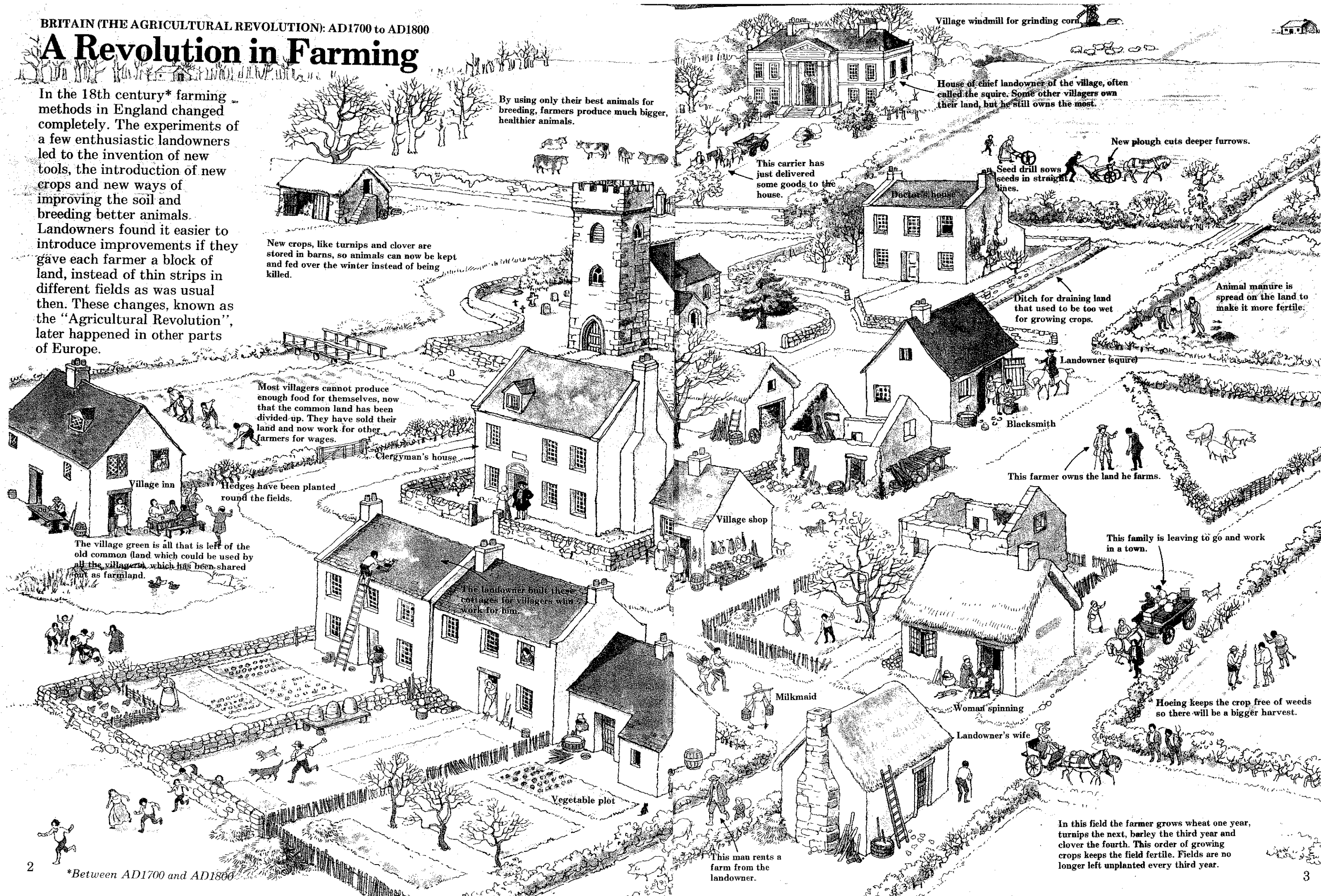


A Revolution in Farming

In the 18th century* farming methods in England changed completely. The experiments of a few enthusiastic landowners led to the invention of new tools, the introduction of new crops and new ways of improving the soil and breeding better animals. Landowners found it easier to introduce improvements if they gave each farmer a block of land, instead of thin strips in different fields as was usual then. These changes, known as the "Agricultural Revolution", later happened in other parts of Europe.



