1875 as part of the J. Edgar Thomson Steel Works. Named for the president of the Pennsylvania Railroad, the mill was capable of producing as much as 255 tons of steel rails a day, many of which went into the construction of the Pennsylvania Railroad line.

A string of wise investments paid off handsomely. Among other things, he owned a locomotive factory and an iron factory that became the nucleus of his steel empire.

In 1872, on a trip to England, Carnegie chanced to see the Bessemer process in action. Awestruck and dreaming of the profits to be made from cheap steel, he rushed home to build the biggest steel mill in the world. It opened in 1875, in the midst of a severe depression. Over the next 25 years, Carnegie added mills at Homestead and elsewhere in Pennsylvania and moved from railroad-building to city-building.

Carnegie succeeded, in part, by taking advantage of the boom-and-bust business cycle. He jumped in during hard times, building and buying when equipment and businesses were cheap. But he also found skilled managers who employed the administrative techniques of the railroads. And Carnegie knew how to compete: he scrapped machinery, workers, even a new mill to keep costs down and undersell competitors. The final key to Carnegie's success was expansion. His empire spread horizontally by purchasing rival steel mills and constructing new ones. It spread vertically, buying up sources of supply, transportation, and eventually sales. Controlling such an integrated system, Carnegie could ensure a steady flow of materials from mine to mill and market, as well as profits at every stage. In 1900 his company turned out more steel than Great Britain and netted \$40 million.

Rockefeller and the Great Standard Oil Trust >> John D. Rockefeller accomplished in oil what Carnegie achieved in steel. And he went further, developing an innovative business structure—the

trust—that promised greater control than even Carnegie's integrated system. At first Rockefeller, who specialized in refining petroleum, grew horizontally by buying out or joining other refiners. To cut costs he also expanded vertically, with oil pipelines, warehouses, and barrel factories. By 1870, when he and five partners formed the Standard Oil Company of Ohio, his high-quality, low-cost products set a competitive standard.

Because the oil-refining business was a jungle of competitive firms, Rockefeller proceeded to twist arms. He bribed rivals, spied on them, created phony companies, and slashed prices. His decisive edge came from the railroads. Desperate for business, they granted Standard Oil not only rebates on shipping rates but also "drawbacks," a fee from the railroad for any product shipped by a rival oil company. Within a decade Standard dominated American refining with a vertically integrated empire that stretched from drilling to selling.

Throughout the 1870s Rockefeller kept his empire stitched together through informal pools and other business combinations. But they were weak and afforded him too little control. He could try to expand further, except that corporations were restricted by state law. In Rockefeller's home state of Ohio, for example, corporations could not own plants in other states or own stock in out-of-state companies.

In 1879 Samuel C. T. Dodd, chief counsel of Standard Oil, came up with a new device, the "trust." The stockholders of a corporation surrendered their shares "in trust" to a central board of directors with the power to control all property. In exchange, stockholders received certificates of trust that paid hefty dividends. Since it did not literally own other companies,

the trust violated no state law, many of which sought to limit the power of big businesses by preventing one corporation from owning stock in another.

trust business arrangement in which owners of shares in a business turn over their shares “in trust” to a board with power to control those businesses for the benefit of the trust.

In 1882 the Standard Oil Company of Ohio formed the country’s first great **trust**. It brought Rockefeller what he sought so fiercely: centralized management of the oil industry. Other businesses soon created trusts

of their own—in meatpacking, wire-making, and farm machinery, for example. Just as quickly, trusts became notorious for crushing rivals and controlling prices.

The Mergers of J. Pierpont Morgan >> The trust was only a stepping-stone to an even more effective means of avoiding competition, managing people, and controlling business: the corporate merger. The merging of two corporations—one buying out another—remained impossible until 1889, when New Jersey began to permit corporations to own other companies through what became known as the “holding company” (a company that held stock in other companies). Many industries converted their trusts into holding companies, including Standard Oil, which moved to New Jersey in 1899.

Two years later came the biggest corporate merger of the era. It was the creation of a financial wizard named J. Pierpont Morgan. His orderly mind detested the chaotic competition that threatened his profits. “I like a little competition,” Morgan used to say, “but I like combination more.” After the Civil War he had taken over his father’s powerful investment bank. For the next 50 years the House of Morgan played a part in consolidating almost every major industry in the country.

Morgan’s greatest triumph came in steel. In 1901 a colossal steel war loomed between Andrew Carnegie and other steelmakers. Morgan convinced Carnegie to put a price tag on his company. When a messenger brought the scrawled reply back—over \$400 million—Morgan merely nodded and said, “I accept this price.” He then bought Carnegie’s eight largest competitors and announced the formation of the United States Steel Corporation. The mammoth holding company produced nearly two-thirds of all American steel. Its value of \$1.4 billion exceeded the national debt and made it the country’s first billion-dollar corporation.

