

The reb would pop up his head; the Yank would do the same.

"Hain't you got any coffee, Johnny?"

"Na'r a bit, but plenty of rot-gut."

"All right; we'll have a trade."

They would meet, while several others would follow the example, until there would be a regular bartering mart established. In some cases the men would come to know each other so well, that they would often call out,—

"Look out, reb; we're going to shoot," or "Look out, Yank, we're going to shoot," as the case may be.

On one occasion the men were holding a friendly reunion of this sort, when a rebel major came down in a great fury, and ordered the men back. As they were going back, he ordered them to fire on the Federals. They refused, as they had made a truce. The major swore and stormed, and in his rage he snatched the gun from one of the men, and fired at a Federal soldier, wounding him. A cry of execration at such a breach of faith rose from all the men, and they called out, "Yanks, we couldn't help it." At night these men deserted into our lines, assigning as a reason, that they could not with honor serve any longer in an army that thus violated private truces. . . .

Our campaign all through Central Georgia was one delightful picnic. We had little or no fighting, and good living. The farm-yards, cellars, and cribs of the planters kept ourselves and animals well stored with provisions and forage. . . .

In passing through the camp one night, I saw a lot of jolly soldiers squatted outside the huts . . . , and between them a table richly stocked with meats and fowls of different kinds, flanked by several bottles of brandy. . . . They thought campaigning in Georgia about the pleasantest sort of life out, and they wondered what would become of the poor dog-gone folks they had left with their fingers in their mouths, and little else to put in them.

Many of our foragers, scouts, and hangers-on of all classes, thought, like Cromwell, that they were doing the work of the Lord, in wantonly destroying as much property as possible. Though this was done extensively in Georgia, it was only in South Carolina that it was brought to perfection. . . .

A planter's house was overrun in a jiffy; boxes, drawers, and escritaires were ransacked with a laudable zeal, and emptied of their contents. If the spoils were ample, the depredators were satisfied, and went off in peace; if not, everything was torn and destroyed, and most likely the owner was tickled with sharp bayonets into a confession where he had his treasures hid. . . . Sorghum barrels were knocked open, bee hives rifled, while their angry swarms rushed frantically about. Indeed, I have seen a soldier knock a planter down because a bee stung him. Hogs are bayoneted, and then hung in quarters on the bayonets to bleed; chickens, geese, and turkeys are knocked over and hung in garlands from the saddles . . . ; cows and calves, so wretchedly thin that they drop down and perish on the first day's march, are driven along, or, if too weak to travel, are shot, lest they should give aid to the enemy.

Should the house be deserted, the furniture is smashed in pieces, music is pounded out of four hundred dollar pianos with the ends of muskets. . . . After all was cleared out, most likely some set of stragglers wanted to enjoy a good fire, and set the house, debris of furniture, and all the surroundings, in a blaze. This is the way Sherman's army lived on the country. They were not ordered to do so, but I am afraid they were not brought to task for it much either.

Source: *Sherman's March Through the South*
by David Conyngham, Sheldon & Co., 1865.



~ Potter House, Atlanta ~

*Blasted by Union
artillery fire, the
Potter house was
one of countless
buildings damaged
or destroyed by
Sherman's forces.*

ADDITIONAL READING

To learn more about the topics discussed in this selection, you might want to read the following books:

- *For Cause and Comrades: The Will to Combat in the Civil War*, by James M. McPherson (New York: Oxford University, 1997)
- *Marching Through Georgia: The Story of Soldiers and Civilians During Sherman's Campaign*, by Lee B. Kennett (New York: HarperCollins, 1995)
- *Mary Chesnut's Civil War*, edited by C. Vann Woodward (New Haven: Yale University Press, 1981)

Expansion: Rewards and Costs

1850–1915

The explosive growth of the post–Civil War era transformed the nation. The promise of new opportunities attracted thousands of settlers to the West, set off a dramatic wave of immigration, and swelled the populations of cities. Expansion brought important rewards, such as technological advances, but at a high cost. Along with expansion came urban poverty, labor unrest, and the displacement of Native Americans.

Chapter 14 The Expansion of American Industry **1850–1900**

Chapter 15 Looking to the West **1860–1900**

Chapter 16 Politics, Immigration, and Urban Life **1870–1915**

Chapter 17 Daily Life in the Gilded Age **1870–1915**

UNIT THEMES

Science and Technology New technologies led to rapid industrial growth.

Diversity White settlement of western lands devastated Native American cultures.

