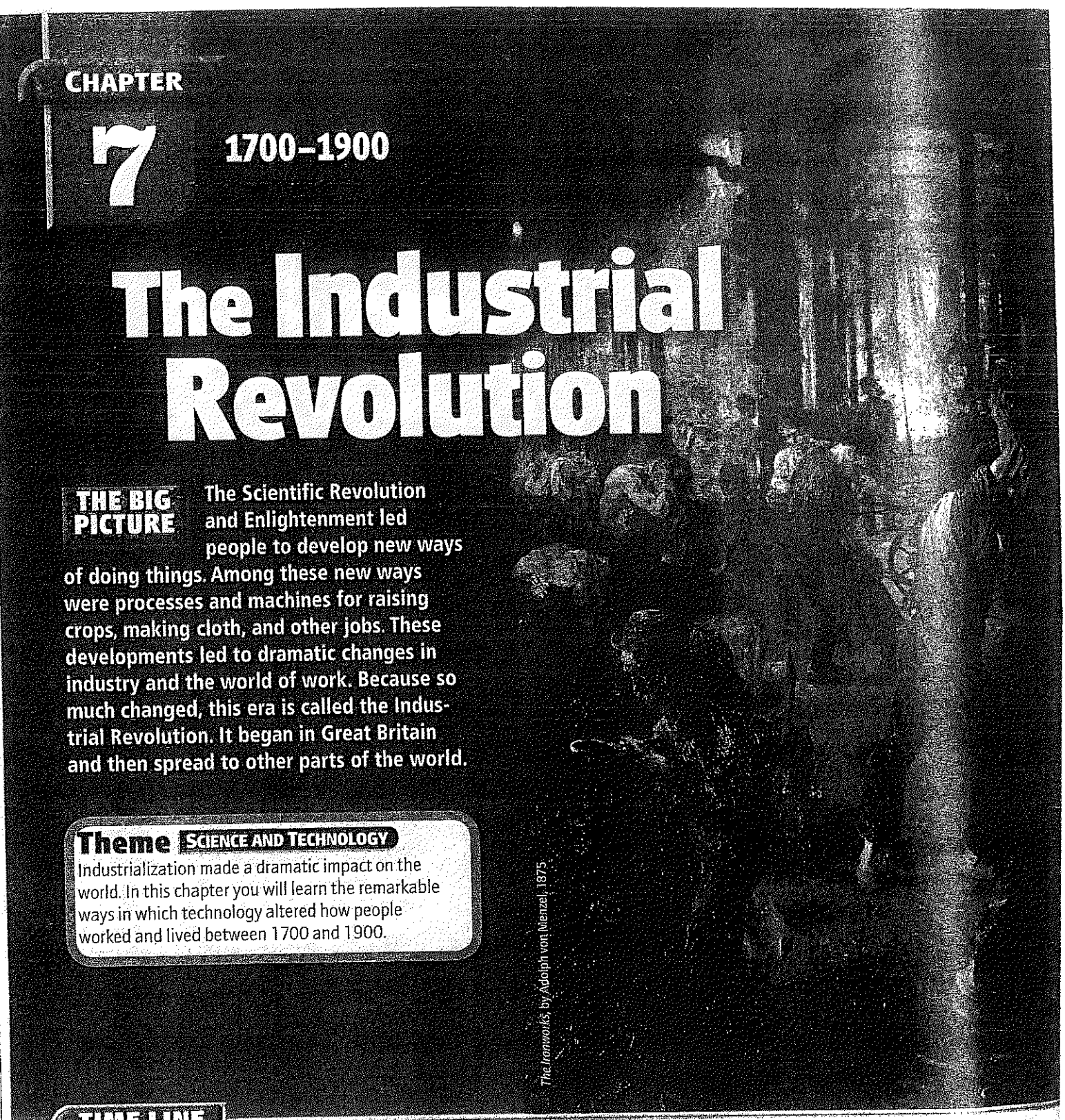
CHAPTER 7 1700–1900

The Industrial Revolution

THE BIG PICTURE The Scientific Revolution and Enlightenment led people to develop new ways of doing things. Among these new ways were processes and machines for raising crops, making cloth, and other jobs. These developments led to dramatic changes in industry and the world of work. Because so much changed, this era is called the Industrial Revolution. It began in Great Britain and then spread to other parts of the world.

Theme SCIENCE AND TECHNOLOGY
Industrialization made a dramatic impact on the world. In this chapter you will learn the remarkable ways in which technology altered how people worked and lived between 1700 and 1900.



The Ironworks, by Adolph von Menzel, 1875

TIME LINE

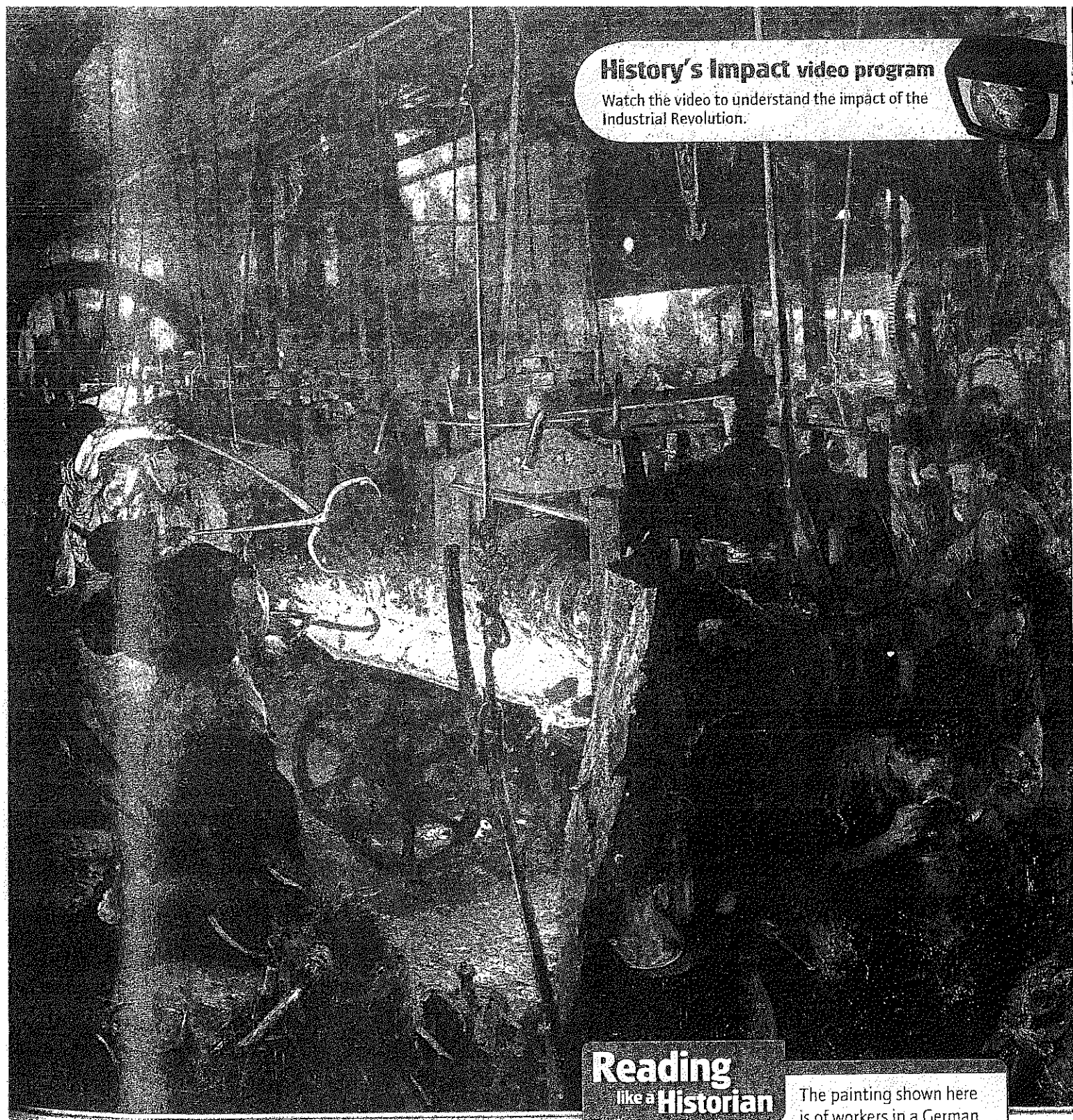
CHAPTER EVENTS

- **1701** Jethro Tull invents the seed drill.
- **1764** James Hargreaves develops the spinning jenny.
- **1793** Eli Whitney introduces the cotton gin.
- **1802** Richard Trevithick builds the first steam locomotive.

1700 — 1750 — 1800

WORLD EVENTS

- **1762** Catherine the Great becomes czarina of Russia.
- **1776** The Thirteen Colonies declare their independence.
- **1815** Napoleon is defeated at Battle of Waterloo.



History's Impact video program

Watch the video to understand the impact of the Industrial Revolution.

1848
Marx and Engels publish *The Communist Manifesto.*

1871
Trade unions are legalized in Britain.

1850

1848
Revolutions occur throughout Europe.

Reading like a Historian

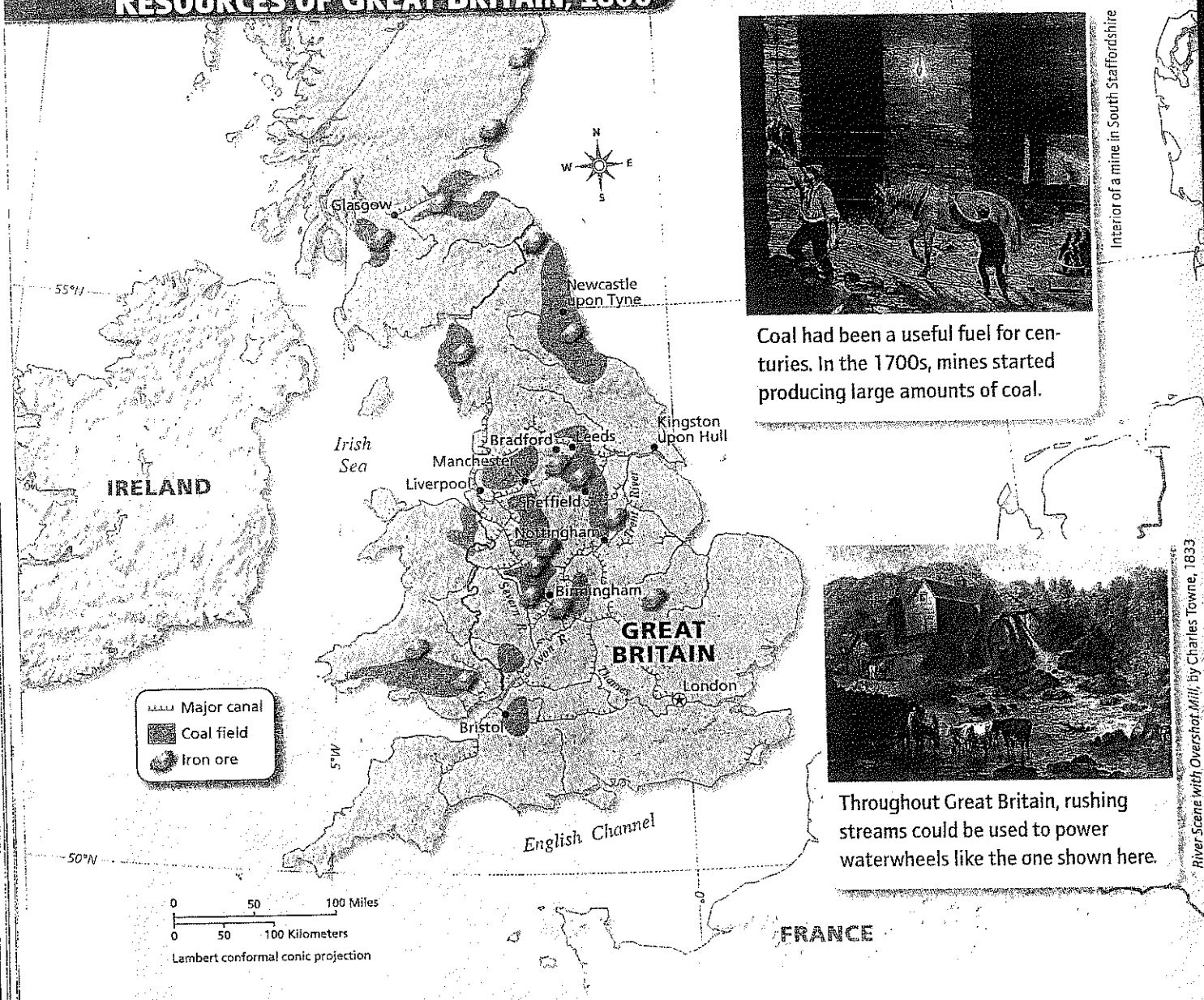
The painting shown here is of workers in a German factory flattening a sheet of hot iron. The artist, Adoph von Menzel, visited factories like this one so he could reproduce the details correctly.