What Morgan helped to create in steel was rapidly coming to pass in other industries. A wave of mergers swept through American business after the depression of 1893. As the economy plunged, cutthroat competition bled businesses until they were eager to sell out. Giants

sprouted almost overnight. By 1904 in each of 50 industries one firm came to account for 60 percent or more of the total output.

Corporate Defenders >> As Andrew Carnegie’s empire grew, so did his social conscience. Preaching a “gospel of wealth,” he urged the rich to act as agents for the poor, “doing for them better than they would or could do for themselves.” “The man who dies rich . . . dies disgraced,” he warned. He devoted more and more of his time to philanthropy by creating foundations and endowing libraries and universities with some \$350 million in contributions.

Defenders of the new corporate order were less troubled than Carnegie about the rough-and-tumble world of big business. They justified the system by stressing the opportunity created for individuals by economic growth. Through frugality, acquisitiveness, and discipline—the sources of cherished American individualism—they believed anyone could rise like Andrew Carnegie.

When most ordinary workers failed to follow in Carnegie’s footsteps, defenders blamed the individual. Failures were lazy, ignorant, or morally depraved, they said. British philosopher Herbert Spencer added the weight of science by applying Charles Darwin’s theories of evolution to society. He maintained that in society, as in biology, only the “fittest” survived. The competitive social jungle doomed the unfit to poverty and rewarded the fit with property and privilege.

Spencer’s American apostle, William Graham Sumner, argued that competition was natural and had to proceed without any interference, including government regulation. Millionaires were simply the “product of natural selection.” Such “social Darwinism” found strong support among turn-of-the-century business leaders. The philosophy certified their success even as they worked to destroy the very competitiveness it celebrated.

Corporate Critics >> Meanwhile, a group of radical critics mounted a powerful attack on corporate capitalism. Henry George, a journalist and self-taught economist, proposed a way to redistribute wealth in *Progress and Poverty* (1879). George attacked large landowners as the source of inequality. They bought property while it was cheap and then held it until the forces of society—labor, technology, and speculation on nearby sites—had increased its value. George proposed to do away with all taxes except a single tax on these “unearned” profits to end monopoly landholding. “Single-tax” clubs sprang up throughout the country, and George nearly won the race for mayor of New York City in 1886.

The journalist Edward Bellamy tapped the same popular resentment against the inequalities of corporate capitalism. In his utopian novel, *Looking Backward* (1888), a fictional Bostonian falls asleep in 1887 and awakens Rip Van Winkle-like in the year 2000. The competitive, caste-ridden society of the nineteenth century is gone. In its place is an orderly utopia, managed by a benevolent government trust. “Fraternal cooperation” and shared abundance reign. Like George’s ideas, Bellamy’s philosophy inspired a host of clubs around the nation. His followers demanded redistribution of wealth, civil service reform, and nationalization of railroads and utilities.

Less popular but equally hostile to capitalism was the Socialist Labor Party, formed in 1877. Under Daniel De Leon, a West Indian immigrant, it stressed class conflict and called for a revolution to give workers control over production. De Leon refused to compromise his radical beliefs, and the **socialists** ended up attracting more intellectuals than workers. Some immigrants found its class consciousness appealing, but most rejected its radicalism and rigidity. A few party

socialism philosophy of social and economic organization in which the means of producing and distributing goods are owned collectively or by government.



^ This drawing is from a 1905 edition of *Collier's* magazine, famous for exposing corporate abuses. Here it mocks John D. Rockefeller, head of the Standard Oil Company, as the new god of the industrial age by parodying the Protestant doxology of thanks: “Praise God from whom all blessings flow, Praise him all creatures here below!”

members bent on gaining greater support revolted and in 1901 founded the more successful Socialist Party of America. Workers were beginning to organize their own responses to industrialism.

By the mid-1880s, in response to the growing criticism of big business, several states in the South and West had enacted laws limiting the size of corporations. But state laws proved all too easy to evade when New Jersey and Delaware eased their rules to cover the whole nation.

In 1890 the public clamor against trusts finally forced Congress to act. The Sherman Antitrust Act relied on the only constitutional authority Congress had over business: its right to regulate interstate commerce. The act outlawed “every contract, combination in the form of trust or otherwise, or conspiracy, in restraint of trade or commerce.” The United States stood practically alone among industrialized nations in regulating the size of business combinations.