Economics Powerful and unregulated businesses brought wealth to the national economy, but many began to question their aggressive practices.

EVENTS IN THE UNITED STATES

1856
Turning Point:
Bessemer steel process (p. 411)

1859
Silver discovered at Nevada's Comstock Lode

1862
Homestead Act

1869
Transcontinental railroad completed

1874
Women's Christian Temperance Union founded

Presidents

Fillmore

Pierce

Buchanan

Lincoln

Johnson

Grant

Hayes

1850

1860

1870

EVENTS IN THE WORLD

1852
The South African Republic is established

1859
Charles Darwin publishes *The Origin of the Species*

1869
The Suez Canal completed

1876
Korea becomes an independent nation



VIEWING HISTORY An excursion party, reveling in the newfound technologies of the era, stops for a photograph a Devil's Gate Bridge in Utah.
Geography How does the photo capture both rewards and costs of the nation's growth?

Assiniboine war shirt



1883

Brooklyn Bridge completed

1886
Haymarket Riot

1890

Sherman Antitrust Act passed

1892

Ellis Island immigration center opened

1896

Plessy v. Ferguson

Garfield

Arthur

Cleveland

Harrison

Cleveland

Roosevelt

1880

1890

1900

1881

Freedom of the press established in France

1889

French Panama Canal Company goes bankrupt

1891

Building of Trans-Siberian Railroad begins

1904

10-hour workday established in France

The Expansion of American Industry

1850-1900



CHAPTER FOCUS

In this chapter you will read about a revolution of new inventions and ideas that transformed the United States after the Civil War. Industrial growth led to more work and wealth for men, women, and business owners. It also led to rising tensions between workers and employers, however.



The *Why Study History?* page at the end of this chapter explores the connection between today's service economy and the industrial economy that arose in the United States after the Civil War.



VIEWING HISTORY

Citadel Rock looms over the construction of the Union Pacific Railroad through Wyoming Territory in 1868. **Economics**
How was the growth of railroads related to the growth of industry?

1844
First Morse
code telegraph
message sent

1856
Bessemer
process
patented

1869
Transcontinental
railroad
completed

1876
Bell
patents the
telephone

1880
Edison develops
a new light
bulb

1883
Brooklyn
Bridge
completed

1840

1850

1860

1870

1880

1890

1 A Technological Revolution

SECTION PREVIEW

Objectives

- 1 Identify some of the changes in people's daily lives in the decades following the Civil War.
- 2 Describe how advancements in transportation, communication, and electric power affected people and businesses.
- 3 Explain the effects of the development of the Bessemer process.
- 4 **Key Terms** Define: patent; productivity; transcontinental railroad; Bessemer process; mass production.

Main Idea

In the years after the Civil War, new technology revolutionized American life.

Reading Strategy

Reinforcing Key Ideas You will be reading about daily life in the United States between 1865 and 1900. As you read, list the ways in which the United States changed in those 35 years.

In the years after the Civil War, the United States developed into an industrial powerhouse. Inventors and scientists, backed by business leaders, created an explosion of inventions and improvements. Their efforts brought about a technological revolution that energized American industry and forever changed people's daily lives.

Changes in Daily Life

Most Americans today can flip a switch for light, turn a faucet for water, and talk to a friend a thousand miles away just by pressing a few buttons. It is hard for us to imagine life without these conveniences. In 1865, however, daily life was vastly different.

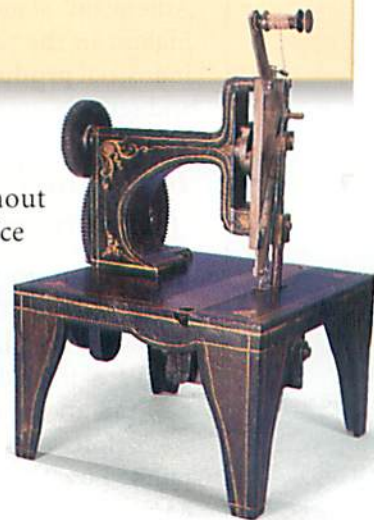
Daily Life in 1865 Indoor electric lighting did not exist in 1865. Instead, the rising and setting of the sun dictated the rhythm of a day's work. After dark, people lit candles or oil lamps if they could afford them. If they could not, they simply went to sleep, to rise at the first light of dawn.