Analyzing Visuals How many different tasks or activities can you see in the painting? How do you think the artist felt about the industry pictured? Explain your answer.

See **Skills Handbook**, p. H26

Interactive

RESOURCES OF GREAT BRITAIN, 1800



Interior of a mine in South Staffordshire

Coal had been a useful fuel for centuries. In the 1700s, mines started producing large amounts of coal.

River Scene with Overshot Mill, by Charles Towne, 1833

Throughout Great Britain, rushing streams could be used to power waterwheels like the one shown here.

Starting Points In 1800, much of Europe's economy was still based on farming. Times were changing, though, particularly in Great Britain. There, fewer people were working on farms, and more were working in manufacturing. Great Britain's natural resources, such as coal and iron, were major factors in the growth of British industry.

1. **Analyze** What do you think is the connection between canals and rivers and industry?
2. **Predict** Based on the map, where do you think Great Britain's first industries grew?

Listen to History

Go online to listen to an explanation of the starting points for this chapter.

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Keyword: SHL IND

SECTION 1

A New Kind of Revolution

Before You Read

Main Idea

In the 1700s, conditions in Great Britain led to the rapid growth of the textile industry, which in turn led to huge changes in many other industries.

Reading Focus

1. Why did the Industrial Revolution begin in Great Britain?
2. How did industrialization cause a revolution in the production of textiles?
3. How did steam power the Industrial Revolution?
4. Where did industrialization spread beyond Great Britain?

Key Terms and People

Industrial Revolution
enclosure movement
factors of production
cottage industry
factory
industrialization
Jethro Tull
Richard Arkwright
James Watt
Robert Fulton

TAKING NOTES As you read, take notes on the early years of the Industrial Revolution.

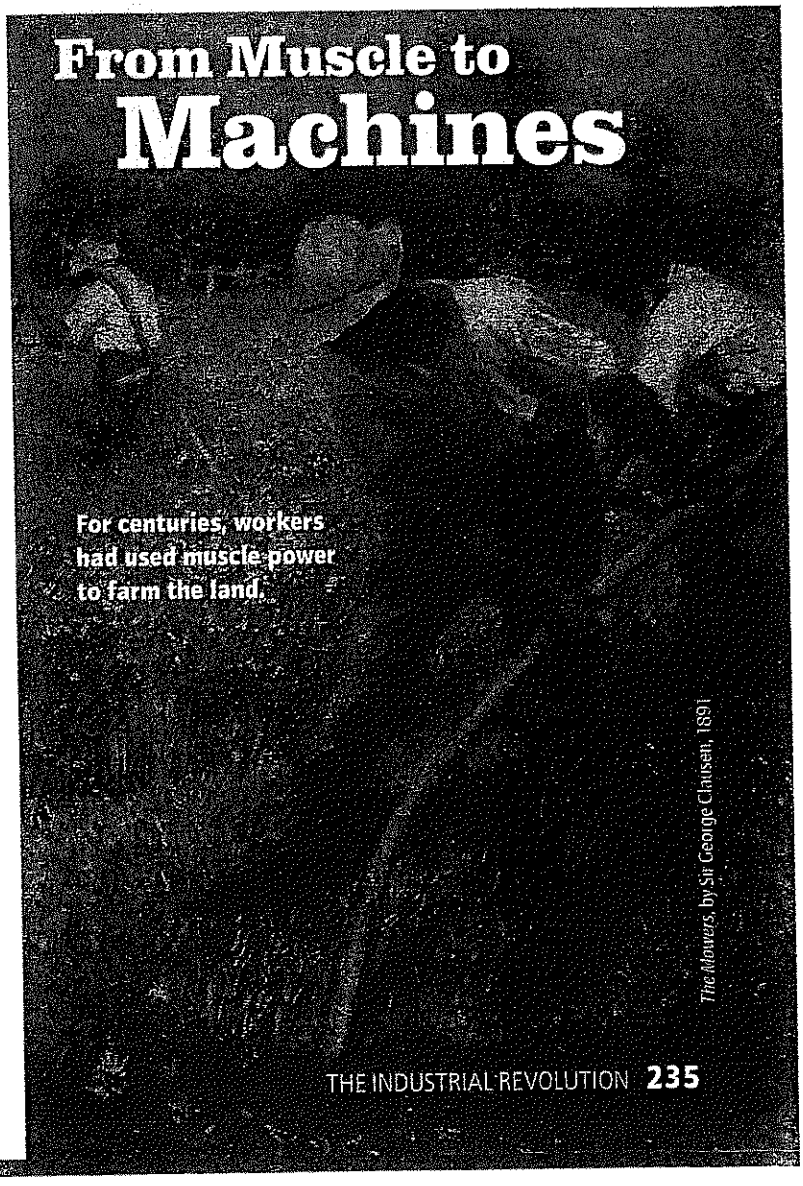
A. In Britain
B. In Textiles
C. Steam Power
D. Spread

THE INSIDE STORY ***How did one farmer's frustration help start a revolution?*** Jethro Tull had never planned to be a farmer. He had trained to be a lawyer but inherited the family farm. While running the farm, Tull was often annoyed by the workers' sloppy habits. For example, when planting, they wasted seeds by throwing big handfuls onto the ground. Sure that the job could be done more efficiently, Tull invented a horse-drawn machine that planted seeds one by one. He called it a seed drill. Without knowing it, Tull was helping to start a revolution—an agricultural revolution that would bring changes to nearly all aspects of life.

A Revolution in Great Britain

During the 1700s changes in technology began that would transform the world. These changes were based on a shift in how people worked. For centuries people had used human and animal power as their main energy sources. Then they began to develop water and steam power to drive new machines and perform countless tasks. This era, when the use of power-driven machinery was developed, is called the **Industrial Revolution**. For several reasons, it started in Great Britain.

Factors for Success By the 1700s several factors had come together to set the scene for the development of industry in Great Britain. Those factors included a range of political and economic events.



- **Exploration and colonialism** Great Britain claimed colonies around the world that provided vast amounts of raw materials, such as cotton fiber. In addition, the colonies became new markets for British goods. (However, India's own textile industry was severely damaged by British competition.)
- **Seapower** Britain could bring in raw materials and send finished goods around the world because it had the largest, most powerful navy and merchant fleet in the world.
- **Political stability** Although Great Britain fought wars in Canada and North America during the 1700s, at home the country was at peace, and commerce thrived.
- **Government support** Parliament passed laws that favored business, helping the country compete successfully against other nations.
- **Growth of private investment** Private businesses funded experiments for creating better products—what we would call "research and development" today.

Agricultural Factors Much of the research and development took place on farms as some of Britain's so-called gentlemen farmers began to experiment with agricultural methods.

Jethro Tull was among these wealthier farmers. In about 1701 Tull invented the seed drill, a machine that made planting grain much more efficient.

Farmers experimented with other aspects of agriculture also. For example, they improved livestock breeding methods to raise healthier animals. Better varieties of food crops, such as potatoes, were developed. These improvements increased Britain's food supply. Since more food can support more people, Britain's population grew rapidly.

Another agricultural development had mixed results. Wealthy landowners could buy up fields that had previously been shared by rich and poor farmers alike. The new landowners combined the small fields to create large farms and fenced them, a transformation

HISTORY and Economics

Factors of Production

The basic factors of production are the essential elements that a nation needs to achieve economic success. They are land (natural resources), labor, and capital. The places where these factors can be found change over time.

Factors of Production in History In the 1700s the factors of production that sparked the Industrial Revolution were all in place in Great Britain. From these factors—coal, iron ore, waterways, unemployed farmers, cash, and human talent—the British built an industrial empire.

Factors of Production Today Much has changed since the 1700s. The land, labor, and capital that made Great Britain an industrial leader no longer have the same value. For example, running water is not as important a power source as it once was. Today, the industrial world depends more on fossil fuels, especially oil. Countries other than Great Britain provide most of the world's supply of the precious fuel. Labor resources can also be found elsewhere. Today, China and India have huge numbers of skilled workers. Capital resources have shifted, too. Investors from Asia and the Middle East now fund many factories in Western countries.

All these shifts in where the factors of production are located affect wealth and, therefore, political power. As you study different countries, keep track of how the factors of production have affected their economies—and their histories.

▲ A worker in Malaysia assembles TVs for a Japanese company.

1. Summarize How has the location of the factors of production changed in current times?
2. Predict How might the factors of production continue to change?

called the **enclosure movement**. The movement allowed for more efficient farming methods and, therefore, further increased the food supply. However, enclosure also threw countless farmers off the land. Unable to make a living in the countryside, these poor farmers went to the cities for jobs. There they would form the workforce for growing industries.

Britain's Big Advantage These conditions all point to the basic reason why the Industrial Revolution began in Great Britain. The country had the essential elements that a nation needs to achieve economic success—what economists call the **factors of production**. There are three factors: land, labor, and capital.

Land, in this context, means all of a place's natural resources. Great Britain had all the resources it needed for industry. It had coal to burn as fuel and iron to make into steel and machinery. But to get industry started, no resource was more important than water. People used Britain's streams and rivers to turn waterwheels and generate power, and many of those same waterways provided transportation between mines, factories, and markets. A network of canals connected major rivers. In the mid-1700s England already had about 1,000 miles of canals, which grew to about 4,000 miles by 1800. Also, for long-distance shipping, Great Britain had good deepwater harbors.

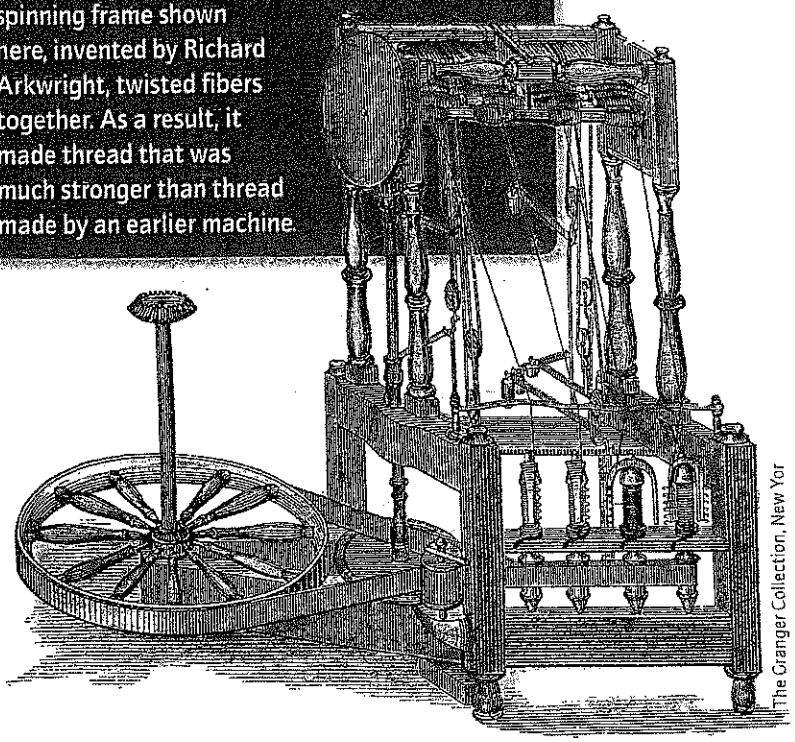
For labor, Britain had the growing population made possible by a greater food supply. Within this growing population were the thousands of people who had lost their farmland because of the enclosure movement. These were often entire families, and entire families would go to work in industry.

Britain's last factor of production was capital, which refers to funds for investment in business. The country was generally prosperous, and people had money to spend. Britain also had "human capital"—people with abilities and skills that are needed in industry. For example, Jethro Tull and later inventors were among this group of capable people. With all these factors of production in place, Great Britain was ready for a boom in business.

READING CHECK **Find the Main Idea** Why was Great Britain in the 1700s ideally suited to be the birthplace of the Industrial Revolution?

New Machines for an Old Industry

The inventors who revolutionized the textile industry improved on each other's ideas. The spinning frame shown here, invented by Richard Arkwright, twisted fibers together. As a result, it made thread that was much stronger than thread made by an earlier machine.



