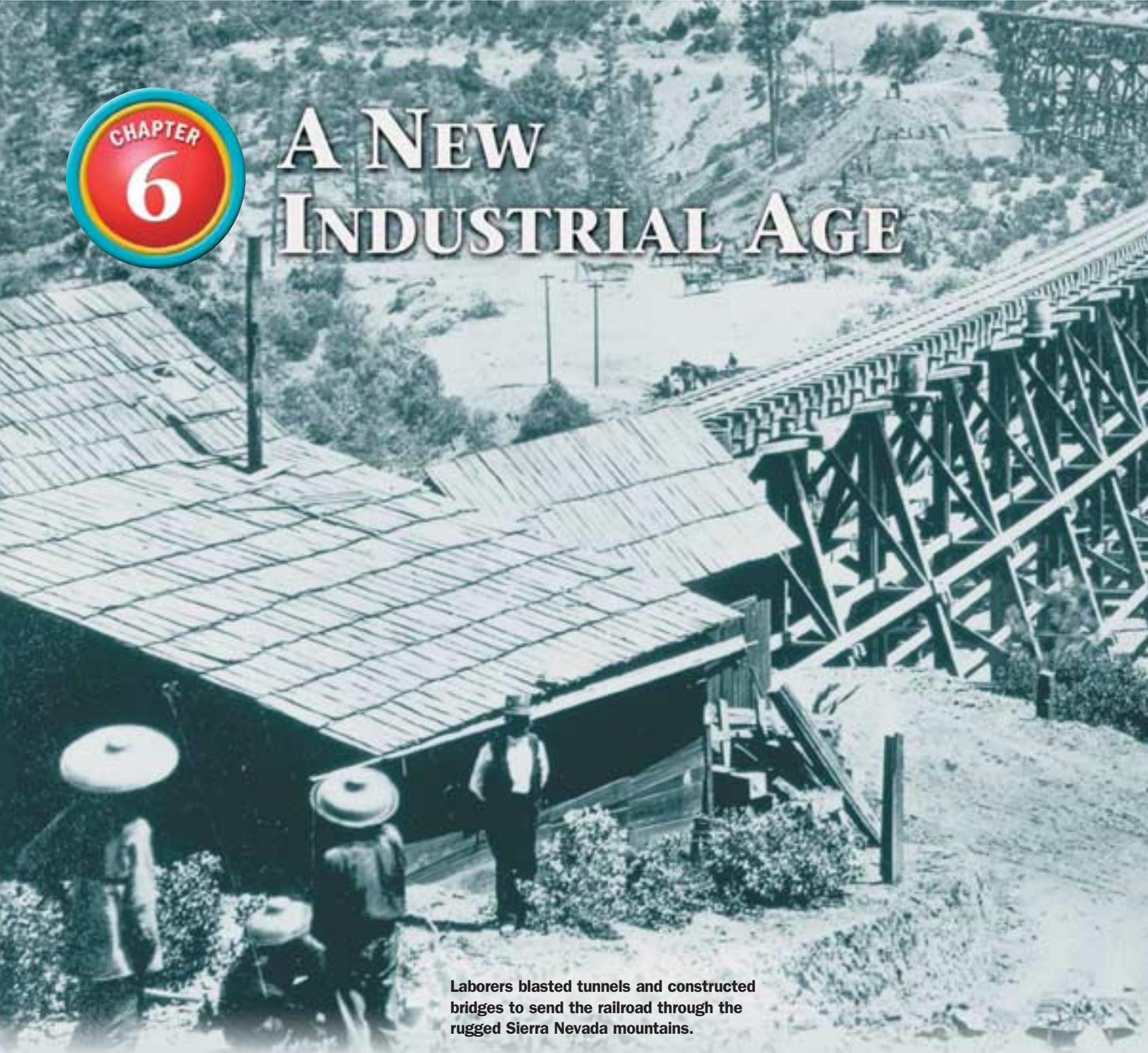


A New Industrial Age



CHAPTER 6

A NEW INDUSTRIAL AGE



Laborers blasted tunnels and constructed bridges to send the railroad through the rugged Sierra Nevada mountains.

1869 Central Pacific and Union Pacific complete the transcontinental railroad.

1876 Alexander Graham Bell invents the telephone.

1877 *Munn v. Illinois* establishes government regulation of railroads.

Mother Jones supports the Great Strike of 1877.

1879 Thomas A. Edison invents a workable light bulb.



1884 Grover Cleveland is elected president.

USA
WORLD

1870

1880

1870 Franco-Prussian War breaks out.

1875 British labor unions win right to strike.



1882 United States restricts Chinese immigration.

1883 Germany becomes the first nation to provide national health insurance.



INTERACT WITH HISTORY

The year is 1863 and railroad construction is booming. In six years, the U.S. will be linked by rail from coast to coast. Central Pacific Railroad employs mainly Chinese immigrants to blast tunnels, lay track, and drive spikes, all for low wages. You are a journalist assigned to describe this monumental construction project for your readers.

What are the pros and cons of railroad expansion?

Examine the Issues

- What dangers do the railroad workers encounter?
- How will businesses and the general public benefit from the transcontinental railroad?
- How might railroad construction affect the environment?



RESEARCH LINKS CLASSZONE.COM

Visit the Chapter 6 links for more information about A New Industrial Age.

1886 Haymarket riot turns public sentiment against unions.



1890 Congress passes the Sherman Antitrust Act.

1894 President Cleveland sends federal troops to Illinois to end the Pullman strike.

1896 William McKinley is elected president.

1900 William McKinley is reelected.

1890

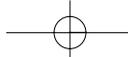
1890 Colonization of sub-Saharan Africa peaks.

1893 Women in New Zealand gain voting rights.

1900

1896 First modern Olympic Games are held in Athens, Greece.





The Expansion of Industry

MAIN IDEA

At the end of the 19th century, natural resources, creative ideas, and growing markets fueled an industrial boom.

WHY IT MATTERS NOW

Technological developments of the late 19th century paved the way for the continued growth of American industry.

Terms & Names

- Edwin L. Drake
- Bessemer process
- Thomas Alva Edison
- Christopher Sholes
- Alexander Graham Bell

One American's Story

One day, Pattillo Higgins noticed bubbles in the springs around Spindletop, a hill near Beaumont in southeastern Texas. This and other signs convinced him that oil was underground. If Higgins found oil, it could serve as a fuel source around which a vibrant industrial city would develop.

Higgins, who had been a mechanic and a lumber merchant, couldn't convince geologists or investors that oil was present, but he didn't give up. A magazine ad seeking investors got one response—from Captain Anthony F. Lucas, an experienced prospector who also believed that there was oil at Spindletop. When other investors were slow to send money, Higgins kept his faith, not only in Spindletop, but in Lucas.



A PERSONAL VOICE PATILLO HIGGINS

“Captain Lucas, . . . these experts come and tell you this or that can't happen because it has never happened before. You believe there is oil here, . . . and I think you are right. I know there is oil here in greater quantities than man has ever found before.”

—quoted in *Spindletop*

In 1900, the two men found investors, and they began to drill that autumn. After months of difficult, frustrating work, on the morning of January 10, 1901, oil gushed from their well. The Texas oil boom had begun.

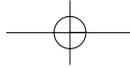


VIDEO

GUSHER!
Pattillo Higgins
and the Great
Texas Oil Boom

Natural Resources Fuel Industrialization

After the Civil War, the United States was still largely an agricultural nation. By the 1920s—a mere 60 years later—it had become the leading industrial power in the world. This immense industrial boom was due to several factors, including: a wealth of natural resources, government support for business, and a growing urban population that provided both cheap labor and markets for new products.



BLACK GOLD Though eastern Native American tribes had made fuel and medicine from crude oil long before Europeans arrived on the continent, early American settlers had little use for oil. In the 1840s, Americans began using kerosene to light lamps after the Canadian geologist Abraham Gesner discovered how to distill the fuel from oil or coal.

It wasn't until 1859, however, when **Edwin L. Drake** successfully used a steam engine to drill for oil near Titusville, Pennsylvania, that removing oil from beneath the earth's surface became practical. This breakthrough started an oil boom that spread to Kentucky, Ohio, Illinois, Indiana, and, later, Texas. Petroleum-refining industries arose in Cleveland and Pittsburgh as entrepreneurs rushed to transform the oil into kerosene. Gasoline, a byproduct of the refining process, originally was thrown away. But after the automobile became popular, gasoline became the most important form of oil.

