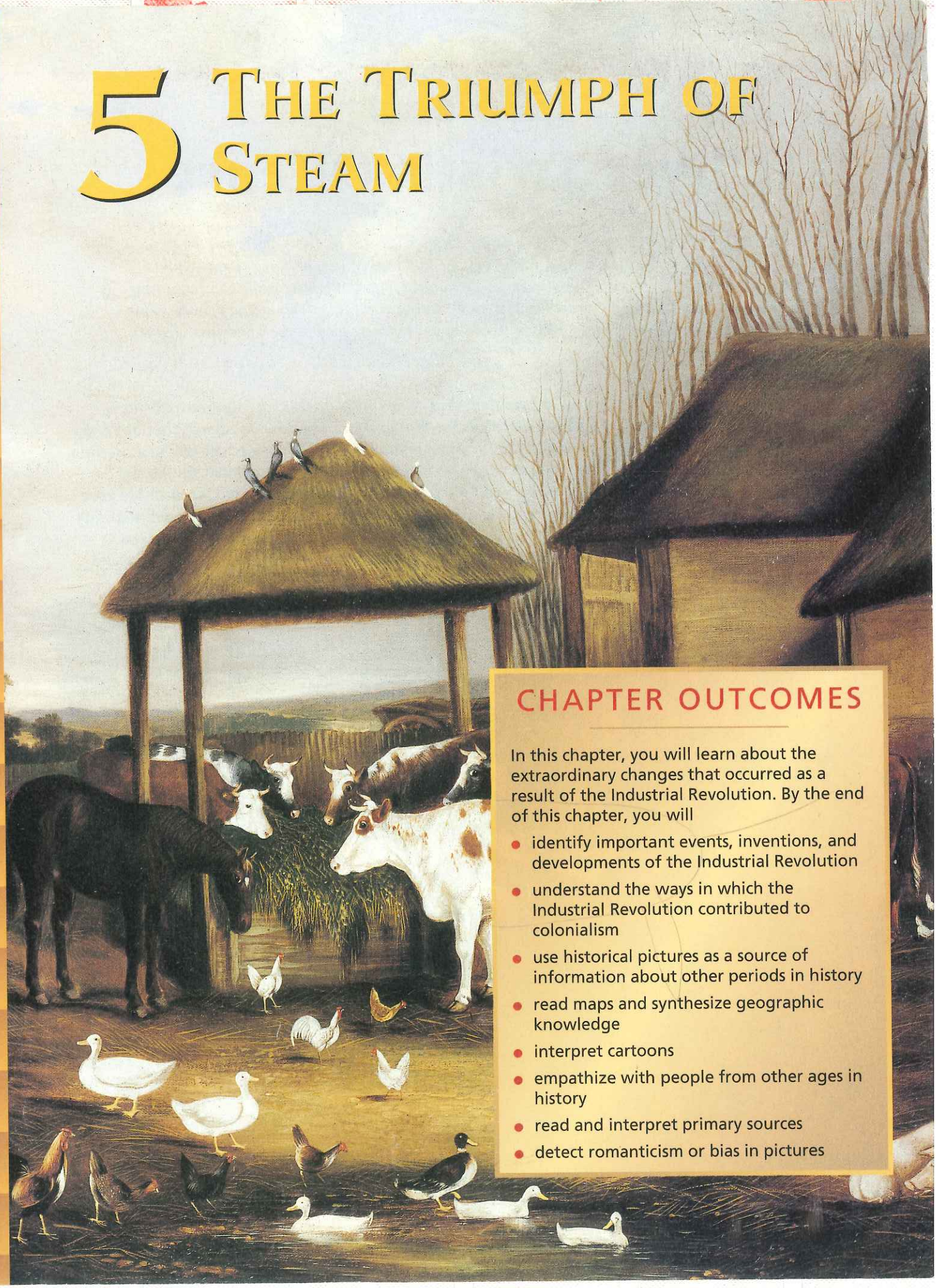
5 The Triumph of Steam



CHAPTER OUTCOMES

In this chapter, you will learn about the extraordinary changes that occurred as a result of the Industrial Revolution. By the end of this chapter, you will

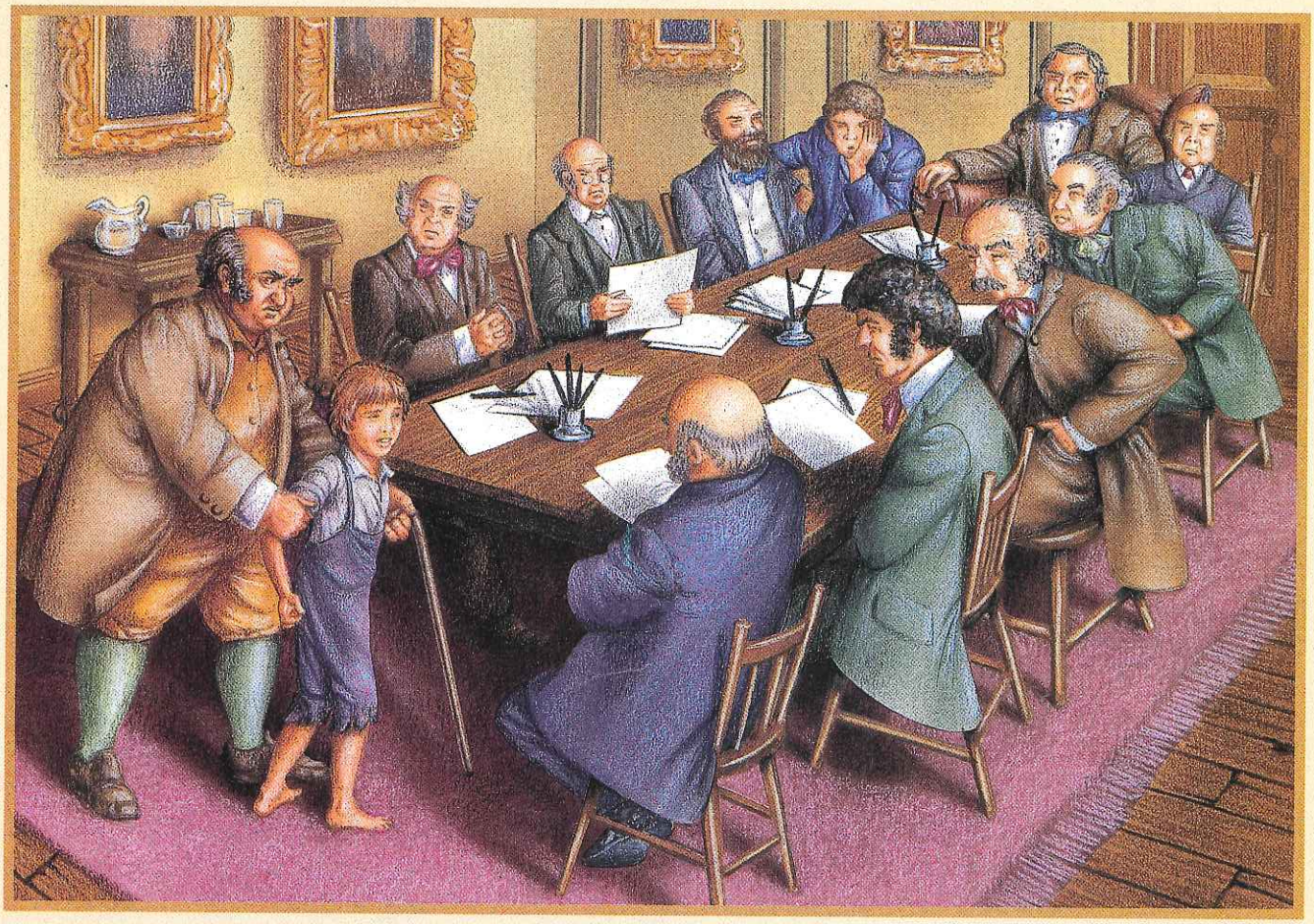
- identify important events, inventions, and developments of the Industrial Revolution
- understand the ways in which the Industrial Revolution contributed to colonialism
- use historical pictures as a source of information about other periods in history
- read maps and synthesize geographic knowledge
- interpret cartoons
- empathize with people from other ages in history
- read and interpret primary sources
- detect romanticism or bias in pictures

Oliver Twist's Offence

Oliver Twist *was written by the English writer Charles Dickens in 1838. Dickens himself had experienced life in a workhouse. As a young boy, he had worked in a blacking factory while his father was in debtor's prison. The experiences he endured during this time made him feel utterly hopeless, and forever changed Dickens's outlook on the society around him. This excerpt from the novel describes how the orphan, Oliver Twist, is chosen to ask for more food at the workhouse, and the consequences of his action.*

Oliver had not been within the walls of the **workhouse** a quarter of an hour and had scarcely completed the demolition of a second slice of bread when Mr. Bumble, who had handed him over to the care of an old woman, returned; and telling him it was **board** night, informed him that the board had said he was to appear before it forthwith.

Not having a clearly defined notion of what a live board was, Oliver was rather astounded by this intelligence and was not quite certain whether he ought to laugh or cry. He had no time to think about the matter, however, for Mr. Bumble gave him a tap on the head with his cane to wake him up and another on the back to make



Oliver meets the board of the workhouse.

him lively; and, bidding him follow, conducted him into a large whitewashed room where eight or ten fat gentlemen were sitting around a table. At the top of the table, seated in an armchair rather higher than the rest, was a particularly fat gentleman with a round, red face.

"Bow to the board," said Bumble. Oliver brushed away two or three tears that were lingering in his eyes and, seeing no board but the table, fortunately bowed to that.

"What's your name, boy?" said the gentleman in the high chair.

Oliver was frightened at the sight of so many gentlemen, which made him tremble, and the **beadle** gave him another tap behind which made him cry. These two causes made him answer in a very low and hesitating voice. Whereupon a gentleman in a white waistcoat said he was a fool, which was a **capital** way of raising his spirits and putting him quite at his ease.

"Boy," said the gentleman in the high chair, "listen to me. You know you are an orphan, I suppose?"

"What is that, sir?" enquired poor Oliver.

"The boy *is* a fool—I thought he was," said the gentleman in the white waistcoat.

"Hush!" said the gentleman who had spoken first. "You know you've got no father or mother and that you were brought up by the parish, don't you?"

"Yes, sir," replied Oliver, weeping bitterly.

"What are you crying for?" enquired the gentleman in the white waistcoat. And to be sure it was very extraordinary. What *could* the boy be crying for?

"I hope you say your prayers every night," said another man in a gruff voice, "and pray for the people who feed and take care of you—like a Christian."

"Yes, sir," stammered the boy.

◆ ◆ ◆

"Well! You have come here to be educated, and taught a useful trade, "said the red-faced gentleman in the high chair.

"So you'll begin to pick **oakum** tomorrow morning at six o'clock," added the surly one in the white waistcoat.

For the combination of both these blessings in the one simple process of picking oakum, Oliver bowed low by the direction of the beadle and was then hurried away to a large ward where, on a rough, hard bed, he sobbed himself to sleep. What a noble illustration of the tender laws of England! They let the **paupers** go to sleep.

◆ ◆ ◆

The room in which the boys were fed was a large stone hall, with a **copper** at one end out of which the master, dressed in an apron for the purpose and assisted by one or two women, ladled the **gruel** at mealtimes. Of this festive composition each boy had one **porringer**, and no more—except on occasions of great public rejoicing, when he had two ounces [57 grams] and a quarter of bread besides. The bowls never wanted washing. The boys polished them with their spoons till they shone again; and, when they had performed this operation (which never took very long, the spoons being nearly as large as the bowls), they would sit staring at the copper with such eager eyes as if they could have devoured the very bricks of which it was composed; employing themselves, meanwhile, in sucking their fingers most **assiduously** with the view of catching up any stray splashes of gruel that might have been cast thereon. Boys generally have excellent appetites. Oliver Twist and his companions suffered the tortures of slow starvation for three months; at last they got so **voracious** and wild with hunger that one boy, who was tall for his age and hadn't been used to that sort of thing (for his father had kept a small cook shop), hinted darkly to his companions that, unless he had another basin of gruel **per diem,** he was afraid he might some night happen to eat the boy who slept next him, who happened to be a weakly youth of tender age. He had a wild hungry eye, and they **implicitly** believed him. A council was held; lots were cast who should walk up to the master after supper that evening and ask for more; and it fell to Oliver Twist.

The evening arrived; the boys took their places. The master, in his cook's uniform, stationed himself at the copper; his pauper assistants ranged themselves behind him; the gruel was served out; and a long grace was said over the **short commons**. The gruel disappeared; the boys whispered to each other and winked at Oliver; while his next neighbours nudged him. Child as he was, he was desperate with hunger and reckless with misery. He rose from the table and, advancing to the master, basin

and spoon in hand, said, somewhat alarmed at his own **temerity**:

"Please, sir, I want some more."

The master was a fat, healthy man, but he turned very pale. He gazed in **stupefied** astonishment on the small rebel for some seconds and then clung for support to the copper. The assistants were paralyzed with wonder; the boys with fear.

"What!" said the master at length in a faint voice.

"Please, sir," replied Oliver, "I want some more."

The master aimed a blow at Oliver's head with the ladle; **pinioned** him in his arms; and shrieked aloud for the beadle.

The board were sitting in solemn conclave when Mr. Bumble rushed into the room in great excitement and, addressing the gentleman in the high chair, said:

"Mr. Limbkins, I beg your pardon, sir! Oliver Twist has asked for more!"

There was a general start. Horror was depicted on every countenance.

"For *more*!" said Mr. Limbkins. "Compose yourself. Bumble, and answer me distinctly. Do I understand that he asked for more, after he had eaten the supper allotted by the **dietary**?"

"He did, sir," replied Bumble.

"That boy will be hung," said the gentleman in the white waistcoat. "I know that boy will be hung."

Nobody **controverted** the **prophetic** gentleman's opinion. An animated discussion took place. Oliver was ordered into instant confinement; and a bill was next morning pasted on the outside of the gate, offering a reward of five pounds to anyone who would take Oliver Twist off the hands of the parish.

◆ ◆ ◆

For a week ... Oliver remained a close prisoner in the dark and solitary room to which he had been consigned by the wisdom and mercy of the board .... He only cried bitterly all day; and, when the long dismal night came on, spread his little hands before his eyes to shut out the darkness, and, crouching in the corner, tried to sleep; **ever and anon** waking with a start and tremble and drawing himself closer and closer to the wall, as if to feel even its cold hard surface were a protection in the gloom and loneliness which surrounded him.

Let it not be supposed by the enemies of "the system" that, during the period of his solitary **incarceration**, Oliver was denied the benefit of exercise, the pleasure of society, or the advantages of religious consolation. As for exercise, it was nice cold weather, and he was allowed to perform his

The reaction to Oliver's request for more food

ablutions every morning under the pump in a stone yard in the presence of Mr. Bumble, who prevented his catching cold and caused a tingling sensation to pervade his frame by repeated applications of the cane. As for society, he was carried every day into the hall where the boys dined and there sociably flogged as a public warning and example. And, so far from being denied the advantages of religious **consolation**, he was kicked into the same apartment every evening at prayer-time and there permitted to listen to, and console his mind with, a general **supplication** of the boys containing a special clause, therein inserted by authority of the board, in which they **entreated** to be made good, virtuous, contented, and obedient, and to be guarded from the sins and vices of Oliver Twist....