The Granger Collection, New Yor

A Revolution in Textiles

The Industrial Revolution began with the British cloth-making, or textile, industry. British workers had been handweaving woolen cloth for centuries. Weaving was a **cottage industry**—a craft occupation performed in the home. But the old ways of making cloth were completely transformed by **industrialization**, or the process of changing to power-driven machinery.

ACADEMIC VOCABULARY
labor work, or people who do the work

A New Way of Making Cloth In Great Britain most fabric was made of wool or cotton. During the 1700s the supply of both fibers increased. The wool supply increased because the enclosure movement converted so many farms to pastures for raising more sheep. Shipments of cotton fiber came from the British colonies, particularly in India and North America. In the southern American colonies the trade in cotton had a tragic result. Slave labor helped make cotton farming more profitable. Therefore, as Great Britain bought more and more American cotton, slavery became more entrenched throughout the South. A new invention also helped keep the American cotton industry—and slavery—profitable.

Reading like a Historian

An Early Historian on the Textile Industry

Analyzing Secondary Sources Historians often read what other historians before them had to say. Using older sources, modern historians can learn how events were viewed in the past. However, historians who wrote about events soon after they happened usually had a different perspective than historians who wrote many years after the event.

The quotation here is from a British historian. When he was writing, the textile industry had already been thoroughly mechanized.

Notice the adjectives the author used to describe the textile industry, starting with "admirable."

> When this admirable series of machines was made known, and by their means yarns were produced far superior in quality to any before spun in England, as well as lower in price, a mighty impulse was communicated to the cotton manufacture. Weavers could now obtain an unlimited quantity of yarn at a reasonable price; manufacturers could use warps of cotton, which were much cheaper than the linen warps formerly used. Cotton fabrics could be sold lower than had ever before been known.
>
> —E. Baines, *History of the Cotton Manufacture in Great Britain*, London, 1835

The lower prices would have long-term results, but Baines could not predict them all at this early stage in the Industrial Revolution.

Skills Focus: READING LIKE A HISTORIAN

1. **Credibility** Would Baines be an authority on the long-term effects of industrialization? Why or why not?
2. **Details** What details show the author's attitude about the textile industry?

See **Skills Handbook**, p. H30

Pulling seeds from raw cotton blossoms was time-consuming when done by hand. An American named Eli Whitney solved the problem. He built a machine, called the cotton gin, that removed the seeds efficiently.

The fiber was then spun into thread or yarn. James Hargreaves, a weaver, revolutionized the spinning process with a machine he called the spinning jenny, which spun several threads at once. Hargreaves' machine was not perfect. The thread it produced was still thick and prone to break when woven into cloth. **Richard Arkwright**, another inventor, solved this problem with the spinning frame, which spun stronger, thinner thread.

Finally, the thread was woven into fabric. The traditional in-home weaving loom was about six feet wide—the width a man could reach from side to side to push the thread back and forth on a shuttle. The "flying shuttle," patented by John Kay, doubled the speed at which a weaver could do the job. Because many workers lost their jobs as a result, Kay was attacked and fled to France. He died in poverty.

Nevertheless, the ever-faster spinning machines soon created a demand for better weaving machines. To meet that demand, in 1785 Edmund Cartwright patented the power loom, a larger, faster weaving system.

Cloth-Making in Factories The new machines were too big for the weaver's cottage. They had to be housed in large buildings constructed specially for that purpose. A building that housed industrial machines became known as a **factory**, from the old word *manufactory*. Factories needed ready supplies of power. Arkwright built early factories to house a spinning system driven by water power. His system was known as the water frame.

From this flurry of invention and innovation, an industry was born. In 1770 England produced about 50,000 bolts of cloth. By 1800 the textile output had increased to 400,000 bolts.

READING CHECK **Identify Problem and Solution** How did machines solve problems that weavers faced?

Steam Powers the Revolution

A simple fact of physics powered the Industrial Revolution: when water is heated and changes into steam, it expands. British inventors learned how to harness the force of steam to drive machines that transformed the world.

Development of the Steam Engine The first commercially successful steam engine was built in England in 1712, but it was very slow. Then an inventor named **James Watt** came up with crucial innovations. His engine was faster and more efficient at driving machinery. By 1800 about 500 of Watt's steam engines were chugging and hissing in mines and factories throughout Britain.

The widespread use of steam engines began when inventors put them to use in the textile mills. Using steam power instead of water power meant that factories no longer had to be built near ready supplies of water. Instead, they could be located where fuel was readily available and where workers already lived. Also, factories could be built closer to roads and ports from which raw materials and finished products could be shipped.

Steam was soon applied to other uses, eventually producing a revolution in transportation. In about 1802 Richard Trevithick used a steam engine to power the first locomotive. Steam-powered trains soon became essential to the Industrial Revolution. They made possible the fast shipment of finished goods even to faraway markets.

Steam also provided a power source for ships. An Irish-born American, **Robert Fulton**, became famous for developing a steamship called the *Clermont*. In 1807 the *Clermont* began operating on the Hudson River between New York City and Albany. Fulton's business was the first profitable use of steam navigation. Steamships would replace sailing ships on the open sea and the horse-drawn barges that hauled goods along canals.

Coal for British Steam Engines Steam engines required immense amounts of fuel to heat water. Wood was scarce, though, because most of England's forests had been cut down for farming. But the country had a big supply of another valuable fuel—coal. Consequently, as more factories were built to run on steam, the coal mining industry in northern and western England grew. By 1800, Great Britain produced 80 percent of Europe's coal.

Naturally, many factories were built near Britain's northern coal mines. Quiet agricultural landscapes changed into busy, noisy boom towns dotted with factories and surrounded by endless rows of workers' and miners' homes.

The miners' families often experienced tragedy. Working in the mines was a dangerous job. Mine explosions, coal dust, collapsing shafts, and the sheer hard labor took a heavy toll. Children were often hired to slip down the narrow shafts and pick and haul coal. Their lives were hard, as one account describes:

HISTORY'S VOICES

"The children, boys and girls, earned their wages by drawing the coals in tubs along the galleries by means of a belt and chain, which passed around their waists. Many girls were thus employed, and after a time became crooked and deformed."

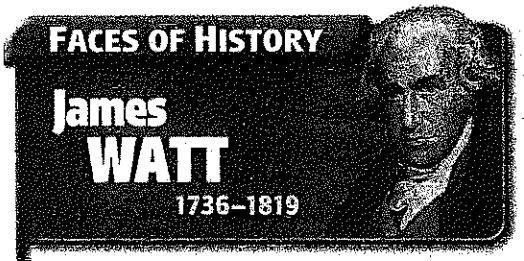
—Carelton Smith, visitor to the Lancashire mines, 1833

Such reports caught the public's attention. Industrialization continued for some time, though, before the situation changed.

READING CHECK **Make Generalizations** What impact did the steam engine have on the growth of British industry?

THE IMPACT TODAY

Coal is still a major resource for the United Kingdom, which is the fifth-greatest coal producer in the European Union.



As a young man, Watt was an instrument maker at Scotland's Glasgow University. There he was given an early steam engine to repair. It was a slow contraption that wasted fuel. One day in 1765, as Watt strolled across the campus, he got an idea for how to improve the old engine. Watt built his new engine in secrecy, patented his design, and began manufacturing it. The engine was very popular and set off a revolution in the production of textiles, paper, and flour, in mining, and in transportation. Thanks to his steam engine and other inventions, Watt became rich and famous. Today in Glasgow, a stone marks the place where young Watt had his "Aha!" moment—the spark of inspiration that helped launch the Industrial Revolution.

A tribute to James Watt can be found on every light bulb in your home. The inventor played such a central role in the development of power generation that today we measure electric power in watts.

Identify Problem and Solution How did James Watt make sure that he would profit from his valuable design?

Industrialization Spreads

With steam driving British factories, industrialization increased rapidly and soon spread to western Europe and the United States. Other regions, including Asia and Africa, did not industrialize in the 1800s. Why did industry not take hold in some areas? What was it about Western countries that encouraged them to embrace industry?

Industry and the West Today's scholars have many ideas about why industrialization did not spread quickly to all parts of the world. Among those ideas is the impact of individual freedom on economic activity.

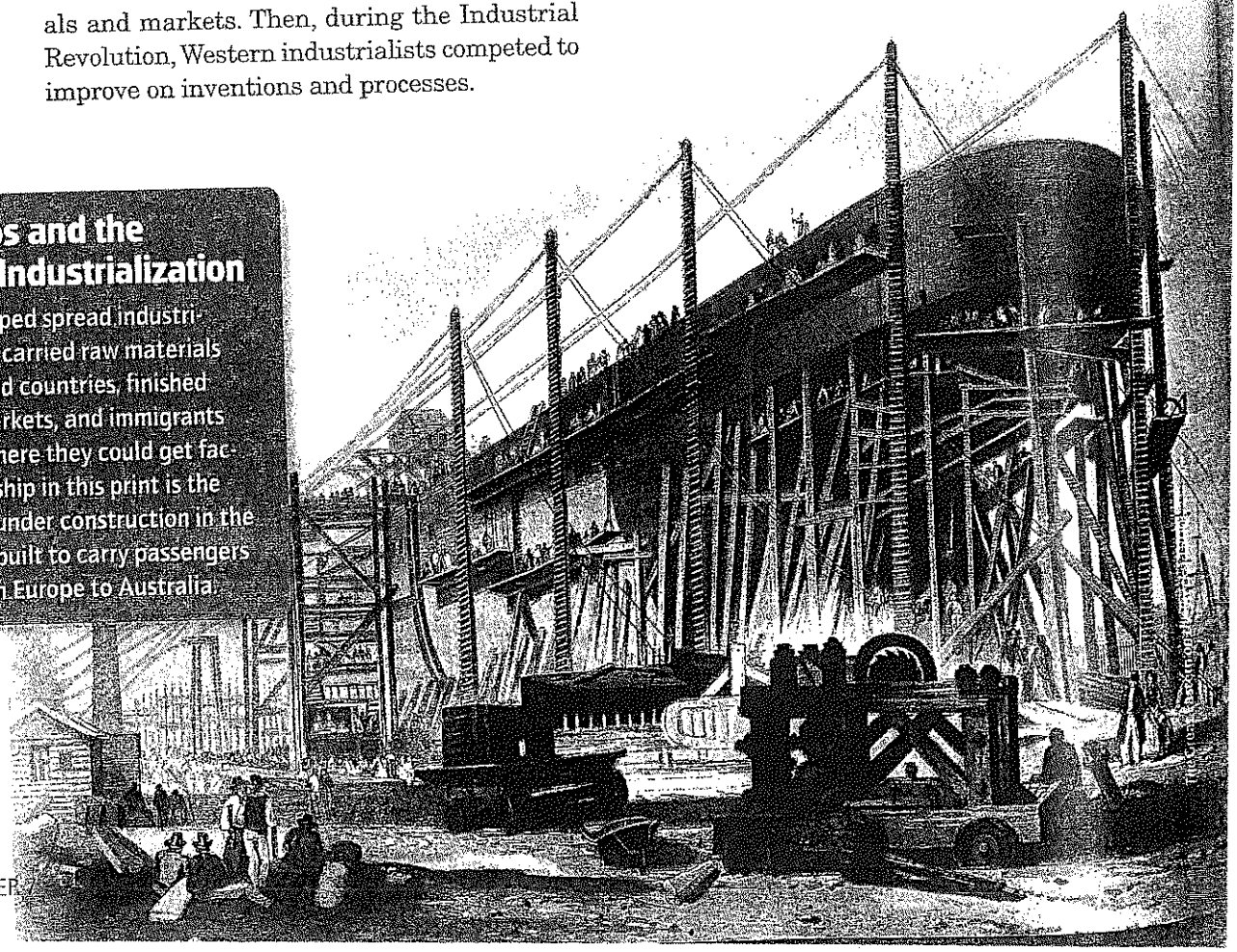
In Western countries, individual freedom was becoming a significant force in society. Although during the 1800s even Western countries were not truly democratic, the individual citizens enjoyed more political liberty than people elsewhere. People with a degree of freedom can compete against each other. Western societies saw competition as good. Wealth and fame rewarded those who competed well. For example, explorers raced to find new lands where merchants could do business. Fierce competition even led some Westerners to exploit other countries in their search for raw materials and markets. Then, during the Industrial Revolution, Western industrialists competed to improve on inventions and processes.