Vocabulary
entrepreneur:

a person who organizes, operates, and assumes the risk for a business venture

BESSEMER STEEL PROCESS Oil was not the only natural resource that was plentiful in the United States. There were also abundant deposits of coal and iron. In 1887, prospectors discovered iron ore deposits more than 100 miles long and up to 3 miles wide in the Mesabi Range of Minnesota. At the same time, coal production skyrocketed—from 33 million tons in 1870 to more than 250 million tons in 1900.

Iron is a dense metal, but it is soft and tends to break and rust. It also usually contains other elements, such as carbon. Removing the carbon from iron produces a lighter, more flexible, and rust-resistant metal—steel. The raw materials needed to make steel were readily available; all that was needed was a cheap and efficient manufacturing process. The **Bessemer process**, developed independently by the British manufacturer Henry Bessemer and American ironmaker William Kelly around 1850, soon became widely used. This technique involved injecting air into molten iron to remove the carbon and other impurities. By 1880, American manufacturers were using the new method to produce more than 90 percent of the nation's steel. In this age of rapid change and innovation, even

Natural Resources and the Birth of a Steel Town, 1886–1906

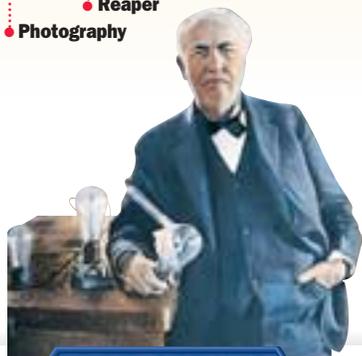


GEOGRAPHY SKILLBUILDER

- Region** Which state had the most steel-producing areas?
- Human-Environment Interaction** What connection can you draw between natural resources (including water) and steel production in Pittsburgh?



The Technological Explosion, 1826–1903



HISTORICAL SPOTLIGHT

ILLUMINATING THE LIGHT BULB

Shortly after moving into a long wooden shed at Menlo Park, Thomas Alva Edison and his associates set to work to develop the perfect incandescent bulb. Arc lamps already lit some city streets and shops, using an electric current passing between two sticks of carbon, but they were glaring and inefficient.

Edison hoped to create a long-lasting lamp with a soft glow, and began searching for a filament that would burn slowly and stay lit. Edison tried wires, sticks, blades of grass, and even hairs from his assistants' beards. Finally, a piece of carbonized bamboo from Japan did the trick. Edison's company used bamboo filaments until 1911, when it began using tungsten filaments, which are still used today.

the successful Bessemer process was bettered by the 1860s. It was eventually replaced by the open-hearth process, enabling manufacturers to produce quality steel from scrap metal as well as from raw materials. **A**

NEW USES FOR STEEL The railroads, with thousands of miles of track, became the biggest customers for steel, but inventors soon found additional uses for it. Joseph Glidden's barbed wire and McCormick's and Deere's farm machines helped transform the plains into the food producer of the nation.

Steel changed the face of the nation as well, as it made innovative construction possible. One of the most remarkable structures was the Brooklyn Bridge. Completed in 1883, it spanned 1,595 feet of the East River in New York City. Its steel cables were supported by towers higher than any man-made and weight-bearing structure except the pyramids of Egypt. Like those ancient marvels, the completed bridge was called a wonder of the world.

Around this time, setting the stage for a new era of expansion upward as well as outward, William Le Baron Jenney designed the first skyscraper with a steel frame—the Home Insurance Building in Chicago. Before Jenney had his pioneering idea, the weight of large buildings was supported entirely by their walls or by iron frames, which limited the buildings' height. With a steel frame to support the weight, however, architects could build as high as they wanted. As structures soared into the air, not even the sky seemed to limit what Americans could achieve.

Inventions Promote Change

By capitalizing on natural resources and their own ingenuity, inventors changed more than the landscape. Their inventions affected the very way people lived and worked.

THE POWER OF ELECTRICITY In 1876, **Thomas Alva Edison** became a pioneer on the new industrial frontier when he established the world's first research laboratory in Menlo Park, New Jersey. There Edison perfected the incandescent light bulb—patented in 1880—and later invented an entire system for producing and distributing electrical power. Another inventor, George Westinghouse, along with Edison, added innovations that made electricity safer and less expensive.

The harnessing of electricity completely changed the nature of business in America. By 1890, electric power ran numerous machines, from fans to printing presses. This inexpensive, convenient source of energy soon became available in homes and spurred the invention of time-saving appliances. Electric streetcars made urban travel cheap and efficient and also promoted the outward spread of cities.

More important, electricity allowed manufacturers to locate their plants

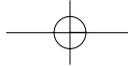
MAIN IDEA

Summarizing

A What natural resources were most important for industrialization?

Vocabulary

incandescent: giving off visible light as a result of being heated


MAIN IDEA
Analyzing Effects

B How did electricity change American life?

wherever they wanted—not just near sources of power, such as rivers. This enabled industry to grow as never before. Huge operations, such as the Armour and Swift meatpacking plants, and the efficient processes that they used became the models for new consumer industries. **B**

INVENTIONS CHANGE LIFESTYLES Edison's light bulb was only one of several revolutionary inventions. **Christopher Sholes** invented the typewriter in 1867 and changed the world of work. Next to the light bulb, however, perhaps the most dramatic invention was the telephone, unveiled by **Alexander Graham Bell** and Thomas Watson in 1876. It opened the way for a worldwide communications network.

The typewriter and the telephone particularly affected office work and created new jobs for women. Although women made up less than 5 percent of all office workers in 1870, by 1910 they accounted for nearly 40 percent of the clerical work force. New inventions also had a tremendous impact on factory work, as well as on jobs that traditionally had been done at home. For example, women had previously sewn clothing by hand for their families. With industrialization, clothing could be mass-produced in factories, creating a need for garment workers, many of whom were women.

Industrialization freed some factory workers from backbreaking labor and helped improve workers' standard of living. By 1890, the average workweek had been reduced by about ten hours. However, many laborers felt that the mechanization of so many tasks reduced human workers' worth. As consumers, though, workers regained some of their lost power in the marketplace. The country's expanding urban population provided a vast potential market for the new inventions and products of the late 1800s.



▲ The typewriter shown here dates from around 1890.

SECTION 1
ASSESSMENT

1. TERMS & NAMES For each term or name, write a sentence explaining its significance.

- Edwin L. Drake
- Thomas Alva Edison
- Alexander Graham Bell
- Bessemer process
- Christopher Sholes

MAIN IDEA
2. TAKING NOTES

In a chart like the one below, list resources, ideas, and markets that affected the industrial boom of the 19th century. In the second column, note how each item contributed to industrialization.

Resources, Ideas, Markets	Impact

CRITICAL THINKING
3. MAKING INFERENCES

Do you think that consumers gained power as industry expanded in the late 19th century? Why or why not?

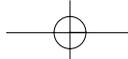
4. HYPOTHESIZING

If the U.S. had been poor in natural resources, how would industrialization have been affected?

5. ANALYZING EFFECTS

Which invention or development described in this section had the greatest impact on society? Justify your choice. **Think About:**

- the applications of inventions
- the impact of inventions on people's daily lives
- the effect of inventions on the workplace



The Age of the Railroads

MAIN IDEA

The growth and consolidation of railroads benefited the nation but also led to corruption and required government regulation.

WHY IT MATTERS NOW

Railroads made possible the expansion of industry across the United States.

Terms & Names

- transcontinental railroad
- George M. Pullman
- Crédit Mobilier
- Munn v. Illinois
- Interstate Commerce Act

One American's Story

In October 1884, the economist Richard Ely visited the town of Pullman, Illinois, to write about it for *Harper's* magazine. At first, Ely was impressed with the atmosphere of order, planning, and well-being in the town George M. Pullman had designed for the employees of his railroad-car factory. But after talking at length with a dissatisfied company officer, Ely concluded the town had a fatal flaw: it too greatly restricted its residents. Pullman employees were compelled to obey rules in which they had no say. Ely concluded that “the idea of Pullman is un-American.”



A PERSONAL VOICE RICHARD T. ELY

“It is benevolent, well-wishing feudalism [a medieval social system], which desires the happiness of the people, but in such way as shall please the authorities. . . . If free American institutions are to be preserved, we want no race of men reared as underlings.”

—“Pullman: A Social Study”

▲ The town of Pullman was carefully laid out and strictly controlled.