Imagine summers without the benefits of refrigeration! Ice was available in 1865, but only at great cost. People sawed blocks of ice out of frozen ponds during the winter, packed them in sawdust, and stored them in icehouses for later use.

By modern standards, long-distance communication was agonizingly slow. In 1860, most mail from the East Coast took ten days to reach the Midwest and three weeks to get to the West. An immigrant living on the frontier would wait months for news from relatives in Europe.

Daily Life in 1900 By 1900, this picture of daily life had changed dramatically for millions of Americans. A combination of factors made this change possible.

The post-Civil War years saw tremendous growth in new ideas and inventions. Between 1790 and 1860, the Patent and Trademark Office of the federal government issued just 36,000



Inventions such as this Singer sewing machine changed daily life for many Americans.



This drawing appeared in the April 1890 edition of a journal called *The Woman Inventor: Science and Technology*. What does it suggest about women's contributions to the industrial growth of the late 1800s?

patents—licenses to make, use, or sell an invention. In contrast, between 1860 and 1890 500,000 patents were issued for inventions such as the typewriter, sewing machine, and phonograph.

European investors and American business leaders began to invest heavily in new inventions. This combination of American ingenuity and financial backing helped create new industries and expand old ones. By 1900 Americans' standard of living was among the highest in the world. So too was the nation's industrial **productivity**—the amount of goods and services created in a given period of time.

Railroads Improve Transportation

In 1850 steam-powered ships still provided much of the nation's transportation. Over the following decades, however, improvements in train and track design, plus the construction of new rail lines, gave railroads a big boost.

Before the Civil War most of the nation's railroad tracks were in short lines that connected neighboring cities, mainly in the East. Since there was no standard track width, or gauge, each train could only travel on certain tracks. As a result, goods and passengers often had to be moved to different trains, which caused costly delays. To make matters worse, train travel was dangerous. No system of standard signals existed, and train brakes were unreliable.

The Transcontinental Railroad The rail business improved greatly after the Civil War. The key event was the building of the **transcontinental railroad**, a railway extending from coast to coast. The project began in 1862. By this time rail lines already reached from the East Coast to the Mississippi River.

Now new rails had to be laid between Omaha, Nebraska, and Sacramento, California.

Government involvement was vital, since private investors alone could not have funded the massive project. The federal government awarded huge loans and land grants to two private companies. The Central Pacific Railroad began laying track eastward out of Sacramento. The Union Pacific Railroad began work toward the west in Omaha.

Most of the workers on the transcontinental railroad were immigrants. Irish workers on the Union Pacific line used pickaxes to dig and level rail beds across the Great Plains at the rate of up to six miles a day. Chinese workers that the Central Pacific had brought to the United States chiseled, plowed, and dynamited their way through the rock, ice, and snow of the Sierra Nevada mountain range.