Industry Comes to America Although industrialization spread far beyond Great Britain, it was not because the British wanted to share the wealth. In fact, Britain outlawed the export of certain machines and even forbade some skilled craftsmen from leaving the country. As a result of these restrictions, from about 1760 to 1830, the Industrial Revolution took place mainly in Great Britain, giving the country a head start in economic development. But it was just a matter of time before knowledge of the machines and how to run them leaked out. The United States was one of the first places to benefit from that knowledge.

In his 1791 *Report on Manufactures*, U.S. Treasury Secretary Alexander Hamilton argued that industrialization would help the young United States gain economic independence from Great Britain. He even wanted the U.S. government to bribe British citizens into bringing their knowledge to this country.

Fortunately for the United States, Samuel Slater, a highly skilled young millworker, had already arrived from Britain. To avoid arrest, Slater had disguised himself as a farmworker and boarded a ship to America in 1789.

Slater had a dream—of making a fortune in America. He had detailed knowledge of the



Steamships and the Spread of Industrialization

Steamships helped spread industrialization. They carried raw materials to industrialized countries, finished products to markets, and immigrants to countries where they could get factory jobs. The ship in this print is the *Great Eastern* under construction in the 1850s. It was built to carry passengers and cargo from Europe to Australia.

machinery created by water frame inventor Richard Arkwright for combing and spinning cotton in a single, efficient process. But Slater did not have a copy of the English machines to use as a model. In a remarkable feat of memory, Slater built the complex Arkwright machinery from scratch at a Rhode Island mill.

Slater's bold move resulted in a big success. In 1793 he built what is known today as Slater's Mill in Pawtucket, Rhode Island. For his contribution, Slater became known as the Father of American Industry.

Textile mill technology spread rapidly throughout the northeast United States. The mill city of Lowell, Massachusetts, became the jewel of American industry. The mill's principle founder, Francis Cabot Lowell, used the power of a nearby waterfall to run his machinery. Lowell's mills, situated in 40 multi-story brick buildings on a network of six miles of canals, were models for modern industry.

Lowell had the world's first all-in-one mill that took raw cotton through the various processes from fiber to finished cloth. He hired young, single girls from nearby farms to work in the mills, providing good wages and clean, safe housing for them. Some 10,000 workers were employed there by 1850.

Industry Spreads to Europe A British engineer named William Cockerill brought industry to continental Europe. In 1807 he founded a textile factory in Belgium, which became the second industrialized European country after Great Britain.

Political unrest delayed the industrialization of France. In 1789 revolution erupted in France. The Napoleonic Wars further delayed the process. After Napoleon was defeated in 1815 the French government gave financial support for building industry. By 1848 France had become an industrial power.

In Germany, there was no central government to support industry. Railroads were being built, however, among the many small German states. The railroads paved the way for industrialization after about 1850. Treaties that dropped trade barriers among the states also helped industry grow.

Industry in Asia Eventually, industry spread to Asia. Although today Japan is one of the world's industrial leaders, the Industrial Revolution spread to Japan fairly late. Industrialization took hold there after 1868, when the Meiji government came to power and modernized Japan's economy. Within just a few decades, Japan had thriving industries.

Japan was far ahead of its Asian neighbors. The industrialization of other major world powers—including China, India, and Russia—would not occur until the 1900s.

READING SKILLS

Drawing Conclusions If you know the Meiji modernized Japan's economy, what can you conclude about the previous government's role in the country's economy?

READING CHECK **Compare and Contrast** How did industrialization in Britain compare to the process in America and Europe?

SECTION 1 ASSESSMENT

go.hrw.com Online Quiz Keyword: SHL IND HP

Reviewing Ideas, Terms, and People

1. **a. Describe** What were the factors of production that helped produce an Industrial Revolution in Great Britain?

   b. Identify Cause and Effect What effect did changes in agriculture have on the Industrial Revolution?

   c. Rate Which condition in mid-1700s England do you think was most crucial to the birth of the Industrial Revolution? Explain your answer.

2. **a. Identify** What did Richard Arkwright invent?

   b. Infer Why did some people not like the arrival of machines?

   c. Predict What effect might the shift from cottages to factories have on the lives of textile workers and on towns and cities?

3. **a. Recall** What industry stimulated the widespread use of steam engines?

   b. Evaluate How do you think people justified the use of children doing hard labor in coal mines?

4. **a. Identify** Why is Samuel Slater known as the Father of American Industry?

   b. Draw Conclusions How do you think visitors reacted when they saw the Lowell mills?

Critical Thinking

5. **Categorize** Use your notes and a graphic organizer like the one below to show how various factors helped start the Industrial Revolution.

Factors in the Start of the Industrial Revolution				
Government	Agriculture	Land	Labor	Capital

FOCUS ON WRITING

6. **Persuasion** Imagine that you are a highly skilled millworker living in Great Britain in about 1800. Write an outline for the main points you would make to government officials to persuade them that you should be allowed to go to the United States to start a textile business.

SECTION 2

Factories and Workers

Before You Read

Main Idea

The transition from cottage industries changed how people worked in factories, what life was like in factory towns, labor conditions, and, eventually, processes within factories.

Reading Focus

1. How was production organized before factories?
2. What were factories and factory towns like?
3. How did the factory system affect workers?
4. What was mass production, and what were its effects?

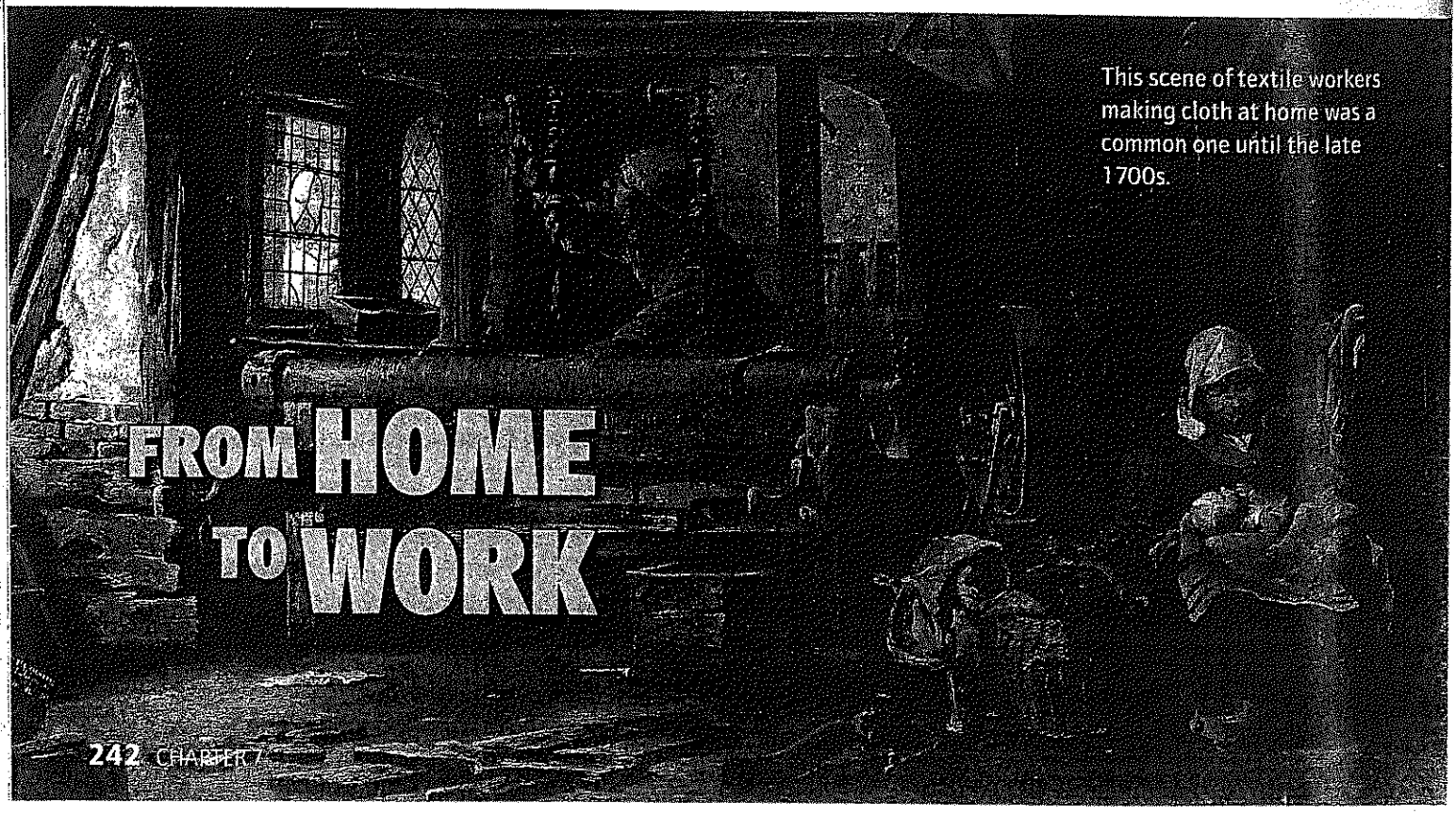
Key Terms

labor union
strike
mass production
interchangeable parts
assembly line

TAKING NOTES Create a table to compare the differences in pre-industrial and industrial production in terms of the factors listed.

Differences in . . .
where work was done
working conditions
towns
labor conditions
factory processes

THE INSIDE STORY ***How did the early Industrial Revolution affect families?*** In 1795 writer Hannah More told a story about a large family in Lancashire, in northern England. The father worked in the coal mine, and the wife and children worked at home spinning fiber into thread and running a small dairy farm. There was not enough work at home to keep all the children busy, though, so three of them, including nine-year-old Mary, went to work with their father in the coal mine. Gradually the family's income increased, thanks to the children's hard work. But tragedy soon struck. The father died in a mine accident, the mother lost her mind from so much grief, and Mary struggled to keep her sisters and brothers fed. Although we do not know if this story of Mary's family was true, the problems it describes were true for many real families. The early years of the Industrial Revolution brought hardships to many British families, whether they worked in the mines or the factories.



FROM HOME TO WORK

This scene of textile workers making cloth at home was a common one until the late 1700s.

Production before Factories

Production of goods for others did not begin with the Industrial Revolution. Instead, it began many years earlier with cottage industries, when workers produced goods at home.

Work in the Home In cottage industries, workers who produced finished goods dealt directly with merchants. Like other such industries, the manufacturing of textiles followed several steps.

In the first step, a merchant delivered raw materials to the weaver's cottage. In the early textile industry, the raw material was usually wool. Next, the weavers and their families processed the wool in several stages, from raw material to finished product. They hand-spun the fiber into thread and wove the thread into cloth. When the cloth was finished, the merchant picked it up and took it to market.

Work at home had some clear benefits. The weavers controlled their work schedules and product quality. They could work faster when they needed to earn more money. Or, they could work more slowly to make cloth of the highest quality. Also, family life revolved around the business. Weavers made their own decisions on when to work and rest, depending on the family's needs. They could make adjustments for illness, holidays, and the seasons.

Problems for Cottage Industries Even though working in the home had benefits for workers such as weavers, it also had disadvantages. A fire or flood that destroyed the home's equipment could ruin a family in an instant. Also, cloth-making demanded a range of technical skills for the various steps—skills that took a long time to learn. Moreover, only adults had the physical strength that some jobs, such as weaving on a loom, required. The typical home loom was at least six feet wide and required strength to operate. So, if the parents fell ill or died, the children could not take their places. As textile production and then other occupations moved from the cottage to the factory, business owners were able to take advantage of the problems these drawbacks caused for workers.

READING CHECK **Find the Main Idea** What were some benefits of the cottage system of production?

Factories and Factory Towns

A major change from the cottage industry system to the factory system was where employees worked. A factory laborer had to leave his or her home and work in a place built especially for industry. For some workers, a job in a factory was a welcome way to support the family. For many workers, however, the factory system caused real hardship.

Working in a Factory Factory work was divided into several separate, easily learned tasks, and each worker was assigned to one task. As a result, children could learn jobs as well as adults could. Many families fleeing poverty in the countryside would send their boys and girls—some as young as six years old—to work in the factories. In fact, some factory owners preferred hiring children because they could pay them lower wages. Still, the majority of factory workers were adult men.

Factory work was dangerous for all workers, but children faced special hazards. For example, one problem with early weaving looms was that the threads often snapped. Children, with their small hands, could reach into the still-running machines to retrieve the broken threads more easily than adults. Some children lost fingers in the process. Because there was no safety protection from the massive machines, such severe injuries were common.

The workday was long—more than twelve hours for even very young children. Noise, lack of ventilation, poor sanitation, and inadequate food added to the hardship.