As the railroads grew, they came to influence many facets of American life, including, as in the town of Pullman, the personal lives of the country's citizens. They caused the standard time and time zones to be set and influenced the growth of towns and communities. However, the unchecked power of railroad companies led to widespread abuses that spurred citizens to demand federal regulation of the industry.

Railroads Span Time and Space

Rails made local transit reliable and westward expansion possible for business as well as for people. Realizing how important railroads were for settling the West and developing the country, the government made huge land grants and loans to the railroad companies.



A NATIONAL NETWORK By 1856, the railroads extended west to the Mississippi River, and three years later, they crossed the Missouri. Just over a decade later, crowds across the United States cheered as the Central Pacific and Union Pacific Railroads met at Promontory, Utah, on May 10, 1869. A golden spike marked the spanning of the nation by the first **transcontinental railroad**. Other transcontinental lines followed, and regional lines multiplied as well. At the start of the Civil War, the nation had had about 30,000 miles of track. By 1890, that figure was nearly six times greater.

ROMANCE AND REALITY The railroads brought the dreams of available land, adventure, and a fresh start within the grasp of many Americans. This romance was made possible, however, only by the harsh lives of railroad workers.

The Central Pacific Railroad employed thousands of Chinese immigrants. The Union Pacific hired Irish immigrants and desperate, out-of-work Civil War veterans to lay track across treacherous terrain while enduring attacks by Native Americans. Accidents and diseases disabled and killed thousands of men each year. In 1888, when the first railroad statistics were published, the casualties totaled more than 2,000 employees killed and 20,000 injured.

RAILROAD TIME In spite of these difficult working conditions, the railroad laborers helped to transform the diverse regions of the country into a united nation. Though linked in space, each community still operated on its own time, with noon when the sun was directly overhead. Noon in Boston, for example, was almost 12 minutes later than noon in New York. Travelers riding from Maine to California might reset their watches 20 times.

In 1869, to remedy this problem, Professor C. F. Dowd proposed that the earth's surface be divided into 24 time zones, one for each hour of the day. Under his plan, the United States would contain four zones: the Eastern, Central, Mountain, and Pacific time zones. The railroad companies endorsed Dowd's plan enthusiastically, and many towns followed suit.

Finally, on November 18, 1883, railroad crews and towns across the country synchronized their watches. In 1884, an international conference set worldwide time zones that incorporated railroad time. The U.S. Congress, however, didn't officially adopt railroad time as the standard for the nation until 1918. As strong a unifying force as the railroads were, however, they also opened the way for abuses that led to social and economic unrest. **A**

MAIN IDEA

Analyzing Effects

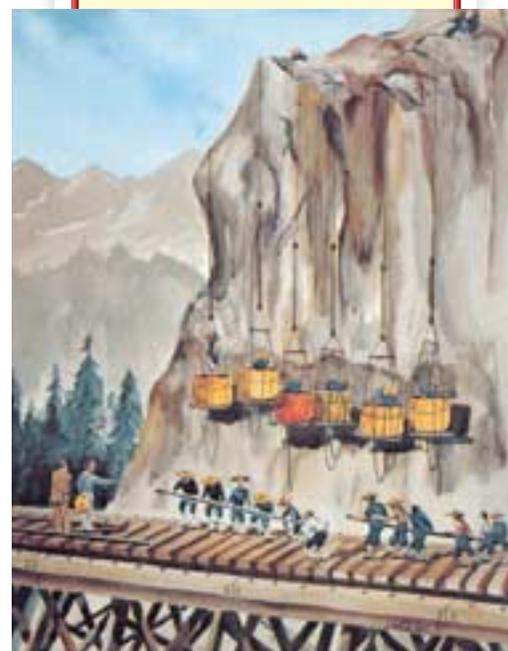
A What were the effects of railroad expansion?

HISTORICAL SPOTLIGHT

CHINESE IMMIGRANTS AND THE RAILROADS

Although the railroads paid all their employees poorly, Asians usually earned less than whites. The average pay for whites working a ten-hour day was \$40 to \$60 a month plus free meals. Chinese immigrants hired by the Central Pacific performed similar tasks from dawn to dusk for about \$35 a month—and they had to supply their own food.

The immigrants' working conditions were miserable, as depicted by artist Jake Lee below. In 1866, for example, the railroad hired them to dig a tunnel through a granite mountain. For five months of that year, the Chinese lived and worked in camps surrounded by banks of snow. The total snowfall reached over 40 feet. Hundreds of the men were buried in avalanches or later found frozen, still clutching their shovels or picks.



Opportunities and Opportunists

The growth of the railroads influenced the industries and businesses in which Americans worked. Iron, coal, steel, lumber, and glass industries grew rapidly as they tried to keep pace with the railroads' demand for materials and parts. The rapid spread of railroad lines also fostered the growth of towns, helped establish new markets, and offered rich opportunities for both visionaries and profiteers.



ANOTHER PERSPECTIVE

ON THE WRONG TRACK

While the railroads captured the imagination of most 19th-century Americans, there were those who didn't get on the bandwagon. The writer Herman Melville raged against the smoke-belching iron horse and the waves of change it set in motion as vehemently as his character Captain Ahab raged against the white whale and the sea in *Moby-Dick*. "Hark! here comes that old dragon again—that gigantic gadfly . . . snort! puff! scream! Great improvements of the age," Melville fumed. "Who wants to travel so fast? My grandfather did not, and he was no fool."

Pullman cars brought luxury to the rails, as shown in this advertisement from around 1890.



NEW TOWNS AND MARKETS By linking previously isolated cities, towns, and settlements, the railroads promoted trade and interdependence. As part of a nationwide network of suppliers and markets, individual towns began to specialize in particular products. Chicago soon became known for its stockyards and Minneapolis for its grain industries. These cities prospered by selling large quantities of their products to the entire country. New towns and communities also grew up along the railroad lines. Cities as diverse as Abilene, Kansas; Flagstaff, Arizona; Denver, Colorado; and Seattle, Washington, owed their prosperity, if not their very existence, to the railroads. **B**

PULLMAN The railroads helped cities not only grow up but branch out. In 1880, for example, **George M. Pullman** built a factory for manufacturing sleepers and other railroad cars on the Illinois prairie. The nearby town that Pullman built for his employees followed in part the models of earlier industrial experiments in Europe. Whereas New England textile manufacturers had traditionally provided housing for their workers, the town of Pullman provided for almost all of workers' basic needs. Pullman residents lived in clean, well-constructed brick houses and apartment buildings with at least one window in every room—a luxury for city dwellers. In addition, the town

offered services and facilities such as doctors' offices, shops, and an athletic field.

As Richard Ely observed, however, the town of Pullman remained firmly under company control. Residents were not allowed to loiter on their front steps or to drink alcohol. Pullman hoped that his tightly controlled environment would ensure a stable work force. However, Pullman's refusal to lower rents after cutting his employees' pay led to a violent strike in 1894.

CRÉDIT MOBILIER Pullman created his company town out of the desire for control and profit. In some other railroad magnates, or powerful and influential industrialists, these desires turned into self-serving corruption. In one of the most infamous schemes, stockholders in the Union Pacific Railroad formed, in 1864, a construction company called **Crédit Mobilier** (kréd'it mō-bél'yər). The stockholders gave this company a contract to lay track at two to three times the actual cost—and pocketed the profits. They donated shares of stock to about 20 representatives in Congress in 1867.

A congressional investigation of the company, spurred by reports in the *New York Sun*, eventually found that the officers of the Union Pacific had taken up to \$23 million in stocks, bonds, and cash. Testimony implicated such well-known and respected federal officials as Vice-President Schuyler Colfax and Congressman James Garfield, who later became president. Although these public figures kept their profits and received little more than a slap on the wrist, the reputation of the Republican Party was tarnished. **C**

The Grange and the Railroads

Farmers were especially affected by corruption in the railroads. The Grangers—members of the Grange, a farmers' organization founded in 1867—began demanding governmental control over the railroad industry.