Its language was purposefully vague, but the Sherman Antitrust Act did give the government the power to break up trusts and other big businesses. So high was the regard for the rights of private property, however, that few in Congress expected the government to exercise that power or the courts to uphold it. They were right. In 1895 the Supreme Court dealt the law a major blow by severely limiting its scope. *United States v. E. C. Knight Co.* held that businesses involved in manufacturing (as opposed to “trade or commerce”) lay outside the authority of the Sherman Antitrust Act. Not until after the turn of the century would the law be used to bust a trust.

The Costs of Doing Business >> The heated debates between the critics and the defenders of industrial capitalism made clear that the changes in American society were two-edged. Big businesses helped to rationalize the economy, to increase national wealth, and to tie the country together. Yet they also concentrated power, corrupted politics, and made the gap between rich and poor more apparent than ever.

More to the point, the practices of big business subjected the economy to enormous disruptions. The banking system could not always keep pace with the demand for capital, and businesses failed to distribute enough of their profits to sustain the purchasing power of workers. The supply of goods periodically outstripped demand, and then the wrenching cycle of boom and bust set in. Three severe depressions—1873–1879, 1882–1885, and 1893–1897—rocked the economy in the last third of the nineteenth century. With hard times came fierce competition and ruthless cost cutting.

Some of the costs were unclear at the time. Although anyone could see the environmental impact of industrialization, the long-term effects were less

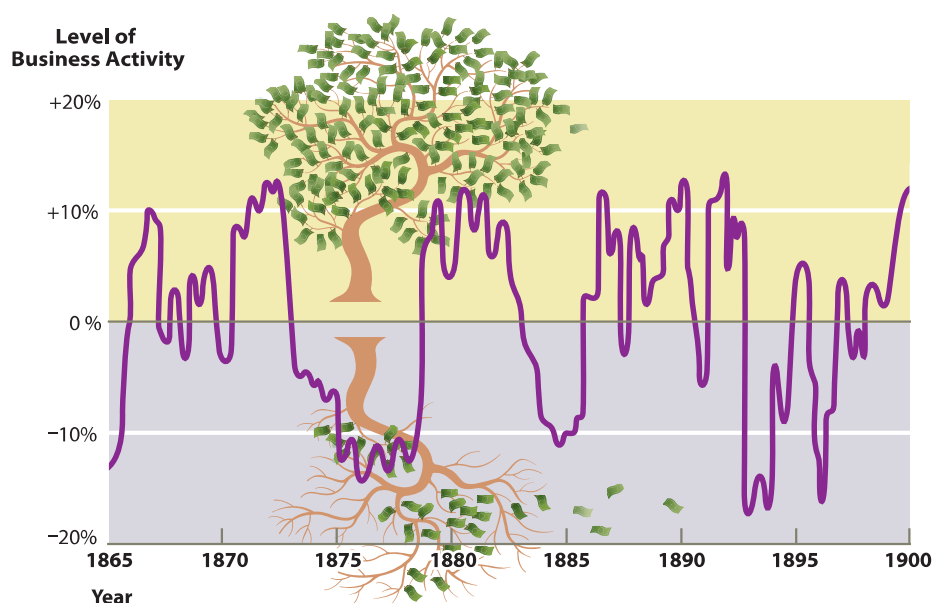
BOOM-AND-BUST BUSINESS CYCLE, 1865–1900

Between 1865 and 1900, industrialization produced great economic growth but also wild swings of prosperity and depression. During booms, productivity soared and near-full employment existed. But the rising number of industrial workers meant high unemployment during deep busts.

apparent. In the nineteenth century most people, scientists included, assumed that nature would maintain its own balance, largely unaffected by human action. And for the handful of observers interested in climate change only the most basic calculations were possible.

It took a Brit and a Swede consumed with discovering the cause of the prehistoric Ice Age to work out the climatic ramifications of new smokestack industries. In 1859 British scientist John Tyndall took up the question of precisely what in the atmosphere *prevented* the Earth from freezing. By testing the “coal gas” (gas emitted by burning coal) from a jet in his laboratory, he found that methane and carbon dioxide captured heat. Historically such gases had come from volcanic eruptions and other natural occurrences, but growing amounts were now being thrown aloft by industry.

In Sweden, Svante Arrhenius carried the idea a step further in 1896. If heat-trapping gases raised global



temperatures even slightly, warmer air would absorb more of the most potent heat trapper of all—water vapor—raising temperatures still higher. A new and dramatic cycle of climate change might spread across the planet. With the age of industry in its infancy, few paid attention to the implications for what would later be called “global warming.”



REVIEW

What strategies and structures did businesses use to grow and at what costs?

THE WORKERS' WORLD



Opinion

Who deserves more credit for making the United States an industrial powerhouse, industrialists or workers?