Poor factory conditions were common throughout the late 1700s and into the 1800s. In the 1830s, however, the public began to take notice and ask for improvements. Some of the requests came from the child workers:

HISTORY'S VOICES

"We respect our masters, and are willing to work for our support, and that of our parents, but we want time for more rest, a little play, and to learn to read and write. We do not think it right that we should know nothing but work and suffering, from Monday morning to Saturday night, to make others rich. Do, good gentlemen, inquire carefully into our concern."

—submission from the Manchester's Factory Children Committee to the House of Commons, 1836

Life in Factory Towns Factories changed not just the lives of their workers, but also the towns where the factories were located. Along rivers, large mill operations sprang up quickly. Whole towns grew up around the factories. Some companies provided housing to their employees, many of whom arrived from the countryside with few belongings and nowhere to stay. Families crowded into shoddy, close-packed company dwellings.

When water power changed to steam power, manufacturing towns rose near the coal mines also. The hazards of burning coal for producing steam quickly became apparent. Thick soot from the burning coal blanketed towns, turning day into night. The smoke sent sulfur and other poisonous chemicals into the air.

Factories for smelting, or refining, iron were often built near coal mines. They sent more dark, smoky pollution into the air. The iron smelting factories in one region of northwestern England emitted so much pollution that the region was nicknamed "black country." Because the iron-smelting required fires, one American visitor to the region called it "black by day and red by night."

North of this region lay the textile city of Manchester—the British city that came to symbolize the problems of industrialization. Sanitation statistics provide detail. According to one account, some neighborhoods of Manchester had only two toilets for every 250 residents. Under such conditions, disease spread easily. As a result, about six children in ten died before the age of five.

READING CHECK **Identify Supporting Details** What are some facts that illustrate the difficulties of factory work?

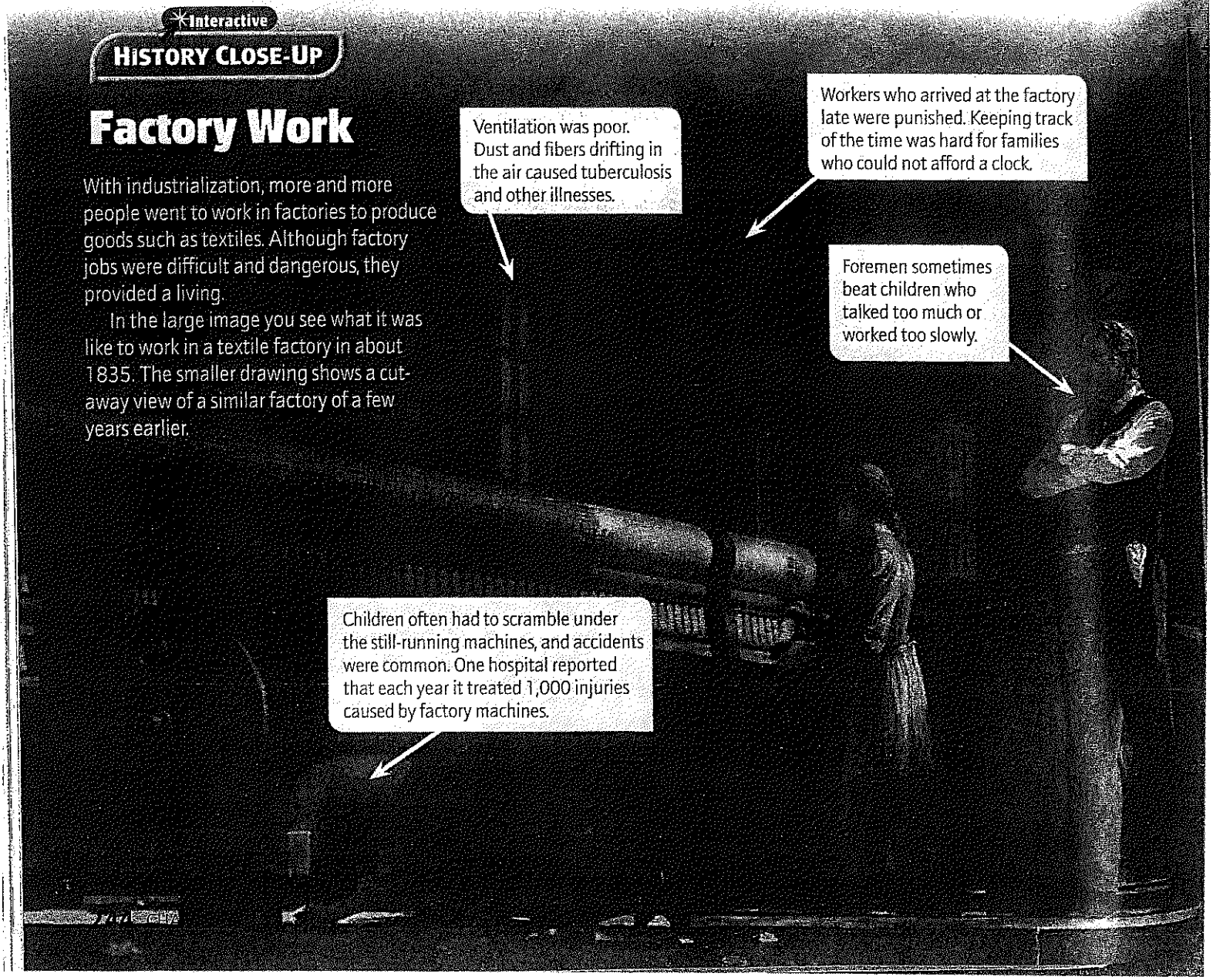
Interactive

HISTORY CLOSE-UP

Factory Work

With industrialization, more and more people went to work in factories to produce goods such as textiles. Although factory jobs were difficult and dangerous, they provided a living.

In the large image you see what it was like to work in a textile factory in about 1835. The smaller drawing shows a cutaway view of a similar factory of a few years earlier.



The Factory System and Workers

Factories changed more than just families and towns. They also transformed the very nature of labor, as industry moved from the home to the factory.

Workers in a New Economy The factory system required large amounts of capital, or money, to pay for building the factories and installing the machinery. This produced three main levels of participants within the system:

- wealthy business people to invest in and own the factories
- mid-level employees to run the factories and supervise the day-to-day operations
- low-level employees to run the machines.

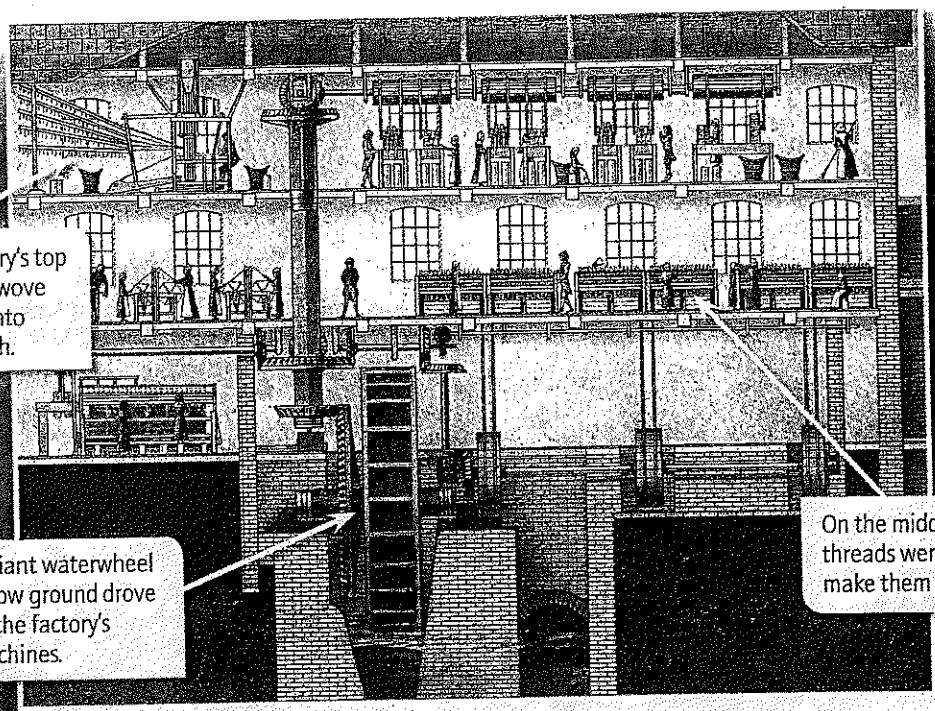
Employers who invested their money expected to make a profit. They shared little of their profits with their employees, who were paid only for the hours they worked. At the same time, no one worker was responsible for the product's quality, and factory workers had little incentive to improve their job performance. Quality could decline.

Also, workers were plentiful. British factories had no trouble finding former farm workers displaced by the enclosure movement. In the United States, immigrants were glad to find any work they could.

Employers often preferred hiring women and children because men expected higher wages. Men were also seen as not taking orders as readily. In addition, many people saw unskilled factory jobs as inappropriate for men. Factory work was seen as "women's work."

ACADEMIC VOCABULARY

invest to commit money in order to make a financial return



Inside a Textile Factory This illustration is based on the inner workings of a cotton-processing factory in Bedworth, England, in about 1800.

Skills Focus: Interpreting Visuals

Draw Conclusions What hazards did children face while working in the factory? What features of the Bedworth factory's construction helped make it efficient?

Go online for a closer look at survival and this event.

go.hrw.com
COULD YOU HAVE SURVIVED?
Keyword: SHL IND

Cottage Workers' Unrest One group of people faced a particular challenge caused by the factory system. These were the weavers and other cottage industry workers still trying to earn their living by making goods at home. Their handmade goods were more expensive than factory-made items, so they had a hard time selling them. Facing ruin, some of these workers turned to violence.

One night in 1811, masked workers attacked a textile factory in Nottingham, England. The incident marked the beginning of the Luddite movement. The Luddites, named after a General Ned Ludd who probably did not exist, opposed machines that were "hurtful to the commonality"—in other words, that put them out of work. Luddites burned factories and smashed machines but tried to avoid injuring people. During 1812 the movement quickly spread to other cities. Several Luddites were caught and hanged, though, and the Luddite movement ended quickly.

THE IMPACT TODAY

People who resist using today's new technologies are sometimes called Luddites.

Changing Labor Conditions The severe treatment of the Luddites illustrates that the British government did not want to get involved in factory problems. Government leaders did not see regulating business as their job. Many citizens thought that if the government helped poor people too much, they would lose their incentive to work harder. As a result, the government did not pass laws relating to work hours, safety, or child labor.

Because the government took no action, in the early 1800s British workers started to organize. They formed the first **labor unions**, which are organizations representing workers' interests. To urge employers to raise wages and improve conditions, unions in Britain organized **strikes**, or work stoppages. At first, Parliament banned unions and strikes, fearing social and economic trouble.

Slowly, pressure from the public and unions brought change. Hearings in Parliament in 1832 produced the Sadler Report, which described abuses in the factories. Eventually Britain passed laws that limited work hours for adults and children. Another law required child workers to be at least nine years old. In 1871 Parliament legalized labor unions.

American workers also organized. In the United States, the first nationwide labor unions developed in the mid-1800s.

A New Class of Workers While factory conditions were slowly improving, another process was also taking place—the growth of the middle class. The middle class included the various groups, or types, of workers that were in the middle income range, between the rich factory owners and the poor factory workers.