MAIN IDEA

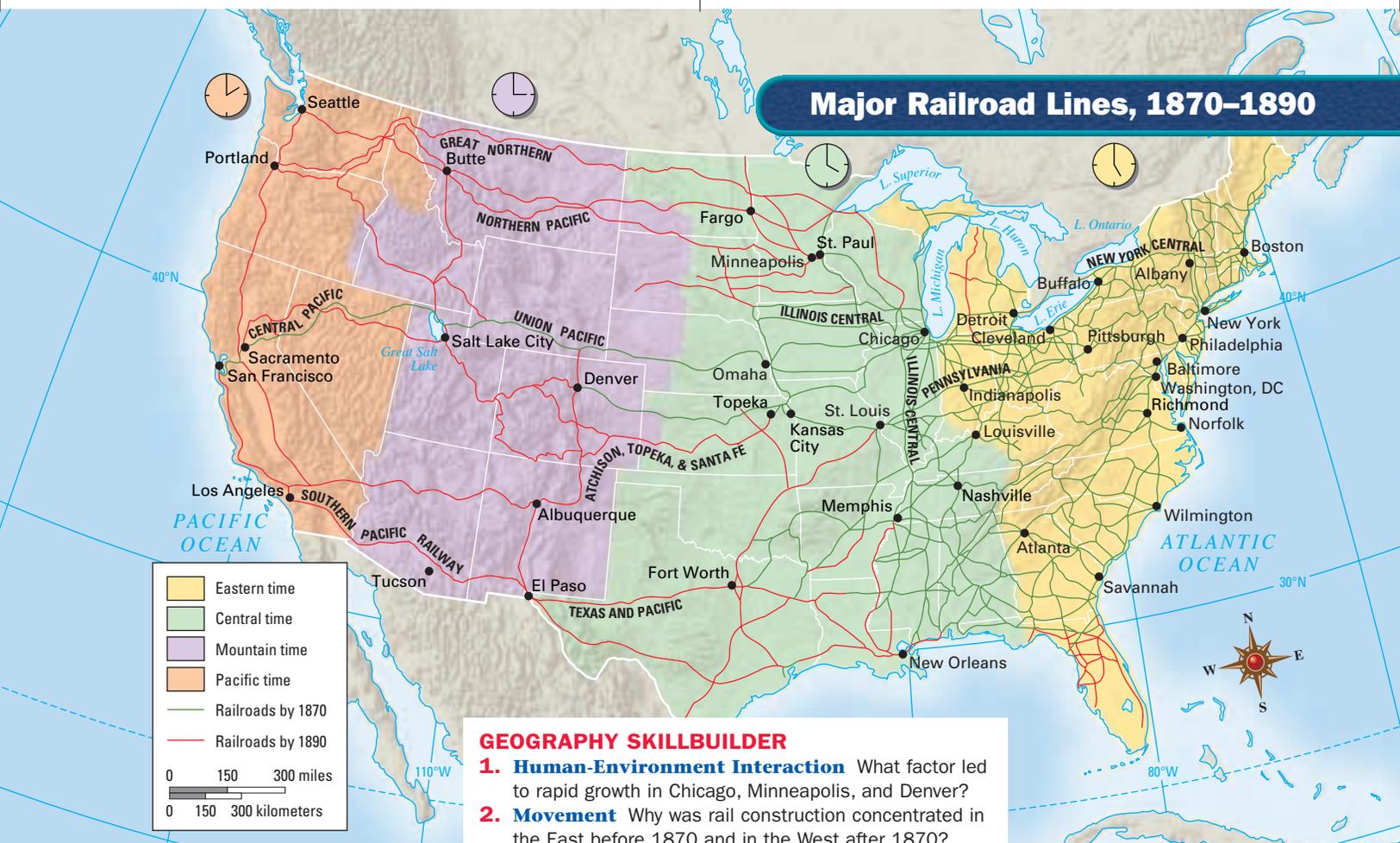
Summarizing

B How did the railroads affect cities?

MAIN IDEA

Summarizing

C How did railroad owners use Crédit Mobilier to make huge, undeserved profits?



Background

Price fixing occurs when companies within an industry all agree to charge the same price for a given service, rather than competing to offer the lowest price.

MAIN IDEA

Analyzing Issues

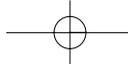
D How did the Grangers, who were largely poor farmers, do battle with the giant railroad companies?

RAILROAD ABUSES Farmers were angry with railroad companies for a host of reasons. They were upset by misuse of government land grants, which the railroads sold to other businesses rather than to settlers, as the government intended. The railroads also entered into formal agreements to fix prices, which helped keep farmers in their debt. In addition, they charged different customers different rates, often demanding more for short hauls—for which there was no alternative carrier—than they did for long hauls.

GRANGER LAWS In response to these abuses by the railroads, the Grangers took political action. They sponsored state and local political candidates, elected legislators, and successfully pressed for laws to protect their interests. In 1871 Illinois authorized a commission “to establish maximum freight and passenger rates and prohibit discrimination.” Grangers throughout the West, Midwest, and Southeast convinced state legislators to pass similar laws, called Granger laws.

The railroads fought back, challenging the constitutionality of the regulatory laws. In 1877, however, in the case of *Munn v. Illinois*, the Supreme Court upheld the Granger laws by a vote of seven to two. The states thus won the right to regulate the railroads for the benefit of farmers and consumers. The Grangers also helped establish an important principle—the federal government’s right to regulate private industry to serve the public interest. **D**

INTERSTATE COMMERCE ACT The Grangers’ triumph was short-lived, however. In 1886, the Supreme Court ruled that a state could not set rates on interstate commerce—railroad traffic that either came from or was going to another state. In response to public outrage, Congress passed the **Interstate Commerce Act** in 1887. This act reestablished the right of the federal government to supervise railroad activities and established a five-member Interstate Commerce Commission (ICC) for that purpose. The ICC had difficulty regulating railroad rates because of a long legal process and resistance from the railroads. The final



Analyzing Political Cartoons

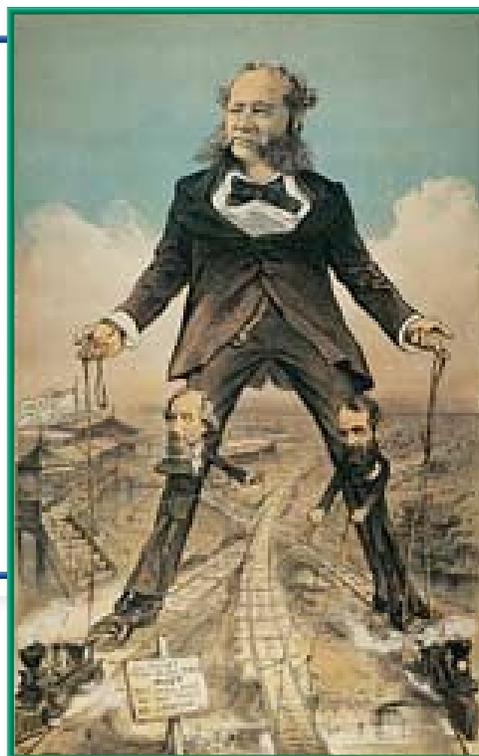
“THE MODERN COLOSSUS OF (RAIL) ROADS”

Joseph Keppler drew this cartoon in 1879, featuring the railroad “giants” William Vanderbilt (top), Jay Gould (bottom right), and Cyrus W. Fields (bottom left). The three magnates formed a railroad trust out of their Union Pacific, New York Central, and Lake Shore & Dependence lines.

SKILLBUILDER Analyzing Political Cartoons

1. The title of this cartoon is a pun on the Colossus of Rhodes, a statue erected in 282 B.C. on an island near Greece. According to legend, the 100-foot-tall statue straddled Rhodes’s harbor entrance. Do you think the artist means the comparison as a compliment or a criticism? Why?
2. The reins held by the railroad magnates attach not only to the trains but also to the tracks and the railroad station. What does this convey about the magnates’ control of the railroads?

SEE SKILLBUILDER HANDBOOK, PAGE R24.



blow to the commission came in 1897, when the Supreme Court ruled that it could not set maximum railroad rates. Not until 1906, under President Theodore Roosevelt, did the ICC gain the power it needed to be effective.

PANIC AND CONSOLIDATION Although the ICC presented few problems for the railroads, corporate abuses, mismanagement, overbuilding, and competition pushed many railroads to the brink of bankruptcy. Their financial problems played a major role in a nationwide economic collapse. The panic of 1893 was the worst depression up to that time: by the end of 1893, around 600 banks and 15,000 businesses had failed, and by 1895, 4 million people had lost their jobs. By the middle of 1894, a quarter of the nation’s railroads had been taken over by financial companies. Large investment firms such as J. P. Morgan & Company reorganized the railroads. As the 20th century dawned, seven powerful companies held sway over two-thirds of the nation’s railroad tracks.

