



UNIT 3: THE INDUSTRIAL REVOLUTION Summary.



• The Industrial Revolution

What was the Industrial Revolution?

The Industrial Revolution was the result of numerous economic and technological changes which took place in Great Britain from the mid-18th Century. From 1850, the Industrial Revolution spread towards parts of Europe and the United States of America.

Machines replaced manual labour and trains replaced horse-and-carriages; to power them a new source of energy was used: steam. Many other things were invented that made it easier to make things and get work done.

The Industrial Revolution also gave rise to a new economic system – Capitalism – which was based on the ideas of private property, production and profit. It also changed the social structure which was based on two main social classes – the bourgeoisie and the proletariat (the workers).

Why was it a ‘revolution’?

This process of change has been called a ‘revolution’, mainly because one transformation led to another. There were a lot of important inventions and changes in a short period of time. These changes didn’t make life a little different, they made it a lot different.

The Textile Industry

The Textile Industry was the first industry to be revolutionised:

- OLD Domestic System:
 - o merchants would take raw cotton to a spinner’s house to be spun into thread
 - o merchants would then collect thread from the spinner when it was ready and take it to a weaver’s house to be weaved into fabric
 - o everything was done at home, by hand
- NEW Cotton Mills:
 - o merchants would run a factory where both the spinning and weaving would take place
 - o the process was a lot quicker and more efficient
 - o everything was done in factories, powered by steam

The North of England became a good market for cotton goods due to its network of canals and abundant supply of coal.



Agriculture

The Industrial Revolution also affected life outside of cities. In 1701, Jethro Tull invented the Seed Drill:

- OLD METHOD:
 - o scattering seeds on the ground (very wasteful)
- NEW METHOD:
 - o sow seeds in rows and to specific depths using the seed drill (more efficient)

- **More about the definition of Industrial Revolution**

The Industrial Revolution was the major technological, socioeconomic and cultural change in the late 18th and early 19th century resulting from the replacement of an economy based on manual labor to one dominated by industry and machine manufacture. It began in England with the introduction of steam power (fueled primarily by coal) and powered machinery (mainly in textile manufacturing). The development of all-metal machine tools in the first two decades of the nineteenth century enabled the manufacture of more production machines for manufacturing in other industries.

The dating of the Industrial Revolution is not exact, but T.S. Ashton held it covers roughly 1760-1830, in effect the reigns of George III, The Regency, and part of William IV. There was no cut-off point for it merged into the Second Industrial Revolution from about 1850, when technological and economic progress gained momentum with the development of steam-powered ships, and railways, and later in the nineteenth century the growth of the internal combustion engine and the development of electrical power generation.

The effects spread throughout Western Europe and North America, eventually affecting the rest of the world. The impact of this change on society was enormous and is often compared to the Neolithic revolution, when mankind developed agriculture and gave up its nomadic lifestyle.

The term industrial revolution was introduced by Friedrich Engels and Louis-Auguste Blanqui in the second half of the 19th century.

- **The Coal Industry**

Why did the demand for coal increase ?

- From 1750 the demand for coal went up for three main reasons :
 - There was a shortage of wood
 - Coal was being used to heat more homes
 - More industries were using coal such as iron making and steam engines.

What problems did the increased demand for coal cause ?

- Mine shafts would have to dug deeper to reach the coal seams.
- Miners would have to travel a lot further to reach the coal face



What were the main problems / dangers mining coal ?

Problem One - How do you get the coal out without causing the roof of the mine to cave in ?

Old solution - Wood posts (pit props) were used to hold the roof up but these rotted

New solution - Iron and steel pit props were used. These lasted a lot longer.