Oliver in solitary confinement

workhouse: a house in which poor people are lodged and sent to work

board: the people who direct a particular business, in this case, the workhouse

beadle: the person in day-to-day charge of the workhouse

capital: excellent (British slang)

oakum: loose fibres picked from old ropes that are used to caulk ships

pauper: a person with no money at all

copper: large boiler used for cooking or laundering

gruel: a light, thin liquid made by boiling a cereal such as oatmeal in water

porringer: one-handed metal bowl or cup

assiduously: attentively

voracious: extremely hungry

per diem: per day

implicitly: implied, not openly stated

short commons: small amount of food

temerity: reckless boldness

stupefied: to be struck senseless

to pinion: to bind or hold fast

dietary: a regulated allowance of food

to controvert: to dispute or deny

prophetic: giving warning of what is to come

ever and anon: now and again

to incarcerate: to imprison

ablution: washing

to console: to comfort

to supplicate: to beg

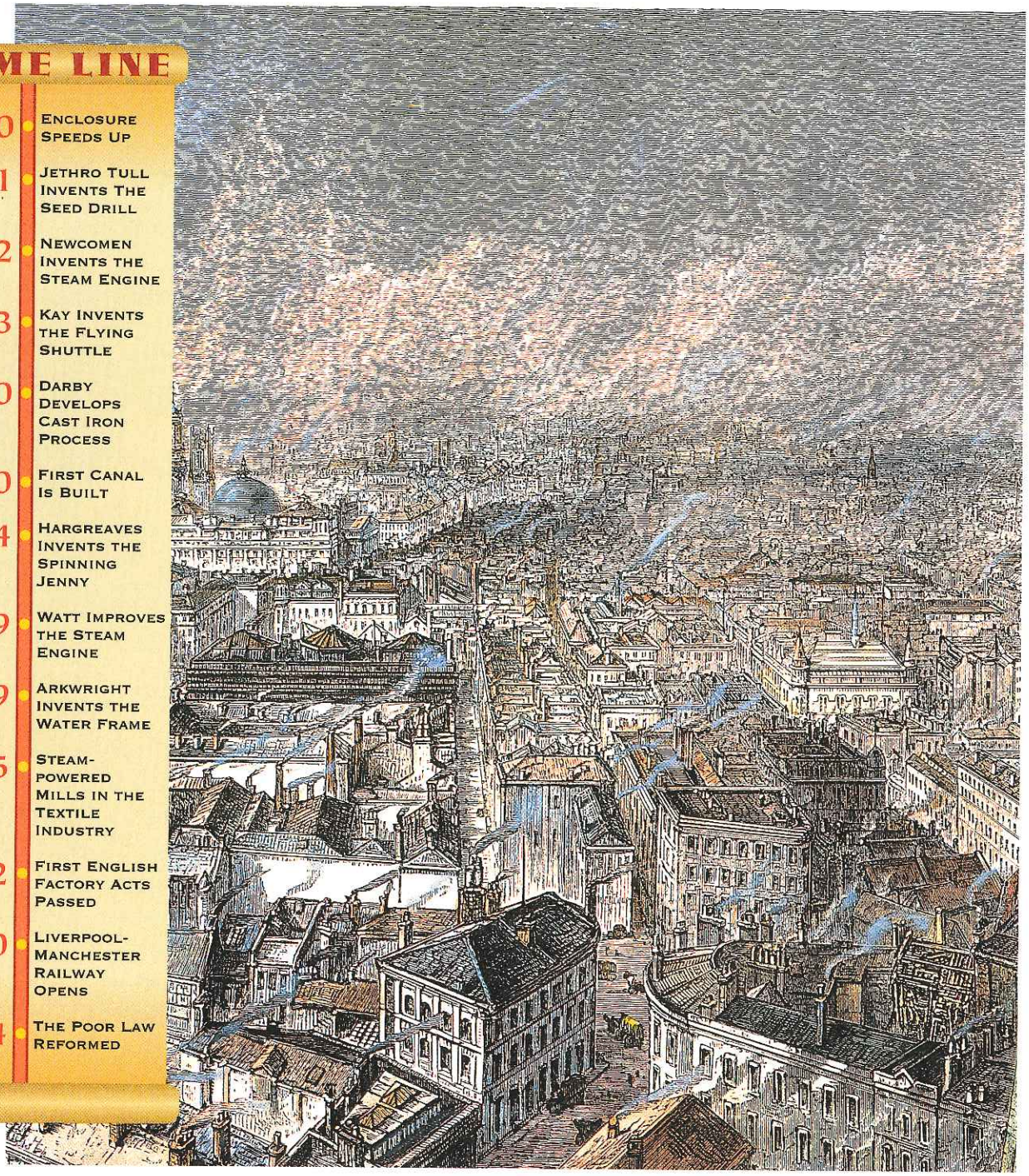
to entreat: to beg

ACTIVITIES

1. This short excerpt shows how Dickens used humour to draw attention to a serious situation. In particular, he used irony. Irony is using language that appears to mean one thing on the surface, when the writer actually means the opposite. Find three examples of irony and explain the double meaning of each.
2. Dickens is famous for the names he gave to his characters—Uriah Heap, Mr. Gradgrind, and Little Doritt are a few examples. Often these names help us to visualize the person. Does the name "Bumble" help you to visualize the beadle? Describe Bumble, and explain why Dickens gave him this name.
3. In this excerpt, we learn a lot about the workhouse from Oliver's point of view. What point of view did the board members have towards the workhouse?

TIME LINE

1700	Enclosure Speeds Up
1701	Jethro Tull Invents The Seed Drill
1712	Newcomen Invents the Steam Engine
1733	Kay Invents the Flying Shuttle
1750	Darby Develops Cast Iron Process
1760	First Canal Is Built
1764	Hargreaves Invents the Spinning Jenny
1769	Watt Improves the Steam Engine
1769	Arkwright Invents the Water Frame
1785	Steam-powered Mills in the Textile Industry
1802	First English Factory Acts Passed
1830	Liverpool-Manchester Railway Opens
1834	The Poor Law Reformed



The earth was made for Dombey and Son to trade in, the sun and the moon were made to give them light. Rivers and seas were made to float their ships...

–CHARLES DICKENS

Charles Dickens caught the spirit of the Industrial Revolution—that humankind had entered a bold new era of progress in which the exploitation of the earth's resources would greatly improve the material well-being of humanity.

INTRODUCTION

Not all **revolutions** are violent. Some revolutions happen as a result of new inventions and new ways of doing things. After 1700, the ways of growing food, and manufacturing and transporting goods changed completely in Great Britain. This change was great enough to be labelled a revolution, usually called the "Industrial Revolution." The changes in agriculture and industry that occurred during the years after 1700 affected all members of society in fundamental ways and completely transformed the face of society. This process has continued during the twentieth century. Your grandparents and parents watched society change as a result of the invention of the car, the airplane, television, and satellites. You are participating in the enormous changes that computer **technology** is creating in society.

The technologies of the Industrial Revolution transformed the old, traditional ways of farming. New towns and cities filled with people seeking employment in factories, where any number of new products could be made quickly and cheaply. Great Britain's economy grew enormously, and many people became very wealthy. Not everyone benefited, however. The majority of people who worked in factories endured long, hard hours in unsafe conditions for very little pay. Cities became even more dirty, crowded, and disease-ridden. Even small children had to work in dangerous and cruel conditions. The history of the Industrial Revolution is also the history of working peoples' struggle to enjoy some of the benefits of the new technologies for themselves.

The economy of the world became **global**, as the Industrial Revolution spread to other countries. Countries became linked in complex trading arrangements. Some countries were linked through colonial ties; the colonies supplied raw materials and bought manufactured goods from the **"mother" country**. Other countries followed Great Britain's example, and became **industrialized** themselves.

The Industrial Revolution also changed the ways in which humans interacted with nature. Until then, although humans had imposed technology on nature, it had never been done on the huge scale that industrialization brought about. At the time, most people looked on this as a sign of progress. They were not aware of the problems that could follow such large-scale **exploitation** of the earth's resources. Pollution, **global warming**, and the depletion of the **ozone layer** are results of the Industrial Revolution that the world must now find ways of coping with.

revolution: a complete change in something; the overthrow of a government

technology: new inventions; the science of industry

global: world-wide

"mother" country: in the language of colonialism, the colonizing power was often referred to as the "mother" country—a sexist reference no longer in use

industrialized: an economy based on industry, not agriculture

to exploit: to use

global warming: an increase in the world's temperature

ozone layer: a layer of gas above the Earth's surface that protects human beings from harmful rays of the sun

WHY BRITAIN?

The Industrial Revolution first took place in Great Britain. It was many years before other European countries followed the British example. There are many reasons why Britain led the world in industrialization.

Britain contained all the essential elements for industrialization. It had a good supply of people who were

labour supply: a supply of workers

Test Act: an act forbidding anyone except members of the Church of England from holding political office or entering the professions

capital: money used to invest in business

raw materials: the essential materials needed in an industry to make a product

inefficient: unproductive; inadequate in performance

commons: land held to be used by everyone

willing to work—in other words, a **labour supply**. The British population had grown rapidly since the 1600s, and the increased population needed work. In addition, because of new developments in farming technology, many former farmers now needed new kinds of work. There were many unemployed people wandering the countryside or moving to cities in search of employment.

The British middle class, who were mostly landowners and business people, had influence in the government as a result of the Glorious Revolution. (See Chapter 2 for an account of this.) Because of their importance in government, they were able to get parliament to pass laws that helped business grow.

Moreover, religious groups, such as the Puritans, were barred by the **Test Act** from positions in government, the church, or the army. These were the official positions of power in Britain. To compensate for this lack of official power, these people devoted themselves to business and industry. They became wealthy, and could invest their money in new businesses. This kind of money is called **capital**, and it is essential for industrialization. When the British colonized India, enormous amounts of treasure were stolen and shipped back to Britain—more capital to support industrialization.

Great Britain also gained an early technological advantage over other countries. The British government encouraged the numerous scientific advances and technological inventions that were being made during this time.

Britain also had large deposits of **raw materials**, such as coal. Coal provided a cheap source of power for the new machines needed in industry. Furthermore, Britain had many colonies. British companies could import raw materials from these colonies and then sell the finished products back to the colonies. Everything needed for industry to grow—a labour supply, a stable and pro-business government, capital, technology, good transportation, and raw materials—was present in Great Britain from 1700 on. Together, these made the Industrial Revolution possible.

An Agricultural Revolution—Sinking Money into The Earth

Enclosure thou art a curse upon the land,
And tasteless was the wretch who thy existence plann'd.

–OLIVER GOLDSMITH

The strip-farming methods used in medieval times, where farmers had many small and scattered strips of land to farm, were very **inefficient**. During Tudor times, landowners began to consolidate the small strips into large fields. This movement was called "enclosure." Larger fields meant that farmers spent less time working the land and could work it more profitably. The process of enclosure speeded up enormously after 1700.

At the same time, the large areas of land held by villages as **commons**—land which could be used by anyone

GUIDEBOOK

Using Pictures to Draw Conclusions

Social historians often use historical pictures to understand how a landscape, or cityscape, changed over time. These can assist historians in compiling the evidence necessary to form **conclusions** about the lives of the people who lived in a particular location at a particular time.

A good painting or drawing is like a snapshot of a time. In addition to the obvious elements of the painting, however, artists often **unconsciously** include many details of great value to historians. These can be just as important as the obvious information presented by the painting. Historians can use this unconscious information to draw conclusions about the time in question, along with other sources of information.

Examine the painting on this page. The painting, done by an unknown artist in the 1700s, shows Dixton Manor, the estate of an important family. Dixton Manor had many enclosed fields. Look carefully. This picture tells us a lot about enclosure.

conclusion: a deduction or inference

unconsciously: unaware

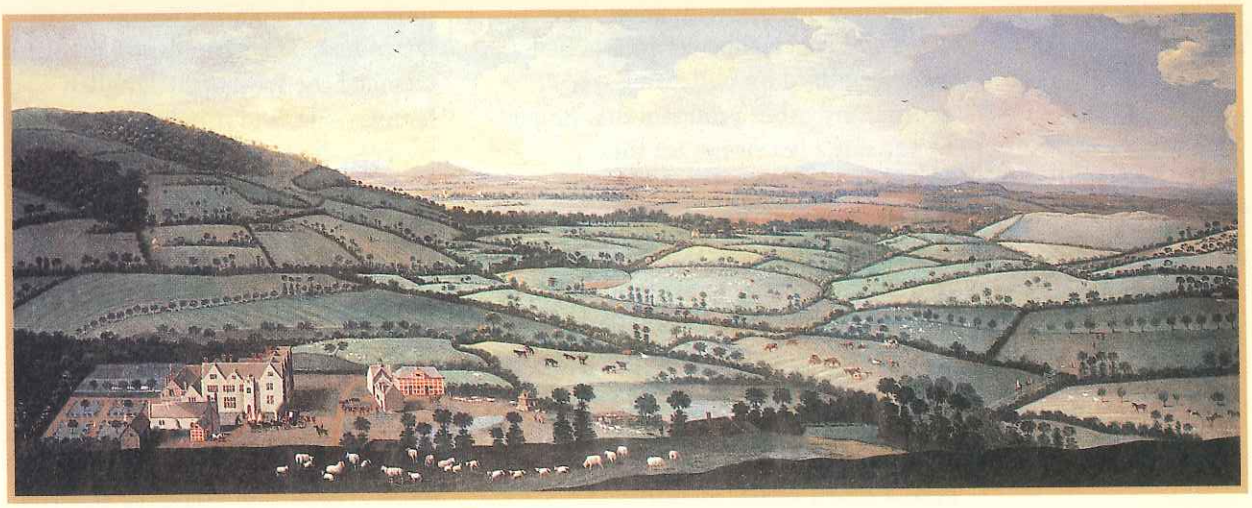


Figure 5–1 Dixton Manor

YOUR TURN

1. Have you been able to pick out the unconscious information the artist included in the painting of Dixton Manor? In this case, you have to look carefully at the ground. If you do, you can see the remains of old ridge-and-furrow agriculture—the strips once worked by individual farmers under the feudal system. At one time, this same view would also have included several villages.
2. Assume that it took four strips to support a family of five. What conclusions can you draw about the number of people who were displaced by enclosure?
3. Look at other paintings and drawings in this chapter and in other chapters of this book. Find one or two that give unconscious information in the details of the painting, and explain how this evidence can help modern historians understand the time period.

in the village—started to be turned into private property. Parliament passed laws making it possible for the commons to be divided up. In theory, all villagers were equally entitled to this land, but, in fact, only the better-off could afford to pay the fees required to obtain commons land. The result was that the amount of land available for farming increased a great deal, but in most cases, only the more wealthy farmers were able to take advantage of the enclosures.