Vocabulary

consolidation: the act of uniting or combining



ASSESSMENT

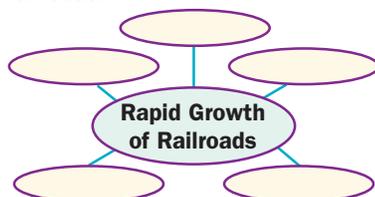
- 1. TERMS & NAMES** For each term or name, write a sentence explaining its significance.

- transcontinental railroad
- *Crédit Mobilier*
- Interstate Commerce Act
- George M. Pullman
- *Munn v. Illinois*

MAIN IDEA

2. TAKING NOTES

In a chart like the one below, fill in effects of the rapid growth of railroads.



How did the growth of railroads affect people’s everyday lives?
How did it affect farmers?

CRITICAL THINKING

3. MAKING INFERENCES

Do you think the government and private citizens could have done more to curb the corruption and power of the railroads? Give examples to support your opinion.

Think About:

- why the railroads had power
- the rights of railroad customers and workers
- the scope of government regulations

4. SYNTHESIZING

The federal government gave land and made loans to the railroad companies. Why was the government so eager to promote the growth of railroads?

5. ANALYZING MOTIVES

Reread “Another Perspective” on railroads (page 238). Why do you think that some Americans disliked this new means of transportation?



Big Business and Labor

MAIN IDEA

The expansion of industry resulted in the growth of big business and prompted laborers to form unions to better their lives.

WHY IT MATTERS NOW

Many of the strategies used today in industry and in the labor movement, such as consolidation and the strike, have their origins in the late 19th century.

Terms & Names

- Andrew Carnegie
- vertical and horizontal integration
- Social Darwinism
- John D. Rockefeller
- Sherman Antitrust Act
- Samuel Gompers
- American Federation of Labor (AFL)
- Eugene V. Debs
- Industrial Workers of the World (IWW)
- Mary Harris Jones

One American's Story

Born in Scotland to penniless parents, **Andrew Carnegie** came to this country in 1848, at age 12. Six years later, he worked his way up to become private secretary to the local superintendent of the Pennsylvania Railroad. One morning, Carnegie single-handedly relayed messages that unsnarled a tangle of freight and passenger trains. His boss, Thomas A. Scott, rewarded Carnegie by giving him a chance to buy stock. Carnegie's mother mortgaged the family home to make the purchase possible. Soon Carnegie received his first dividend.



A PERSONAL VOICE ANDREW CARNEGIE

“One morning a white envelope was lying upon my desk, addressed in a big John Hancock hand, to ‘Andrew Carnegie, Esquire.’ . . . All it contained was a check for ten dollars upon the Gold Exchange Bank of New York. I shall remember that check as long as I live. . . . It gave me the first penny of revenue from capital—something that I had not worked for with the sweat of my brow. ‘Eureka!’ I cried. ‘Here’s the goose that lays the golden eggs.’”

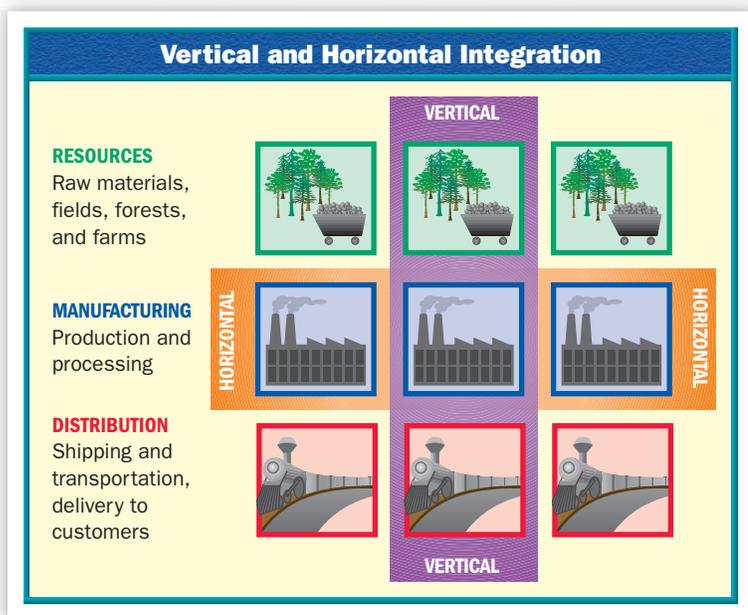
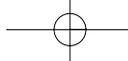
—Autobiography of Andrew Carnegie

Andrew Carnegie was one of the first industrial moguls to make his own fortune. His rise from rags to riches, along with his passion for supporting charities, made him a model of the American success story.

▲ Nineteenth-century industrialist Andrew Carnegie gave money to build public libraries, hoping to help others write their own rags-to-riches story.

Carnegie's Innovations

By 1865, Carnegie was so busy managing the money he had earned in dividends that he happily left his job at the Pennsylvania Railroad. He entered the steel business in 1873 after touring a British steel mill and witnessing the awesome spectacle of the Bessemer process in action. By 1899, the Carnegie Steel Company



manufactured more steel than all the factories in Great Britain.

NEW BUSINESS STRATEGIES

Carnegie's success was due in part to management practices that he initiated and that soon became widespread. First, he continually searched for ways to make better products more cheaply. He incorporated new machinery and techniques, such as accounting systems that enabled him to track precise costs. Second, he attracted talented people by offering them stock in the company, and he encouraged competition among his assistants.

In addition to improving his own manufacturing operation, Carnegie attempted to control as much of the steel industry as he could. He did this mainly by **vertical integration**, a process in which he bought out his suppliers—coal fields and iron mines, ore freighters, and railroad lines—in order to control the raw materials and transportation systems. Carnegie also attempted to buy out competing steel producers. In this process, known as **horizontal integration**, companies producing similar products merge. Having gained control over his suppliers and having limited his competition, Carnegie controlled almost the entire steel industry. By the time he sold his business in 1901, Carnegie's companies produced by far the largest portion of the nation's steel. **A**

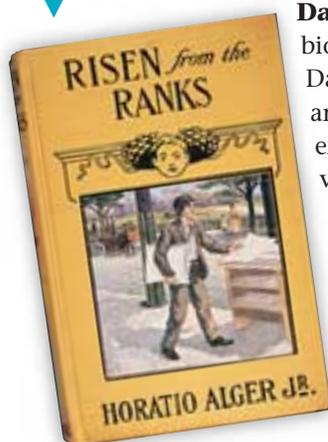
MAIN IDEA

Summarizing

A What were Andrew Carnegie's management and business strategies?

Social Darwinism and Business

Popular literature promoted the possibility of rags-to-riches success for anyone who was virtuous and hard-working.



Andrew Carnegie explained his extraordinary success by pointing to his hard work, shrewd investments, and innovative business practices. Late-19th-century social philosophers thought that Carnegie's achievement could be explained scientifically by a new theory—Social Darwinism.

PRINCIPLES OF SOCIAL DARWINISM The philosophy called **Social Darwinism** grew out of the English naturalist Charles Darwin's theory of biological evolution. In his book *On the Origin of Species*, published in 1859, Darwin described his observations that some individuals of a species flourish and pass their traits along to the next generation, while others do not. He explained that a process of "natural selection" weeded out less-suited individuals and enabled the best-adapted to survive.

The English philosopher Herbert Spencer used Darwin's biological theories to explain the evolution of human society. Soon, economists found in Social Darwinism a way to justify the doctrine of *laissez faire* (a French term meaning "allow to do"). According to this doctrine, the marketplace should not be regulated. William G. Sumner, a political science professor at Yale University, promoted the theory that success and failure in business were governed by natural law and that no one had the right to intervene.

A NEW DEFINITION OF SUCCESS The premise of the survival and success of the most capable naturally made sense to the 4,000 millionaires who had emerged since the Civil War. Because the theory supported the notion of individual responsibility and blame, it also appealed to the Protestant work ethic of



many Americans. According to Social Darwinism, riches were a sign of God's favor, and therefore the poor must be lazy or inferior people who deserved their lot in life.

Fewer Control More

Although some business owners endorsed the “natural law” in theory, in practice most entrepreneurs did everything they could to control the competition that threatened the growth of their business empires.