At seven in the morning Sadie Frowne sat at her sewing machine in a Brooklyn garment factory. Her boss, a man she barely knew, dropped a pile of unfinished skirts next to her. She pushed one under her needle and began to rock her foot on the pedal that powered her machine. Sometimes Sadie pushed the skirts too quickly, and the needle pierced her finger. “The machines go like mad all day because the faster you work the more money you get,” she explained of the world of industrial work in 1902.

The cramped sweatshops, the vast steel mills, the dank tunnels of the coal fields—all demanded workers and required them to work in new ways. Farmers or peasants who had once timed themselves by the movement of the sun now lived by

the clock and labored by the twilight of gaslit factories. Instead of being self-employed, they were under the thumb of a supervisor and were paid by the piece or hour. Not the seasons but the relentless cycle of machines set their pace. Increasingly, workers bore the brunt of depressions, faced periodic unemployment, and toiled under dangerous conditions as they struggled like their managers to bring the new industrial processes under control.

Industrial Work >> In 1881 the Pittsburgh Bessemer Steel Company opened its new mill in Homestead, Pennsylvania. Nearly 400 men and boys went to work in its 60 acres of sheds. They kept the mill going around the clock by working in two 12-hour shifts. In the furnace room, some men fainted from the heat, while the vibration and screeching of machinery deafened others. There were no breaks, even for lunch.

Few industrial laborers worked under such conditions, but the Homestead mill reflected common characteristics of industrial work: the use of machines for mass production; the division of labor into intricately organized, often repetitive tasks; and the dictatorship of the clock. At the turn of the century, two-thirds of all industrial work came from large-scale mills.

Under such conditions labor paid dearly for industrial progress. By 1900 most of those earning wages in industry worked 6 days a week, 10 hours a day. They held jobs that required more machines and fewer skills. Repetition of small chores replaced fine craftwork. In the 1880s, for example, almost all

the 40 different steps that had gone into making a pair of shoes by hand could be performed by a novice or “green hand” with a few days of instruction at a simple machine.

With machines also came danger. Tending furnaces in a steel mill or plucking tobacco from cigarette-rolling machines was tedious. If a worker became bored or tired, disaster could strike. Each year from 1880 to 1900, industrial mishaps killed an average of 35,000 wage earners and injured more than 500,000. Workers and their families could expect no payment from employers or government for death or injury. The law operated under the presumption that such accidents were the worker’s fault.

Higher productivity and profits were the aims, and for Frederick W. Taylor, efficiency was the way to achieve them. During the 1870s and 1880s Taylor undertook careful time-and-motion studies of workers’ movements in the steel industry. He set up standard procedures and offered pay incentives for beating his production quotas. On one occasion he designed 15 ore shovels, each for a separate task. One hundred forty men were soon doing the work of 600. By the early twentieth century “Taylorism” was a full-blown philosophy, complete with its own professional society. “Management engineers” prescribed routines from which workers could not vary.

For all the high ideals of Taylorism, ordinary laborers refused to perform as cogs in a vast industrial machine. In a variety of ways they worked to maintain control. Many European immigrants continued to observe the numerous saints’ days and other religious holidays of their homelands, regardless of factory rules. When the pressure of six-day weeks became too stifling, workers took an unauthorized “blue Monday” off. Or they slowed down to reduce the grueling pace. Or they simply walked off the job. Come spring and warm weather, factories reported turnover rates of 100 percent or more.

For some, seizing control of work was more than a matter of survival or self-respect. Many workers regarded themselves as citizens of a democratic republic. They expected to earn a “competence”—enough money to support and educate their families and enough time to stay abreast of current



<< This photograph from 1902 of the lock-and-drill assembly line at the National Cash Register Company suggests something of the growing scale of factory enterprise—and also of the dangers that workers in these manufacturing shops faced.

affairs. Few but highly skilled workers could realize such democratic dreams. More and more, labor was being managed as another part of an integrated system of industry.

Children, Women, and African Americans >>

The needs of industry for workers were so great that groups traditionally left out of the industrial ambit—children, women, African Americans—found themselves drawn into it. In the mines of Pennsylvania nimble-fingered eight-year-olds snatched bits of slate from amid the chunks of coal. In Illinois glass factories “dog boys” dashed with trays of red-hot bottles to the cooling ovens. By 1900 the industrial labor force included some 1.7 million children, more than double the number 30 years earlier. Parents often had no choice. As one union leader

observed, “Absolute necessity compels the father...to take the child into the mine to assist him in winning bread for the family.” On average, children worked 60 hours a week and carried home paychecks a third the size of those of adult males.

Women had always labored on family farms, but by 1870 one out of every four nonagricultural workers was female. In general they earned one-half of what men did. Nearly all were single and young, anywhere from their mid-teens to their mid-20s. Most lived in boardinghouses or at home with their parents. Usually they contributed their wages to the family kitty. Once married, they often took on a life of full-time housework and child rearing.