Poor farmers were left in very unfortunate circumstances. The loss of the commons land was a particular hardship to them because they no longer had anywhere to **graze** their cows and sheep. The commons had also been used for collecting wood, acorns, and other products that helped to eke out a better life for their families. Many small farmers were driven to despair by the enclosures, and had no choice but to sell their farms to richer landowners, who could afford to take advantage of the situation.

In addition, enclosure led to a whole new attitude toward agriculture. Farming became a business, and people began to farm to earn a profit rather that just to support themselves. Large landowners were able to take advantage of technological innovations in farming techniques that occurred at this time. New plants and animals were introduced, and farming became much more mechanized.

Most of the small farmers who sold their land at this time spent the money they had received quickly. Sometimes they could become farm labourers, but often farming families had no choice but to go to the city to look for work. The cities were flooded with unemployed farmers and their families. On the other hand, the new city populations could be fed because the enclosed farms produced much more food than the old-fashioned, small farms had. The agricultural revolution changed the look of the English countryside, and it helped to create and support the Industrial Revolution.

DID YOU KNOW?

In 1790, the rural population of Britain was twice as high as the urban population. By 1840 this had reversed, and the urban population was twice as high as the rural population.

to graze: to feed on growing plants, such as grass

breed: a group of animals distinguished by particular characteristics

NEW BREEDS

Many English landowners saw that better farm animals would bring higher profits. Gradually, new **breeds** of cattle and sheep replaced the old, medieval types. These new breeds of animals produced more meat—and, in the case

Figure 5–2 The Gloucester Old Spot Pig, the result of years of careful selective breeding

of sheep, thicker wool—than in earlier times. It is a surprising fact, but until the agricultural revolution, people did not raise sheep or cattle primarily for meat. They raised cattle for milk and sheep for wool—and ate the ones they slaughtered in the fall because they lacked enough **fodder** to keep all the animals alive over the winter.

The new breeds of animals were hardier and did not catch diseases as easily. However, the new animals were expensive and, at first, in short supply. Keeping them over the winter was also expensive. Soon, many farmers were caught in a money crunch. They could not afford new and better animals and plants, and they could not compete with those farmers and landlords who did have enough money to invest in the new breeds.

NEW CROPS AND TECHNOLOGIES

As landowners became committed to raising food for profit, they became willing to invest money in farming techniques that had the potential to make them even richer. As business people, they understood that they had to accept the occasional failure and take financial risks if new ways of farming were to be found. Their goal was to make an acre of land produce more crop—and more money—while lowering their own costs of raising crops.

Jethro Tull and Lord Townshend (nicknamed "Turnip Townshend") were two innovators who helped make agriculture more profitable. Jethro Tull was an English inventor who tried to understand the way soil helped plants grow. He found that when soil was well broken up, or cultivated, and enriched with **manure**, or fertilizer, crops grew much better. Tull invented a planting machine, called a "seed drill," which could be pulled by horses. The seed drill planted seeds neatly in rows and was faster and much less wasteful than the old method of **broadcasting** seed. Many more seeds sprouted, instead of being eaten by birds and animals. Planting in uniform rows made weeding and crop maintenance much easier. The seed drill solved the problem of waste and made it possible to farm with fewer people.

"Turnip Townshend" was an English lord who had also been an important politician. Like most members of parliament of the time, he was also a wealthy landowner. Townshend had a great interest in agriculture and when he retired he devoted himself to making the farms on his estate more profitable. He found that by growing four crops—turnips, barley, grasses, and wheat—in rotation (turnips one year, barley the second year, grasses the third year, and wheat the forth year, and then repeating the cycle) four times as much crop could be produced. Land no longer needed to be kept fallow to recover its nutrients, because the new crops of turnips and clover released nitrogen into the soil.

In addition, turnips and clover could be used as inexpensive fodder to feed animals over the winter. This made it even easier to build and maintain large herds of animals. Enclosure, improved animal breeds,

DID YOU KNOW?

One young man who inherited a farm in 1776 used all the new agricultural methods available to him. In 1776, his farm earned £2000 a year; by 1816, it earned £20 000 a year. What percentage increase in revenue does this represent?

fodder: animal food

manure: animal droppings used to fertilize land

to broadcast: to sow seeds by throwing them over a field by hand

DID YOU KNOW?

During medieval times, one-third of farming land was always in fallow—meaning that no crops were grown on this land. Reducing the need to leave fields fallow increased agricultural production by one-third.

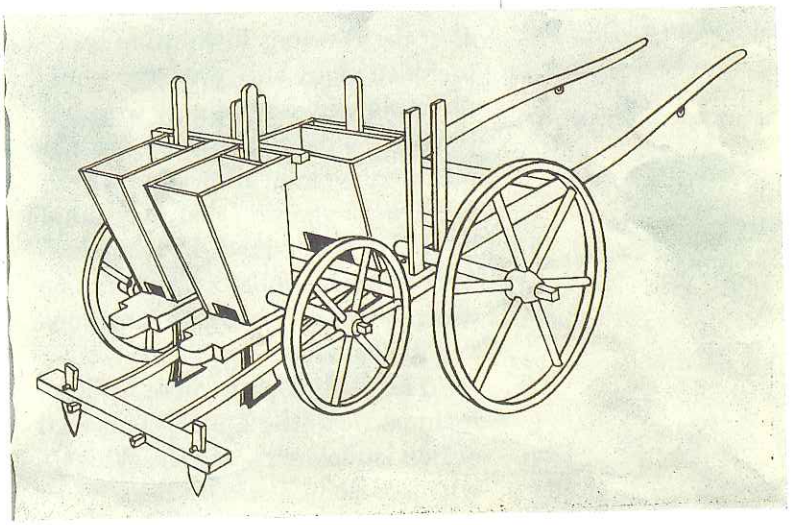


Figure 5–3 This seed drill was invented in 1701 by Jethro Tull.

cultivation, fertilization, careful seeding, and crop rotation all made farms much more productive. The agriculture of France and other European countries was backward in comparison.

With enclosure, the population of many towns grew very quickly, especially in the centre part of England—an area called "the Midlands." Towns such as Manchester and Liverpool changed from sleepy little country towns into bustling cities, filled by the many farming families who no longer had farms. The growth of cities and towns was possible because improvements in agriculture increased the amount of food and made it possible for fewer farmers to feed large city populations.

ACTIVITIES

1. What are the essential ingredients of industrialization? Draw a circle in your notebook and label the circle "industrialization." Draw lines radiating out from the circle to represent the essential elements needed for industrialization to occur. Explain how each of these elements contributed to industrialization.
2. Write a letter to your local member of parliament from the point of view of a poor farming family. Explain the consequences of enclosure for your family.
3. Pretend you are a prosperous eighteenth-century English landowner. Write a letter to your friends in London describing some of the experiments you are trying on your farm. Explain why you are trying them, and the results you expect to get from them.

An Economic Revolution

entrepreneur: a person who runs a business, taking the risk in order to earn a profit

franchise: the right to vote

self-interest: action in one's own interest, rather than in another's

England had a pro-business government. Although only people with wealth and power could get seats in parliament, after the Glorious Revolution this included many **entrepreneurs** from the middle class. Ordinary working people still did not have the **franchise**. Nor were women allowed to vote. Even the suggestion that they should be able to vote—made by women such as Mary Wollstonecraft among others—was considered a dangerous and foolish idea.

The English parliament had two main parties—the Tories, composed of rich landowners, and the Whigs, who represented middle-class business people. The business people caused the government to follow an economic policy called *laissez-faire*.

The laissez-faire policy meant that business and industry would be as free as possible from government regulation. The theory was that competition and **self-interest** would provide the greatest good for the greatest number of people. In other words, if people were free to pursue profit without too many government regulations, they would be motivated to make their industries bigger. In turn, this would create a wealthy and productive economy. The wealth created by the businesses would benefit everyone in society. Business

people who supported laissez-faire were opposed to any government regulations that would hurt their ability to pursue a profit. This was not always good for the workers, because it meant the business owners wanted to keep the wages paid to workers as low as possible, in order to increase profits.

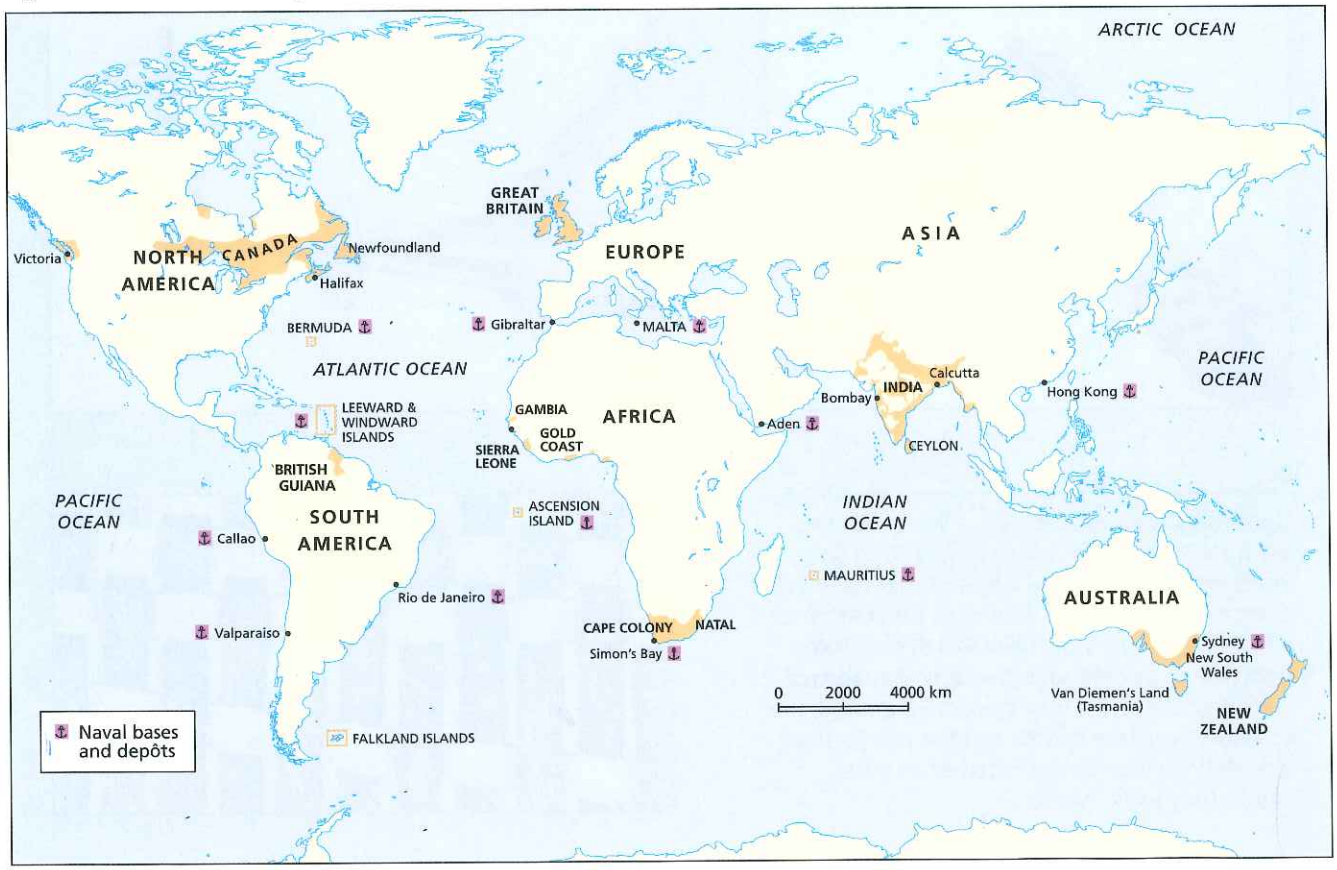
In addition to the government's laissez-faire policies, industry in Great Britain was helped by a whole range of new technologies that greatly improved industrial processes. Inventions in the textile industry, in the coal and iron industries, in ceramics, and in many other fields completely changed those industries. Also, a source of power was found that would revolutionize, first, Great Britain's industry, and then the world's. Under such conditions, business and industry grew enormously.

THE TEXTILE INDUSTRY

The textile industry was an important part of the Industrial Revolution, and it helped make Great Britain into a rich and powerful country. Textiles are cloth and cloth products. Today, of course, many textiles are made from **synthetic** fibres, many of which are made from oil. Until the twentieth century, however, all cloth was made from plant or animal fibres—wool from sheep, silk from silk worms, and linen from flax. Britain's climate and geography suited the raising of sheep, so that wool had been an extremely important industry in Britain for a long time. Enclosure, for the first time, had made it possible and profitable to maintain enormous herds of sheep. British wool could be harvested fairly cheaply and turned into cloth in nearby communities.

synthetic: made by humans

Figure 5–4 Areas colonized by Britain in 1850



DID YOU KNOW?

Britain's demand for cotton meant that many people in the southern United States became cotton farmers. This greatly increased the number of slaves in the United States, because slaves were used to work in the cotton fields.

British wool was high quality wool, and British woolen cloth was in high **demand** in Europe and elsewhere.

The textile industry was a major factor in Britain's desire to acquire new colonies. A cotton as well as a wool industry developed. Cotton from the former colonies in the southern United States was supplemented by cotton from newly conquered India, which also supplied natural dyes.

Many of the important inventions during the early days of the Industrial Revolution had to do with the manufacture of cloth. Many people in Britain were involved in the textile industry, either as investors or as textile workers. Inventions that could speed up the process of making cloth could make the inventor a fortune. Several inventors, John Kay and James Hargreaves, for example, literally went from "rags to riches" because their inventions improved profits in the textile industry.

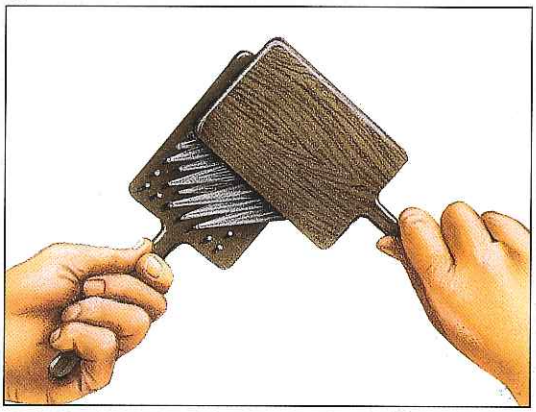
One of the first important inventions in the textile industry was the "flying shuttle," invented by John

demand: desire for particular goods

The Making of Cloth

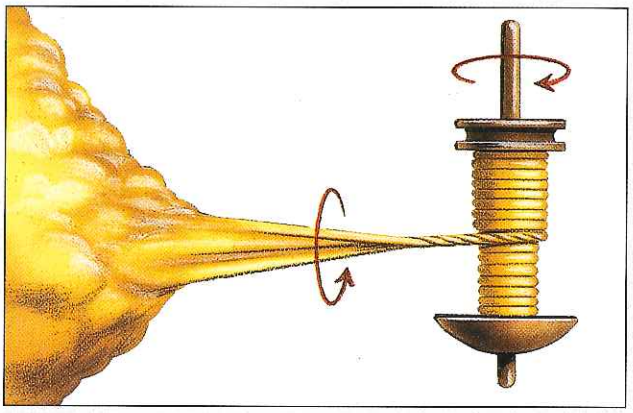
1

Raw textile fibre always needed some preparation. Cotton had to be cleaned of seeds and other plant materials, and wool from sheep had to be cleaned of the debris the sheep had picked up.