By using only their best animals for breeding, farmers produce much bigger, healthier animals.

House of chief landowner of the village, often called the squire. Some other villagers own their land, but he still owns the most.

New plough cuts deeper furrows.

Seed drill sows seeds in straight lines.

This carrier has just delivered some goods to the house.

New crops, like turnips and clover are stored in barns, so animals can now be kept and fed over the winter instead of being killed.

Animal manure is spread on the land to make it more fertile.

Ditch for draining land that used to be too wet for growing crops.

Landowner (squire)

Blacksmith

This farmer owns the land he farms.

This family is leaving to go and work in a town.

Hoeing keeps the crop free of weeds so there will be a bigger harvest.

In this field the farmer grows wheat one year, turnips the next, barley the third year and clover the fourth. This order of growing crops keeps the field fertile. Fields are no longer left unplanted every third year.

Most villagers cannot produce enough food for themselves, now that the common land has been divided up. They have sold their land and now work for other farmers for wages.

Clergyman's house

Village inn

Hedges have been planted round the fields.

The village green is all that is left of the old common (land which could be used by all the villagers), which has been shared out as farmland.

The landowner built these cottages for villagers who work for him.

Village shop

Milkmaid

Woman spinning

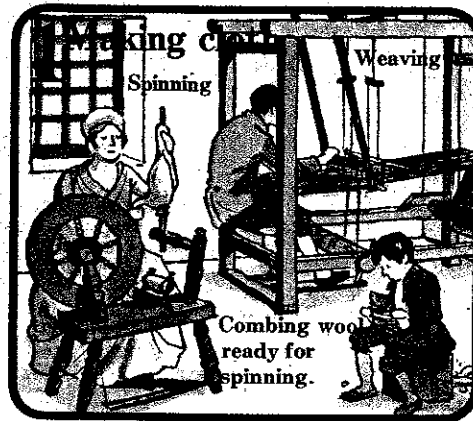
Landowner's wife

Vegetable plot

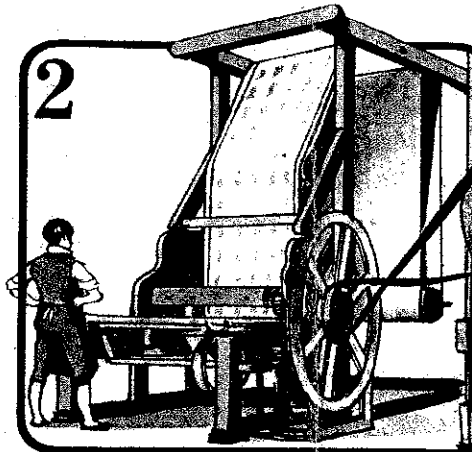
This man rents a farm from the landowner.

Machines and Factories

In the first half of the 18th century, most people in Britain still lived and worked in the countryside. Woollen and cotton cloth, produced in the north of England, were the chief manufactured goods. Before 1750 cloth was mainly made by hand, in people's homes. But by 1850 it was being made by machines in factories. The new factories employed lots of people and towns quickly grew up round them. These changes in working life have become known as the "Industrial Revolution".

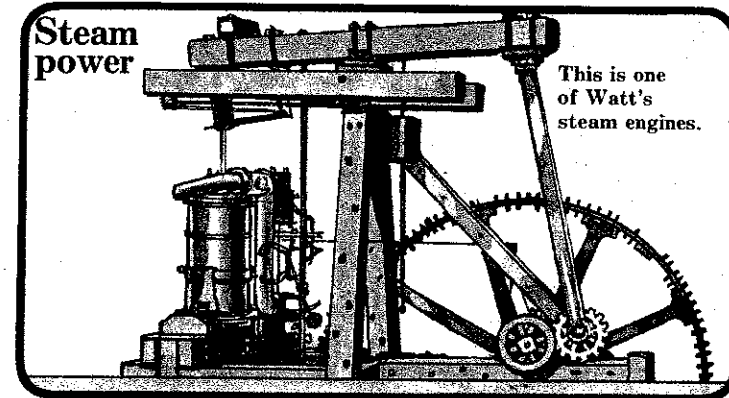


Britain produced a great deal of woollen cloth. In the first half of the 18th century, most of it was made by villagers in their homes and sold to visiting merchants.