Several groups of workers who were essential to the factory system became part of the middle class. Managers and accountants kept

EFFECTS OF THE FACTORY SYSTEM

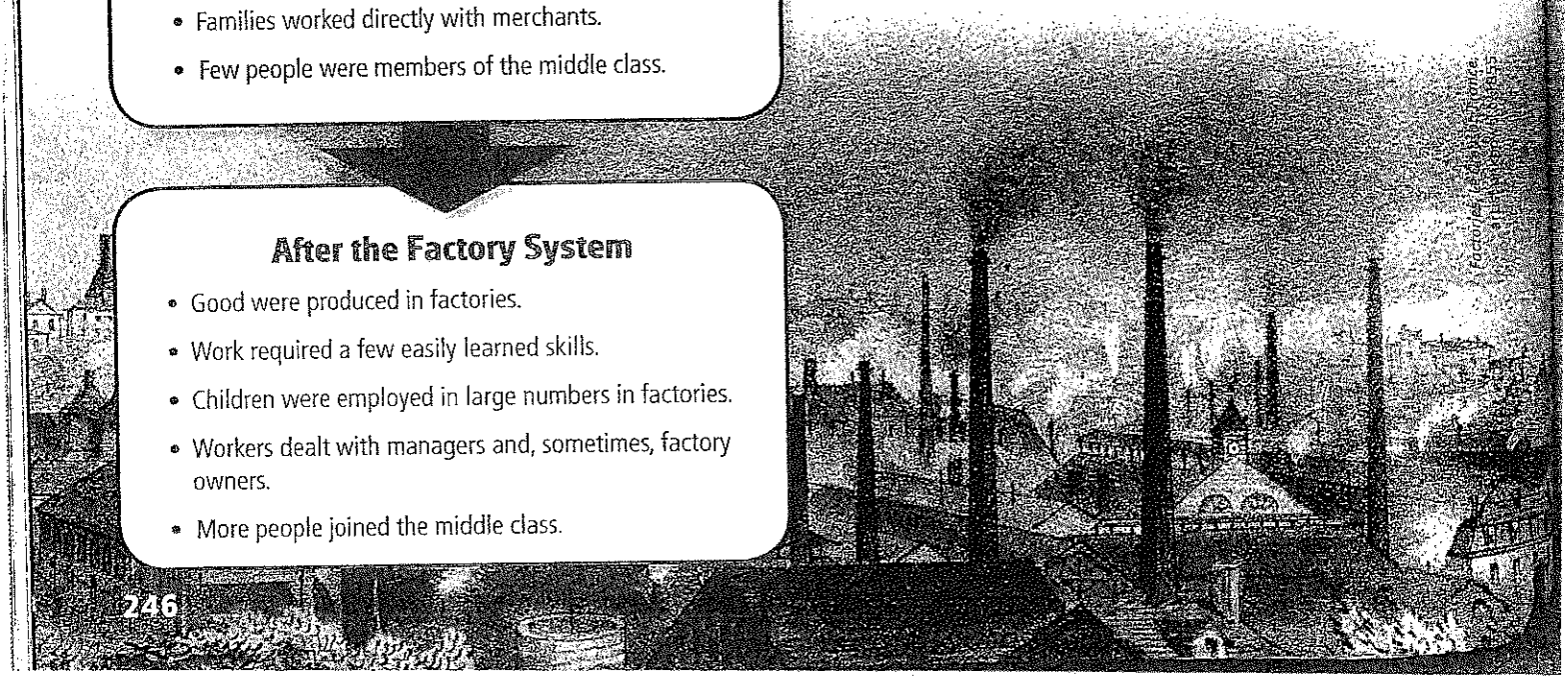
QUICK FACTS

Before the Factory System

- Goods were produced in the home.
- Work required a wide range of skills.
- Children did chores at home with the family.
- Families worked directly with merchants.
- Few people were members of the middle class.

After the Factory System

- Good were produced in factories.
- Work required a few easily learned skills.
- Children were employed in large numbers in factories.
- Workers dealt with managers and, sometimes, factory owners.
- More people joined the middle class.



the factories running and their books balanced. Engineers designed the machines, and mechanics kept them in good repair. Other workers transported the goods to market while still others were engaged in sales of those goods. As the income from increased manufacturing, buying, and selling spread throughout the economy, more people entered the middle class.

READING CHECK **Identify Cause and Effect** How did the factory system affect different groups?

Factories and Mass Production

The factory system certainly changed the world of work. In addition, new processes further changed how people worked in factories and what they could produce.

The Process of Mass Production Many changes in industry evolved fully in the United States. One of these changes was the development of **mass production**—the system of manufacturing large numbers of identical items. Elements of mass production, including interchangeable parts and the assembly line, came to be known as the American system.

Interchangeable parts are identical machine-made parts. They made production and repair of factory-made goods more efficient. Before industrialization, one skilled worker might have made an entire gun, clock, or other product by himself. He would make or gather all the parts and assemble them. The process could be slow, and because the parts were all handmade, the finished products were a little different from each other. With interchangeable parts, though, one worker could put together many identical products in a short time. Making repairs was easier, too, because replacement parts did not have to be custom-made to fit.

The other element of mass production related to movement within factories. In early workshops, the product stayed in one place and workers moved around it, adding parts and making refinements. An innovation was the **assembly line**. In an assembly line, the product moves from worker to worker, as each one performs a step in the manufacturing process. With this division of labor, workers can make many items quickly.

Effects of Mass Production Mass production had advantages and disadvantages. A big advantage was a dramatic increase in production. Businesses that made many items quickly could charge less per item. As a result, more people could afford to buy these mass-produced goods.

For employees, however, mass production could lead to more repetitious jobs. At first, some workers protested, refusing to work quickly. But the changes could not be stopped, and mass production became the norm in factories.

READING CHECK **Summarize** What was mass production?

SECTION 2 ASSESSMENT

go.hrw.com
Online Quiz
Keyword: SHL IND HP

Reviewing Ideas, Terms, and People

1. **a. Describe** How did the textile business work when it was a cottage industry?

   b. Compare List some advantages and disadvantages of cottage industry.

2. **a. Recall** Why were early factory towns unhealthy?

   b. Explain Why was factory work especially dangerous for children?

   c. Infer If working in factories and living in the cities was so terrible, why did people stay?

3. **a. Identify** What was the structure of authority within the new factories?

   b. Infer What factors combined to keep workers' wages low?

   c. Evaluate Why might workers have been reluctant to hold a **strike** in the early years of the factory system?

4. **a. Define** What were the two main components of the American System of **mass production**?

   b. Develop Why would the American system help many industries grow larger and richer?

Critical Thinking

5. **Analyze** Use your notes to fill in a chart like the one below by analyzing the effects of the factory system. Who do you think benefited the most and least from the changes?

Industrial Production	
Advantages	Disadvantages

FOCUS ON WRITING

6. **Narration** Write a paragraph or two in which you describe the changes that a typical English town and its residents might have experienced in the 1800s as industries developed in the town.

SECTION 3

New Ideas in a New Society

Before You Read

Main Idea

The Industrial Revolution inspired new ideas about economics and affected society in many ways.

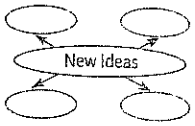
Reading Focus

1. What new ideas about economics developed during the Industrial Revolution?
2. What competing economic ideas arose as a result?
3. How did the Industrial Revolution affect society?

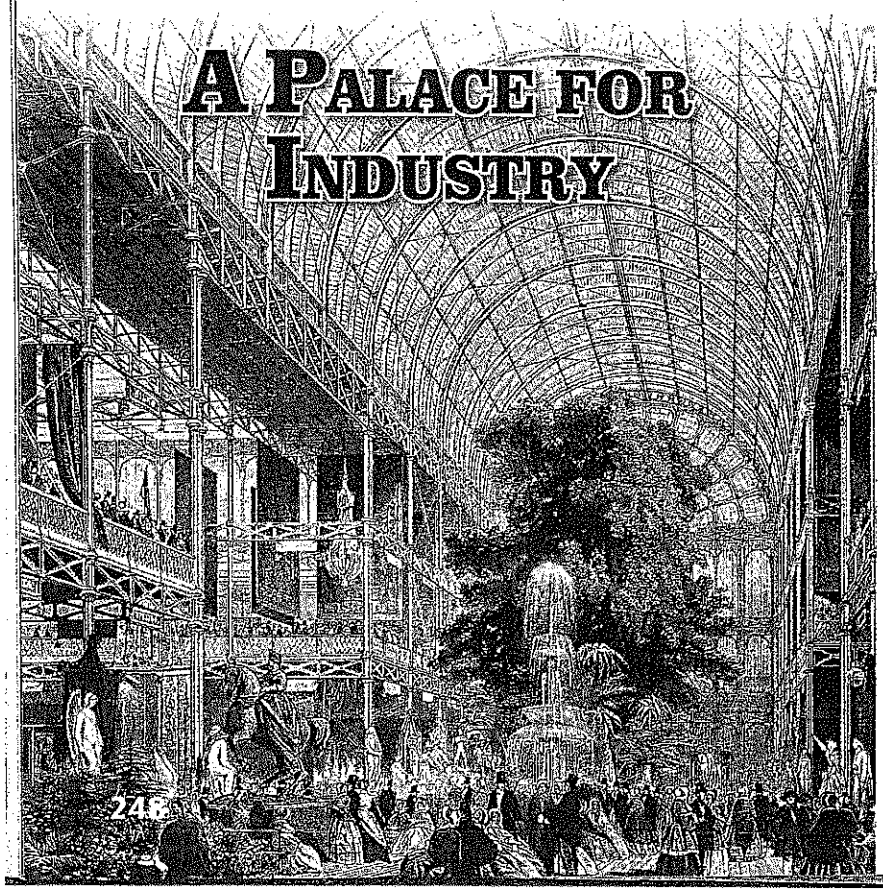
Key Terms and People

laissez-faire
Adam Smith
Thomas Malthus
entrepreneur
Andrew Carnegie
socialism
Karl Marx
communism
standard of living

TAKING NOTES Take notes on the new ideas of the Industrial Revolution.



THE INSIDE STORY ***What marvels of industry were displayed in a glass palace?*** In 1851 the Great Exhibition in London drew residents and visitors to a huge glass and iron building called the Crystal Palace. Inside the marvelous structure were nearly 14,000 exhibits, many of which displayed industrial products and processes. English writer Charlotte Brontë was dazzled by the exhibition: "It is a wonderful place—vast, strange, new, and impossible to describe. Its grandeur does not consist in *one* thing, but in the unique assemblage of *all* things." Brontë was impressed by the wide range of exhibits, including "great compartments filled with railway engines and boilers, with mill machinery in full work . . ." All these remarkable exhibits showed the accomplishments of the Industrial Revolution. People came from far away to gawk at those achievements. In fact, some 6 million visitors from across Europe and elsewhere attended the exhibition. ■



◀ Visitors crowded into the Crystal Palace to view the displays.

Dickinsons' Pictures of Great Exhibition, 1851

New Ideas about Economics

During the late 1700s and early 1800s industrialization was changing not just products and work, but also how people thought about economics. One change was that mercantilism was giving way to capitalism and competition.

Capitalism and Competition Under the old mercantile system, governments restricted trade to protect their own industries from foreign competition. Then, starting in the late 1700s, some people said that governments should not interfere in business. This idea is called **laissez-faire** (lehz-ay-FEHR) economics, from a French phrase meaning "free to do."

Adam Smith became the leading advocate of laissez-faire economics. In 1776 he published *The Wealth of Nations*, in which he analyzed the definition and creation of wealth. Smith wrote that markets free from government interference benefited all. Such an economic system free from regulation is called a market economy. Also in a market economy, businesses can compete freely against each other for trade. The British government agreed with Smith's ideas and ended most regulations by the 1840s.

Smith influenced **Thomas Malthus**, who was concerned about population growth caused by the development of industry. Malthus wrote that the population would always grow faster than food production. Therefore, he concluded, poverty and misery would never go away. Population growth, Malthus said, was slowed only by war, disease, famine, and decreased reproduction. Because many people agreed that these problems were unavoidable, Malthus' ideas were used to justify low wages and laws that limited charity to the poor.

In time, Malthus was proved wrong. The disasters he predicted did not happen, but the population did grow. Still, the ideas of Smith and Malthus affected attitudes. As Smith predicted, industrialization succeeded and spread. Industrial capitalism emerged as the main economic pattern in the Western world.

New Roles for Business Leaders Industrialization also changed the roles that business leaders played in public life. Before the Industrial Revolution, people who owned land controlled the wealth and power. But by the mid-1800s, the leaders of industry began taking away the landowners' influence. Some industrialists became extremely wealthy, and their new wealth bought them political power.

The Industrial Revolution also highlighted the role of the **entrepreneur**, someone who starts a new business. Among the entrepreneurs were financiers, bankers, and investors who pooled their money to create large corporations. As demand increased for capital to build factories, banking and finance became more important occupations. Some industrialists made fortunes simply by buying and selling companies for a profit.

A few industrialists, mainly in the United States, built some of the largest corporate empires ever seen—and acquired wealth that few people could imagine. In the late 1800s, their stories helped make them famous.

Andrew Carnegie, who was born in Scotland, was an example of "rags to riches" success. His father, a weaver, was driven out of work by the textile mills. The family moved to America, and Carnegie started working in a mill at age 12. With hard work, creativity, intelligence, and tough business practices, he led the expansion of the American steel industry.

PRIMARY SOURCES

A View of Andrew Carnegie

Andrew Carnegie, who took the steel industry to new heights, gave away some $350 million to fund various charities. This cartoon from *Punch*, a satirical British magazine, shows Carnegie giving $2 million to Scottish universities. The original title is "The MacMillion."