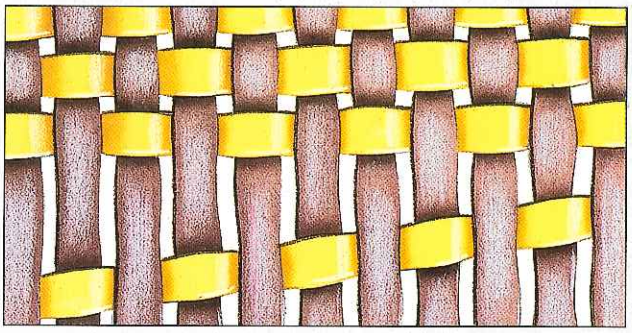
2

The cotton or wool fibres needed to be drawn out by a spinner and twisted together to make a continuous, rope-like thread. Before the Industrial Revolution, spinners used a spinning wheel, or a distaff—which was a pole, often with a weight, that could be twirled to make thread.



3

Once the thread was created, a weaver turned the thread into cloth. Weaving was done on a loom, which allowed the weaver to set up a web of strands of yarn from the top to the bottom of a frame. A shuttle was then used to pass yarn from side to side through the vertical strands of yarn. Because of the way the loom operated, the up-and-down yarn strands and the side-to-side strands were interlocked together. In other words, they were "woven."



Kay in 1733. This device made weaving much faster, and allowed large looms to be operated by only one person. On a small loom, the weaver could throw the shuttle from one hand to the other across the threads, but on a large loom two people were needed. John Kay's invention, however, used springs and levers to pull the shuttle back after it had crossed the threads. This made weaving on a large loom much faster. Of course, it also put one of the two shuttle throwers out of a job.

Weaving used up yarn faster than the spinners could produce it; the flying shuttle made the problem of yarn supply even worse. It was obvious to many people that inventions that could make spinning faster would quickly be accepted. Inventors hurried to fill the need for more thread. Many people tried to invent spinning machines, but without success. In 1764, however, James Hargreaves built the Spinning Jenny, which he named for his wife.

The Spinning Jenny was an ingenious device, driven by a hand-cranked wheel, which allowed a spinner to spin off a number of threads at the same time. This meant that one spinner could now do the work of several spinners. Hargreaves was himself a poor spinner. Because of this, he tried to keep his invention a secret, using it only to produce yarn for himself. This proved to be impossible, and the existence of the new machine soon became known. One day, an angry mob of spinners broke into Hargreaves's house and destroyed the original Spinning Jenny. Forced to move away, Hargreaves soon found partners and set up his own spinning factory. He became a very wealthy man and had no sympathy for other textile workers.

The Spinning Jenny was an important improvement for the spinning part of the textile industry. The need for spun yarn was so great that Spinning Jennies were soon being used all over England.

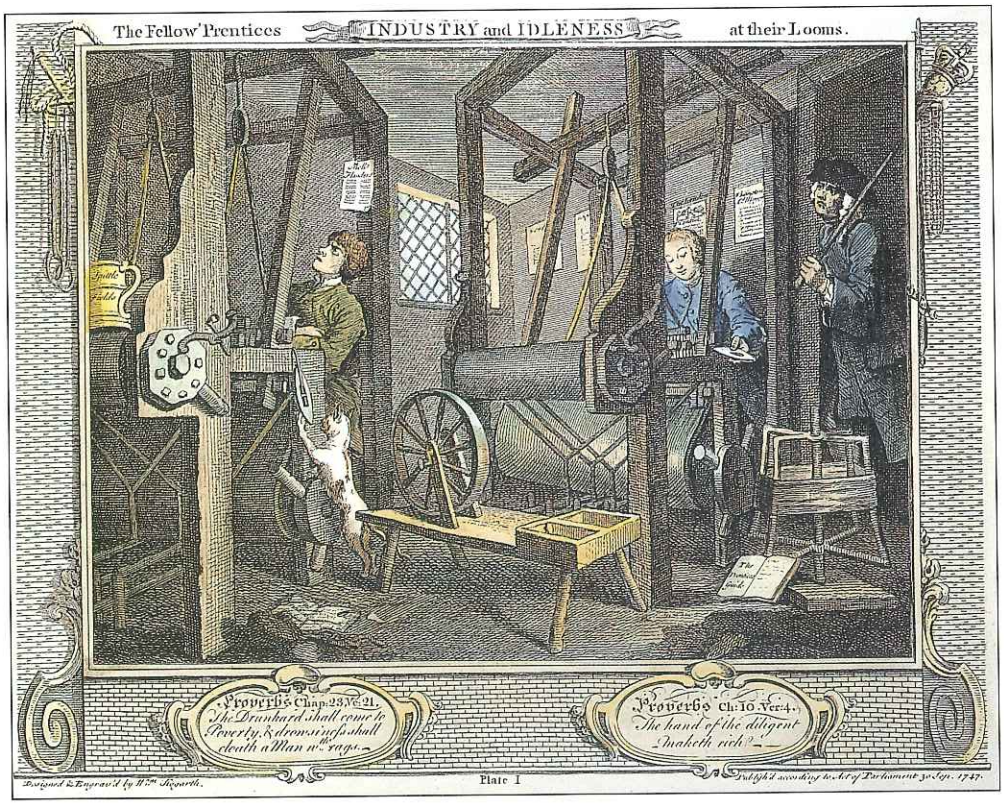


Figure 5–5 *The Fellow 'Prentices at Their Looms,* by William Hogarth. This engraving from 1747 shows two apprentice weavers working at their looms, watched by the master holding a stick. The boy closest to the door is holding a shuttle in his left hand ready to throw it through the yarn to the other side. Yarn is wrapped around a large spool. There is also a spinning wheel in the room. Such pictures help us learn about the conditions under which people worked and about the machines they used. How would you find out if this shop was typical of the period?

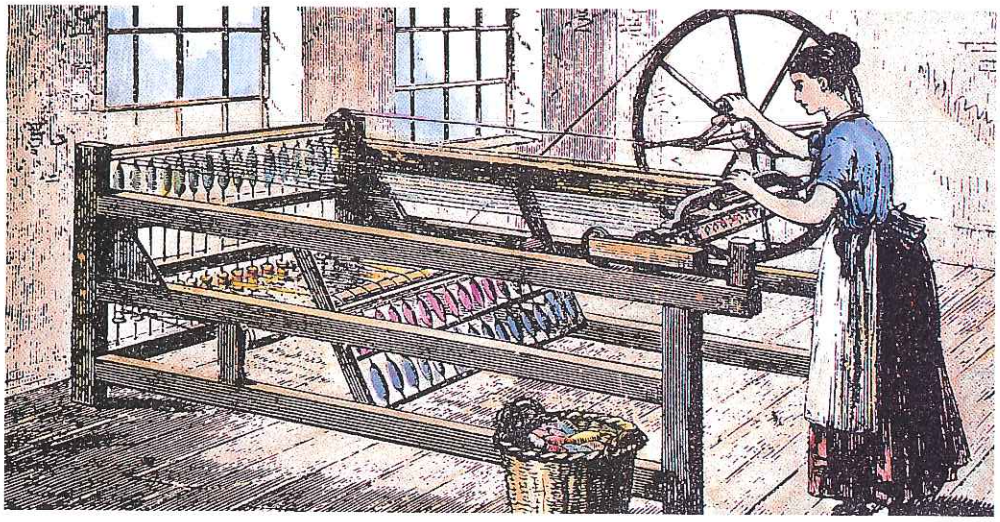


Figure 5–6 By using many spindles, the Spinning Jenny allowed a spinner to make yarn much faster than by the old methods.

to seep: to trickle slowly

compressed steam: steam under pressure

Other ways of improving spinning were also invented. Richard Arkwright developed the Water Frame, a way of spinning yarn using rollers. This machine improved the strength of the yarn being spun and was even faster than the Jenny. Arkwright also became very wealthy as a result of his invention. Later, Samuel Compton built a machine he called a "mule." The mule combined the best features of the Water Frame and the Spinning Jenny. Many other inventions followed, all designed to improve the spinning process.

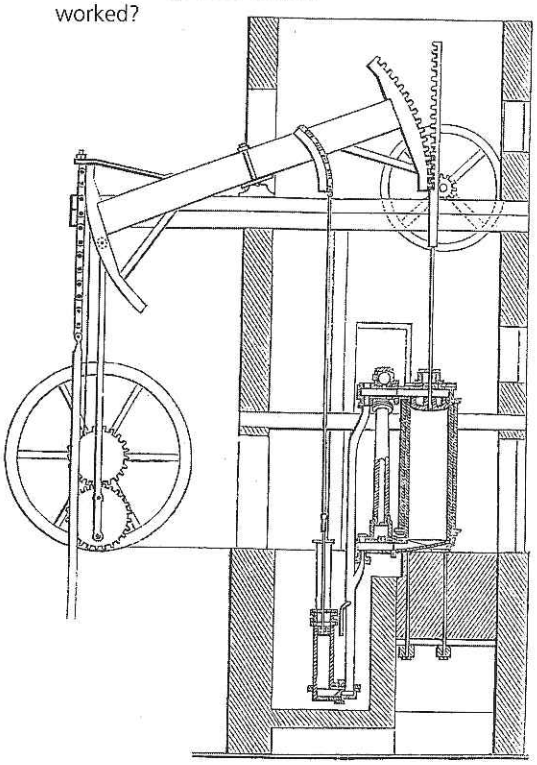


Figure 5–7 James Watt's double-rotating steam engine, 1769. Steam engines made many things possible—large machines, locomotives, and large ocean-going ships made of steel. The steam engine was at the heart of many machines, and coal was used to produce the steam. Can you see how it worked?

Once a plentiful supply of good quality yarn was available, it was possible to mechanize weaving even more. This led to enormous looms, which could no longer be powered by human labour. Such large machines also needed large buildings to house the machines and the labourers needed to work them. Many new factories were built. The textile industry became a factory industry dependent upon power.

THE STEAM MACHINE

Other industries also became dependent upon a secure source of power. Many industries close to a source of running water could use water wheels to run machines, as long as the factory was not too big. But the lack of power was a major problem for many factory owners.

The first breakthrough in providing power for factories—and for other industries—came as a result of problems with water that **seeped** into deep coal mines. This water had to be pumped out before the miners could work, and the deeper underground the mines went, the harder it was to pump water out. Part of the problem was solved when Thomas Newcomen invented a machine that harnessed the power of **compressed steam**. This machine—or engine—used steam to pump the water out of the mines.

But Newcomen's engine did not work very well, and it was only the first step in solving the growing power needs of industry. The real breakthrough came when James Watt, a Scottish machine-maker, figured out a way to get the maximum use out of the steam being produced in Newcomen's engine. Watt's new

steam engine was much more practical and efficient, producing power with relatively little waste. Used first to pump water out of mines, Watt adapted the engine so that it could drive machines. In so doing, Watt had solved the problem of powering the factory age.

THE IRON AND COAL INDUSTRIES

The iron and coal industries were also important to the Industrial Revolution. They began to grow much faster after 1750, when Abraham Darby invented a process for making better **cast iron**. Improvements by other inventors followed quickly. Soon cast-iron products were available everywhere, largely because they were much easier and cheaper to produce than other metal products. Cast iron could be used for all sorts of things, from pots and pans to the supports needed to hold up bridges. Larger and larger cast-iron factories were built. England became the world's leading producer of cast iron.

The coal industry was closely linked to the iron industry because coal is used in its manufacture. Darby used coke—a form of coal that has been heated to burn off the sulphur that coal contains—to make better iron. As the iron industry grew, the coal industry grew with it. The stream engine also used coal, provoking even greater growth in the coal industry.

Everyone burned coal for heat in the cold, damp English winter. England had large deposits of coal in many areas, so it was a relatively cheap fuel. Coal deposits were often far underground, and mines were dangerous places to work—coal produces methane gas, which explodes very easily. Coal dust is also highly toxic. Coal miners worked from the dark of early morning to the dark of night, and saw the sun only one day a week. Miners usually died young, in accidents or from "Black Lung," which is a disease caused by breathing coal dust. Wages were as low as mine-owners could make them. Without coal, however, there would not have been an Industrial Revolution

DID YOU KNOW?

Until relatively few years ago, the buildings of most larger European cities were black with grime from coal smoke, and their air was badly polluted. London, for example, sometimes had "killer fogs," dense clouds of moisture and coal-smoke pollution. What changes were necessary before these problems could be solved?

cast iron: molten iron poured into a mould to make a product

ACTIVITIES

1. Make a list of the positive and negative aspects of laissez-faire economic theory.
2. Explain what the textile industry is, and why it became important in Britain. In what ways was the textile industry a global industry? How did it spur the growth of colonies?
3. Imagine you are one of the spinners who protests the invention of the Spinning Jenny. Write a letter to a newspaper explaining your reasons. Your letter should show that you understand the implications of the invention. It should also give good reasons why you think its use should not be allowed.
4. Identify and explain the importance of three other inventions of the Industrial Revolution. Show how one invention lead to another.
5. Make up an epitaph for a young coal miner, detailing the cause of death and the circumstances. Were such people heroes of the Industrial Revolution? Explain your opinion.

Transportation—From Market to Market

market: those wishing to purchase goods

toll: a fee for using a road

The Industrial Revolution could happen only if the products factories made could be cheaply transported to people who needed them—to the **market**, in other words. At the other end, factories also needed tonnes and tonnes of raw materials of every kind. Some raw materials had to be brought from colonies on the other side of the world.

In 1700, England's transportation system was very poor indeed. It was almost impossible to travel quickly or easily for long distances. Many roads were still "medieval" and became no more than muddy tracks in bad weather. Although goods could be sent by sea, or along the rivers, whole areas of the country could not be reached this way. Good transportation was desperately needed.

Roads in 1700 were so bad that in many places goods had to be carried on pack-horses for long distances. Each pack-horse could only carry 100 or 200 kilograms, and they had to be loaded just right. Pack-horses often slipped or dumped their loads. Horses used for transport had to be regularly fed and rested, and this slowed progress considerably. Long stretches of good road—where large wagons could be used—were needed before the factory system could develop completely.

One of the first strategies for improving roads was the turnpike system. This was a way of getting roads built at no cost to the government. Private companies were allowed to build a section of road and to charge **tolls** to anyone who used it.

One of the most successful turnpike engineers was James Macadam. Macadam built roads that would not become muddy. The roads were built of three layers of graded stone, with the largest stones on the bottom and fine granite gravel on the surface. The surface of the road would shed water because the sides of the road sloped away from the center. Macadam roads were a vast improvement on earlier roads. Soon, the Macadam technique was being used everywhere. Today's gravel roads in British Columbia are Macadam roads.