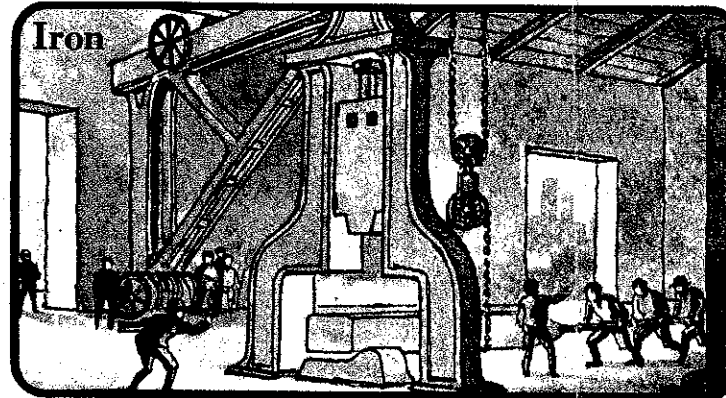
Then machines like this were invented. They helped spinners and weavers to work much faster. Later they were adapted to be driven by water, and later still by steam.

The new machines were too big to fit into people's homes and too expensive for them to buy. Clever men with money to invest built factories like this one and bought machines to put in them. People working at home could not compete with the prices of factory-made goods, so they had to go and work in the factories. They were joined by country people who thought they would make a better living in the factories than on the land.



The early factories used water power to make their machines go. Various people experimented with the idea of using steam. Eventually a Scotsman

called James Watt found out how to make steam engines drive the wheels of other machines and these were soon being used in factories.

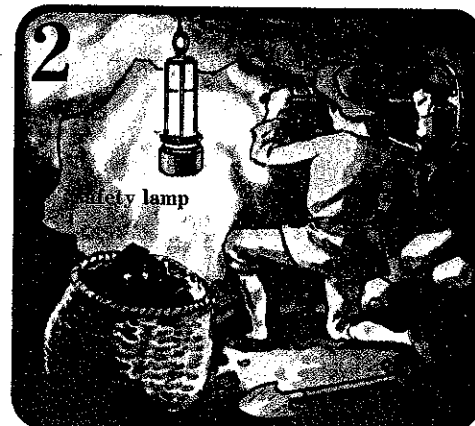


This is an iron works. Iron was needed for making the new machines, but iron-smelting needed charcoal and the wood for making this was in short supply.

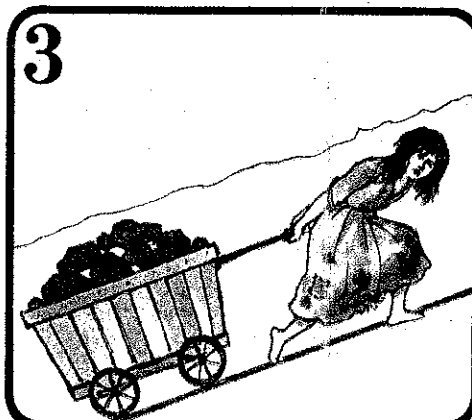
Coal was no good as its fumes made the iron brittle. Then, Abraham Darby discovered coal could be turned into coke which was pure enough for making iron.



