The Rise of Industry

1. Introduction

On Saturday, March 25, 1911, the quitting bell had just sounded at the Triangle Shirtwaist Factory in New York City. Nearly 500 employees, most of them young immigrant women, headed toward the exit. It was Saturday, and they were looking forward to a day off with family and friends.

This photograph, taken around 1915, shows a typical workroom in a sewing factory.

One woman sniffed the air. Something was burning! Another spotted flames leaping out of a pile of cloth scraps. Before she could react, the wooden table above the fabric was ablaze. From there, the flames jumped to the paper fabric patterns hanging above the table. Flaming bits of paper and fabric whirled around the room, setting other tables on fire.

The room filled with smoke. The air became so hot that it burst the windows. Fresh air poured into the room, sending the flames even higher. The fire started to scorch workers' clothing and hair.

"I heard somebody cry, 'Fire!' I left everything and ran for the door," recalled one woman. "The door was locked and immediately there was a great jam of girls before it." She could see at once that "if we couldn't get out, we would all be roasted alive."

Factories and their dangers were a relatively new part of life in the United States. After the Civil War, new inventions and business methods allowed Americans to create industry on a much larger scale than ever before. The rise of industry brought great benefits. New inventions, such as the telephone, made life better for many people. New ways of making products, such as using the

assembly line to make cars, made it possible for more Americans to raise their standard of living. The people who were employed in new industries often lived and worked in miserable and even dangerous conditions. In this chapter, you will learn about both the benefits and costs of industrialization.
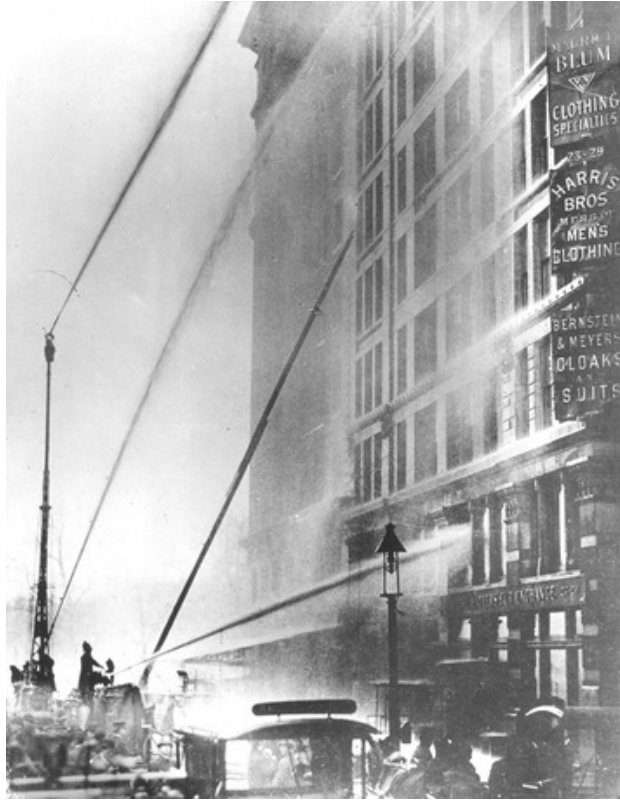
Firefighters could do little to stop the blaze that claimed 146 lives at the Triangle Shirtwaist Factory fire in 1911. Unsafe working conditions contributed to the high death toll.

2. A Nation Transformed

Industrialization clearly brought benefits to some. On March 26, 1883, Alva Vanderbilt threw a party to show off her family's new home in New York City. It was not just a party, it was a grand ball—the most dazzling social event in the city's history. And it was not just any home. The Vanderbilts had built a mansion in the style of a European castle, complete with medieval furniture, tapestries, and armor.

But then, the Vanderbilts were not just any family. Mrs. Vanderbilt's husband was William Kissam Vanderbilt, a railroad industrialist. He was the grandson of Cornelius Vanderbilt, who had made a fortune in banking and shipping. The Vanderbilt clan was one of the country's wealthiest and most powerful families.

More than 1,200 of New York's social elite flocked to Mrs. Vanderbilt's ball, dressed in glittering costumes. Many of the guests came as kings and queens. But Mrs. Vanderbilt's sister-in-lawdecided to be more modern. She came dressed as the electric light.

Mrs. Vanderbilt's party reflected the way industrialization was transforming American life in the decades after the Civil War. Cities like New York were booming. Entrepreneurs in banking, commerce, and industry were gaining enormous wealth. Technological marvels like the electric light were changing how Americans lived and worked. But not everyone benefited from this progress.