With new roads, regular stagecoaches could carry passengers and mail relatively quickly from town to town. Goods could be transported by wagons, the equivalent of modern transport trucks.

New roads alone did not solve the transportation problems of the Industrial Revolution. Investors also began to build canals in the 1700s. Soon a network of waterways linked the different parts of Great Britain. Canals—narrow, artificial water channels—were built to link rivers together. The canals carried raw materials and goods to the big industrial cities, reducing the cost of shipping by three-quarters.

Figure 5–8 A Macadam road in Delta, BC. Macadam roads were later improved by the addition of tar to the surface layer of gravel. The resulting surface was called "tarmac."

Figure 5–9
Today, the canals are used for pleasure boating. An aqueduct carries this canal over a valley.

The first canal, finished in 1760, was only a few kilometres long, but soon England was criss-crossed with canals busy with traffic. Some of these canals were remarkable feats of engineering—sometimes being carried on bridges high over river valleys. By the early nineteenth century, over 4000 kilometres of canals had been built.

Improvements in transportation made it possible to ship raw materials and manufactured goods relatively quickly and cheaply. This vastly increased the profits of English industry. In Europe and America, other nations followed suit, rushing to build the infrastructure necessary to support industry.

RAILWAYS

Even more important to the transportation system, in the long run, was the use of the steam engine in **locomotives**. In 1829, George and Robert Stephenson built a locomotive—called the "Rocket"—that could pull a small train at the unheard of speed of 39 kilometres per hour. Nothing built by human beings had ever been able to travel so fast. By the mid-1800s many railway lines had been built in Europe and North America, as well as in Britain. By the end of the century, countries all over the world had railway networks. Railways became the most important means of transportation during the late-nineteenth century.

locomotive: a steam engine designed to pull cars on a railway

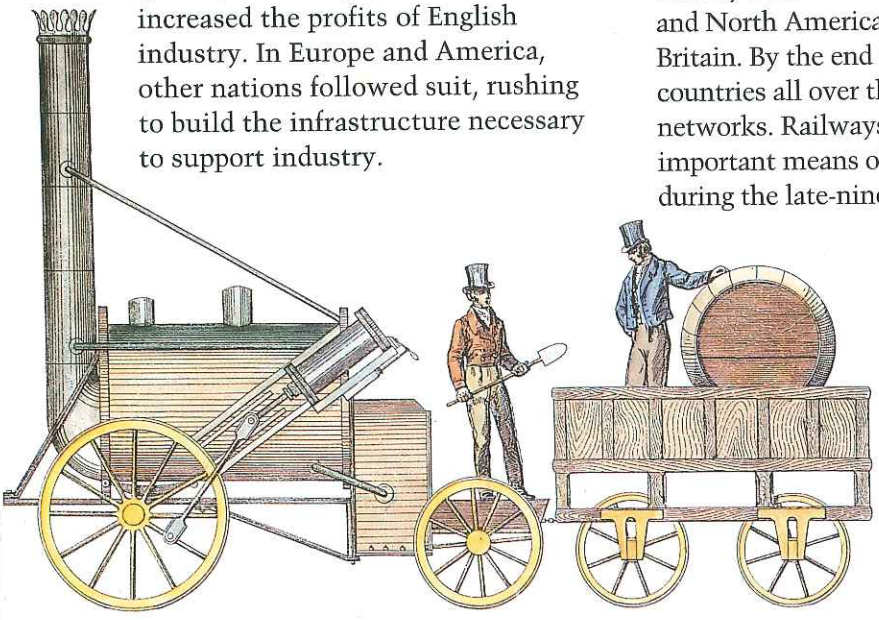


Figure 5–10 The "Rocket" built by George and Robert Stevenson

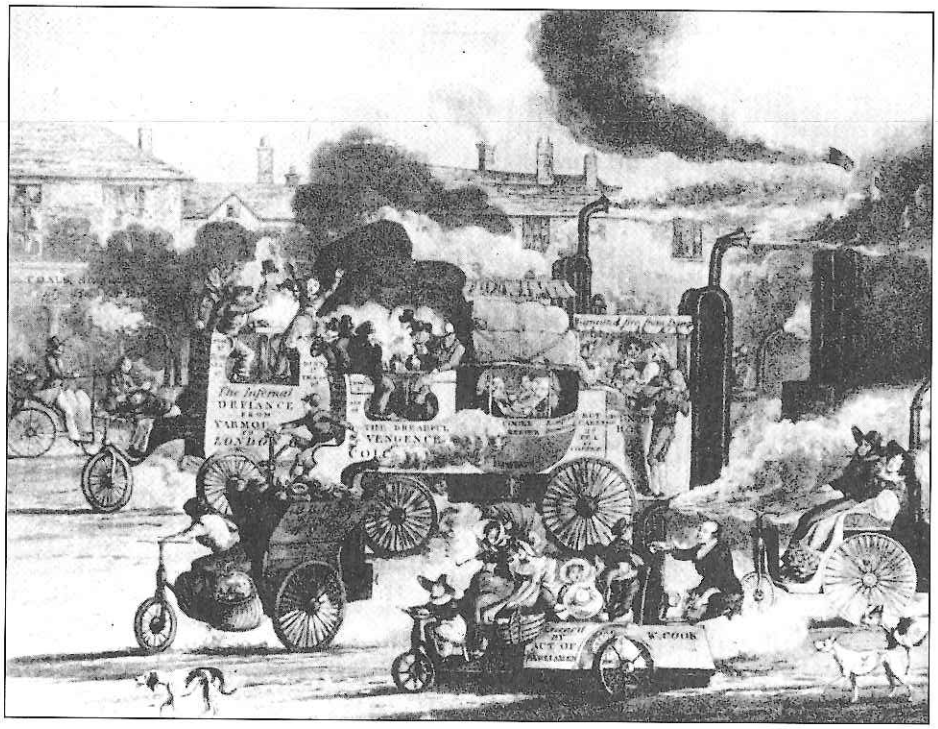


Figure 5–11 A futuristic view of the traffic and pollution problems to come, 1831. Steam carriages had already been tried, with limited success.

DID YOU KNOW?

At first, people thought that it was unhealthy for humans to travel at the speed the locomotives could reach.

The Opening of the Liverpool to Manchester Railway, 1830

This account of the first train ride on the Liverpool to Manchester line describes the joy and fear people felt. Unfortunately, a fatal accident spoiled the great event. What modern or future technology might draw such crowds?

"We started on Wednesday last, to the number of about 800 people, in carriages. The most intense curiosity and excitement prevailed, and, though the weather was uncertain, enormous masses of densely packed people lined the road, shouting and waving hats and handkerchiefs as we flew by them... What with the tremendous velocity with which we were borne past them, my spirits rose to real champagne height, and I never enjoyed anything so much as the first hour of our progress ... [my mother] rejoined me when I was at the height of my ecstasy, which was considerably damped by finding that she was frightened to death, and intent upon nothing but devising a means of escaping from a situation which appeared to her to threaten with instant annihilation herself and all her travelling companions ... presently a hundred voices were heard exclaiming that Mr. Huskisson was killed ... Poor Mr. Huskisson [one of several men who had jumped off the train to look around while it took on a supply of water, did not notice an engine approaching on the other track]... bewildered by the frantic cries of "Stop the Engine! Clear the Track!" ... completely lost his head, looked helplessly to the left and right, and was instantly prostrated by the fatal machine, which dashed down like a thunderbolt upon him, and passed over his leg, smashing it and mangling it in the most horrible way.... So great was the shock that the Duke of Wellington declared his intention not to proceed, but to return immediately to Liverpool... However ... the whole population of Manchester had turned out to witness the procession, and because a disappointment might give rise to riots and disturbances, he consented to go on, and gloomily enough the rest of the journey was accomplished." [Mr. Huskisson subsequently died of his injuries.]

PRIMARY SOURCE

ACTIVITIES

1. Explain why a transportation system can help or hinder industrialization.
2. Describe the improvements in transportation which took place in the eighteenth and nineteenth centuries in Britain. Make a PMI chart focusing on improvements in transportation and their effects.
3. With a partner, brainstorm the ways that the steam engine would change society. Would these changes be restricted to the area of transportation alone? Explain why or why not.

Improvements (point form)	Plus	Minus	Interesting

MECHANIZATION AND THE FACTORY SYSTEM

Before the Industrial Revolution, many of the products that people bought and used were made in people's houses—or cottages—not in factories. This has been called "cottage industry," and was part of the early Industrial Revolution. Cottage industry has never completely disappeared, even in the modern world.

A person with money to invest—a **capitalist**—paid people to make a particular product in their homes. The product was then collected from their homes. Usually, the cottager was paid a fixed price for each completed item.

The cottage industry was especially important in Britain in the textile industry. Spinning and weaving were all done by cottagers who were also farmers. Frequently, the farm wives would spin in their spare time to supplement the income from farming. In many cases, one person in each village would act as the weaver, since looms took up too much space to fit into each cottager's house. The finished goods were then collected by **clothiers**, who sold the finished goods.

There were advantages and disadvantages to the cottage system. The cottagers were working at home and so could look after their families. They were able to live and work in their own communities, with the support of their friends and relatives. And the income benefited the family.

On the other hand, spinning and weaving were generally very poorly paid. People worked extremely long hours for very little return. This was partly because almost anyone could learn to spin and weave. It was not necessary for a spinner or weaver to be an artist; it was more important to produce work of reasonable quality. In addition, individual cottagers worked alone. Without the support of other workers, they had little power when dealing with their employers. In poor farming years, when many people turned to spinning and weaving for additional income, the

capitalist: a person with money to invest

clothier: a capitalist who invests money in textile-making

Figure 5–12 A modern cottage industry where pottery is made

Figure 5–13 An engraving of cottage industry, 1783. These people are preparing flax for the manufacture of linen in a cottage in County Down, Ireland. Likely they are all family members, but we do not know because they have not been identified.

clothiers were able to lower the prices they paid because there were so many people willing to work. This is called "the law of supply and demand"—the more **supply** there is of a particular item, the cheaper it is. If an item is in scarce supply, the **demand** for that item is high, therefore, the more expensive it is.

THE FACTORY AGE

The new inventions of the Industrial Revolution made the cottage system obsolete. Most of the new inventions were large and required a source of energy—either water or steam—that individual people could not provide. Richard Arkwright's Water Frame, for example, was just too large to fit into a cottage, and it could not be powered by hand or foot, the way simple spinning wheels could be.

supply: the amount of goods available

demand: the desire of people to buy a certain good or product

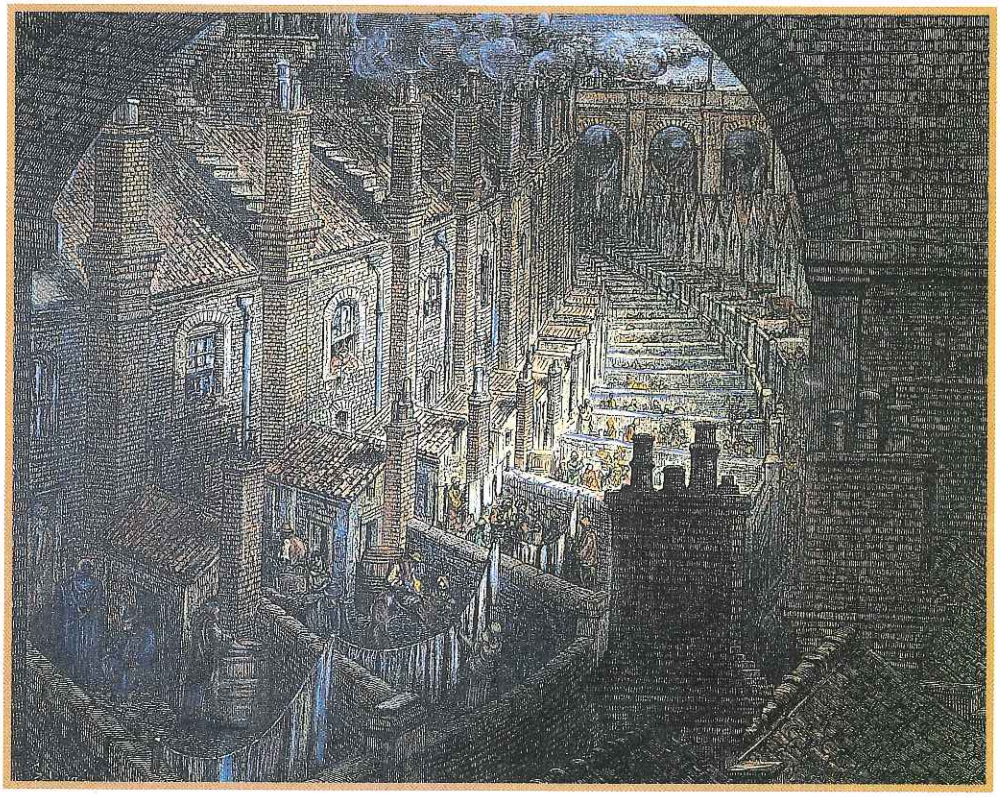


Figure 5–14 Workers' houses were built around the factories. Neighbourhoods were cramped, noisy, and unhealthy, but people had little choice in housing. Often they rented their living space from the factory owner and bought food and other necessities from a company store. What advantages did such arrangements give the factory owner?

The new machines required factories to accommodate the needs for space and power. Factories changed the way many British people lived and worked. The switch from the cottage system to the factory system affected thousands and thousands of people. It created vast new cities, with factory workers living in large housing developments. The factory system made Britain a wealthy country, but it was brutally hard on working people.

Since people could no longer remain in their communities to spin and weave, they had to go to the factories, which were usually located in the larger cities. In the factories, many different parts of the manufacturing process were carried out under one roof. It made sense to centralize as many parts of manufacturing as possible. Arkwright was one of the first to see the advantages of the factory system. He built huge factories that combined all the processes involved in the manufacture of cloth. The raw fibres were cleaned, spun, and woven in the same factory. Arkwright controlled every part of the factory, as well as the labour of his employees.

Most factory owners cared little about the people who laboured long hours in their noisy, dangerous, and dirty buildings. In fact, because labour was part of overhead—the expenses a business has to pay out before it can count its profits—they tended to try to lower this expense by paying extremely low wages. They also avoided making improvements that

DID YOU KNOW?

An observer noted the way Arkwright managed his factories:

"Coordinating, organizing and disciplining large bodies of men, so that each man fitted into his niche and the whole acted with the mechanical precision of a trained army."

