

Factories in the Industrial Revolution

Richard Arkwright is the person credited with being the brains behind the growth of factories. After he patented his spinning frame in 1769, he created the first true factory at Cromford, near Derby.

This act was to change Great Britain. Before very long, this factory employed over 300 people. Nothing had ever been seen like this before. The domestic system only needed two to three people working in their own home. By 1789, the Cromford mill employed 800 people. With the exception of a few engineers in the factory, the bulk of the work force were essentially unskilled. They had their own job to do over a set number of hours. Whereas those in the domestic system could work their own hours and enjoyed a degree of flexibility, those in the factories were governed by a clock and factory rules.

Edmund Cartwright's power loom ended the life style of skilled weavers. In the 1790's, weavers were well paid. Within 30 years many had become labourers in factories as their skill had now been taken over by machines. In 1813, there were only 2,400 power looms in Britain. by 1850, there were 250,000.

Factories were run for profit. Any form of machine safety guard cost money. As a result there were no safety guards. Safety clothing was non-existent. Workers wore their normal day-to-day clothes. In this era, clothes were frequently loose and an obvious danger.

Children were employed for four simple reasons :

there were plenty of them in orphanages and they could be replaced easily if accidents did occur they were much cheaper than adults as a factory owner did not have to pay them as much they were small enough to crawl under machinery to tie up broken threads they were young enough to be bullied by 'strappers' - adults would not have stood for this

Some factory owners were better than others when it came to looking after their work force. Arkwright was one of these. He had some harsh factory rules (such as workers being fined for whistling at work or looking out of the window) but he also built homes for his work force, churches and expected his child workers to receive a basic amount of education. Other owners were not so charitable as they believed that the workers at their factories should be grateful for having a job and the comforts built by the likes of Arkwright did not extend elsewhere.

The Cotton Industry and the Industrial Revolution

The United Kingdom experienced a huge growth in the cotton industry during the Industrial Revolution. The factories that were required to produce cotton became a legacy of the time – Sir Richard Arkwright at Cromford built the world's first true factory to produce cotton. With an ever increasing population and an ever-expanding British Empire, there was a huge market for cotton and cotton factories became the dominant feature of the Pennines.

The north of England had many areas around the Pennines that were perfect for the building of cotton factories. The original factories needed a constant power supply and the fast flowing rivers in the Pennines provided this. In later years coal provided this power – this was also found in large quantities in the north of England.

The factories also needed a work force and the population in the northern cities provided this, especially as many families had been engaged in the domestic system prior to the industrialisation that occurred in the north. There was therefore a ready supply of skilled weavers and spinners. Liverpool, a rapidly expanding port, also provided the region with a means of importing raw cotton from the southern states of America and exporting finished cotton abroad. The internal market was well served with decent transport means, especially when the railways extended from London to the north.

Of great importance to the cotton industry was the repeal in 1774 of a heavy tax that was charged on cotton thread and cloth made in Britain.

Combined with all the above factors were numerous inventions that transformed the British cotton industry and helped to make the UK the 'workshop of the world'

Lancashire and the Industrial Revolution

The Lancashire cotton industry – and its success in the Industrial Revolution – was based on seven features that were effectively unique to Lancashire at the time.

Before the development and growth of factories across Great Britain, domestic industry had been common throughout the land. As factories caused this to rapidly decline, Lancashire found that it had a skilled workforce already in the area as prior to the Industrial Revolution, Lancashire had been famous for the number of people who worked in its woollen industry. This workforce was already skilled in spinning and weaving.

The port of Liverpool was already importing raw cotton from Turkey and the Middle East. As the cotton industry grew, Liverpool found that it was ideally situated – on the west, Atlantic facing coast - to import cotton from the plantations that were developing in the southern states of America. Fast flowing streams were required as a source of power and the water that flowed off of the Pennines into Lancashire was perfect for this. It was also soft water so it was perfect for washing the cotton.

Coal was also found in large quantities in Lancashire so that when cotton factories made the transition from waterpower to steam power, the natural source of energy – coal – was already there. Lancashire also had a damp climate that was useful in the cotton factories as it stopped the cotton thread from drying out and snapping when it was under strain.

The cotton industry was new to Lancashire and it attracted to it new entrepreneurs such as Richard Arkwright who had new ideas that acted as a stimulus for the industry. By comparison, the woollen industry, which had been around for much longer, was more conservative in its outlook and less inclined to adopt new methods of working.