GROWTH AND CONSOLIDATION Many industrialists took the approach “If you can't beat 'em, join 'em.” They often pursued horizontal integration in the form of mergers. A merger usually occurred when one corporation bought out the stock of another. A firm that bought out all its competitors could achieve a monopoly, or complete control over its industry's production, wages, and prices.

One way to create a monopoly was to set up a holding company, a corporation that did nothing but buy out the stock of other companies. Headed by banker J. P. Morgan, United States Steel was one of the most successful holding companies. In 1901, when it bought the largest manufacturer, Carnegie Steel, it became the world's largest business.

Corporations such as the Standard Oil Company, established by **John D. Rockefeller**, took a different approach to mergers: they joined with competing companies in trust agreements. Participants in a trust turned their stock over to a group of trustees—people who ran the separate companies as one large corporation. In return, the companies were entitled to dividends on profits earned by the trust. Trusts were not legal mergers, however. Rockefeller used a trust to gain total control of the oil industry in America. **B**

ROCKEFELLER AND THE “ROBBER BARONS” In 1870, Rockefeller's Standard Oil Company of Ohio processed two or three percent of the country's crude oil. Within a decade, it controlled 90 percent of the refining business. Rockefeller reaped huge profits by paying his employees extremely low wages and driving his competitors out of business by selling his oil at a lower price than it cost to produce it. Then, when he controlled the market, he hiked prices far above original levels.

Alarmed at the tactics of industrialists, critics began to call them robber barons. But industrialists were also philanthropists. Although Rockefeller kept most of his assets, he still gave away over \$500 million, establishing the Rockefeller Foundation, providing funds to found the University of Chicago, and creating a medical institute that helped find a cure for yellow fever.

Background

See *monopoly* on page R43 in the Economics Handbook.

MAIN IDEA

Summarizing

B What strategies enabled big businesses to eliminate competition?

KEY PLAYER



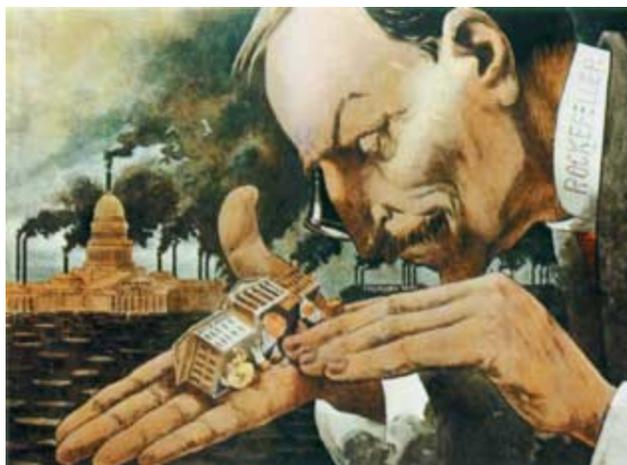
JOHN D. ROCKEFELLER
1839–1937

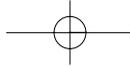
At the height of John Davison Rockefeller's power, an associate noted that he “always sees a little farther than the rest of us—and then he sees around the corner.”

Rockefeller's father was a flashy peddler of phony cancer cures with a unique approach to raising children. “I cheat my boys every chance I get. . . . I want to make 'em sharp,” he boasted.

It seems that this approach succeeded with the oldest son, John D., who was sharp enough to land a job as an assistant bookkeeper at the age of 16. Rockefeller was very proud of his own son, who succeeded him in the family business. At the end of his life, Rockefeller referred not to his millions but to John D., Jr., as “my greatest fortune.”

This 1900 cartoon, captioned “What a funny little government!” is a commentary on the power of the Standard Oil empire. John D. Rockefeller holds the White House in his hand.





Andrew Carnegie donated about 90 percent of the wealth he accumulated during his lifetime; his fortune still supports the arts and learning today. “It will be a great mistake for the community to shoot the millionaires,” he said, “for they are the bees that make the most honey, and contribute most to the hive even after they have gorged themselves full.” **C**

SHERMAN ANTITRUST ACT Despite Carnegie’s defense of millionaires, the government was concerned that expanding corporations would stifle free competition. In 1890, the **Sherman Antitrust Act** made it illegal to form a trust that interfered with free trade between states or with other countries.

Prosecuting companies under the Sherman act was not easy, however, because the act didn’t clearly define terms such as *trust*. In addition, if firms such as Standard Oil felt pressure from the government, they simply reorganized into single corporations. The Supreme Court threw out seven of the eight cases the federal government brought against trusts. Eventually, the government stopped trying to enforce the Sherman act, and the consolidation of businesses continued.

BUSINESS BOOM BYPASSES THE SOUTH Industrial growth concentrated in the North, where natural and urban resources were plentiful. The South was still trying to recover from the Civil War, hindered by a lack of capital—money for investment. After the war, people were unwilling to invest in risky ventures. Northern businesses already owned 90 percent of the stock in the most profitable Southern enterprise, the railroads, thereby keeping the South in a stranglehold. The South remained mostly agricultural, with farmers at the mercy of railroad rates. Entrepreneurs suffered not only from excessive transportation costs, but also from high tariffs on raw materials and imported goods, and from a lack of skilled workers. The post-Reconstruction South seemed to have no way out of economic stagnation. However, growth in forestry and mining, and in the tobacco, furniture, and textile industries, offered hope. **D**

In this photograph, taken by Lewis Hine in 1912, a young sweatshop laborer in New York City carries piecework home.



MAIN IDEA

Evaluating

C Do you agree with Carnegie’s defense of millionaires? Why or why not?

MAIN IDEA

Synthesizing

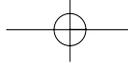
D How did economic factors limit industrialization in the South?

Labor Unions Emerge

As business leaders merged and consolidated their forces, it seemed necessary for workers to do the same. Although Northern wages were generally higher than Southern wages, exploitation and unsafe working conditions drew workers together across regions in a nationwide labor movement. Laborers—skilled and unskilled, female and male, black and white—joined together in unions to try to improve their lot.

LONG HOURS AND DANGER One of the largest employers, the steel mills, often demanded a seven-day workweek. Seamstresses, like factory workers in most industries, worked 12 or more hours a day, six days a week. Employees were not entitled to vacation, sick leave, unemployment compensation, or reimbursement for injuries suffered on the job.

Yet injuries were common. In dirty, poorly ventilated factories, workers had to perform repetitive, mind-dulling tasks, sometimes with dangerous or faulty equipment. In 1882, an average of 675 laborers were killed in work-related accidents each week. In addition, wages were so low that most families could not survive unless everyone held a job. Between 1890 and 1910, for example, the number of women working for wages



doubled, from 4 million to more than 8 million. Twenty percent of the boys and 10 percent of the girls under age 15—some as young as five years old—also held full-time jobs. With little time or energy left for school, child laborers forfeited their futures to help their families make ends meet.

In sweatshops, or workshops in tenements rather than in factories, workers had little choice but to put up with the conditions. Sweatshop employment, which was tedious and required few skills, was often the only avenue open to women and children. Jacob Riis described the conditions faced by “sweaters.”

A PERSONAL VOICE JACOB RIIS

“The bulk of the sweater’s work is done in the tenements, which the law that regulates factory labor does not reach. . . . In [them] the child works unchallenged from the day he is old enough to pull a thread. There is no such thing as a dinner hour; men and women eat while they work, and the ‘day’ is lengthened at both ends far into the night.”

—How the Other Half Lives

Not surprisingly, sweatshop jobs paid the lowest wages—often as little as 27 cents for a child’s 14-hour day. In 1899, women earned an average of \$267 a year, nearly half of men’s average pay of \$498. The very next year Andrew Carnegie made \$23 million—with no income tax.

EARLY LABOR ORGANIZING Skilled workers had formed small, local unions since the late 1700s. The first large-scale national organization of laborers, the National Labor Union (NLU), was formed in 1866 by ironworker William H. Sylvius. The refusal of some NLU local chapters to admit African Americans led to the creation of the Colored National Labor Union (CNLU). Nevertheless, NLU membership grew to 640,000. In 1868, the NLU persuaded Congress to legalize an eight-hour day for government workers. **E**

NLU organizers concentrated on linking existing local unions. In 1869, Uriah Stephens focused his attention on individual workers and organized the Noble Order of the Knights of Labor. Its motto was “An injury to one is the concern of all.” Membership in the Knights of Labor was officially open to all workers, regardless of race, gender, or degree of skill. Like the NLU, the Knights supported an eight-hour workday and advocated “equal pay for equal work” by men and women. They saw strikes, or refusals to work, as a last resort and instead advocated arbitration. At its height in 1886, the Knights of Labor had about 700,000 members. Although the Knights declined after the failure of a series of strikes, other unions continued to organize.