Problem Two - How do you avoid flooding in the mines ? As the mine shafts got deeper and deeper they started to fill up with water and flooding would happen very quickly

Old solution - Leather buckets were filled with water and carried up to the surface

New solution - **Thomas Savery** in 1698 invented a steam pump
- **James Watt** in 1776 invented a steam engine this was used to pump the water out of mines

Problem Three - How do you avoid 'bad air in the mine ? As mine shafts got deeper miners were at risk from two gases: **a) Fire Damp** – would explode on contact with a flame, the problema was that miners carried candles for light **b) Choke Damp** – would suffocate the miners

Old solution - For Fire Damp – ventilation shafts were dug to let fresh air in - **For Choke damp** – miners carried a canary in a cage

New Solution - For Fire Damp – . The main help for the miners was the Safety Lamp. This was invented in 1815 by **Sir Humphrey Davy**. This lamp had a fine gauze around the candle and so it didn't give off enough heat to light the gas. **For Choke Damp** – Exhaust fans (which sucked the bad air out of the mine shaft) were tried but didn't work well

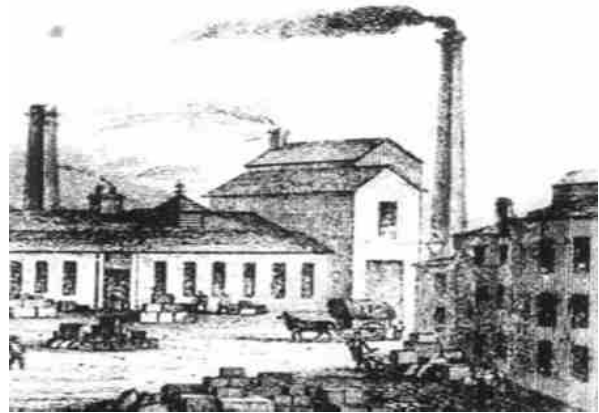
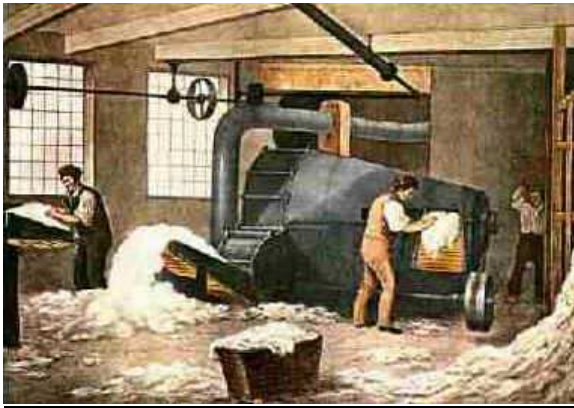
Problem Four How do you get the coal to the surface ? Coal is heavy to carry so how do you get it along the mine shaft and then out of it ?

Old solution - Trucks were pushed along the mine shafts on wooden rails, but the rails buckled. Baskets were carried up the mine shafts (normally by women!)

New Solution - Iron rails were used instead of wooden ones and pit ponies would pull the truck. By 1780 horse powered winding gear was used to pull the coal to the surface.

• Child Labour & The Industrial Revolution

During the 1800s the *Industrial Revolution* spread throughout Britain. The use of steam-powered machines, led to a massive increase in the number of factories (particularly in textile factories or mills).



From Country to Town

As the number of factories grew people from the countryside began to move into the towns looking for better paid work. The wages of a farm worker were very low and there were less jobs working on farms because of the invention and use of new machines such as threshers. Also thousands of new workers were needed to work machines in mills and foundries and the factory owners built houses for them. Cities filled to overflowing and London was particularly bad. At the start of the 19th Century about 1/5 of Britain's population lived there, but by 1851 half the population of the country had set up home in London. London, like most cities, was not prepared for this great increase in people. People crowded into already crowded houses. Rooms were rented to whole families or perhaps several families. If there was no rooms to rent, people stayed in lodging houses.

Housing

The worker's houses were usually near to the factories so that people could walk to work. They were built really quickly and cheaply. The houses were cheap, most had between 2-4 rooms - one or two rooms downstairs, and one or two rooms upstairs. Victorian families were big with 4 or 5 children. There was no running water or toilet. A whole street would have to share an outdoor pump and a couple of outside toilets. Most houses in the North of England were "back to backs" (built in double rows) with no windows at the front, no backyards and a sewer down the middle of the street. The houses were built crammed close together, with very narrow streets between them. Most of the houses were crowded with five or more people possibly crammed into a single room. Even the cellars were full. Most of the new towns were dirty and unhealthy. The household rubbish was thrown out into the streets. Housing conditions like these were a perfect breeding grounds for diseases. More than 31,000 people died during an outbreak of cholera in 1832 and lots more were killed by typhus, smallpox and dysentery.