Punch, May 29, 1901

Skills Focus READING LIKE A HISTORIAN

1. **Analyze** What might Carnegie's clothing have meant to people at the time?
2. **Evaluate** How do you think the artist felt about Carnegie's donation? Explain your answer.

See **Skills Handbook**, p. H25

PRIMARY SOURCES

The Iron Law of Wages

The ideas of Adam Smith and Thomas Malthus had many admirers. Among them was David Ricardo (1772–1823), an English banker. In an 1817 work, Ricardo argued that natural economic forces would keep wages low—so low that workers barely had enough to survive. Ricardo's theory came to be called The Iron Law of Wages, indicating that the "law" was real and unchangeable. The theory was popular with factory owners, since it justified their paying low wages to their employees.

"It is when the market price of labour exceeds its natural price that the condition of the labourer is flourishing and happy, that he has it in his power to command a greater proportion of the necessaries and enjoyments of life, and therefore to rear a healthy and numerous family. When, however, by the encouragement which high wages give to the increase of population, the number of labourers is increased, wages again fall to their natural price, and indeed from a reaction sometimes fall below it."

—David Ricardo, *On Wages*, 1817

Like Malthus, Ricardo predicted a rise in population. According to Ricardo, what encourages population growth?

Skills Focus: READING LIKE A HISTORIAN

1. **Sequence** According to Ricardo, what is the sequence of the rise and fall of wages?
2. **Draw Conclusions** Do you think Ricardo felt some sympathy with workers? Why or why not?

See **Skills Handbook**, p. H25

Other industrialists achieved similar feats. Examples include Cornelius Vanderbilt in railroads and John D. Rockefeller in oil. These men built giant corporations that drove out their competitors. They were both admired for their contributions to human progress and criticized for their treatment of workers. For example, they were generally against their employees' joining labor unions. Although some, like Andrew Carnegie, gave generously to charity, people who disapproved of their methods sometimes called them "robber barons."

READING CHECK **Summarize** What were some of the new ideas about economics?

Competing Economic Views

Not everyone agreed that laissez-faire capitalism was a good thing. Some thinkers blamed capitalism for bad working conditions and big gaps between the rich and poor. They took a different stance on economic sytems. Two of these men were Robert Owen and Karl Marx.

ACADEMIC VOCABULARY
stance attitude or position

Robert Owen In contrast to the gloomy views of Thomas Malthus, Robert Owen had a more hopeful view of how industry might affect people. He thought that for the good of all, society or the government, instead of individuals, should own property and control industry—a theory called **socialism**. The theory was a clear contrast to capitalism.

To demonstrate his ideas, Owen built a mill complex at New Lanark, Scotland, that gained widespread praise as a model industrial town. The workers there enjoyed good working conditions, shopped at nonprofit stores, lived in decent houses, and could earn sick pay. Because he felt that education improved character, Owen even provided free schooling for the workers' children. He also imposed strict rules on workers' personal lives, including curfews and bathing requirements.

Owen brought his ideas to the United States in 1825, when he founded a community called New Harmony in Indiana. New Harmony was to be a utopia, an ideal community where poverty and other evils of society did not exist. The belief that such communities can solve society's problems is called utopianism.

The efforts of Owen and other people who believed in socialism led to a movement called social democracy. Those who advocated social democracy wanted to move from capitalism to socialism by democratic means.

Karl Marx A more radical view of socialism was put forth by two Germans, Friedrich Engels and Karl Marx. They declared that as capitalism grew, more and more workers would sink into poverty. In time they would rebel, seize control of the "means of production"—such as factories and farms—and govern themselves. Capitalism would collapse. Workers would establish a society based on cooperation and equal distribution of wealth. Such a revolution was inevitable, the authors claimed.

In time, Marx would be better known than Engels. In 1867 Marx produced the first volume of *Das Kapital.* In this three-part work, he put forth his arguments against capitalism. One of its evils, Marx said, was how capitalism disrupts the relationship between labor and profit. He thought there should be a direct connection between one's work and one's pay. For example, he thought it was not fair that one worker could toil all day at back-breaking labor and make very little money while another person got rich doing nothing more than sitting in an office speculating on future markets.

Marx thought that socialism could help rid the world of these injustices. However, he believed that the transition to socialism would not happen quickly because many people, especially the wealthier classes, would not see any benefit for themselves. For that reason, he thought the workers would have to control the government. Because the government would then control the economy, a command economy would result. The system in which the government owns almost all the means of production and controls economic planning is called **communism**. Years later, some governments would adopt communism and use it to violate basic human rights and freedom of choice.

READING CHECK **Infer** Why did capitalism provoke strong response from the socialists?

Effects on Society

The rise of new economic ideas was among the countless effects of the Industrial Revolution. Other effects were felt in small and large ways, from how families lived to how countries dealt with each other. For example, the shift away from cottage industries affected home life and the roles of women in society.

Effects on Home Life When work was done in the home, women often worked alongside their husbands. Then when industry drew workers away from home, women were usually the ones who stayed home to care for children. The worlds of work and home began to separate. Women and men were seen as occupying "separate spheres"—the woman in the home and the man in the workplace to support the home and family.

EFFECTS OF INDUSTRIALIZATION ON WOMEN

QUICK FACTS

Women Who Went from Cottage Industries to Factory Work

- Earned low wages in low-skill jobs
- Separated from their families
- No real improvement in their status

Other Working-Class Women

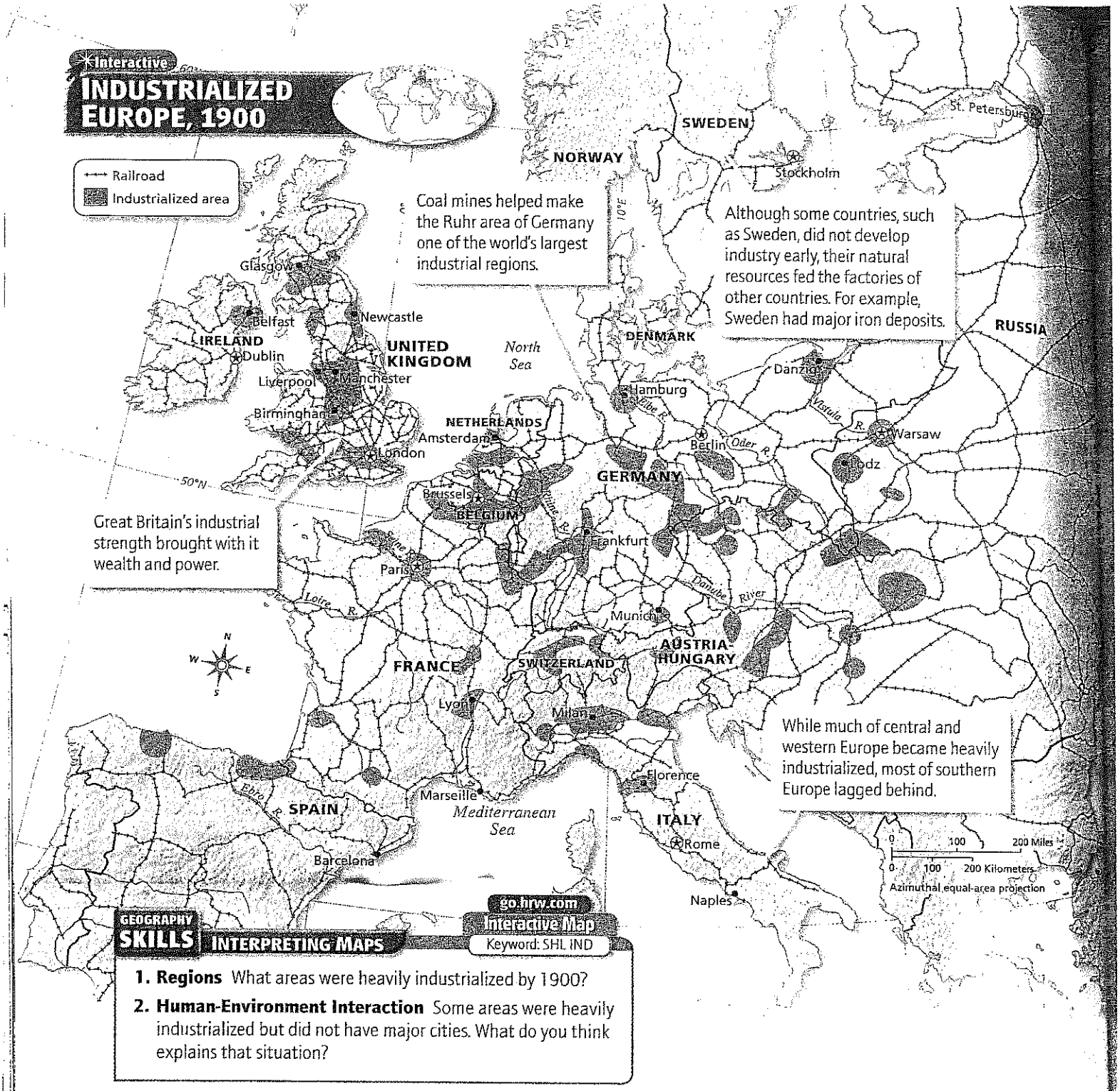
- Found jobs as cooks, maids, and child-care workers because more families could afford to hire them
- Found some new educational and cultural opportunities in cities
- Overall improvement for many women

Middle-Class Women

- Freed from chores because many could afford to hire domestic help
- Began to attend college and get jobs as teachers and nurses
- Those who did work often criticized by people who said that they should not work outside the home
- Most affected by idea of separate spheres

Time for Tea, by Valentine Prinsep, 1800s

The Terrace, by Silvestro Lega, 1868



The idea of separate spheres had another effect. Although so many people enjoyed what the new industrialized economy provided, in general they saw the business world as without moral controls. Women were expected to provide moral guidance in the home.

Middle-class families were more affected by this division between home and work than were lower-class families. Poorer families that depended on two incomes to survive could not afford for the wife to stay home. However, belief in the home as society's moral center was equally powerful among lower-class families.

Effects on Countries On a scale much larger than the family home, industrialization also affected entire countries. For some nations, industry brought with it great power. For example, Great Britain, France, and Germany became leaders in the global economy.

Mass production increased their ability to build ships and make weapons. With increased military strength, some countries were able to conquer and control sources of raw materials around the world.

The powerful industrial giants could even control the economy of a place thousands of miles away. For example, India had made and exported cotton cloth for centuries already when Britain took control of the region. Indian textile workshops were not mechanized, however, so cotton cloth imported from Britain was cheaper. The Indian textile industry could not compete and was practically destroyed.

Back on this side of the world, the effect of industrialization on the United States was very dramatic. With its huge size, wealth of natural resources, and spirit of independence, the United States industrialized rapidly. Like the major industrial powers of Europe, the United States gained global political power based on its industrial strength. In addition, industry helped the country's population grow quickly. A large number of the new Americans had moved from other lands around the world, drawn by jobs in American factories. The immigrants, both skilled and unskilled, contributed to the nation's economic success and its cultural variety.

Long-Term Effects on Societies Overall, industrialized societies saw an increase in wealth. It is true that much of the wealth flowed into the pockets of a few rich industrialists. But manufacturing also created a new middle class of clerks, merchants, and managers. In general, the **standard of living**, or level of material comfort, for people in industrialized countries improved. Even many of the poorest people gradually benefited from labor-saving devices and cheap, machine-made goods.

The Industrial Revolution introduced something new to the middle class: leisure. People had more time on their hands and more money in their pockets. They could enjoy public sports events, a concert in the park, a day at the beach, or even a vacation. With increased leisure time, they could become more educated or participate more deeply in politics.

You will soon read how industrialization brought big changes to almost all aspects of daily life—from art to transportation. We are still experiencing those changes in our lives today. The full story of the Industrial Revolution has yet to be written.

READING CHECK **Identify Cause and Effect** What were some of the major effects industrialization had on families and countries?

SECTION 3 ASSESSMENT

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Online Quiz
Keyword: SHL IND HP

Reviewing Ideas, Terms, and People

1. **a. Identify** What is the connection between Adam Smith and laissez-faire economics?

   b. Draw Conclusions Why do you think some economists believed that unrestricted capitalism would help all of society?

   c. Predict What are some of the groups of people who might have called the big industrialists "robber barons"? Who might have called them "captains of industry"?

2. **a. Describe** What was the role of Karl Marx and Friedrich Engels in the development of socialism?

   b. Analyze How would someone who advocated social democracy have responded to Marx's prediction?