Union Movements Diverge

As labor activism spread, it diversified. Two major types of unions made great gains under forceful leaders.

CRAFT UNIONISM One approach to the organization of labor was craft unionism, which included skilled workers from one or more trades. **Samuel Gompers** led the Cigar Makers’ International Union to join with other craft unions in 1886. The **American Federation of Labor (AFL)**,

MAIN IDEA

Analyzing Issues

E How did industrial working conditions contribute to the growth of the labor movement?

Vocabulary

arbitration: a method of settling disputes in which both sides submit their differences to a mutually approved judge

HISTORICAL

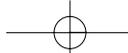
SPOTLIGHT

AFRICAN AMERICANS AND THE LABOR MOVEMENT

Angered by their exclusion from the NLU, African American laborers formed the Colored National Labor Union (CNLU) in 1869. Led by Isaac Meyers, a caulker from Baltimore, the CNLU emphasized cooperation between management and labor and the importance of political reform.

The CNLU disbanded in the early 1870s, but many African-American laborers found a home in the Knights of Labor, the first union to welcome blacks and whites alike. The Great Strike of 1877 brought whites and African Americans together, but the labor movement remained largely divided along racial lines.

Management often hired African Americans as strikebreakers, which intensified white unions’ resistance to accepting blacks. African Americans continued to organize on their own, but discrimination and their small numbers relative to white unions hurt black unions’ effectiveness.



In New York City's Union Square in 1914, IWW members protest violence against striking coal miners in Colorado.

“The strike is the weapon of the oppressed.”

EUGENE V. DEBS

with Gompers as its president, focused on collective bargaining, or negotiation between representatives of labor and management, to reach written agreements on wages, hours, and working conditions. Unlike the Knights of Labor, the AFL used strikes as a major tactic. Successful strikes helped the AFL win higher wages and shorter workweeks. Between 1890 and 1915, the average weekly wages in unionized industries rose from \$17.50 to \$24, and the average workweek fell from almost 54.5 hours to just under 49 hours.

INDUSTRIAL UNIONISM Some labor leaders felt that unions should include all laborers—skilled and unskilled—in a specific industry. This concept captured the imagination of **Eugene V. Debs**, who made the first major attempt to form such an industrial union—the American Railway Union (ARU). Most of the new union's members were unskilled and semiskilled laborers, but skilled engineers and firemen joined too. In 1894, the new union won a strike for higher wages. Within two months, its membership climbed to 150,000, dwarfing the 90,000 enrolled in the four skilled railroad brotherhoods. Though the ARU, like the Knights of Labor, never recovered after the failure of a major strike, it added to the momentum of union organizing. **F**

SOCIALISM AND THE IWW In an attempt to solve the problems faced by workers, Eugene Debs and some other labor activists eventually turned to socialism, an economic and political system based on government control of business and property and equal distribution of wealth. Socialism, carried to its extreme form—communism, as advocated by the German philosopher Karl Marx—would result in the overthrow of the capitalist system. Most socialists in late-19th-century America drew back from this goal, however, and worked within the labor movement to achieve better conditions for workers. In 1905, a group of radical unionists and socialists in Chicago organized the **Industrial Workers of the World (IWW)**, or the Wobblies. Headed by William “Big Bill” Haywood, the Wobblies included miners, lumberers, and cannery and dock workers. Unlike the ARU, the IWW welcomed African Americans, but membership never topped 100,000. Its only major strike victory occurred in 1912. Yet the Wobblies, like other industrial unions, gave dignity and a sense of solidarity to unskilled workers.

OTHER LABOR ACTIVISM IN THE WEST In April 1903, about 1,000 Japanese and Mexican workers organized a successful strike in the sugar-beet fields of Ventura County, California. They formed the Sugar Beet and Farm Laborers' Union of Oxnard. In Wyoming, the State Federation of Labor supported a union of Chinese and Japanese miners who sought the same wages and treatment as other union miners. These small, independent unions increased both the overall strength of the labor movement and the tension between labor and management.

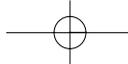
MAIN IDEA

Contrasting

F How did craft unions and industrial unions differ?

Background

See *socialism* on page R44 in the Economics Handbook.



Strikes Turn Violent

Industry and government responded forcefully to union activity, which they saw as a threat to the entire capitalist system.

THE GREAT STRIKE OF 1877 In July 1877, workers for the Baltimore and Ohio Railroad (B&O) struck to protest their second wage cut in two months. The work stoppage spread to other lines. Most freight and even some passenger traffic, covering over 50,000 miles, was stopped for more than a week. After several state governors asked President Rutherford B. Hayes to intervene, saying that the strikers were impeding interstate commerce, federal troops ended the strike.

THE HAYMARKET AFFAIR Encouraged by the impact of the 1877 strike, labor leaders continued to press for change. On the evening of May 4, 1886, 3,000 people gathered at Chicago's Haymarket Square to protest police brutality—a striker had been killed and several had been wounded at the McCormick Harvester plant the day before. Rain began to fall at about 10 o'clock, and the crowd was dispersing when police arrived. Then someone tossed a bomb into the police line. Police fired on the workers; seven police officers and several workers died in the chaos that followed. No one ever learned who threw the bomb, but the three speakers at the demonstration and five other radicals were charged with inciting a riot. All eight were convicted; four were hanged and one committed suicide in prison. After Haymarket, the public began to turn against the labor movement. **G**

THE HOMESTEAD STRIKE Despite the violence and rising public anger, workers continued to strike. The writer Hamlin Garland described conditions at the Carnegie Steel Company's Homestead plant in Pennsylvania.

MAIN IDEA

Analyzing Causes

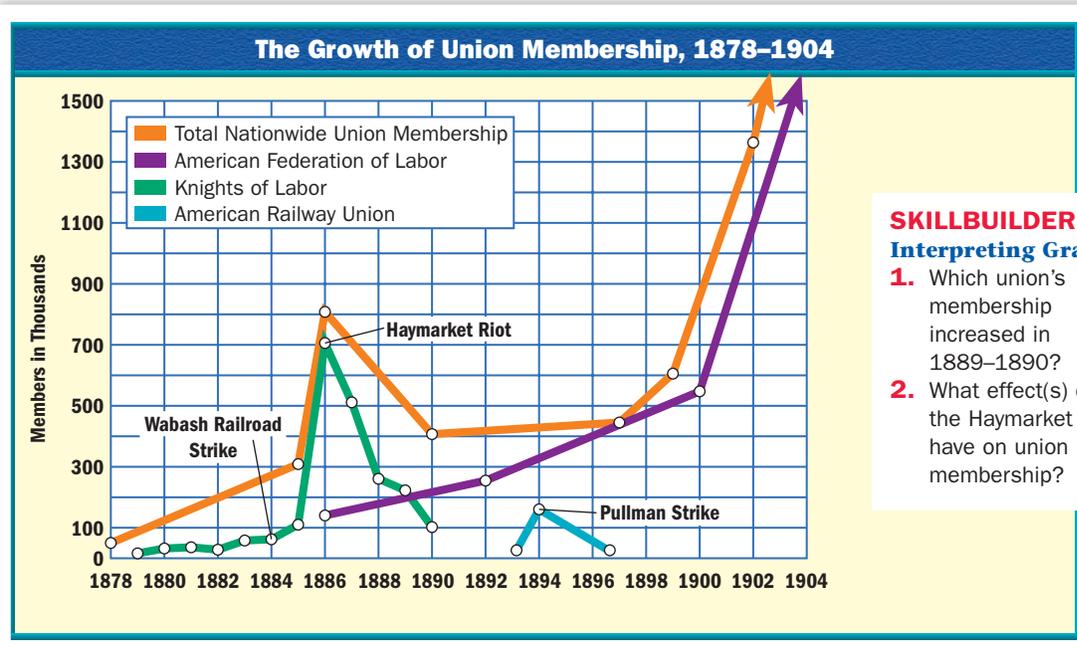
G How did the 1877 strike and Haymarket cause the public to resent the labor movement?