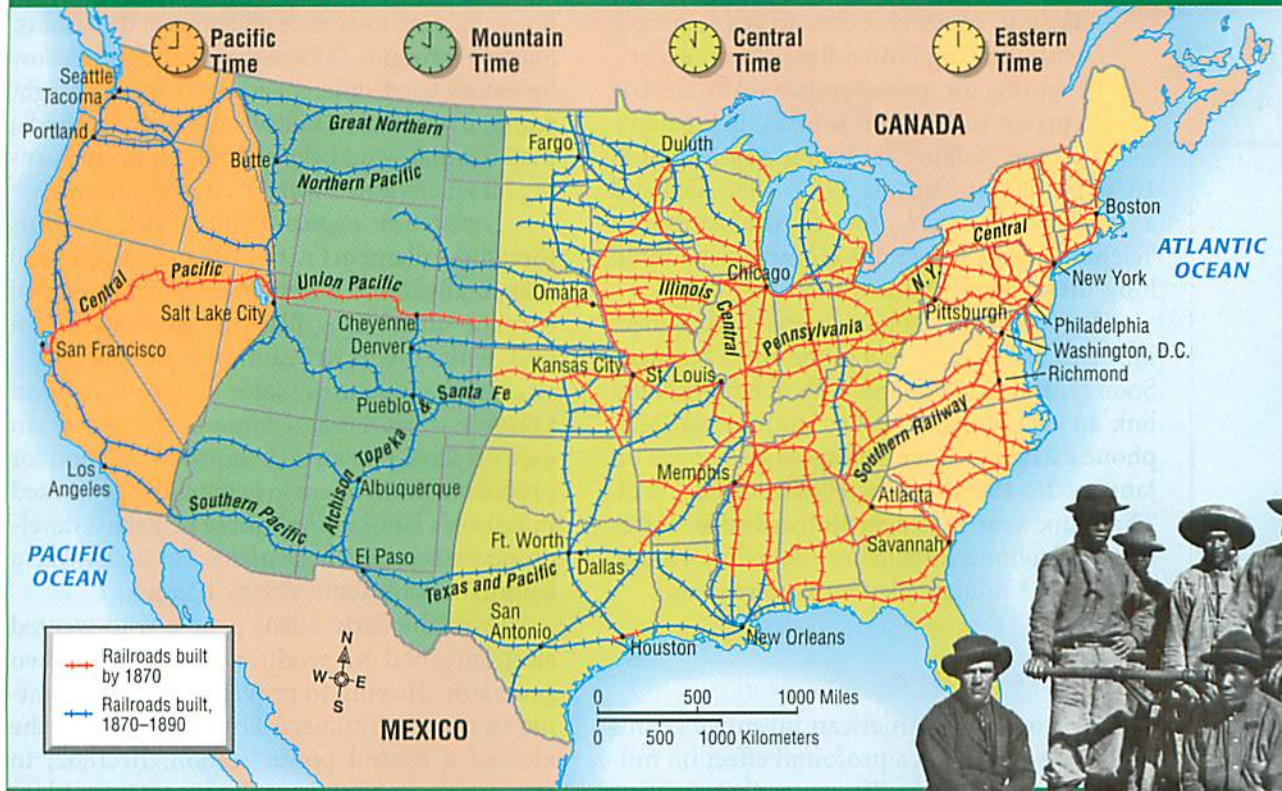
Finally, after seven years of grueling labor, the two crews approached each other in what is now Utah. On May 10, 1869, at a place called Promontory Point, Central Pacific president Leland Stanford raised his hammer to drive the final, golden spike. A telegraph operator beside the track tapped out a message to crowds throughout the country: "Almost ready now. Hats off. Prayer is being offered. . . . Done!" The nation had its first transcontinental railroad.

Rail Problems and Solutions By 1870 railroads could carry goods and passengers from coast to coast, but they still had problems. Trains were often noisy, dirty, and uncomfortable for travelers. The huge engines, spewing smoke and cinders as they thundered through the countryside, aroused fear and distrust.

In spite of the problems, train travel continued to expand and improve. Steel rails replaced iron rails, and track gauges and signals became standardized. Railroad companies also took steps to improve safety. In 1869 George Westinghouse developed more effective air brakes. In 1887 Granville Woods patented a telegraph system for communicating with moving trains, thus reducing the risk of collision.

Railroads and Time Zones Scheduling proved to be another problem for railroads. In the 1800s most towns set their clocks independently, according to solar time. When trains started regular passenger service, they had to be "on time." Time differences from town to town created chaos. In 1883 the railroads adopted a national system of time zones to improve

Time Zones and the Growth of the Railroads, 1870–1890



Following the Civil War railroads expanded rapidly across the United States, making necessary the introduction of standard time zones. Workers such as those pictured here performed the dangerous, backbreaking construction. **Movement** In what ways did the nation's growing transportation system help promote industrial growth?



scheduling. As a result, clocks in broad regions of the country showed the same time.

Rail improvements such as this made life easier not only for passengers but also for businesses that shipped goods. By the end of the century, some 190,000 miles of rails linked businesses and their customers. Shipping costs dropped enormously. In 1865 shipping a barrel of flour from Chicago to New York cost \$3.45. In 1895 it cost just 68 cents.

Advances in Communications

In the late 1800s thousands of people left their homes in Europe and the eastern United States to seek a new life in the West. One of the greatest hardships for these migrants was leaving their loved ones behind. Would they ever hear from family and friends again? By 1900, thanks to many advances in communications, such fears of isolation had diminished.

The Telegraph The idea of sending messages over wires had occurred to inventors in the early 1700s. Several inventors actually set up working telegraph systems well before an American, Samuel F. B. Morse, took out a patent on telegraphy.

Morse may not have invented the telegraph, but he perfected it. Morse devised a code of short and long electrical impulses to represent the letters of the alphabet. Using this system, later called Morse code, he sent his first message in 1844. His success signaled the start of a communications revolution.

After the Civil War, several telegraph companies joined together to form the Western Union Telegraph Company. In 1870 Western Union had more than 100,000 miles of wire, over which some 9 million telegraph messages were transmitted. By 1900 the company owned more than 900,000 miles of wire and was sending roughly 63 million telegraph messages a year.