Pollution

Chimneys, bridges and factory smoke blocked out most of the light in the towns. A layer of dirty smoke often covered the streets like a blanket. This came from the factories that used steam to power their machines. The steam was made by burning coal to heat water. Burning coal produces a lot of dirty, black smoke.

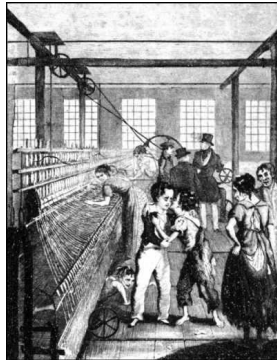


Improvements

Gradually, improvements for the poor were made. In 1848, Parliament passed laws that allowed city councils to clean up the streets. One of the first cities to become a healthier place was Birmingham. Proper sewers and drains were built. Land owners had to build houses to a set standard. Streets were paved and lighting was put up.

Over time slums were knocked down and new houses built. However, these changes did not take place overnight. When slums were knocked down in 1875 the poor people had little choice but to move to another slum, making that one worse. Few could afford new housing.

Child Labour



Many factory workers were children. They worked long hours and were often treated badly by the supervisors or overseers. Sometimes the children started work as young as four or five years old. A young child could not earn much, but even a few pence would be enough to buy food.

Coal Mines

The coal mines were dangerous places where roofs sometimes caved in, explosions happened and workers got all sorts of injuries. There were very few safety rules. Cutting and moving coal which machines do nowadays was done by men, women and children.

The younger children often worked as "*trappers*" who worked trap doors. They sat in a hole hollowed out for them and held a string which was fastened to the door. When they heard the coal wagons coming they had to open the door by pulling a string. This job was one of the easiest down the mine but it was very lonely and the place where they sat was usually damp and draughty.

Older children might be employed as "*coal bearers*" carrying loads of coal on their



backs in big baskets. *The Mines Act* was passed by the Government in 1842 forbidding the employment of women and girls and all boys under the age of ten down mines. Later it became illegal for a boy under 12 to work down a mine.

Mills

While thousands of children worked down the mine, thousands of others worked in the cotton mills. The mill owners often took in orphans to their workhouses, they lived at the mill and were worked as hard as possible. They spent most of their working hours at the machines with little time for fresh air or exercise. Even part of Sunday was spent cleaning machines. There were some serious accidents, some children were scalped when their hair was caught in the machine, hands were crushed and some children were killed when they went to sleep and fell into the machine.

Factories and Brick Works

Children often worked long and gruelling hours in factories and had to carry out some hazardous jobs. In match factories children were employed to dip matches into a chemical called phosphorous. This phosphorous could cause their teeth to rot and some died from the effect of breathing it into their lungs.

Chimney Sweeps

Although in 1832 the use of boys for sweeping chimneys was forbidden by law, boys continued to be forced through the narrow winding passages of chimneys in large houses. When they first started at between five and ten years old, children suffered many cuts, grazes and bruises on their knees, elbows and thighs however after months of suffering their skin became hardened.

Street Children

Hordes of dirty, ragged children roamed the streets with no regular money and no home to go to. The children of the streets were often orphans with no-one to care for them. They stole or picked pockets to buy food and slept in outhouses or doorways. Charles Dickens wrote about these children in his book "Oliver Twist".

Some street children did jobs to earn money. They could work as crossing-sweepers, sweeping a way through the mud and horse dung of the main paths to make way for ladies and gentlemen. Others sold lace, flowers, matches or muffins etc out in the streets.

Country Children

Poor families who lived in the countryside were also forced to send their children out to work. Seven and eight year olds could work as bird scarers, out in the fields from four in the morning until seven at night. Older ones worked in gangs as casual labourers.

Changes for the better

It took time for the government to decide that working children ought to be protected by laws as many people did not see anything wrong with the idea of children earning their keep. They also believed that people should be left alone to help themselves and not expect others to protect or keep them. They felt children had a right to send their children out to work. People such as Lord Shaftesbury and Sir Robert Peel worked hard



to persuade the public that it was wrong for children to suffer health problems and to miss out on schooling due to work.

NOTE: WRITE IN YOUR DICTIONARY ALL WORDS YOU CAN'T UNDERSTAND.