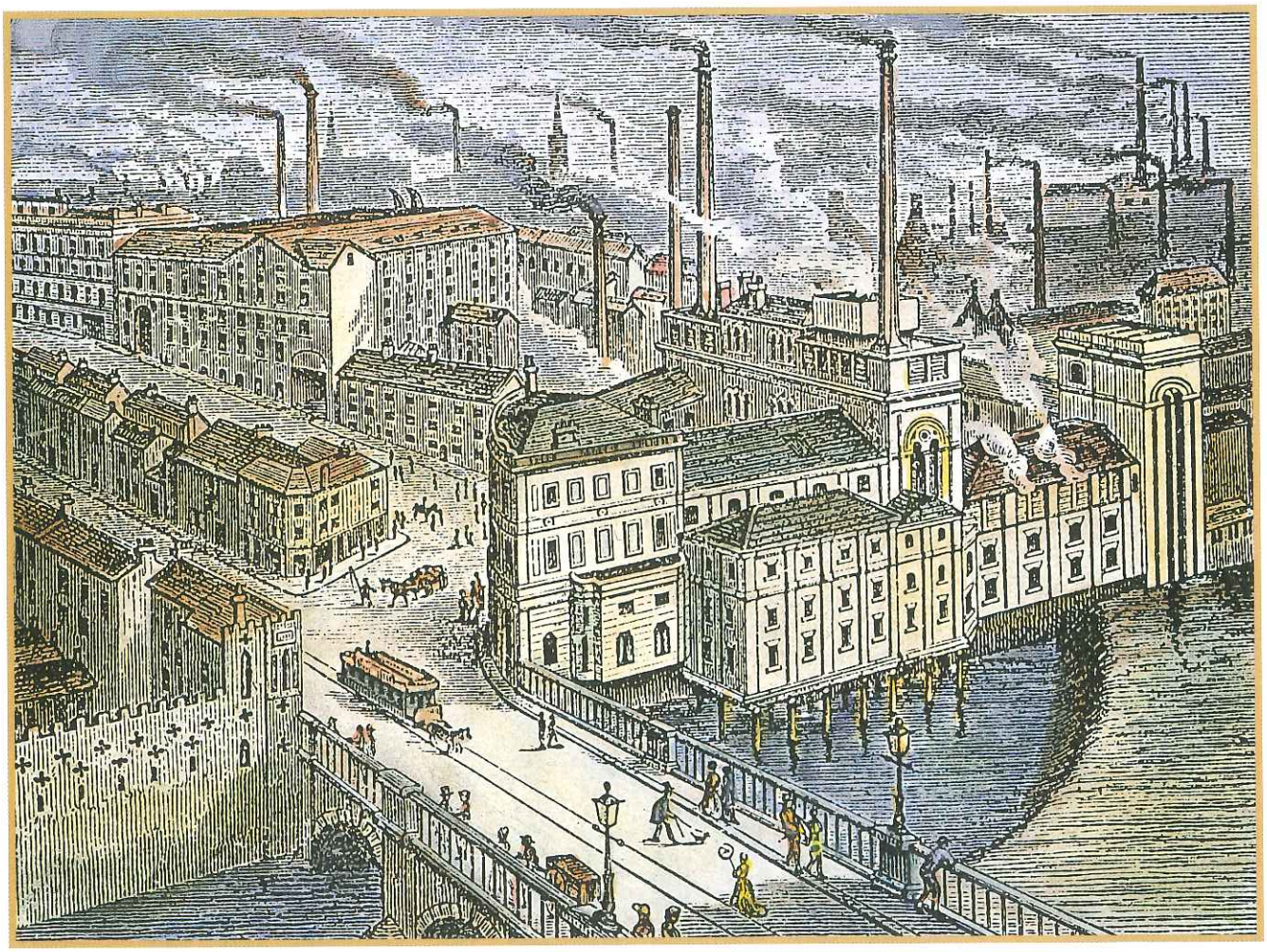


Figure 5–15 An engraving of Sheffield, England, showing the many factories and steel works

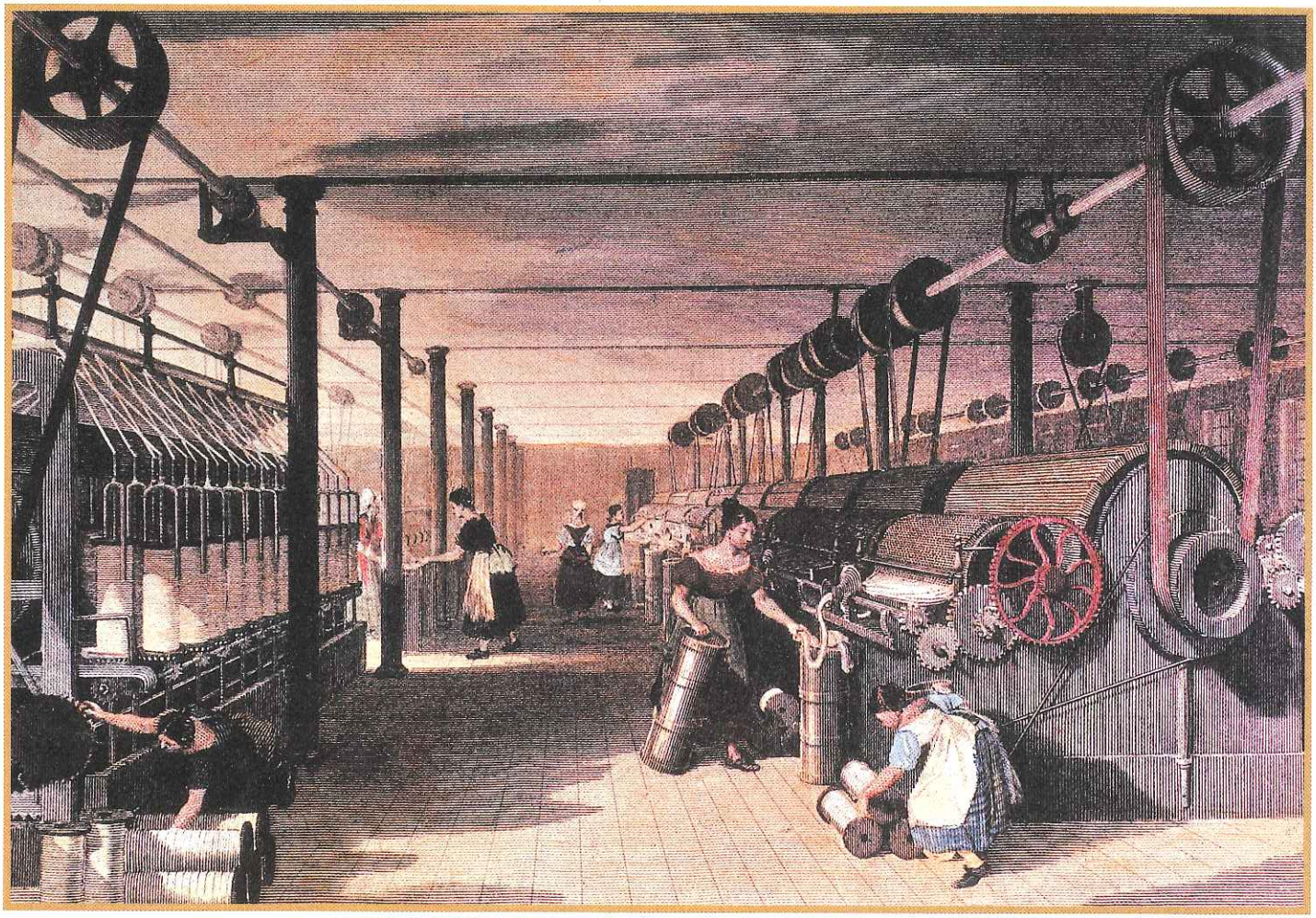


Figure 5–16 The interior view of a typical textile factory

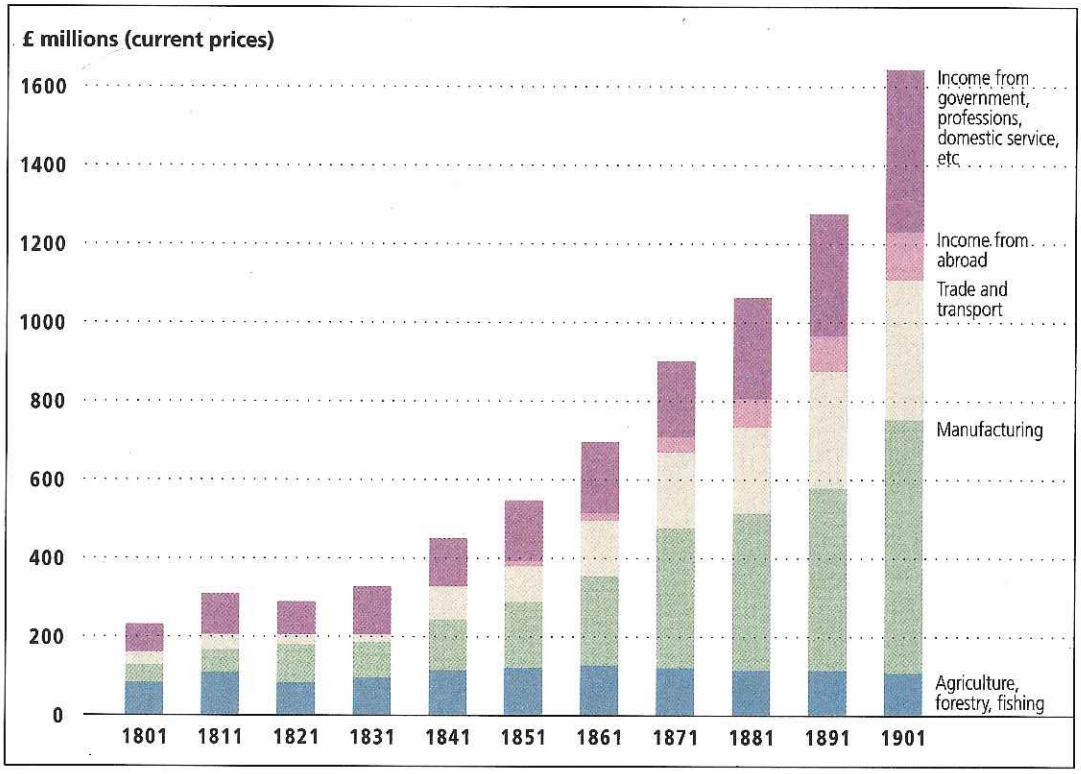


Figure 5–17 During the Industrial Revolution, England's economy changed dramatically. How much richer was England in 1901 than it was in 1801? What industries provided most of England's income?

would make working conditions better. Any money spent on workers would cut into profits. As a result, the early factory age produced some appalling conditions in which people were forced to work.

CHILD LABOUR

Many of the people enduring the horrendous working conditions of the Industrial Revolution were children. They suffered outrageous injustices during the early stages of industrialization.

Poor children went into the labour force because they had no other choice. Education was not compulsory, so very few working-class children could read or write. Also, in order to survive, poor families needed every person to work at the earliest possible age. Wages were so low that parents could not make ends meet.

Children were particularly useful workers in some industries—such as textile factories and mine shafts—because of their small size. Many children were employed to run in and out of the workings of power looms. They could get their small hands into the workings of the machines to pick out loose threads or tangles. Chimney-cleaners also employed small boys, who were sent up into the chimneys of large homes and businesses to clean out the soot.

Working-class children, as well as adults, suffered physically from their home and factory environments. They were exposed to pollution from coal-burning as well as other industrial pollution. In textile factories, the air was usually filled with fluff and microscopic fibres, which got deep into workers' lungs. The noise of looms and other machines was sometimes deafening. Often, workers were forced to take part of their wages in food, which was usually of very poor quality. Workers were also forced to work long overtime shifts. Many were beaten. A lifetime in the mills was a hard life and often a short one.

Such conditions affected everyone, but they were more serious for children, stunting their growth and deforming their bodies. In the 1830s, the government of Britain became interested in conditions for workers and interviewed many who were, or had been, child labourers. One seventeen-year-old worker described the bald spot on her head, which she got from pushing coal carts through mine tunnels. She pushed and pulled her cart more than 2 kilometres every trip.

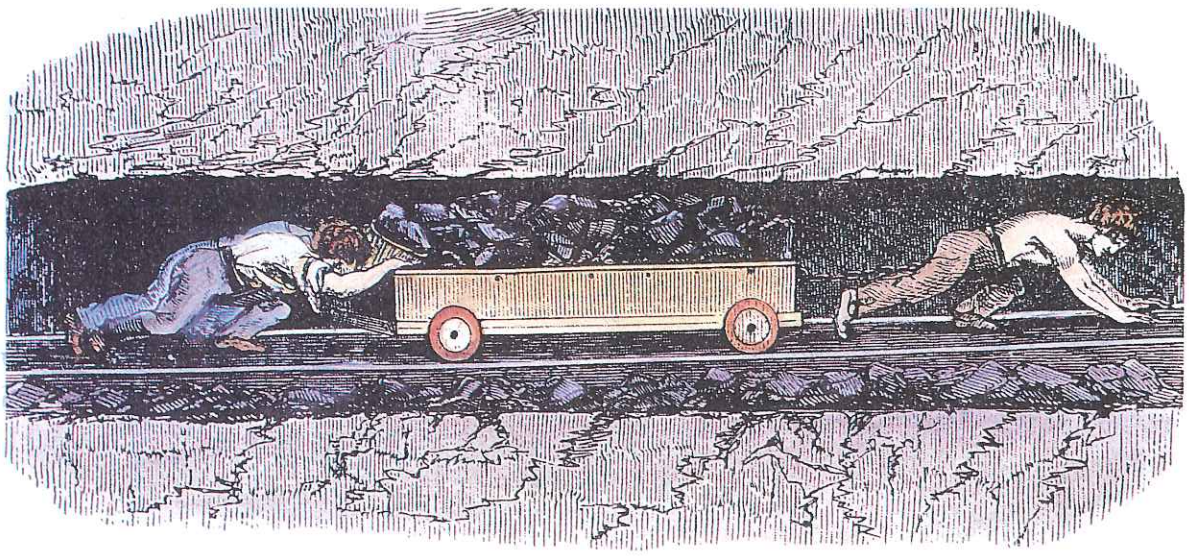


Figure 5–18 Children working in a mine in Lancashire, England. They are taking a load of coal through the mine tunnel. Could adults fit into this tunnel?

Using a Government Report as a Primary Source

CATALOGUE CARD

What is It? *An inquest report*

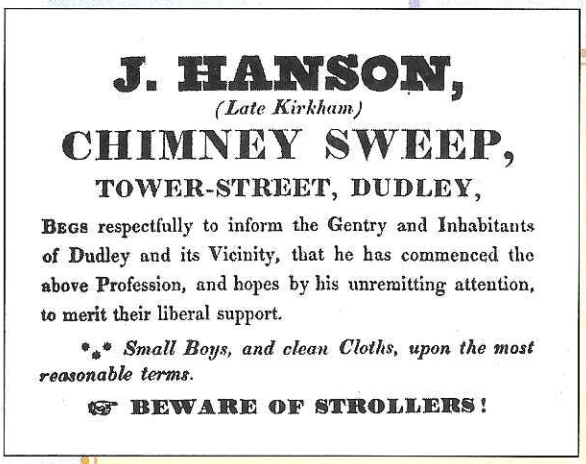
Who wrote it? *Government employees*

When? *1817*

Why? *To deal with matters of public concern*

Government documents are a good source on information about social conditions and attitudes. Such documents contain—usually word for word—transcriptions of actual testimony. The testimony that follows about the death of a chimney sweep is straightforward and eloquent. The fact that an inquest was held after his death is important. It shows that many people were deeply distressed by working conditions. Of course, others—such as the employer of the chimney sweep—probably had other views.