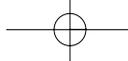
A PERSONAL VOICE HAMLIN GARLAND

“Everywhere . . . groups of pale, lean men slouched in faded garments, grimy with the soot and grease of the mills. . . . A roar as of a hundred lions, a thunder as of cannons, . . . jarring clang of falling iron . . . !”

—quoted in *McClure's Magazine*

The steelworkers finally called a strike on June 29, 1892, after the company president, Henry Clay Frick, announced his plan to cut wages. Frick hired armed





guards from the Pinkerton Detective Agency to protect the plant so that he could hire scabs, or strikebreakers, to keep it operating. In a pitched battle that left at least three detectives and nine workers dead, the steelworkers forced out the Pinkertons and kept the plant closed until the Pennsylvania National Guard arrived on July 12. The strike continued until November, but by then the union had lost much of its support and gave in to the company. It would take 45 years for steelworkers to mobilize once again.

THE PULLMAN COMPANY STRIKE Strikes continued in other industries, however. During the panic of 1893 and the economic depression that followed, the Pullman company laid off more than 3,000 of its 5,800 employees and cut the wages of the rest by 25 to 50 percent, without cutting the cost of its employee housing. After paying their rent, many workers took home less than \$6 a week. A strike was called in the spring of 1894, when the economy improved and the Pullman company failed to restore wages or decrease rents. Eugene Debs asked for arbitration, but Pullman refused to negotiate with the strikers. So the ARU began boycotting Pullman trains.

After Pullman hired strikebreakers, the strike turned violent, and President Grover Cleveland sent in federal troops. In the bitter aftermath, Debs was jailed. Pullman fired most of the strikers, and the railroads blacklisted many others, so they could never again get railroad jobs.

WOMEN ORGANIZE Although women were barred from many unions, they united behind powerful leaders to demand better working conditions, equal pay for equal work, and an end to child labor. Perhaps the most prominent organizer in the women's labor movement was **Mary Harris Jones**. Jones supported the Great Strike of 1877 and later organized for the United Mine Workers of America (UMW). She endured death threats and jail with the coal miners, who gave her the nickname Mother Jones. In 1903, to expose the cruelties of child labor, she led 80 mill children—many with hideous injuries—on a march to the home of President Theodore Roosevelt. Their crusade influenced the passage of child labor laws.

Other organizers also achieved significant gains for women. In 1909, Pauline Newman, just 16 years old, became the first female organizer of the International Ladies' Garment Workers' Union (ILGWU). A garment worker from the age of eight, Newman also supported

KEY PLAYERS



EUGENE V. DEBS
1855–1926

Born in Indiana, Eugene V. Debs left home at the age of 14 to work for the railroads. In 1875 he helped organize a local lodge of the Brotherhood of Locomotive Firemen, and after attempts to unite the local railroad brotherhoods failed, Debs organized the American Railway Union.

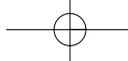
While in prison following the Pullman strike in 1894, Debs read the works of Karl Marx and became increasingly disillusioned with capitalism. He became a spokesperson for the Socialist Party of America and was its candidate for president five times. In 1912, he won about 900,000 votes—an amazing 6 percent of the total.



MOTHER JONES
1830–1930

Mary Harris “Mother” Jones was a native of Ireland who immigrated to North America as a child. She became involved in the American labor movement after receiving assistance from the Knights of Labor. According to a reporter who followed “the mother of the laboring class” on her children’s march in 1903, “She fights their battles with a Mother’s Love.” Jones continued fighting until her death at age 100.

Jones was definitely not the kind of woman admired by industrialists. “God almighty made women,” she declared, “and the Rockefeller gang of thieves made ladies.”



the “Uprising of the 20,000,” a 1909 seamstresses’ strike that won labor agreements and improved working conditions for some strikers.

The public could no longer ignore conditions in garment factories after a fire broke out at the Triangle Shirtwaist Factory in New York City on March 25, 1911. The fire spread swiftly through the oil-soaked machines and piles of cloth, engulfing the eighth, ninth, and tenth floors. As workers attempted to flee, they discovered that the company had locked all but one of the exit doors to prevent theft. The unlocked door was blocked by fire. The factory had no sprinkler system, and the single fire escape collapsed almost immediately. In all, 146 women died; some were found huddled with their faces raised to a small window. Public outrage flared after a jury acquitted the factory owners of manslaughter. In response, the state of New York set up a task force to study factory working conditions. **H**

MAIN IDEA

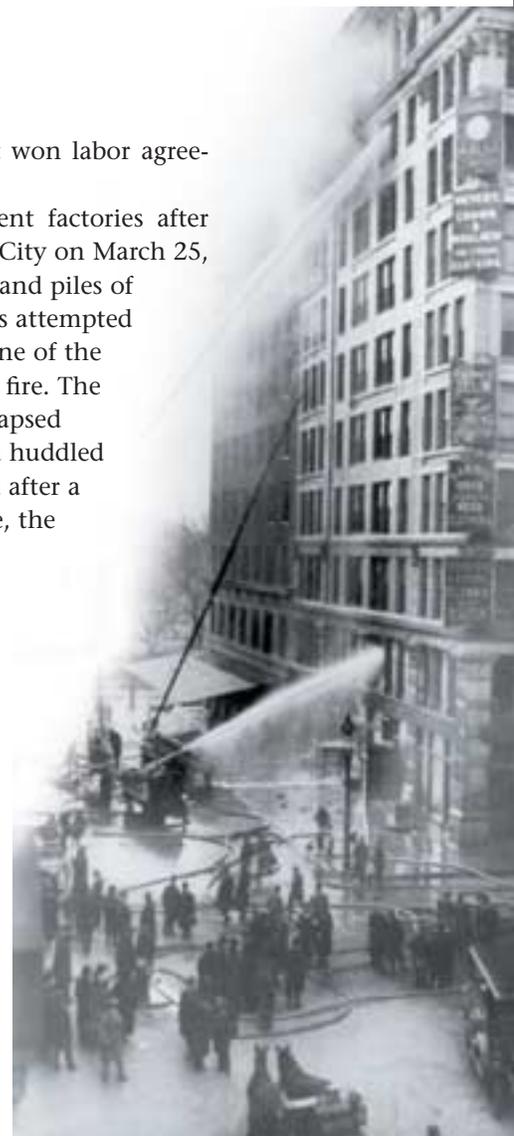
Summarizing

H What factors made the Triangle Shirtwaist fire so lethal?

MANAGEMENT AND GOVERNMENT PRESSURE UNIONS

The more powerful the unions became, the more employers came to fear them. Management refused to recognize unions as representatives of the workers. Many employers forbade union meetings, fired union members, and forced new employees to sign “yellow-dog contracts,” swearing that they would not join a union.

Finally, industrial leaders, with the help of the courts, turned the Sherman Antitrust Act against labor. All a company had to do was say that a strike, picket line, or boycott would hurt interstate trade, and the state or federal government would issue an injunction against the labor action. Legal limitations made it more and more difficult for unions to be effective. Despite these pressures, workers—especially those in skilled jobs—continued to view unions as a powerful tool. By 1904, the AFL had about 1,700,000 members in its affiliated unions; by the eve of World War I, AFL membership would climb to over 2 million.



▲ The fire department’s ladders reached only to the sixth floor, two floors below the burning Triangle Shirtwaist Company.



ASSESSMENT

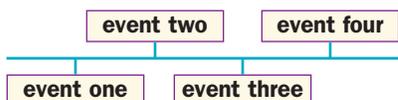
1. TERMS & NAMES For each term or name, write a sentence explaining its significance.

- Andrew Carnegie
- John D. Rockefeller
- American Federation of Labor (AFL)
- Industrial Workers of the World (IWW)
- vertical and horizontal integration
- Sherman Antitrust Act
- Eugene V. Debs
- Mary Harris Jones
- Social Darwinism
- Samuel Gompers

MAIN IDEA

2. TAKING NOTES

Make a time line of the notable achievements and setbacks of the labor movement between 1876 and 1911.



In what ways did strikes threaten industry?

CRITICAL THINKING

3. EVALUATING LEADERSHIP

Do you think that the tycoons of the late 19th century are best described as ruthless robber barons or as effective captains of industry?

Think About:

- their management tactics and business strategies
- their contributions to the economy
- their attitude toward competition

4. DRAWING CONCLUSIONS

Does the life of Andrew Carnegie support or counter the philosophy of Social Darwinism? Explain.

5. HYPOTHESIZING

If the government had supported unions instead of management in the late 19th century, how might the lives of workers have been different?