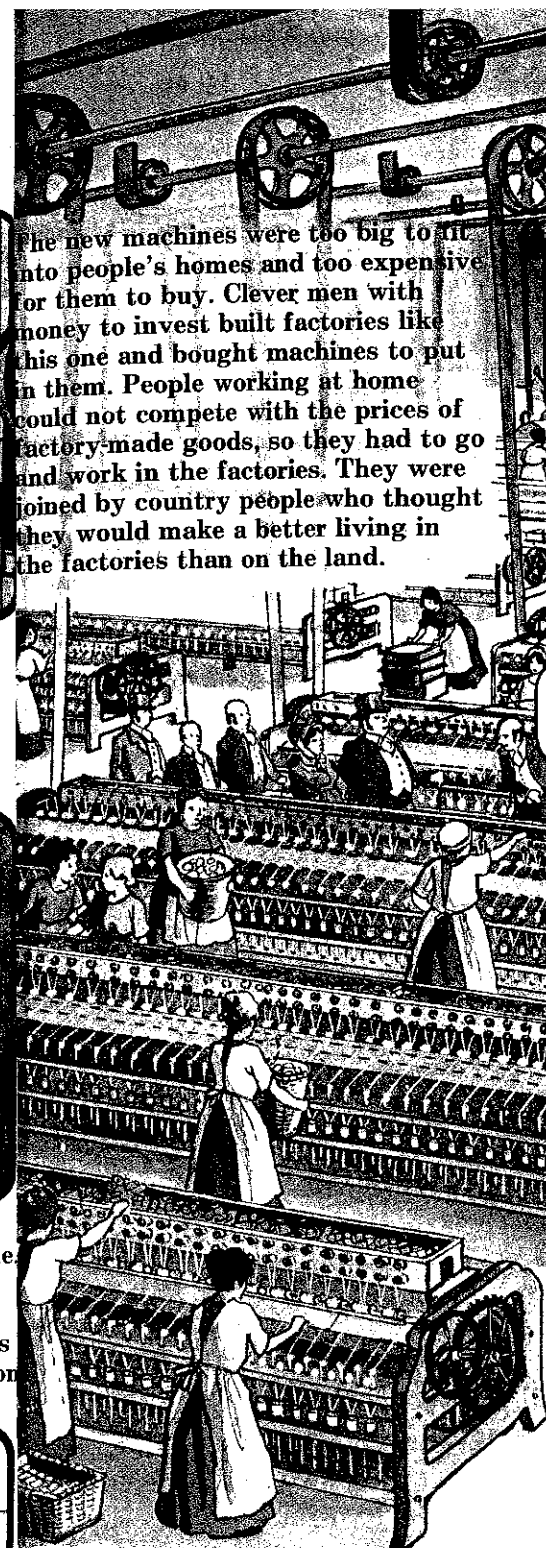
People had been using coal to heat their homes for a long time, but it had been dug only from shallow mines. Deep mines were too dangerous.



Several inventions made mining safer. The safety lamp cut down the danger of explosions. Steam pumps helped prevent flooding and there was also a machine which sucked out stale air.



Underground rails made it easier to haul coal to the surface from great depths, but conditions in the mines were still very bad. Small children were used to pull the heavy trucks.