Industrialization helped big businesses grow and furthered the development of new technological innovations. One of these innovations was the electric light. In 1901, the Pan-American Exposition in Buffalo, New York, featured a building that showcased electricity.

The Growth of Big Business

Families like the Vanderbilts made huge profits from the growth of big business after the Civil War. Businesses got bigger in part because of new technology and manufacturing practices. They also grew because the rise of banking and financial institutions gave people more opportunities to borrow money to start businesses. Bankers were happy to invest the necessary funds in hopes of earning large returns. Some of the money that fueled industrialization came from the large-scale mining of gold and silver in the West.

Government policies also contributed to the boom in big business. According to the theory of laissez-faire (leh-say-FAIR), economies work best with minimal government involvement. (Laissez-faire is French for "to let alone.") The idea of laissez-faire was that government should not regulate the price or quality of goods, the working conditions of laborers, or the business practices of bankers and industrialists.

Some types of government involvement protected business and industry. Federal, state, and local governments helped business and industry through favorable laws and subsidies, such as the land grants given to railroads and farmers. A key exception during this period was the Interstate Commerce Act of 1887. The law targeted interstate commerce as practiced by the railroad industry, which operated across state lines and therefore was not under the authority of state laws. The act required railroads to make shipping rates fair for all customers, banning the practice of giving lower rates to companies who shipped large amounts.

The business boom fed the growth of American cities. For 100 years, Americans had been going west to seek their fortunes. In 1890, the Census Bureau said that the frontier line no longer existed. This was the imaginary line on the continent beyond which the country's population density was less than two persons per square mile. The 1890 census marked the closing of the frontier. The new "land of opportunity" was located in the cities of the Northeast and around the Great Lakes, where factories provided thousands of new jobs.

The Vanderbilts were one of the wealthiest and most powerful families of the Gilded Age. This is the lavishly decorated dining room of their summer home in Newport, Rhode Island.

Outside cities, even farming was getting to be big business. Commercial farmers used new machinery and techniques to grow crops on a larger scale than ever before. "Nothing is too large

for belief," reported one writer in 1887. "Twenty and even thirty thousand acre farms . . . The New West . . . is a veritable 'Wonderland.'"

The Gilded Age

As businesses got bigger, so did the fortunes of those who owned or invested in them. Between 1860 and 1892, the number of millionaires in the United States grew from 400 to more than 4,000. The newly rich filled their palace-like homes with elaborate decorations and European art and antiques. In 1873, the great American writer Mark Twain dubbed this time of showy wealth "the Gilded Age." (Gilded means overlaid with gold.)

Twain's name stuck, but it did not describe the lives of most Americans. While wealthy capitalists lived like royalty, many workers lived in dismal poverty. Those who were immigrants often faced discrimination. During business downturns, many workers lost their jobs. People were angry about the relationships between some business owners and politicians that resulted in widespread corruption. These conditions eventually sparked protests and calls for reform.

3. Improved Technology

By the 1860s, many of the factors necessary for the rapid industrialization of the United States were already in place. Machines had taken over much of the work once done by hand. Work had moved from homes to factories. Railroads had begun to connect customers and manufacturers with an efficient transportation system.

After the Civil War, new inventions and improved technology prompted the growth of new industries. Some of these innovations, or new ideas, helped businesses to grow and become more efficient. Others made daily life easier for many Americans.

The Age of Steel

Before the Civil War, the nation's railroads ran on iron rails that wore out quickly. Railroad owners knew that rails made of steel—a mixture of iron, carbon, and sometimes other metals— were stronger and would last longer. Steel, however, was difficult and costly to make.

In 1872, a Scottish immigrant named Andrew Carnegie went to England to study a less expensive method of making steel, a method invented by Henry Bessemer. Carnegie owned a company that made iron bridges for railroads. He knew that his bridges would be better if they were made of steel. Carnegie was so impressed by the Bessemer process that he brought it back to the United States. "The day of iron has passed," he announced. "Steel is king!"

Carnegie was right. Within a decade, steel was replacing iron in rails, locomotives, and bridges. Other industries took advantage of steel, which was less expensive than iron. Steel nails, needles, and knives became common household items.

Many steel companies competed fiercely to supply steel for such products. To remain the leader, Carnegie hired scientists to improve the quality of his company's steel. He employed good managers to make his steel mill run efficiently. His recipe for success was "adopt every improvement, have the best machinery, and know the most."
To keep costs low, Carnegie set out to control every step in the steelmaking process. He purchased iron mines to supply his ore, coalfields to fire his furnaces, and railroads to ship his finished steel to customers.