3. **a. Recall** How did the Industrial Revolution affect the standard of living for people in industrialized countries?

   b. Interpret Why do you think Americans' spirit of independence encouraged the growth of capitalism?

   c. Predict How do you think the idea of separate spheres affected the children of middle-class families?

Critical Thinking

4. **Compare and Contrast** How did each of the major economic theories propose to change or benefit society? Fill in a table like the one below with as many changes as you can.

Theory	Proposed Social Change
Capitalism	
Utopianism	
Socialism	
Communism	

FOCUS ON WRITING

5. **Description** Imagine that you belong to a middle-class family in the late 1800s. Write a conversation that you have with your great-grandfather about the changes that your family has experienced over the years.

CHAPTER 7

Document-Based Investigation

Child Labor

Historical Context The four documents below tell us about child labor during the early Industrial Revolution and how different people saw the issue.

Task Examine the documents and answer the questions that follow. After you have studied the documents, you will be asked to write an essay describing the connection between child labor and public attitudes. Use evidence from these selections and the chapter to support the position you take in your essay.

DOCUMENT 1

Interview with Elizabeth Bentley

In 1815 the British Parliament sent out researchers to interview child workers and learn more about factory conditions. Here is an excerpt from an interview with a young woman who had worked in a textile mill.

Q *What were the hours of labour when you were not so thronged [busy]?*
A From six in the morning till seven at night.

Q *What time was allowed for meals?*
A Forty minutes at noon.

Q *Had you any time to get your breakfast or drinking?*
A No, we had to get it as we could.

Q *Do you consider doffing a laborious employment?*
A Yes.

Q *Explain what you had to do.*
A When the frames are full, they have to stop the frames, and take the flyers off, and take the full bobbins off, and carry them to the roller, and then put empty ones on, and set the frame going again.

Q *Does that keep you constantly on your feet?*
A Yes, there are so many frames and they run so quick.

Q *Your labour is very excessive?*
A Yes, you have not time for anything.

Q *Suppose you flagged [slowed down] a little, or were late, what would they do?*
A Strap [whip] us.

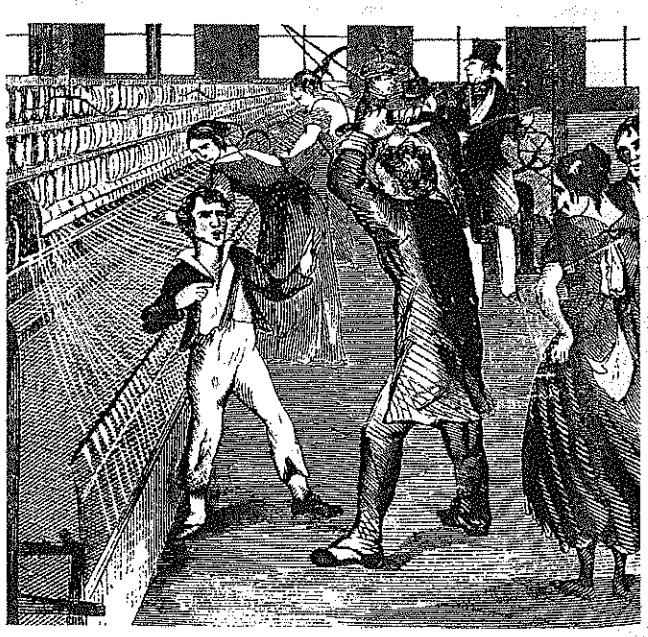
Q *And they are in the habit of strapping those who are last in doffing?*
A Yes.

Q *Constantly?*
A Yes.

DOCUMENT 2

Children in Danger

Factory owners often preferred to hire children and women rather than men. Men expected higher wages, and employers suspected that they were more likely to rebel against the strict rules and conditions that were common in factories. The children were subject to harsh punishment if they were late, fell behind in their work, or talked too much.

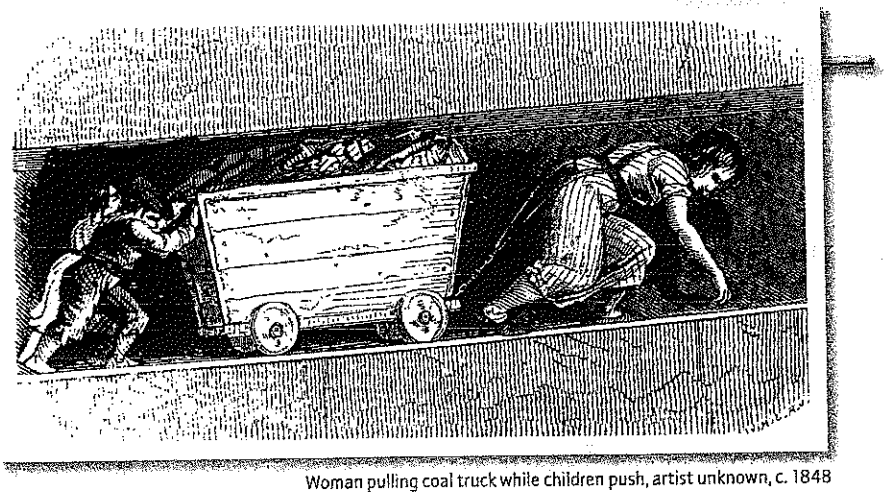


Supervisor whipping a young boy, artist unknown, 1853

DOCUMENT 3

Children in the Mines

Children were also hired to work in Great Britain's coal mines. In this drawing, you see an older, stronger worker wearing a harness and pulling a cart full of coal. Smaller children push the cart from behind.



Woman pulling coal truck while children push, artist unknown, c. 1848

DOCUMENT 4

Speech in the House of Commons, 1832

John Charles Spencer was a member of the British Parliament's House of Commons. Although he supported some reforms for child workers, he was against a proposed law to limit their work day to 10 hours. Here he addresses Michael Sadler, a fellow member who proposed the law, in a speech.

I am of the opinion that the effect . . . must necessarily be a fall in the rate of wages, or, what is more probable, that children would cease to be employed at all in manufactories. Now I appeal to the honourable member whether a measure which would prevent children from obtaining any employment in factories would not be more injurious than beneficial to the labouring classes?

As long as we have a manufacturing population in the kingdom it will be impossible to render their occupation as wholesome as that of agricultural labourers, or persons engaged in out-door labour. This is an evil that cannot be remedied. It is too late now to argue about the unwholesome nature of manufacturing employment. We have got a manufacturing population, and it must be employed. Any measure which shall have the effect of diminishing the means of employment to labourers engaged in manufactures will produce extensive misery.

Skills Focus READING LIKE A HISTORIAN

DOCUMENT 1

a. **Summarize** What were some of the problems that Elizabeth Bentley faced at the factory?

b. **Draw a Conclusion** How does Elizabeth's plain way of speaking affect your reaction to her testimony?

DOCUMENT 2

a. **Describe** What does the scene show?

b. **Compare** Does this illustration confirm or contradict what was said in Document 1? Explain your answer.

DOCUMENT 3

a. **Describe** What would happen to the small children if the worker in the harness were to fall or stumble?

b. **Infer** How do you think the person who drew this picture felt about children working in the mines?

DOCUMENT 4

a. **Summarize** What is Spencer's main argument against the proposal to limit children's workday to 10 hours?

b. **Analyze** What social class does Spencer seem to represent, and whose interests is he upholding?

DOCUMENT-BASED ESSAY QUESTION

What do you think were the connections among child labor, factory conditions, attitudes about capitalism, reactions to capitalism, and the rise of labor movements? Using the documents above and information from the chapter, form a thesis that might explain the general impact of child labor on public opinion. Then, write a short essay to support your position.

See **Skills Handbook**, pp. H25–H26

CHAPTER 7

Chapter Review

VISUAL STUDY GUIDE

Causes and Effects of the Industrial Revolution

CAUSES

- Availability of raw materials and markets in colonies
- Great Britain's seapower and political stability
- Parliament's support of free enterprise
- Agricultural improvements in Great Britain
- Enclosure movement in Great Britain
- Great Britain's factors of production
- Invention of new machines in the textile industry
- Development of the steam engine
- Increased individual freedom in the West
- Western attitudes toward competition

Industrial Revolution

EFFECTS

- Development of labor-saving, time-saving machines
- The factory system
- Poor working conditions in factories
- Overcrowding, pollution, disease in cities
- Competing ideas about economics
- Rise in standard of living, growth of middle class
- Rise of new industries and powerful industrialists
- New emphasis on middle-class home life
- Increased power of industrialized countries

QUICK FACTS

Key Events of the Industrial Revolution

1701 ■ Jethro Tull invents the seed drill.

1765 ■ James Watt develops idea for practical steam engine.

1776 ■ Adam Smith publishes *The Wealth of Nations*.

1785 ■ Edmund Cartwright patents the power loom.

1789 ■ Samuel Slater arrives in the United States.

1793 ■ Slater's Mill is established in Rhode Island.

1802 ■ Richard Trevithick uses a steam engine to drive the first locomotive.

1807 ■ William Cockerill builds a factory in Belgium.

1811 ■ The Luddites stage their first attack on textile factories.

1832 ■ The Sadler Report details the conditions in British factories.

1851 ■ The Great Exhibition displays the marvels of industry to the world.

1867 ■ Karl Marx publishes the first volume of *Das Kapital*.

1871 ■ The British Parliament legalizes labor unions.

Reviewing Key Terms and People

Identify the correct term or person from the chapter that best fits each of the following descriptions.

1. level of material comfort
2. the essential elements that a nation needs to achieve economic success
3. invented a seed drill that made planting more efficient
4. to commit money in order to make a financial return
5. person who starts a business
6. a craft occupation performed in the home
7. economic system in which government does not regulate business and commerce
8. the process of changing to power-driven machinery

History's Impact video program

Review the video to answer the closing question on the impact of the Industrial Revolution.

Comprehension and Critical Thinking

SECTION 1 *(pp. 235–241)*

9. **a. Recall** What natural resources enabled the Industrial Revolution to begin in Great Britain?

   b. Sequence How did the cotton gin affect slavery in the United States?

   c. Support a Position Defend or refute this statement: "Without the steam engine, the Industrial Revolution would not have amounted to more than a pile of rickety machines."

SECTION 2 *(pp. 242–247)*

10. **a. Identify** Who were the Luddites, and what did they do?

    b. Explain What were some of the hazards of working in the early factories?

    c. Rank Which family do you think faced more potential problems—a cottage industry family, or one whose members worked in a factory? Explain.

SECTION 3 *(pp. 248–253)*

11. **a. Identify** Who were some of the industrialists who gained wealth and power in the United States?

    b. Compare How do socialism and communism differ?

    c. Evaluate In what ways did industrialization give countries such as Great Britain and Germany an advantage over some of their neighbors?

Reading Skills

Drawing Conclusions *Use what you know about drawing conclusions to answer the questions below.*

12. If you know that coal mines had narrow passageways and low ceilings, what can you conclude about why many children were hired to work in the mines?

13. If you know that Eli Whitney's cotton gin speeded up the process of pulling seeds from raw cotton blossoms, what can you conclude about a change in the rate of cotton production during the 1800s?

Analyzing Secondary Sources

Reading Like a Historian

> "Early breeders of better animals succeeded not because of a knowledge of chemistry, which was in its infancy, or of genetics, which did not exist, but because they backed hunches. Even so, the results were remarkable. The appearance of the livestock inhabiting the landscape changed; the scraggy medieval sheep whose backs resembled, in section, the Gothic arches of the monasteries which bred them, gave way to the fat, square, contented-looking animal familiar today."
>
> —J. M. Roberts, *History of the World,* 1993

14. **Explain** Do you think Roberts would agreed that the changes in agriculture could be called an agricultural revolution? Why or why not?

15. **Analyze** How does Roberts's description of the sheep help the reader understand the change in their appearance over time?

Using the Internet

go.hrw.com
Practice Online
Keyword: SHL IND

16. The cities of Manchester and Birmingham, England, suffered some of the worst effects of the Industrial Revolution. The two cities also contributed much to Great Britain's rise to power and wealth. Choose one of these cities and use the Internet to research the role it played in industrialization. Then, create a chart showing the city's contributions and problems.

WRITING ABOUT HISTORY

Exposition: Writing an Explanation *The Industrial Revolution changed life in every society it touched. It affected individuals as well as groups, the rich as well as the poor, the cities as well as the rural areas.*

17. **Assignment:** In an essay, explain how this revolution affected people in three ways: how they worked, how they conducted business, and how they lived at home. To provide support for your explanation, use information from this chapter and from other research sources as needed. Be sure to use facts and examples to clearly illustrate the points you are making about the ways in which life changed.