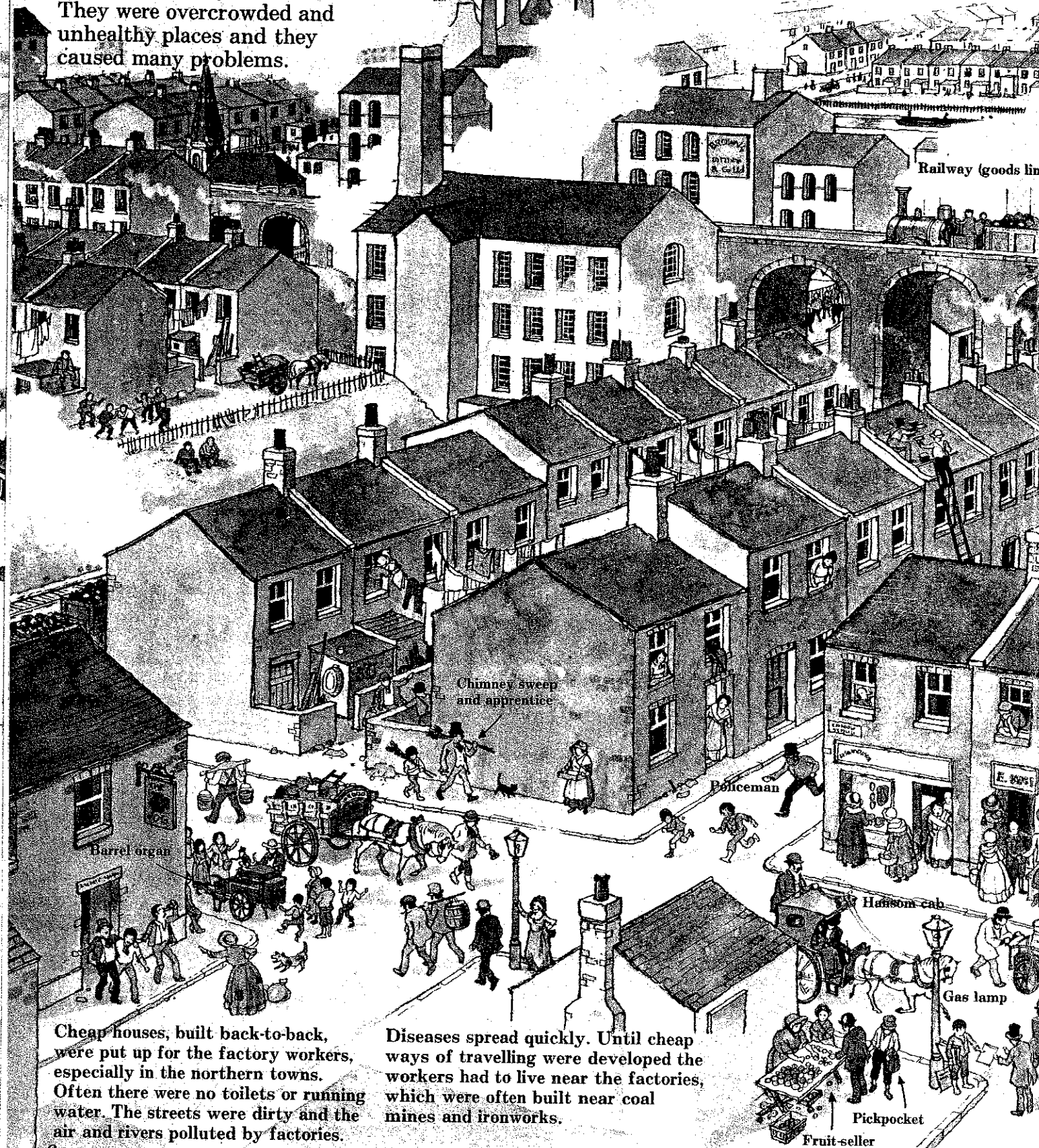
At first, conditions in the factories were very bad. Men, women and children worked very long hours for low wages. Machines had no safety guards and there were bad accidents.

Gradually laws were passed to make the factory owners improve conditions in the factories, make working hours shorter and protect the rights of working people.

Machines were very unpopular with people who had no jobs. Some people even banded together to smash them. One group was called the Luddites after their leader, Ned Ludd.

Life in the New Towns

Where factories were built, new towns quickly grew up to house the factory workers. They were overcrowded and unhealthy places and they caused many problems.



Cheap houses, built back-to-back, were put up for the factory workers, especially in the northern towns. Often there were no toilets or running water. The streets were dirty and the air and rivers polluted by factories.

Diseases spread quickly. Until cheap ways of travelling were developed the workers had to live near the factories, which were often built near coal mines and ironworks.

Factory owner's house

Factories

Railway (goods line)

Chimney sweep and apprentice

Policeman

Hansom cab

Gas lamp

Pickpocket

Fruit-seller



The changes in farming and industry left some people without jobs and desperately poor. To get help they had to go and live in "workhouses". Conditions in the workhouses were

very harsh to discourage lazy people from using them. Men and women lived in separate quarters so families were split up. Poor people often preferred to live on the streets.



Several reformers tried to help poor people. Dr Barnardo, shown here, set up children's homes and General Booth started a Christian organization called the Salvation Army.



Many laws were passed during the 19th century to improve people's lives by cleaning up towns, building better houses and setting up schools where all children could go without paying.



Old-age pensions started in 1909. These people are collecting theirs from the post office. In 1911, a law was passed which insured people against sickness and unemployment.



Workers began to join together to form trade unions so that they could bargain for better wages and working conditions by threatening to strike. At first the trade unions were illegal

but gradually laws were passed which made them legal and gave them the right to picket (stand outside their work places and try to persuade other workers not to go in).



Some trade unionists and people who agreed with them formed the Labour Party. In the general election of 1906, 29 of their members were elected to parliament.