The centuries of tradition within the woollen industry was also a disadvantage as it was stymied by centuries old rules introduced by guilds in the Middle Ages. These rules defended quality and the rights of weavers but they were not of any value to an industry moving into the Industrial Revolution

Coal Mines in the Industrial Revolution

Coal was needed in vast quantities for the Industrial Revolution. For centuries, people in Britain had made do with charcoal if they needed a cheap and easy to acquire fuel. What 'industry' that existed before 1700, did use coal but it came from coal mines that were near to the surface and the coal was relatively easy to get to. The Industrial Revolution changed all of this.

Before the Industrial Revolution, two types of mines existed : drift mines and bell pits. Both were small scale coal mines and the coal which came from these type of pits was used locally in homes and local industry.

However, as the country started to industrialise itself, more and more coal was needed to fuel steam engines and furnaces. The development of factories by Arkwright and the improvement of the steam engine by Watt further increased demand for coal. As a result coal mines got deeper and deeper and coal mining became more and more dangerous.

Coal shafts could go hundreds of feet into the ground. Once a coal seam was found, the miners dug horizontally. However, underground the miners faced very real and great dangers.

even with Watt's improved steam engine, flooding was a real problem in mineexplosive gas (called fire damp) would be found the deeper the miners got. One spark from a digging miner's pick axe or

candle could be disastrouspoison gas was also found undergroundpit collapses were common; the sheer weight of the ground above a worked coal seam was colossal and mines were only held up by wooden beams called props.

Regardless of all these dangers, there was a huge increase in the production of coal in Britain. Very little coal was found in the south, but vast amounts were found in the Midlands, the north, the north-east and parts of Scotland. Because coal was so difficult and expensive to move, towns and other industries grew up around the coal mining areas so that the workers came to the coal regions. This in itself was to create problems as these towns grew without any obvious planning or thought given to the facilities the miners and their families would need.

The increase in coal production :

1700 : 2.7 million tonnes

1750 : 4.7 million tonnes

1800 : 10 million tonnes

1850 : 50 million tonnes

1900 : 250 million tonnes

Life in Industrial Towns

The Industrial Revolutionwitnessed a huge growth in the size of British cities. In 1695, the population of Britain was estimated to be 5.5 million. By 1801, the year of the first census, it was 9.3 million and by 1841, 15.9 million. This represents a 60% growth rate in just 40 years.

Manchester, as an example, experienced a six-times increase in its population between 1771 and 1831. Bradford grew by 50% every ten years between 1811 and 1851 and by 1851 only 50% of the population of Bradford was actually born there.

As enclosure and technical developments in farming had reduced the need for people to work on farmland, many people moved to the cities to get accommodation and a job. These cities were not prepared for such an influx in such a short period of time and cities such as Birmingham, Liverpool, Manchester etc. (all vital to the Industrial Revolution) suffered problems not witnessed anywhere else in the world at this time.

These cities needed cheap homes as the Industrial Revolution continued to grow. There were few building regulations then and those that did exist were frequently ignored. Builders had a freehand to build as they wished. Profit became the main motivator for builders. They knew that those coming to the cities needed a job and somewhere to live. Therefore, a house was put up quickly and cheaply – and as many were built as was possible. The Industrial Revolution saw the start of what were known as **back-to-back**terrace housing. These had no garden and the only part of the building not connected to another house would be the front (and only) entrance (unless you were lucky enough to live in the end of the terrace). In Nottingham, out of a total of 11,000 homes in the 1840's, 7,000 were back-to-back

Factory Laws :

The 1819 factory act

no children under 9 to work in factories. Children from 9 to 16 allowed to work a maximum of 72 hours per week with one and a half hours a day for meals.

1833 Althorp's Factory Act : children from 9 to 13 to work a maximum of 42 hours per week; also children aged 13 to 16 to work a maximum of 69 hours a week. No night work for anybody under the age of 18.

1842 Mines and Collieries Act :

banned all women and children under 10 from working underground. No-one under 15 years was to work winding gear in mines.

1844 Graham's Factory Act :

minimum age for working in factories reduced to 8 years old. 8 to 13 years old to work a maximum of six and a half hours a day. 13 to 18 year olds to work a maximum of 12 hours a day and the same applied to women. Safety guards had to be fitted to all machines.

1847 Fielder's Factory Act :

10 hour day introduced for under 18's and for women.

There were factory inspectors to 'enforce' these laws but they were so poorly paid, they were easily bribed. Also many working parents were desperate for money and they lied about the ages of their children to get them work in factories and mines. So the laws may have been good in theory, they were very difficult to enforce