Only 5 percent of married women held jobs outside the home in 1900. Married black women—in need of income because of the low wages paid to their husbands—were four times more likely than married



▲ Clerks' jobs, traditionally held by men, came to be filled by women as growing industrial networks created more managerial jobs for men. Here a factory floor full of neatly dressed female clerks bang away at their “Type-Writers,” patented first in 1868.

white women to hold jobs outside the home. Industrialization inevitably pushed women into new jobs. Mainly they worked in industries considered extensions of housework: food processing, textiles and clothing, cigar making, and domestic service.

New methods of management and marketing opened positions for white-collar women as “typewriters,” “telephone girls,” bookkeepers, and secretaries. On rare occasions women entered the professions, though law and medical schools were reluctant to admit them. Such discrimination drove ambitious, educated women into nursing, teaching, and library work, all considered forms of female nurturance. Their growing presence soon “feminized” these professions, pushing men upward into managerial slots or out entirely.

Even more than white women, all African Americans faced discrimination in the workplace. They were paid less than whites and given menial jobs. Their greatest opportunities in industry often came as strikebreakers to replace white workers. Once a strike ended, however, black workers were replaced themselves—and hated by the white regulars all the more. The service trades furnished the largest single source of jobs. Craftworkers and a sprinkling of black professionals could usually be found in cities. After the turn of the century, black-owned businesses thrived in the growing black neighborhoods of the North and the South.

The American Dream of Success >> What—ever their separate experiences, working-class Americans did improve their overall lot. Though the gap between the very rich and the very poor widened, most wage earners made some gains. Between 1860 and 1890 real daily wages—pay in terms of buying power—climbed some 50 percent as prices gradually fell. And after 1890 the number of hours on the job began a slow decline.

Yet most unskilled and semiskilled workers in factories continued to receive low pay. In 1890 an unskilled laborer could expect about \$1.50 for a 10-hour day; a skilled one, perhaps twice that amount. It took about \$600 a year to make ends meet, but most manufacturing workers made under \$500 a year. Native-born white Americans tended to earn more than immigrants, those who spoke English more than those who did not, men more than women, and all others more than African Americans and Asians.

Few workers repeated the rags-to-riches rise of Andrew Carnegie. But some did rise, despite periodic unemployment and ruthless wage cuts. About one-quarter of the manual laborers in one study entered the lower middle class in their own lifetimes. More often such unskilled workers climbed in financial status within their own class. And most workers, seeing some improvement, believed in the American dream of success, even if they did not fully share in it.

✓ REVIEW

How did industrialization change the working day for people employed in factories?

THE SYSTEMS OF LABOR

For ordinary workers to begin to control industrialization they had to combine, just as businesses did. They needed to join together horizontally—organizing not just locally but on a national scale as well. They needed to integrate vertically by coordinating action across a wide range of jobs and skills, as Andrew Carnegie coordinated the production of steel. Unions were the workers’ systematic response to industrialization.

Early Unions >> In the United States, unions began forming before the Civil War. Skilled craftworkers—carpenters, iron molders, cigar makers—united to counter the growing power of management. Railroad “brotherhoods” also furnished insurance for those hurt or killed on the accident-plagued lines. Largely local and exclusively male, these early craft unions remained weak and unconnected to each other as well as to the growing mass of unskilled workers.

After the war a group of craft unions, brotherhoods, and reformers united skilled and unskilled workers in a nationwide organization. The National Labor Union (NLU) hailed the virtues of a simpler America, when workers controlled their workday, earned a decent living, and had time to be good informed citizens. NLU leaders attacked the wage system as unfair and enslaving and urged workers to manage their own factories. By the early 1870s NLU ranks swelled to more than 600,000.

Among other things, the NLU pressed for the eight-hour workday, the most popular labor demand of the era. Workers saw it as a way not merely of limiting their time on the job but of limiting the power of employers over their lives. “Eight hours for work; eight hours for rest; eight hours for what we will!” proclaimed a banner at one labor rally. Despite the popularity of the issue, the NLU wilted during the depression of 1873.

The Knights of Labor >> More successful was a national union born in secrecy. In 1869 Uriah Stephens and nine Philadelphia garment cutters founded the Noble and Holy Order of the Knights of Labor. They draped themselves in ritual and regalia to deepen their sense of solidarity and met in secret to evade hostile

H Historian's TOOLBOX

Digital Detecting



Eastport, Maine: what adjectives would you use to describe the scene?

At first the view looks somewhat rural, but at least three elements in the photograph suggest otherwise. What are they?

What strikes you about this digitally enlarged portion of the photo?