Main Idea CONNECTIONS

How did the telephone revolutionize American life?

The Telephone In 1871 Alexander Graham Bell of Scotland immigrated to Boston, Massachusetts, to teach people with hearing difficulties. After experimenting for several years with an electric current to transmit sounds, Bell patented the “talking telegraph” on March 7, 1876. He had just turned 29. In 1885, Bell and a group of partners set up the American Telephone and Telegraph Company to build long-distance telephone lines.

The earliest local phone lines could connect only two places, such as a home and a business. Soon central switchboards with operators could link an entire city. The first commercial telephone exchange began serving 21 customers on January 28, 1878, in New Haven, Connecticut. That same year President Rutherford B. Hayes had a telephone installed at the White House. By 1900, 1.5 million telephones were in use.

Electric Power

The blossoming of American inventive genius in the late 1800s had a profound effect on millions of people's lives. For example, scientists began developing new uses for petroleum, including fuels such as gasoline that would help power new machines. Electricity proved to be another productive energy source. It led to many important advances in the nation's industrial development and changed people's eating, working, and even sleeping habits.

Edison, a Master of Invention The work of Thomas A. Edison helped make electric power widely available. Born in 1847, Edison grew up tinkering with electricity. While working for a New York company, he improved the stock tickers that sent stock and gold prices to other offices. When his boss awarded him a \$40,000 bonus, the 23-year-old Edison left his job and set himself up as an inventor.

In 1876 Edison moved into his “invention factory” in Menlo Park, New Jersey. The young genius, who had never received any formal science training, claimed that he could turn out “a minor invention every ten days and a big thing every six months or so.”

Edison's favorite invention, the phonograph, recorded sounds on metal foil wrapped around a rotating cylinder. The first words Edison recorded and then replayed on his phonograph were “Mary had a little lamb.” This wondrous machine, introduced in 1877, gained Edison the nickname “Wizard of Menlo Park.”

Edison also experimented with electric lighting. His goal was to develop affordable, in-home lighting to replace oil lamps and gaslights. Starting around 1879, Edison and his fellow inventors tried different ways to produce light within a sealed glass bulb. They needed to find a material that would glow without quickly burning up when heated with an electric current.

The team experimented with various threadlike filaments with little success. In 1880 they finally found a workable filament made of bamboo fiber. This filament glowed, Edison said, with “the most beautiful light ever seen.”

Other inventors later improved upon Edison's work. Lewis Latimore, the son of an escaped slave, patented an improved method for producing the filament in light bulbs. He worked in Edison's laboratories, where he helped develop new advances in electricity. He later wrote a landmark book about electric lighting.

Until the early 1880s people who wanted electricity had to produce it with their own generator. Hoping to provide affordable lighting to many customers, Edison developed the idea of a central power station. In 1882, to attract investors, Edison built a power plant that lit dozens of buildings in New York City. Investors were impressed, and Edison's idea spread. By 1890 power stations across the country provided electricity for lamps, fans, printing presses, and many other newly invented appliances.

Westinghouse and Alternating Current At first Edison used a form of electricity called direct current to transmit power from his stations. Direct current was expensive to generate and could travel only a mile or two.

In 1885 George Westinghouse began to experiment with alternating current, which could be produced and transmitted more cheaply and efficiently. Westinghouse also used a device called a transformer to boost power levels at a station so that electricity could be sent over long distances. Another transformer at a distant substation could reduce power levels as needed. These aspects of Westinghouse's system made home use of electricity practical.

By the early 1890s, investors had used Edison's and Westinghouse's ideas and inventions to create two companies, General Electric and Westinghouse Electric. These companies' products encouraged the spread of the use of electricity. By 1898 nearly 3,000 power stations were lighting some 2 million light bulbs across the land.

Electricity's Impact on Daily Life Household use of electric current revolutionized many aspects of daily life. To take but one example, electricity made the refrigerator possible. This invention reduced food spoilage and the need to cut, distribute, and store ice.

Electricity also transformed the world of work and created new jobs. For example, people powered early sewing machines by pushing on a foot pedal. The electric sewing machine, first made in 1886, led to the rapid growth of the ready-made clothing industry. Many of the country's new immigrants, especially women and children, found work making clothing in factories powered by electricity.

Yet the benefits of electricity were not felt equally by all Americans. Rural areas, especially, went without electricity for many decades. Even where electric power was available, many people could not afford the home appliances or other conveniences that ran on electricity.