To reduce his competition, Carnegie also bought up several rival steel companies. He then combined them all to form the giant Carnegie Steel Company. By 1900, Carnegie Steel produced a quarter of the nation's steel.

Thomas Edison's invention of the lightbulb transformed the nation and gave birth to the age of electricity. In this picture of New York in the late 1880s, electric lines formed a crisscross canopy over the street. At night, these buildings glowed with electric light.

Electric Power

In 1876, Thomas Edison opened an "invention factory" in New Jersey. With a team of workers, he set out to create a "minor" invention every ten days and a major one "every six months or so." Edison succeeded brilliantly. More than any other inventor, he helped turn electricity into an everyday source of light and power. His workshop turned out the first practical electric lightbulb, the phonograph (record player), the motion picture projector, and many other inventions.

In 1882, Edison built the first electrical power station and distribution system in New York City. His team invented everything the system required, including generators, regulators, meters, switches, light sockets, fuse boxes, and underground electric cables. When he finally turned the generator on, electricity began to flow to homes, stores, and factories. The age of electricity had begun.

By 1900, some 25 million lightbulbs were glowing across the country. Many factories were replacing waterwheels and steam engines with electric motors. Streetcars powered by electricity carried workers and shoppers along city streets. New electric-powered devices, such as washing machines and vacuum cleaners, were making housework easier.

The Telephone

The telephone was invented by a Scottish immigrant, Alexander Graham Bell. In 1876, as he was getting ready to test his "talking machine," Bell spilled acid on himself. "Watson—come here—I want to see you," he commanded his assistant. Thomas Watson, who was in another room, heard every word over Bell's telephone.

Bell's invention worked so well that, by 1915, Americans were communicating with one another over 9 million telephones. All these telephones made American industry more efficient and competitive by allowing producers, sellers, and customers to communicate quickly and easily.

New Production Methods

New methods of organizing work were also making businesses more efficient. Factory owners adopted Eli Whitney's idea of assembling a wide variety of products from interchangeable parts. They also used the assembly line. In a shoe factory, for example, one worker operated a heel-cutting machine. Another operated a sole-cutting machine. Another made shoelaces. Still other workers assembled, labeled, and packaged the shoes.

Henry Ford was one person who foresaw the great potential in the assembly line. Ford created a moving assembly line to mass-produce automobiles. In Ford plants, workers stood in place all day, while a conveyor brought the work to them. After each worker did one or two tasks, the belt moved the product to the next worker's station.

These techniques of **mass production** enabled workers to produce more goods per day at a lower cost. As prices dropped, more Americans could afford to buy manufactured products. More

customers meant more factories. By 1900, almost four times as many Americans worked in factories as had a generation earlier.

Air Transport

While Henry Ford was turning out cars on the assembly line, brothers Orville and Wilbur Wright were experimenting with flying. In 1903, with his brother Wilbur running alongside, Orville successfully piloted the first "flying machine" in Kitty Hawk, North Carolina. Although the flight was only 12 seconds in duration, it sparked worldwide interest in flying.

Lying flat on the lower wing of the 1903 Wright flyer, Orville Wright begins the first successful airplane flight in history as his brother Wilbur runs alongside during takeoff. The Wright brothers designed and built the flyer out of wood and cloth. .

4. The Rise of Big Business

By the late 1920s, an industry based on air travel had emerged. The U.S. postal service used planes to transport mail across the country while the military used planes for exploration and scouting. At the same time, wealthy Americans took their first commercial flights across the country.

When Andrew Carnegie opened his first factory in 1865, most businesses were still owned by one person or a few partners. Because the owners' funds were limited, businesses were small. Owners knew their employees and often treated them like family.

Growth of Corporations

A partnership might work well for a garment, or clothing, factory. But big businesses, such as railroads, needed much more capital (money to start a business) than a few partners could provide. To raise larger sums of money, entrepreneurs set up corporations. A corporation is a business that is owned by many investors, or people who help pay the business's initial expenses.

A corporation raises funds by selling stock, or shares in a business. Investors who buy the stock are known as stockholders. In return for their investment, stockholders hope to receive dividends, or a share of the corporation's profits.

The money invested by the stockholders is used to build the business. To make sure their money is used properly, stockholders elect a board of directors. The people on the board of directors oversee the running of the corporation.