The death of a chimney sweep was not uncommon. Small boys, called "climbing boys," were used to clean the chimneys of Britain because they were small enough to climb through the many chambers and flues.



J. HANSON,
(Late Kirkham)
CHIMNEY SWEEP,
TOWER-STREET, DUDLEY,

BEGS respectfully to inform the Gentry and Inhabitants of Dudley and its Vicinity, that he has commenced the above Profession, and hopes by his unremitting attention, to merit their liberal support.

*** *Small Boys, and clean Cloths, upon the most reasonable terms.*

☞ **BEWARE OF STROLLERS!**

Figure 5–19 What evidence in this advertisement shows that most people accepted child labour?

On Monday morning, 29 March, 1813, a chimney sweeper of the name of Griggs attended to sweep a small chimney in the brewhouse of Messrs Calvert and Co.... he was accompanied by...a lad of about eight years of age, of the name of Thomas Pitt. The fire had been lighted as early as 2 o'clock the same morning, and was burning on the arrival of Griggs and his little boy at eight. ...[Griggs] had no sooner extinguished the fire than he suffered the lad to go down the [chimney]; and the consequence, as might be expected, was his almost immediate death, in a state, no doubt, of inexpressible agony. The flue was of the narrowest description, and must have retained heat sufficient to have prevented the child's return to the top .... Soon after his descent, the master, who remained on the top, was apprehensive that something had happened, and therefore desired him to come up; the answer of the boy was, "I cannot come up, master, I must die here." An alarm was given in the brewhouse immediately that he had stuck in the chimney, and a bricklayer at work near the spot attended, and after knocking down part of the brickwork of the chimney, just above the fireplace, made a hole sufficiently large to draw him through. A surgeon attended, but all attempts to restore life were ineffectual. On inspecting the body, various burns appeared; the fleshy part of the legs and a great part of the feet more particularly were injured; those parts too by which climbing boys most effectually ascend or descend chimneys, viz. the elbows and knees, seemed burnt to the bone, from which it must be evident that the unhappy sufferer made some attempts to return as soon as the horrors of his situation became apparent.

PRIMARY SOURCE

YOUR TURN

1. Was this death preventable?
2. Write an account of the climbing boy's experiences from his point of view?
3. Write an account of the death from Griggs's point of view.
4. Do you think that this inquest led to improvements in the working conditions for climbing boys? Why or why not?

CROSS CURRENTS

Child Labour Today

Craig Keilburger is a teenager who lives just north of Toronto. He became interested in child labour when he read a newspaper article about a twelve-year-old Pakistani child who, at the age of four, had reportedly been sold by his father to a rug manufacturer in exchange for a loan. Craig got his classmates together and formed "Free the Children," an organization devoted to ending child labour.

Since then, Craig has generated an enormous amount of publicity on child labour around the world. He has appeared on numerous television programs, and met the prime minister of Canada as well as **Mother Teresa**. He has toured South Asia and countries in South America.

Not everyone supports Craig or "Free the Children," but there is no doubt that he has raised the consciousness of the North Americans who frequently buy products made by children in the developing world. It is estimated, for example, that 1 million children are labourers in Bangladesh alone.

Solutions to child labour are not easy. Many children who work are the sole support of their families. If they lose their jobs in one industry as the result of an anti-child-labour campaign, they and their families will suffer greatly. Generally, they will simply go into a new industry because they need to earn money in order to eat.

Some people feel that a better solution to child labour is to improve the working conditions for children who work. Another solution would be to provide families with sufficient income so that they do not need to send their children out to work. Instead, they could send their children to school.

Figure 5–20 This child is making matches in southern India. Most children earn less than $1 per day (US). They work for eight or nine hours a day, and few attend school.

WHAT DO YOU THINK?

1. Would abolishing child labour be an effective strategy to improve the lives of children? Why or why not?
2. What other strategies have been proposed to end child labour?
3. Which strategy do you think would be most effective and why?

THE FACTORY ACTS

Throughout the eighteenth and nineteenth centuries, many **social reformers** tried to improve the lot of working people. In spite of their efforts, it took many decades before working people saw the kind of changes that gave them both dignity and decent working conditions.

Working people also tried to help themselves. They attempted to use the medieval system of guilds, in which the workers in particular crafts or trades had formed associations to look after the interests of their members, as a model. If workers could band together, they would be less isolated and more able to influence the actions of their employers. However, the workers were constantly frustrated in their efforts by the government, which declared such associations illegal.

Parliament was controlled by the rich and powerful who, under the theory of laissez-faire, rejected any

Mother Teresa: a nun who devoted her life to the care of the poor and diseased in India

social reformers: people who wish to change the nature of society

labour unions: organizations devoted to improving conditions for their members

Society: in this context, the upper class

move to improve the lot of the working people, whether by social reformers or workers' associations. They claimed that such acts would damage the economy. Eventually, however, enough members of parliament became so deeply disturbed by the evils of the factory system that new laws, called "Factory Acts," were written. These were designed to improve the lives of working people.

Children were among the first to benefit. The Factory Act of 1802, for example, made it illegal to have children work more than twelve hours straight in cotton mills. Later, work hours for children were reduced still further. In 1819, it became illegal to hire a child under nine years of age for work in the textile industry. However, there were no inspectors to make sure that these rules were obeyed, and children working in other industries were still not protected. In 1824, workers' associations became legal, and an early form of **labour unions** were established.

The majority of middle- and upper-class people continued to believe that the working class should work as much as possible. In their view, leisure was bad for the working class, who might slip into "evil" occupations, such as drinking and gambling. In spite of this attitude, the Factory Acts were passed.

ACTIVITIES

1. In the eighteenth century, a group of workers called "Luddites" destroyed machines that were taking peoples' jobs. Find out more information about the Luddites. If you were a worker during that period, would you have been a Luddite? Give reasons for your answer.
2. Describe working conditions for children in factories and mines during the eighteenth century.
3. Imagine that you are a factory owner in eighteenth-century Britain. Write a letter from an employer's point of view to a friend explaining why you think child labour is important to the economy and why it is undesirable to improve working conditions.
4. Why were the Factory Acts an important step in improving the lives of working people. Write a preamble to the Factory Act from the point of view of an employee.

SOCIETY AND CULTURE

Never speak disrespectfully of ***Society****, Algernon. Only people who can't get into it do that.*

–LADY BRACKNELL, IN *THE IMPORTANCE OF BEING ERNEST*, ACT THREE, BY OSCAR WILDE

Like other countries during the eighteenth and nineteenth centuries, Britain had a rigid and complex class structure. This affected almost every area of life. The British class system is still powerful in the twentieth century, although its power is declining. In a class system, a person is born into a specific social group that sees itself as different from, and perhaps better than, other social groups. The British used a person's accent to determine what social class the person belonged to. Upper-class people, who called themselves "Society," went to the right schools, belonged to the right

Class Structure

This quote, from words written by Walter Besant in 1836, shows the rigid lines that existed between the classes.

> In the first place, it was far more a class apart. In no sense did it [the middle class] belong to society [the upper class].... Bankers were still accounted tradesmen who could not possibly belong to society. That is to say, if they went to live in the country they were not called upon by the [society] families, and in town they were not admitted by men into their clubs, or by ladies into their houses ... The middle class knew its own place, respected itself, made its own society for itself, and cheerfully [honoured the upper class].

PRIMARY SOURCE

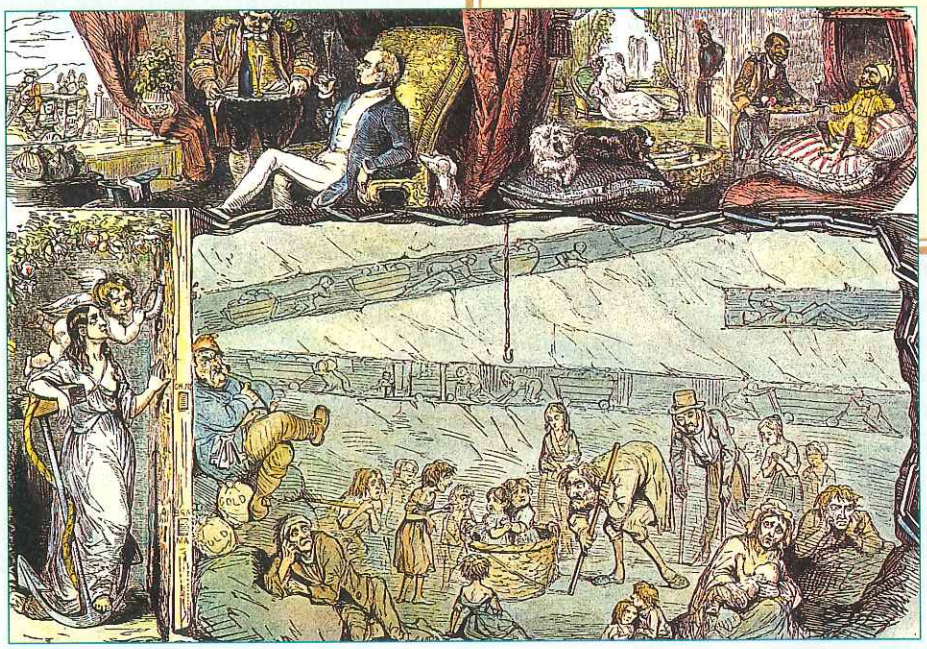


Figure 5–21 This cartoon, from 1843, was inspired by a government report on working conditions in the coal mines. What point about social class is the cartoonist making?

churches, and even read the right newspapers. They knew each other personally, or by reputation. People in the upper class kept track of each other. Lists of the upper class are still available today in books such as *Debrett's Peerage*.

Middle-class and working-class people had their own culture and amusements. The middle class grew enormously during the Industrial Revolution. In Canada, today, the definition of "middle class" is much looser than it was in Britain during the nineteenth century. To the British at that time, middle class meant that your father worked in the professions, as a doctor, engineer, or lawyer, for example, or he was a business person with property and money, or a military officer. A university degree also helped lift a person into the middle class.

There was also a lower middle class. White-collar workers, for example, who worked in stores or offices or who owned small shops, were part of the lower middle class. Teachers below the university level were also part of the lower middle class, even though university professors were in the middle class.

A person who worked in the trades, or in a factory, was considered working class. The working class also had different rankings—skilled labour, unskilled labour, and casual labour. The lowest class was composed of people who could only find jobs intermittently.

WOMEN IN THE INDUSTRIAL AGE

The Industrial Revolution changed the family, and the way women worked and lived. In the cottage system, women worked as part of the family, which was essentially a home-based business. Because everything was done at home, husbands and wives tended to work cooperatively. Unmarried women and elderly women could work in the "family business" and support themselves. When the cottage industry began to die, thousands of these home-based businesses were destroyed, forcing the women who had been part of them to look for work elsewhere. Those who stayed in the countryside had very few options. They could try to go into service—work as a servant for someone with money—or they could look for work on farms. Often, landowners used large "gangs" of women labourers to do agricultural work, such as weeding and harvesting.

Failing that, the women had to work in factories. Because so many women were available for work, employers could pay them very poorly.

In the factories and mines, working-class women shared all the hardships common to the rest of the working class. Women pulled carts loaded with coal through tiny underground mine shafts and did all sorts of hard, dirty work in the textile industry.

Not all women were poor during the Industrial Revolution. Many were actually better off because of the changes that occurred. For one thing, many women had cash money of their own for the first time, and this gave them some independence. Middle- and upper-class women were able to live very good lives, pampered by servants. Many households had large numbers of servants, fifty or more in the very large houses. Because servant's wages were so low, almost everyone in the middle class had at least one servant—a cook, perhaps. Large families with many servants needed large houses.

Figure 5–22 These women and children are picking hops, which are used in the making of beer. This pattern of work gangs, consisting of women and their children, was a feature of English life throughout the eighteenth and nineteenth centuries. Do you think that this is an accurate portrayal, or an **idealized** one? Why or why not?

idealized: not realistic

Servants were given rooms of their own, usually in the attics. Soon, the large industrial cities were filled with the large houses of the prosperous middle class.

THE POOR

Every English city had its slums, where the poor lived in cramped apartment buildings. Often whole families lived in a single room. The industrial cities had grown so quickly that proper streets and sewers had not been planned or built. Crime was common and so was disease—scarlet fever, tetanus, tuberculosis, and cholera. Cholera, carried in polluted water, was deadly—and there were epidemics of it in all the major industrial cities in Britain, and on some of the emigrant ships bound for Canada.

Britain's Poor Law, which was supposed to help the needy, did not work well. In the early Industrial Revolution, the Poor Law had been in existence—and unchanged—since the sixteenth century. Even when it was reformed in 1834, it was still not a remedy for the thousands who could not find work.

Figure 5–23 Occasionally, women were able to earn superior positions in Britain. This illustration shows a woman pit-head worker—a very unusual situation.

Figure 5–24 Slums in Whitechapel, London

Charity was the responsibility of local authorities, usually the parish. Often, Poor Law relief was given out by people who had absolutely no understanding of, or sympathy for, the poor. With little or no experience, they often made mistakes. Large families would sometimes get no help, while a loafer—with a good story—could get help. In desperation, people were forced to move into workhouses. These were terrible places where, for shelter and a little food, the poor worked at menial jobs. Often, overseers and board members made profits from the goods or services produced by workhouse inmates.

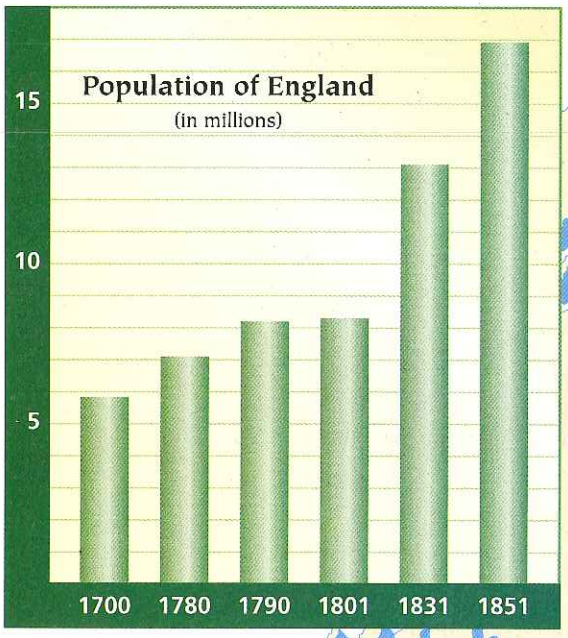


Figure 5–25 The population of England tripled in 150 years. What factors do you think might cause such a rapid rise in population?

Table 5–1 What do these statistics tell you about the poor in Liverpool?