Key dates

- AD1733/1793 Invention of several machines for spinning and weaving cloth.
- AD1769 **James Watt** invented his first steam engine.
- AD1812 Outbreaks of machine-smashing by the Luddites.
- AD1824 & 1825 Trade Unions made legal, but with many restrictions.
- AD1833 First of many laws passed to improve working conditions in factories.
- AD1833, 1870, Education Acts*.
- 1880, 1891, 1902
- AD1845/1905 Life of **Dr Barnardo**.
- AD1848 First Public Health Act.
- AD1875 First Housing Act.
- AD1878 Salvation Army founded.
- AD1900 Labour Party founded.
- AD1909 Old-age pension Act.
- AD1911 National Insurance Act.

*An Act is a law passed by parliament.

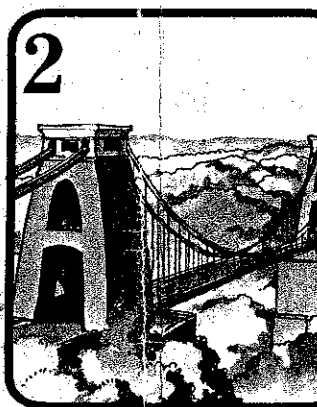
Transport and Travel

The Industrial Revolution brought about immense changes in transport and travel. Some important developments happened first in Britain, others happened first in America and other parts of Europe.



In England, companies called Turnpike Trusts were set up. They built and repaired roads and charged people tolls for using

them. This is one of the tollgates. Engineers, like Telford and Macadam, found ways of building roads with hard surfaces.



New bridges were also built, many of them iron. This is the Clifton Suspension Bridge in England, designed by Brunel, a famous engineer.

Railways



The first steam locomotive to run on rails was built in England in 1804 by Richard Trevithick. Twenty years later, the first passenger railway was opened and from then on railways became very popular. They were a

quick, cheap and safe way of carrying people and goods. As train services improved, it became possible for ordinary people to go on seaside and country holidays. England's roads and canals were neglected.

London got its first long stretch of underground railway in 1863. Until 1890, when electric trains came in, the underground trains were steam-powered. The tunnels are still filled with the soot they made.

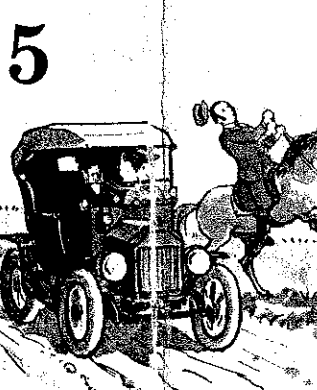


Bicycles were in general use by the 1880s. The early "penny-farthings" were ridden by men, but later models were suitable for women to ride too.

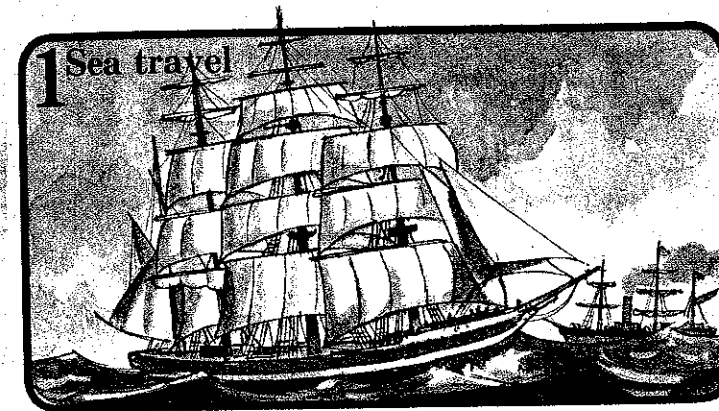


As the population increased during the 19th century, cities grew in size. People had to live further from their work and horse-drawn

buses were introduced to provide them with transport. Before long, city streets became packed with traffic.

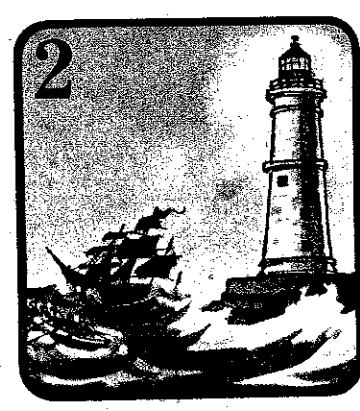


The first motor cars were made in Germany in 1885. They remained too expensive for anyone but the very wealthy until the 1920s.