After the Civil War, corporations attracted large amounts of money from investors. By the 1880s, thousands of corporations were doing business across the United States.

Rockefeller's Oil Trust

A giant in the oil business, John D. Rockefeller introduced another form of business organization, the trust. A trust is a group of corporations run by a single board of directors.

Rockefeller invested in his first oil refinery in 1862, at the age of 23. At that time, petroleum, or oil found underground, was just becoming a valuable resource. Oil refineries purify petroleum into fuel oil. During the 19th century, oil was used to light homes, cook food, and run engines and generators.

The "people's entrance" to the U.S. Senate is "closed" in this 1889 cartoon. According to the cartoonist, the Senate was controlled by business trusts, shown as giant, bloated moneybags.

Before long, many small refineries were competing fiercely in the oil business. The amount of oil these firms produced rose and fell wildly, along with prices. Rockefeller saw this as wasteful and inefficient. To reduce competition, he did everything he could to drive his rivals out of business. Companies he could not destroy, he bought.

Like Carnegie, Rockefeller took control of every step of his business. He bought oil fields along with railroads, pipelines, and ships to move his oil. He built his own warehouses and even made his own oil barrels for storing oil products. By 1880, Rockefeller controlled 95 percent of the nation's oil-refining industry.

To manage his many businesses, Rockefeller combined them into the Standard Oil Trust. The trust made the oil industry more efficient than ever before. But, as a monopoly, the trust had the power to control oil prices. This worried people who depended on oil in their homes and businesses.

Following Rockefeller's example, entrepreneurs created trusts in other businesses such as railroads, meatpacking, sugar, whiskey, and tobacco. The business leaders who controlled these huge trusts became fabulously wealthy. Because most had made their fortunes by crushing their competitors, critics called them "robber barons."

The Evils of Trusts

The growth of trusts alarmed many Americans. They saw these monopolies as a threat to the free-enterprise system. This system depends on free competition among businesses to provide the public quality products at fair prices. A monopoly, people argued, has little reason to improve its products or to keep prices low because it has no competition.

People also worried about the influence of trusts on the political process. Wealthy entrepreneurs, they complained, were using their enormous wealth to buy elections and corrupt public officials. As the Chicago Tribune warned, "liberty and monopoly cannot live together."

5. The Growth of Cities

Industrialization brought with it urbanization, or city growth. Most of the nation's new industries were located in urban areas. Immigrants and rural Americans flocked to these industrial centers looking for jobs. Chicago, for example, more than tripled its population between 1880 and 1900.

Urban Tenements As urban populations increased, demand for cheap housing exploded. To meet this demand, developers threw up cheap apartment buildings called tenements.

One person described tenements as "great prison-like structures of brick, with narrow doors and windows, cramped passages and steep, rickety stairs." By 1900, about two-thirds of New Yorkers lived in such buildings.

A poor family might occupy just one or two rooms in a tenement, usually with no heat or water. Friends or family often took in newcomers who arrived in cities without money for rent. As a result, tenement neighborhoods were some of the most densely populated areas on Earth.

Tenements were unclean and even dangerous places to live. Only a few rooms had windows to provide light and fresh air. The rest were dark and airless. In some tenements, the only source of water was a single faucet in a courtyard. Many lacked sewer services. In such conditions, diseases such as typhoid and cholera spread quickly, killing infants and young children. Fire was another constant worry.

Cities Expand Upward

As cities expanded, urban land costs shot up. In New York, land that had sold for $80 in 1804 was selling for $8,000 by 1880. Such prices inspired builders to construct more building space on less land by expanding upward. Using lightweight steel beams to support walls and ceilings, builders constructed skyscrapers that rose ten or more stories into the air. Electric elevators whisked people and freight effortlessly from floor to floor.

This family is shown in a New York City tenement in the early 1900s. Cramped, dirty, dark, and crowded, tenements spread disease and misery among inhabitants.

Businesspeople rented space in city skyscrapers for their offices and factories. Factory owners preferred the top floors. Rents were cheaper higher up, and the natural light was better, saving owners money on electric lighting. The cost of insurance was low as well because steel buildings were thought to be fireproof. By the early 1900s, more than half of New York City's workers labored above the seventh floor.

City Excitement

For all their problems, cities were also exciting places to live. Stores were filled with products never seen by people who had grown up on farms. City dwellers enjoyed all sorts of entertainment, from operas and art museums to dance halls and sporting events. When writer Hamlin Garland came to Chicago with his brother, he found that "Everything interested us . . . Nothing was commonplace; nothing was ugly to us."