Turning Point: The Bessemer Process

Through the mid-1800s, the nation depended on iron for railroad rails and the frames of large buildings. But in the 1850s, Henry Bessemer in

England and William Kelly in Kentucky independently developed a new process for making steel. In 1856 Bessemer received the first patent for the **Bessemer process**. Steel had long been produced by melting iron, adding carbon, and removing impurities. The Bessemer process made it much easier and cheaper to remove the impurities.

Steel is lighter, stronger, and more flexible than iron. The Bessemer process made possible the **mass production**, or production in great amounts, of steel. As a result, a new age of building began. A majestic symbol of this new age was the Brooklyn Bridge.

The Brooklyn Bridge After the Civil War, New York City grew in size as well as population. Many people who worked on the island of Manhattan lived in nearby Brooklyn. The only way to travel between Brooklyn and Manhattan was by ferry across the East River. In winter, ice or winds often shut down the ferry service. Could a bridge high enough to clear river traffic be built across such a large distance? Engineer John A. Roebling, a German immigrant, thought it could.

Roebling designed a suspension bridge with thick steel cables suspended from high towers to hold up the main span. That span,

TURNING POINT: The Bessemer Steel Process

The Bessemer process led to the use of steel in a variety of products, as the time line below indicates.



1856

Development of Bessemer process encourages mass production of steel

1914

Method developed for producing stainless-steel cutlery

1931

Design of the Empire State Building calls for structural skeleton of steel girders



1850

1900

1950

2000



1883

Brooklyn Bridge completed, using steel cables to suspend a long bridge span

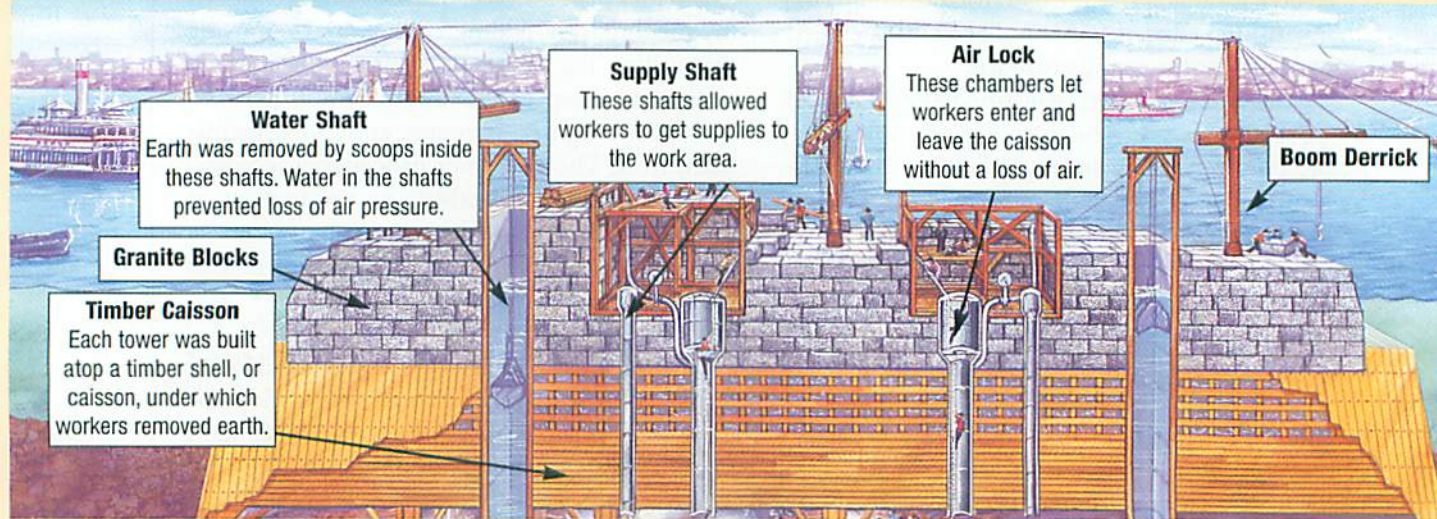
1948

Steel-belted radial tires introduced

1998

Ultra-light steel frame for autos unveiled





The Brooklyn Bridge included two massive towers, one of which is shown being built here. As workers removed earth beneath the tower and piled granite blocks above it, the tower sank into the ground. When completed, the two towers supported the steel cables that in turn held up the span.