Photographs can be both revealing and deceptive, but technology can help historians detect what the camera lens actually captured. This print (upper left) of a photo by Lewis Hine, a turn-of-the-century photographer, shows eight-year-old Phoebe Thomas returning to her house in Eastport, Maine. The scene seems to be nothing more than a little girl making her way home up a set of stairs. Hine tells us that the young Syrian worked all day in a cannery, shearing the heads off sardines with a butcher's knife. When the Library

of Congress scanned the image nearly a century later, a portion of the photo could be digitally enlarged to reveal much more than meets the unaided eye. What appears to be an ordinary homecoming is, in fact, something much worse, as Hine's notes reveal. Phoebe was "running home from the factory all alone, her hand and arm bathed with blood, crying at the top of her voice. She had cut the end of her thumb nearly off, cutting sardines in the factory, and was sent home alone, her mother being busy."

THINKING CRITICALLY

How does the close-up of Phoebe Thomas change the nature of the photograph? What would we make of the photograph without Hine's explanatory notes? Google "Lewis Hine" to learn what he photographed and why.

Credit: Library of Congress Digital Photo ID: nclc 00966.

owners. The Knights remained small and fraternal for a decade. Their strongly Protestant tone repelled Catholics, who made up almost half the workforce in many industries.

In 1879 the Knights elected Terence V. Powderly as their Grand Master Workman. Handsome, dynamic, Irish, and Catholic, Powderly threw off the Knights' secrecy, dropped their rituals, and opened their ranks. He called for "one big union" to embrace the "toiling millions"—skilled and unskilled, men and women, natives and immigrants, all religions, all

racess. By 1886 membership had leapt to more than 700,000, including nearly 30,000 African Americans and 3,000 women.

Like the NLU, the Knights of Labor looked to abolish the wage system and in its place create a cooperative economy of worker-owned businesses. The Knights set up more than 140 cooperative workshops, where workers shared decisions and profits, and sponsored some 200 political candidates. To tame the new industrial order, they supported the eight-hour workday and the regulation of trusts. Underlying this program was a moral



^ In this painting by Robert Koehler, *The Strike* (1886), labor confronts management in a strike that may soon turn bloody. One worker reaches for a stone as an anxious mother and her daughter look on.

vision of society. If only people renounced greed, laziness, and dishonesty, Powderly argued, corruption and class division would disappear. Democracy would flourish. To reform citizens, the Knights promoted the prohibition of child and convict labor and the abolition of liquor.

It was one thing to proclaim a moral vision for his union, quite another to coordinate the activities of so many members. Locals resorted to strikes and violence, actions Powderly condemned. In the mid-1880s such stoppages wrung concessions from the western railroads, but the organization soon became associated with unsuccessful strikes and violent extremists. By 1890 the Knights of Labor teetered near extinction.

The American Federation of Labor >> The Knights' position as the premier union in the nation was taken by the rival American Federation of Labor (AFL). The AFL reflected the practicality of its leader, Samuel Gompers. Born in a London tenement, the son of a Jewish cigar maker, he had emigrated in 1863 with his family to New York's Lower East Side. Unlike the visionary Powderly, Gompers accepted capitalism and the wage system. What he wanted was "pure and simple unionism"—higher wages, fewer hours, improved safety, more benefits.

Gompers chose to organize highly skilled craftworkers because they were difficult to replace. He then bargained with employers, using strikes and boycotts only as last resorts. With the Cigar Makers' Union as his base, Gompers helped create the first national federation of craft unions in 1881. In 1886 it was reorganized as the American Federation of Labor.

Twenty-five labor groups joined, representing some 150,000 workers. Stressing gradual, concrete gains, he made the AFL the most powerful union in the country. By 1901 it had more than a million members, almost a third of all skilled workers in America.

Gompers was less interested in vertical integration: combining skilled and unskilled workers. For most of his career he preserved the privileges of craftsmen and accepted their prejudices against women, blacks, and immigrants. Only two locals—the Cigar Makers' Union and the Typographers' Union—enrolled women. Most affiliates restricted black membership through high entrance fees and other discriminatory practices.

Despite the success of the AFL the laboring classes did not organize themselves as systematically as the barons of industry. At the turn of the century, union membership included less than 10 percent of industrial workers. Separated by different languages and nationalities, divided by issues of race and gender, workers resisted unionization during the nineteenth century. In fact, a strong strain of individualism often made them regard all collective action as un-American.

The Limits of Industrial Systems >> As managers sought to increase their control over the workplace, workers often found themselves at the mercy of the new industrial order. Even in boom times, one in three workers was out of a job at least three or four months a year.

In hard times, when a worker's pay dropped and frustration mounted, when a mother worked all night and fell asleep during the day while caring for her

children, when food prices suddenly jumped—violence might erupt. “A mob of 1,000 people, with women in the lead, marched through the Jewish quarter of Williamsburg last evening and wrecked half a dozen butcher shops,” reported the *New York Times* in 1902.