1845 Census		
Total population		223 054
People living in cellars		40 000
People living in crowded apartments		60 000
Members of the working class		160 000
Death rate (per thousand)		35
Newborn's chances of reaching the age of five	(working class)	1 in 2
	(upper class)	4 in 5
Average age at death		22
Number of toilets in Irish sections		2 to 250 people

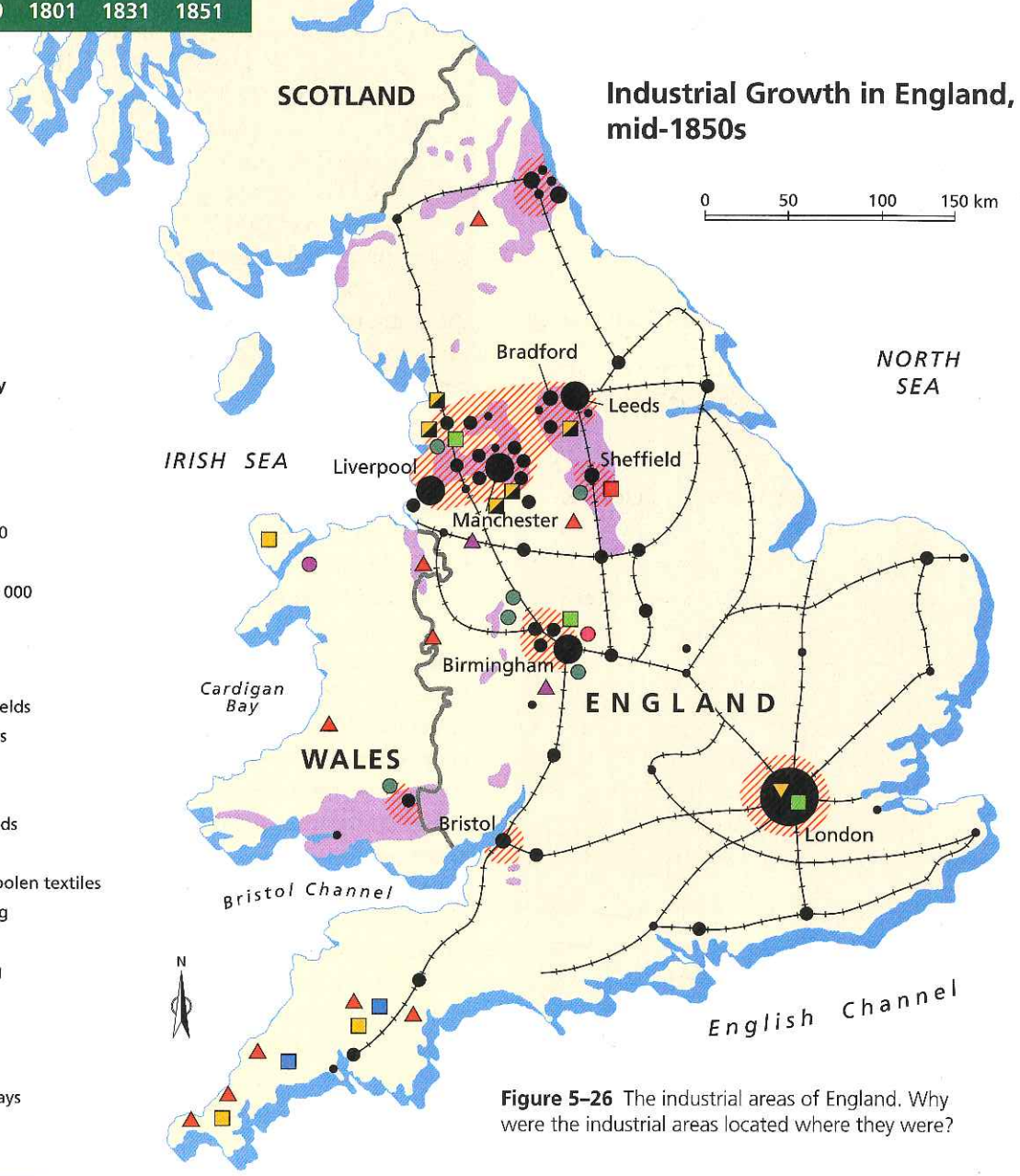


Figure 5–26 The industrial areas of England. Why were the industrial areas located where they were?

During the 1800s, the English government, social reformers, churches, and other groups began to gather information about society. Often this was in the form of statistics. Numerical data was collected on the number of people living, being born, dying, or working—even on the number of toilets available.

POPULATION ON THE MOVE

The population of Britain increased dramatically during the Industrial Revolution. Although many people moved from the countryside to the cities, many others emigrated to overseas colonies, such as Canada. They saw little opportunity in the overcrowded and impoverished cities of Britain. The colonies, on the other hand, seemed to offer an escape from poverty, the class system, and factory life. The colonies were promoted by the government and by **land speculators** as places with great potential for honest, hard-working people.

Immigrants often had to endure great hardship and misery before they had any kind of success in the colonies.

THE IRISH POTATO FAMINE

After their introduction into Europe from the New World, potatoes quickly became a staple food for millions of Europeans. By the 1840s, most Irish peasants grew and ate potatoes. Many lived in virtual poverty. Wealthy landlords, usually English and often **absent**, grew grain and other cash crops for shipment to England and Europe. In 1845, the Irish potato crop suffered a terrible blight—a disease that rotted the potatoes in the fields. Soon, millions of Irish were suffering severe hunger because of the loss of their basic food.

Figure 5–27 Starving Irish people trying to enter the workhouse

Thousands of families were driven from their land, either because they could no longer pay the rent, or because they had to sell their property to buy food. In desperation, many Irish left their homeland to work in the industrial cities of Britain, such as Liverpool, or to go overseas to the colonies.

DID YOU KNOW?

The English response to the Potato Famine was to continue to allow grain to be sent out of Ireland and sold at high prices, rather than to use it to feed the starving Irish.

to speculate: to buy land in the expectation that its value will increase

absent: away, in this case, owners who owned land but did not live on it

THE CLEARANCES

In Scotland, thousands of people were displaced by the so-called "clearances." The clearances were part of the policy of enclosure. Landlords got rid of their poor tenant farmers, called "crofters," so that they could use the land for raising sheep. Typically, the crofters were given a very short time to sell their furniture and livestock before they were forced to leave their lands forever. The vacated farms were often burned to the ground to prevent the tenants from returning. Thousands of Scots had to find new homes and work. As with the Irish, some went overseas, while others travelled to the large industrial cities of southern Scotland and England.

A Terrible Journey

The voyages to the colonies were very difficult. Many people got sick and died from the conditions in steerage—the cramped quarters in the ship's hold where they were forced to stay. This report of a shipping official helps us to understand the terrible hardships that Irish immigrants suffered.

PRIMARY SOURCE

Out of the 4000 or 5000 emigrants that have left since Sunday, at least 2000 will fall sick somewhere before three weeks are over. They ought to have accommodation for 2000 sick at least in Montreal and Quebec, as all the Cork and Liverpool passengers are half-dead from starvation and want before embarking; and the least bowel complaint, which is sure to come with a change of food, finishes them without a struggle. I never saw people so indifferent to life; they would continue in the same berth with a dead person until the seamen or captain dragged out the corpse with boat hooks. Good God! What evils will befall the cities wherever they alight! Hot weather will increase the evil..."

Figure 5–28 This picture of immigrants leaving for Canada or the United States captures the sadness of being parted from their homeland. How would you feel if you were forced to leave your loved ones and friends, never to see them again?

ACTIVITIES

1. Make an organizer with the headings Clothing, Housing, Transportation, Earning a Living, and Education. List the factors that made a person upper class, middle class, or working class in Britain during the eighteenth and nineteenth centuries.
2. Did the Industrial Revolution improve conditions for women? List three ways in which life improved and three ways in which life got worse for women.
3. Using the data in Table 5–1, determine how large a part of the population was considered working class. What proportion of Liverpool's population had sub-standard housing? Compare the death rate for children in the upper and lower classes. How do you account for the difference? Why are sanitation facilities important?
4. Examine the map of industrial regions of Britain on page 154. Give reasons why industrial areas are located where they are.
5. What effect did the highland clearances and the Irish potato famine have on Canada? Do you know anyone of Irish or Scottish ancestry? How and when did their family come to Canada? Pretend you are a Scottish or Irish farmer who must immigrate. Write a short speech to your village, explaining why you must leave home.

CONCLUSION

The changes brought about by the Industrial Revolution were enormous and long-lasting. In industrialized countries, first in Britain and later almost everywhere in the world, society was transformed. Traditional rural life ended, to be replaced by urban and factory life. Working-class families had to learn to cope with city life and the factories, with their brutal conditions and low wages. On the other hand, the upper and middle classes profited greatly from the Industrial Revolution.

Eventually the cruelties of the factory system, and of life for the lower classes in general, shocked writers such as Charles Dickens, who helped to force change by appealing directly to middle-class people. Gradually, industrialization began to make life better for all people. In time, laws were passed that ended child labour and other discriminatory practices.

Great improvements in transportation helped many people, not just the industrialists. Cities became more livable, with gas lights and better sanitation. Children started going to school. Mass entertainment—sports, like football, for example—became very popular. Before long, people forgot about the country life of earlier times and accepted the city as a place of opportunity and excitement.

The Industrial Revolution is not quite over. You are in a new phase of that great process, and you will have to adjust, just as your ancestors did, to the revolutionary changes that the future will bring.

SUMMARY ACTIVITIES

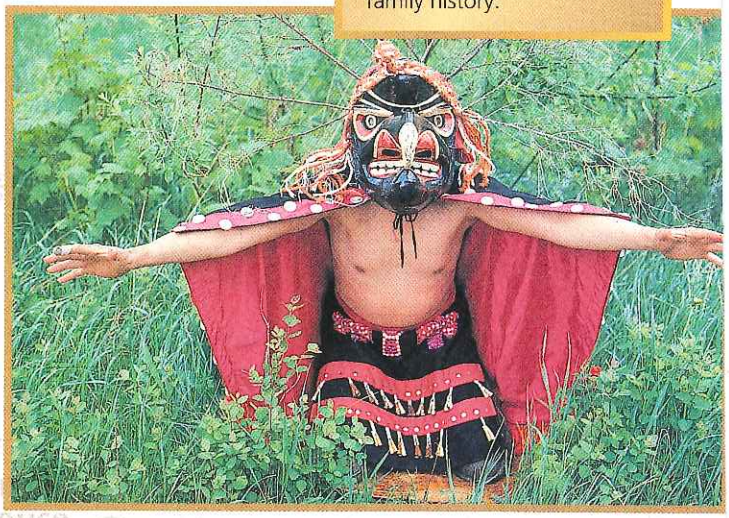
1. Prepare a protest poster against enclosure. Your poster should point out the negative aspects of enclosure and highlight the profits that will be made by landowners.
2. With a partner, or partners, draw up a submission to parliament which contains a list of recommendations for laws dealing with child labour. Your list should begin with a preamble—an explanation of what the recommendations are concerned with and why you feel it is necessary that they be adopted.
3. How did the Industrial Revolution spur the growth of colonies? What was the value of colonies to an industrialized nation? What were the benefits of being a colony? Were there any drawbacks?
4. The Industrial Revolution transformed life for the people of Britain. Develop a chart showing how life was transformed for various groups of people. Present a position paper on which social group's life changed the most.

ON YOUR OWN

1. With a partner, write a business proposal to investors outlining your plans for a new railway that will connect two important English cities. To help plan your venture, use a good atlas map showing the topography of Britain. Be sure to include costs (in pounds), time needed, labour force required, and other factors that you think are important in your proposal. Your estimates need not be accurate, but should show that you have an understanding of the problems, and expected profits, of the venture.
2. Research the Peterloo Massacre, the Chartist Movement, and trade unions. Write a short report on attempts by working people to organize themselves in order to better their lives.
3. Imagine that you are a worker in a textile mill in England. Do research to find out more about working conditions in the mill. Write a letter to your MP, explaining your daily life in the mills and at home.
4. Compare the factories of today with the factories of the early Industrial Revolution. What aspects are the same? What aspects are different?
5. Research the impact of European immigration on the Native peoples of North America. Has the situation been resolved?

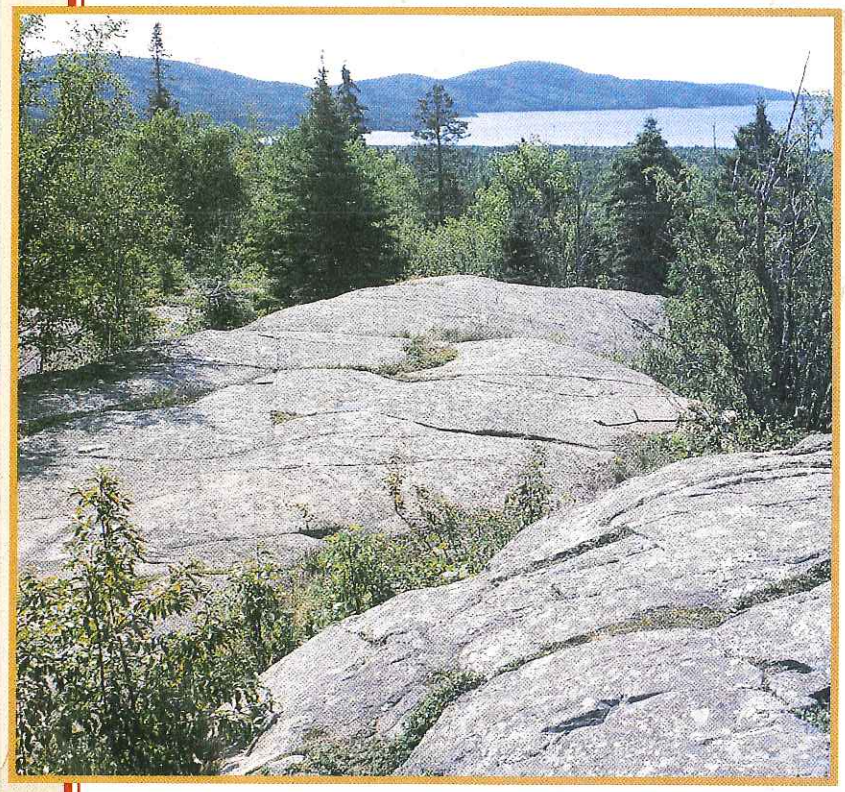
UNIT 2

NORTH AMERICA BECKONS



The Northwest Coast peoples. Ritual dancing is an ancient feature of Northwest Coast aboriginal life. It reminds people of the importance of clan and family history.

The European colonists who began to move to North America in ever-increasing numbers after 1600 usually found a land that was different from the land they had left. They discovered that the landscape, climate, and vegetation varied greatly from region to region in North America. Their first years were usually years of struggle as they adapted to the new environment.



This process of adaption would have been much more difficult without the assistance of the Native peoples of North America, who generously shared their expertise and knowledge with the newcomers. Having lived in North America for many thousands of years, the Native peoples understood the impact of the physical environment on their lives. Over the years, they had developed societies that expressed their values in harmony with their environment.

The Canadian Shield. The Canadian Shield has become symbolic of Canada. Images of the Shield were popularized by the Group of Seven painters.