Science and Technology How did the Bessemer process for manufacturing steel make possible the construction of the Brooklyn Bridge?

arching 1,595 feet above the river, would be the longest in the world. Roebling died shortly after construction of the Brooklyn Bridge began in 1869, so his son Washington took over the project. Washington was disabled in 1872 by a severe attack of decompression sickness ("the bends") while inspecting a foundation deep under the river. Other disasters followed, from explosions and fires to dishonest dealings by a greedy steel-cable contractor.

A Symbol of American Success Despite these problems, the Brooklyn Bridge was completed and opened on May 24, 1883. At nightfall crowds gasped as electric light bulbs, which had been strung along the bridge, lit up the darkness and shimmered on the river below. The city celebrated with a magnificent fireworks display. Indeed, the entire United States celebrated, its inventive genius and hard work plainly visible for all the world to see.

SECTION 1 REVIEW

Comprehension

- Key Terms** Define: (a) patent; (b) productivity; (c) transcontinental railroad; (d) Bessemer process; (e) mass production.
- Summarizing the Main Idea** How did Americans' daily lives change between 1865 and 1900?
- Organizing Information** Create a chart to describe the major inventions in this section and explain the impact they had on Americans.

Critical Thinking

- Analyzing Time Lines** Review the time line at the start of the section. Which events involved advances in transportation? In communication? In electric power?
- Predicting Consequences** What long-term impact do you think the Brooklyn Bridge had on the people of the New York City area?

Writing Activity

- Writing an Expository Essay** Write an essay about the inventiveness of Americans in the last half of the 1800s.

Using Cross-Sectional Maps

Sometimes it is necessary to use more than one type of map to understand the way a particular piece of land looks. Cross-sectional maps show how an area of land would look if viewed from the side. The cross-sectional map below shows the changes in elevation along the route of the first transcontinental railroad, completed in 1869. These changes in elevation appear on the map as the rising and falling of the bold line. In contrast, physical-political maps show Earth's surface as if viewed from above. The physical-political map below gives a bird's-eye view of the vast horizontal distances covered by the railroad.

Snowstorms, floods, and extreme heat all posed great challenges to the workers who built the transcontinental railroad, but the greatest challenges arose from the changes in elevation of the terrain. Follow the steps below to study the cross-sectional map.

1. Study the region shown on the maps. (a) Which landforms on the physical-political map correspond to those on the cross-sectional map? (b) Does the cross-sectional map show the same land area as the political map? Explain.

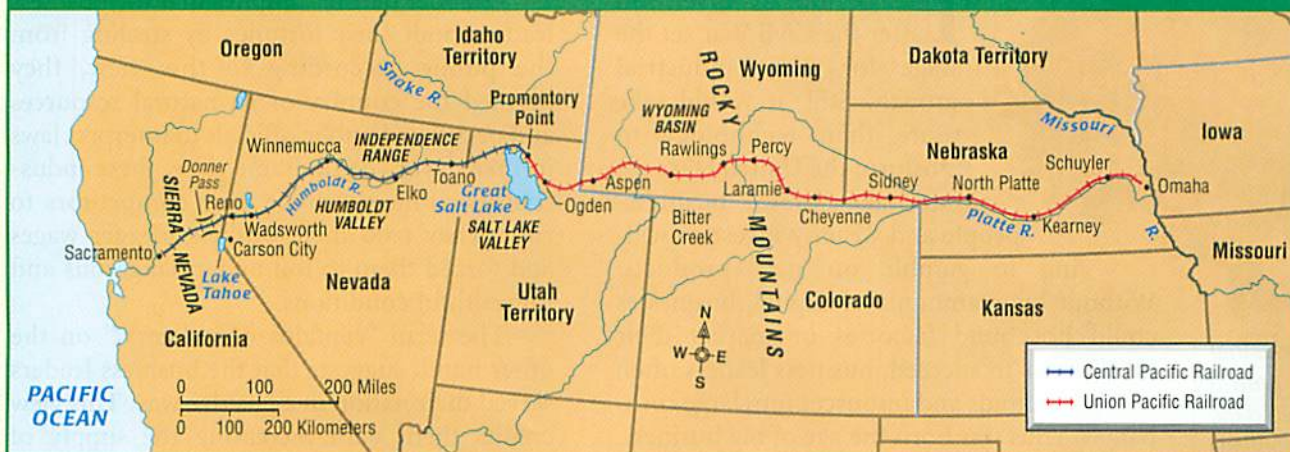
2. Analyze the information shown on the cross-sectional map.