In the late nineteenth century a wave of labor activism swept the nation. More often than mob violence, it was strikes and boycotts that challenged the authority of employers and gave evidence of working-class identity and discontent. Most strikes broke out spontaneously, organized by informal leaders in a factory. Thousands of rallies and organized strikes were staged as well, often on behalf of the eight-hour workday, in good times and bad, by union and nonunion workers alike.

In 1877 the country’s first nationwide strike opened an era of confrontation between labor and management. When the Baltimore and Ohio Railroad cut wages by 20 percent, a crew in Martinsburg, West Virginia, seized the local depot and blocked the line. Two-thirds of the nation’s track shut down in sympathy. When companies hired strikebreakers, striking workers torched rail yards, smashed engines and cars, and tore up track. Local police, state militia, and federal troops finally crushed the strike after 12 bloody days. In its wake, the Great Railroad Strike of 1877 left 100 people dead and \$10 million worth of railroad property in rubble. “This may be the beginning of a great civil war . . . between labor and capital,” warned one newspaper.

In 1886 tension between labor and capital exploded in the “Great Upheaval”—a series of strikes, boycotts, and rallies. One of the most violent episodes occurred at Haymarket Square in Chicago. A group of anarchists was protesting the recent killing of workers by police at the McCormick Harvesting Company. As rain drenched the small crowd, police moved in and ordered everyone out of the square. Suddenly a bomb exploded. One officer was killed, and 6 others were mortally wounded. When police opened fire, the crowd fired back. Nearly 70 more police officers were injured, and at least 4 civilians died.

Conservatives charged that radicals were responsible for the “Haymarket Massacre.” Ordinary citizens who had supported labor grew fearful of its power to spark violence and disorder. Though the bomb thrower was never identified, eight anarchists were found guilty of conspiracy to murder. Seven were sentenced to death. Cities enlarged their police forces, and states built more National Guard armories on the borders of working-class neighborhoods.

Management Strikes Again >> The strikes, rallies, and boycotts of 1886 were followed by a second surge of labor activism in 1892. In the silver mines of Coeur d’Alene, Idaho, at the Carnegie steel mill

in Homestead, Pennsylvania, in the coal mines near Tracy City, Tennessee, strikes flared. Often state and federal troops joined company guards and Pinkerton detectives to crush these actions.

The broadest confrontation between labor and management took place two years later. A terrible depression had shaken the economy for almost a year when George Pullman, owner of the Palace Car factory and inventor of the plush railroad car, laid off workers and cut wages (but kept rents high on company-owned housing). He refused to discuss any grievances. In 1894 workers struck and managed to convince the new American Railway Union (ARU) to support them by boycotting all trains that used Pullman cars. Quickly the strike spread to 27 states and territories. Anxious railroad owners appealed to President Grover Cleveland for federal help. On the slim pretext that the strike obstructed mail delivery (strikers had actually been willing to handle mail trains without Pullman cars), Cleveland secured a court order halting the strike. He then called several thousand special deputies into Chicago to enforce it. In the rioting that followed, 12 people died and scores were arrested. But the strike was quashed.

In all labor disputes the central issue was the power to shape the new industrial systems. Employers always enjoyed the advantage. They hired and fired workers, set the terms of employment, and ruled the workplace. They fought unions with “yellow dog” contracts that forced workers to refuse to join. Blacklists circulated the names of labor agitators. Lockouts kept protesting workers from plants, and labor spies infiltrated their organizations. With a growing pool of labor, employers could replace strikers and break strikes.

Management could also count on local, state, and federal authorities to send troops to break strikes. In

addition, businesses used a powerful new legal weapon, the **injunction**. These court orders prohibited certain actions, including strikes, by barring workers from interfering with their employer’s business. It was just such an order that had brought federal deputies into the Pullman strike and put Eugene Debs, head of the railway union, behind bars.

injunction court order requiring individuals or groups to participate in or refrain from a certain action.

✓ REVIEW

Through what means, organized and unorganized, did workers respond to industrialization?

In a matter of only 30 or 40 years, the new industrial order transformed the landscape of America. It left its mark elsewhere in the world, too. British railroad tracks covered some 20,000 miles by the 1870s,

while Germany and France built even larger systems. Japan began constructing its network in the 1870s. Other nonindustrial countries followed, especially those rich in raw materials and agricultural commodities. In India the British built the fourth—longest railway system in the world. None outstripped the United States. By 1915 its rail network was longer than the next seven largest systems combined.