Very fast sailing ships called "clippers" were built during the 19th century and used to carry light cargoes such as tea. A completely new kind of

ship was also being developed at this time. These ships were built of iron and had steam-engines. They gradually replaced sailing ships.



Many lighthouses were built and a life-boat service introduced, making sea travel much safer than it had been in the past.

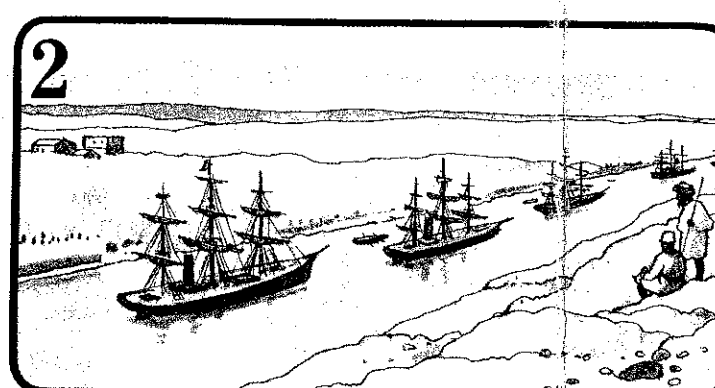


Faster and safer sea travel tempted wealthy people to take holidays abroad. In 1869, Thomas Cook ran his first holiday tour to Egypt.



In the 18th century, it was much cheaper to send heavy goods by water than by road. Where there were no suitable rivers, canals were cut to link important

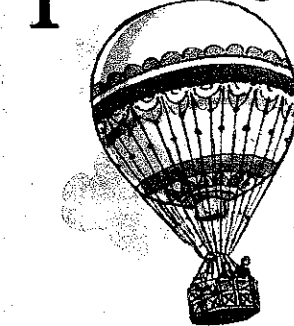
ports and cities. Locks, like the ones shown here, took the boats up and down slopes. The barges were pulled by horses walking along the "towpath."



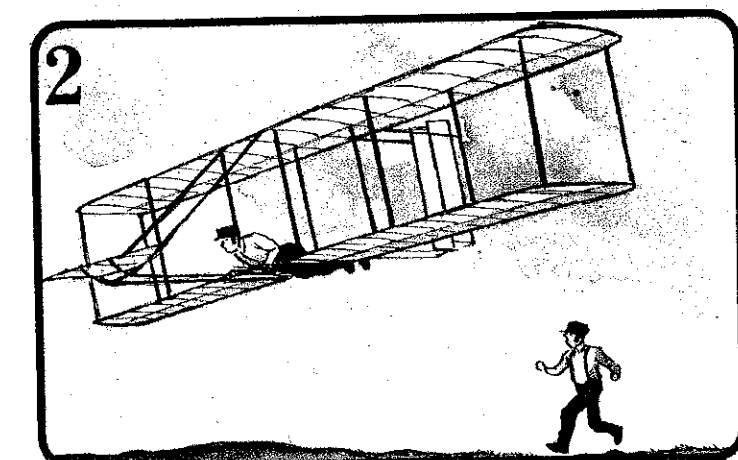
In 1869 the Suez Canal, which links the Mediterranean Sea to the Red Sea, was opened. This canal cut several weeks off the journey from Europe to

India. Later, in 1915, another long ship canal was opened. This was the Panama Canal in Central America which joined the Atlantic and Pacific Oceans.

1 The first flights



The French Montgolfier brothers were the first people to take off into the air. This was in 1783 in a hot-air balloon. Other balloonists tried using hydrogen.



At the beginning of the 20th century, two Americans, the Wright brothers, built a glider like

this one. Later they built an aeroplane fitted with an engine and in 1903 made the first powered flight.

Key dates

AD1663/1770	Turnpike trusts set up.
AD1783	First ascent of hot air balloon.
AD1804	First steam vehicle to run on rails.
AD1829	First railroads opened in U.S.A.
AD1839	First pedal bicycle made.
AD1863	Opening of first underground railway.
AD1869	Suez Canal opened.
AD1885	Karl Benz made a 3-wheeled motor car.
AD1886	Gottlieb Daimler made a 4-wheeled motor car.
AD1903	First powered flight.