(a) What were the highest and lowest elevations of each railroad route? (b) Where did the sharpest and the most gradual changes occur? (c) Write a paragraph comparing the length and elevation changes of the Central Pacific and Union Pacific routes.

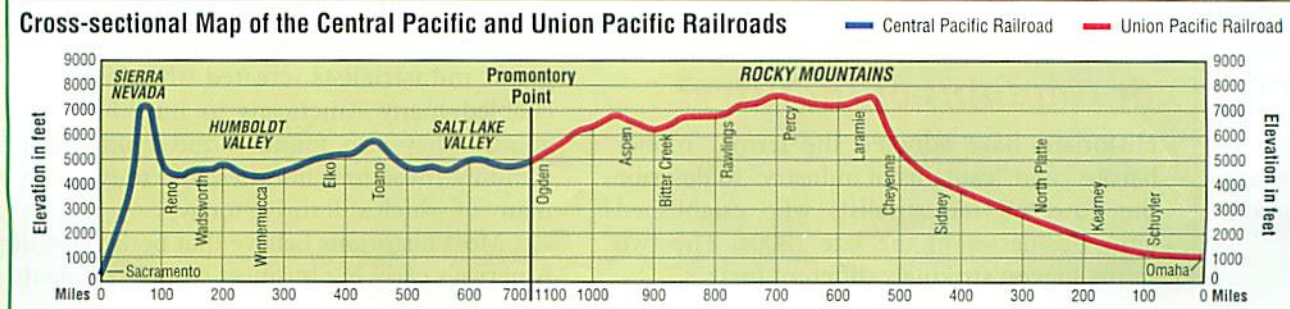
TEST FOR SUCCESS

Think about the route you follow to school or some other familiar route. Would a cross-sectional map like the one shown below help you explain your route to a stranger? Or would a physical-political map provide all the necessary information? Explain.

The Routes of the Union Pacific and Central Pacific Railroads



Cross-sectional Map of the Central Pacific and Union Pacific Railroads



1859
Titusville
oil strike

1870
Standard Oil
founded

1882
Standard
Oil Trust
set up

1889
Carnegie
Steel
founded

1890
Sherman
Antitrust Act
passed

1850

1860

1870

1880

1890

2 The Growth of Big Business

SECTION PREVIEW

Objectives

- 1 Explain why American industrialists of the late 1800s were called both “robber barons” and “captains of industry.”
- 2 Describe the theory of social Darwinism and its connection to big business.
- 3 Summarize the ways that industrialists gained a competitive edge over rivals, and the effects that big businesses had on American society.
- 4 **Key Terms** Define: social Darwinism; monopoly; cartel; trust; Sherman Antitrust Act; horizontal consolidation; vertical consolidation; economies of scale; business cycle.

Main Idea

Big business created wealth for its owners and also for the nation, but it also prompted controversy and concern over its methods.

Reading Strategy

Finding Evidence Read the paragraphs under the heading “Robber Barons or Captains of Industry?” on this page. Look for evidence to support both of these views of industrialists of the late 1800s.



Industrial growth required the contributions of both workers and business owners, as this illustration suggests.

The period of invention after the Civil War set the stage for great industrial growth. Still, it would take more than technology to transform the United States. It would take shrewd businesspeople and wealthy investors willing to gamble on new products. Without huge amounts of capital, businesses could not build factories or market their inventions. To succeed, business leaders often combined funds and resources into large companies. Thus was born the age of big business.

Robber Barons or Captains of Industry?

Historians have adopted the terms “robber barons” and “captains of industry” to describe the powerful industrialists who established large businesses in the late 1800s. The two terms suggest strikingly different images.

“Robber barons” implies that the business leaders built their fortunes by stealing from the public. According to this view, they drained the country of its natural resources and persuaded public officials to interpret laws in their favor. At the same time, these industrialists ruthlessly drove their competitors to ruin. They paid their workers meager wages and forced them to toil under dangerous and unhealthful conditions.

The term “captains of industry,” on the other hand, suggests that the business leaders served their nation in a positive way. This view credits them with increasing the supply of goods by building factories, raising productivity, and expanding markets. In addition, the giant industrialists created the jobs that enabled many Americans to buy their new goods. They also founded and funded outstanding museums, libraries, and universities, many of which still thrive today.

Most historians believe that both views of America’s early big business contain elements