With remarkable speed, networks of communication and transportation spread across the globe. Underwater telegraph cables were laid from the United States to Europe in 1866, to Australia in 1871 and 1872, to Latin America in 1872 and 1873, and to West Africa by 1886. The completion of the Suez Canal in 1869 (the same year a golden spike connected the last link in the transcontinental railroad) hastened the switch from sail—power to steam—driven ships, by slicing thousands of miles from the journey between Europe and Asia. Wheat from the United States and India, wool from Australia, and beef from Argentina poured into Europe, while Europe sent textiles, railroad equipment, coal, and machinery to Asia and the Americas.

As these networks tied together national economies, swings in the business cycle produced global consequences. When an Austrian bank failed in 1873, depression soon reached the United States. In the mid—1880s and again in the mid—1890s, recessions drove prices down and unemployment up all across the industrialized world.

Industrial workers bore the brunt of the burden, but in Europe they had greater success in unionizing, especially after anticombination laws forbidding strikes were abolished in the decades following 1850. By 1900 British unions had signed up 2 million workers, twice the number of members in either the United States or Germany. As strikes became more common and labor unions more powerful, industrializing nations passed social legislation that included the first social security systems and health insurance. Neither would come to the United States until the Great Depression of the 1930s.

CHAPTER SUMMARY

In the last third of the nineteenth century, a new industrial order reshaped the United States.

- New systems—of resource development, technology, invention, transportation, communications, finance, corporate management, and labor—boosted industrial growth and productivity.
- Businesses grew big, expanding vertically and horizontally to curb costs and competition and to increase control and efficiency.

- Industrialization came at a price.
 - ▶ Workers found their power, job satisfaction, and free time reduced as their numbers in factories mushroomed.
 - ▶ The environment was degraded.
 - ▶ A vicious cycle of boom and bust afflicted the economy.
- Workers both resisted and accommodated the new industrial order.
 - ▶ Some resisted through informal mechanisms such as slowdowns, absenteeism, and quitting and through spontaneous and formal ones, including radical unions like the Knights of Labor.
 - ▶ Other workers were more accommodating, accepting low-paying jobs and layoffs and creating “pure—and—simple” unions, such as the American Federation of Labor, that accepted the prevailing system of private ownership and wage labor while bargaining for better wages and working conditions.
- The benefits of industrialization were equally undeniable.
 - ▶ Life improved materially for many Americans.
 - ▶ The real wages of even industrial workers climbed.
- The United States rocketed from fourth place among industrial nations in 1860 to first by 1890.

Additional Reading

For a useful introduction, see Edward C. Kirkland, *Industry Comes of Age: Business, Labor, and Public Policy, 1860–1897* (1967). Mechanization and its impact are the focus of Siegfried Giedion’s classic *Mechanization Takes Command* (1948). The best overview of American labor is American Social History Project, *Who Built America? Working People and the Nation’s Economy, Politics, Culture, & Society, Volume Two: From the Gilded Age to the Present* (1992). Herbert Gutman, *Work, Culture, and Society in Industrializing America: Essays in American Working-Class History* (1976), explores the development of working-class communities in the nineteenth century; while David Montgomery assesses the impact of industrialization on American labor in *The Fall of the House of Labor: The Workplace, the State, and American Labor Activism, 1865–1925* (1987). Leon Fink, *Workingmen’s Democracy: The Knights of Labor and American Politics* (1983), examines early efforts of the Knights of Labor to challenge corporate capitalism. Alice Kessler-Harris, *Out to Work: A History of Wage-Earning Women in the United States* (1982), surveys female wage earners and their effect on American culture, family life,

and values. Kevin Kenny, *Making Sense of the Molly Maguires* (1998), is a superb study not only of the mysterious Mollys and their tragic end but of immigration, working-class violence, and the history of the Irish in America. Ron Chernow's *Titan: The Life of John D. Rockefeller, Sr.* (1998); and Jean Strouse's definitive *Morgan: American Financier* (1999) help to debunk the image of business leaders as "robber barons," without minimizing their ruthlessness. David Nasaw's *Andrew Carnegie* (2006) gives us the most human portrait of the legendary steel baron; for the rise of big railroads, consult T. J. Stiles, *The First Tycoon: The Epic Life of Cornelius Vanderbilt* (2009). Business historian Alfred D. Chandler Jr.'s *Strategy and Structure: Chapters in the History of American-Industrial Enterprise* (1962) and *The Visible Hand: The Managerial Revolution in American Business* (1977) are seminal accounts of business organization that profile the emergence of a new class of managers. For a comparative view of the rise of big business in the United States, Great Britain, and Germany, see his *Scale and Scope* (1988). Richard White's *Railroaded: The Transcontinentals and the Making of Modern America* (2012) makes a powerful case for the profligacy of the transcontinental railroad lines in a revisionist retelling of the epic story.

Significant Events

