

The Years of Revolution

1.Britain before the Industrial Revolution

Only a few towns existed in England and they were very small. Most people lived in the countryside and worked in agriculture and up to 1750, the population grew very slowly. London was the largest town which existed at that time (500.000 to 700.000 inhabitants). The towns in the 1700 were spacious and there were no houses built back to back. The rich lived in large houses and the poor lived in squalid houses and in some areas as many as 12 poor men lived in one room. Only a few towns began to make improvements in sanitary arrangements, but these were rudimentary and related to drainage. Most of the town streets were narrow two metres wide with no lighting at night.

Death rate was very high because of wars and diseases. Children under five were particularly exposed to diseases which ravaged society in towns and countryside. The low level of life expectancy was one of the characteristics of the pre-industrial society; it was about 30years, there was also a high level of infant and children mortality.

There was little or no education for the poor. Some grammar schools were founded by private charity but they existed only in few areas. The children of the wealthy people went to the public schools and to the very few universities, in general there was a little interest in study or learning.

In the 1700, agriculture was the main occupation of the people and their methods of cultivation were still primitive. The open field system prevailed over most of the country and the main crops were cereals. Food production was poor and only for internal consumption. The most prosperous farmers kept poultry and pigs. They had gardens for growing vegetables. The farmers carried for the land which was scattered into Strips and open fields. They were either free holders (those who owned their land) or tenants (those who had a lease), but there were men with no land at all (landless). The most important person was the squire; a nobleman who lived with his family in the hall. He owned most of the land.

The towns of England were cut off from each other. Those who travelled, doctors and businessmen, went on horseback. By 1700 the large wheeled wagons were being used,

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however, they could only travel from 2 to 3 miles/hour and on hill travellers had to go out to push the coach. Winter conditions were so difficult that the coach did not run. Most goods were carried by land at very high cost; whenever possible goods were moved through water.

In the early 18th century, local trade was the most important, because articles could easily move from town to town. Abroad, Europe was the chief market and wool was the main export. Corn was equally exported, but only in years of good harvest.

The only industry which existed was of domestic type. Different areas were specialised in different kinds of manufacturing. Wool was the most important industry. Silk could be found in South Lancashire and the highlands. Iron goods in Sussex, copper could be found in Cornwall. Ship building in towns near the sea: Bristol, South Hampton, Newcastle.

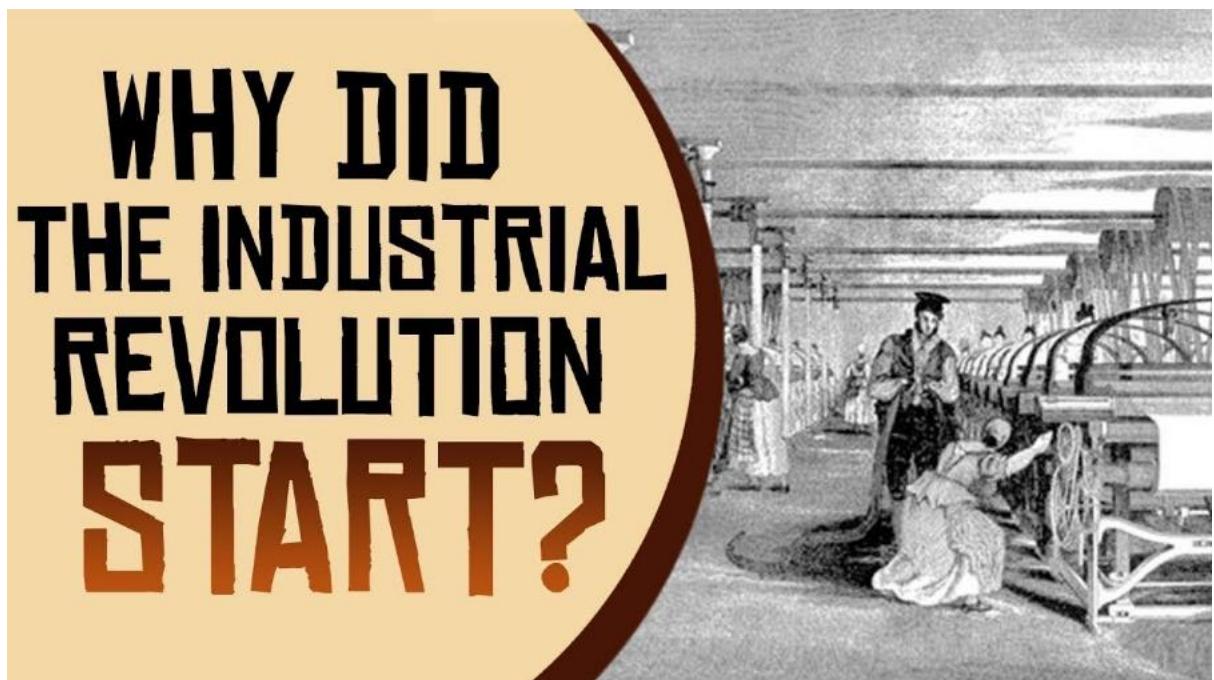
Power was provided by men muscles or by animals. Horses walked around to wind cobbles or to haul coal, water power was to work mills, and wind mills were equally a source of power.

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2.The Industrial Revolution

The years between 1750 and 1830 are generally spoken of as the crucial years of the Industrial Revolution. However, this term may be misleading because it has been a continuing process throughout history. In 1750, most English people lived in villages and by 1830 England became an urban society. Later on Arnold Toynbee gave the name of Industrial Revolution to show the changes from an agricultural country to an urban one.



2.1. Factors that Contributed to Change in Britain

Britain was not the richest or strongest country in Europe, but later on by its going through the first stages of the Industrial Revolution, it became the strongest and it was capable of increasing its markets when: 1-The English were able to win in their wars (7 years wars in India, Canada and the West Indies (1756-1763); so the growth of the population led to increase the demand for goods and that demand had to be satisfied.

2- Britain was helped by the flexibility of its laws, which allowed the British people to experiment without fear to be arrested; this gave scientists the chance to invent and produce new machines.

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3- There were many rich people in Britain who had been investing their money in their government stocks. Scientists, whenever they wanted to invent anything were helped by rich people.

4-The influence of Puritanism and Calvinism which taught people that indulgence in worldly pleasure was condemned. They did not spend their money on grand houses, splendid clothes or luxury living, so their money would be invested in industrial development. At the same time, their religious belief taught that God will approve of success in business.

5-Great Britain was fortunate in raw materials mainly coal and iron. The coal industry was the old industry, but the demand for coal in the iron as well as in the textile industry led to many changes:-Men had to go deeper down to get coal. They faced the danger of flooding which created the need for new efficient pumps to get water out from the mines. In the deeper areas, there was the danger of firedamp which led to the invention of ‘the safety lamp’ by Sir Humphrey Davies.

2.2. The Steam Engine

Thomas Savery invented a steam pump to get water from coal mines and copper mines. It was developed into a more efficient machine that was used by the Darby family. James Watt’s first experiments with the steam engines involved attempts to repair the old machine and by 1775 he had invented a more efficient steam engine with less fuel and more power. In 1783, Watt discovered a way of using the engine to turn other machinery, then sir William Murdoch showed him how to build a series of logs and wheels which Watt called ‘sun and planets system’, this changed the machine into a rotator one that was used by the end of the century in the textile factories, in iron work, in corn mills, in flour mills and other industries which made of the steam engine the royal start of industrialisation.

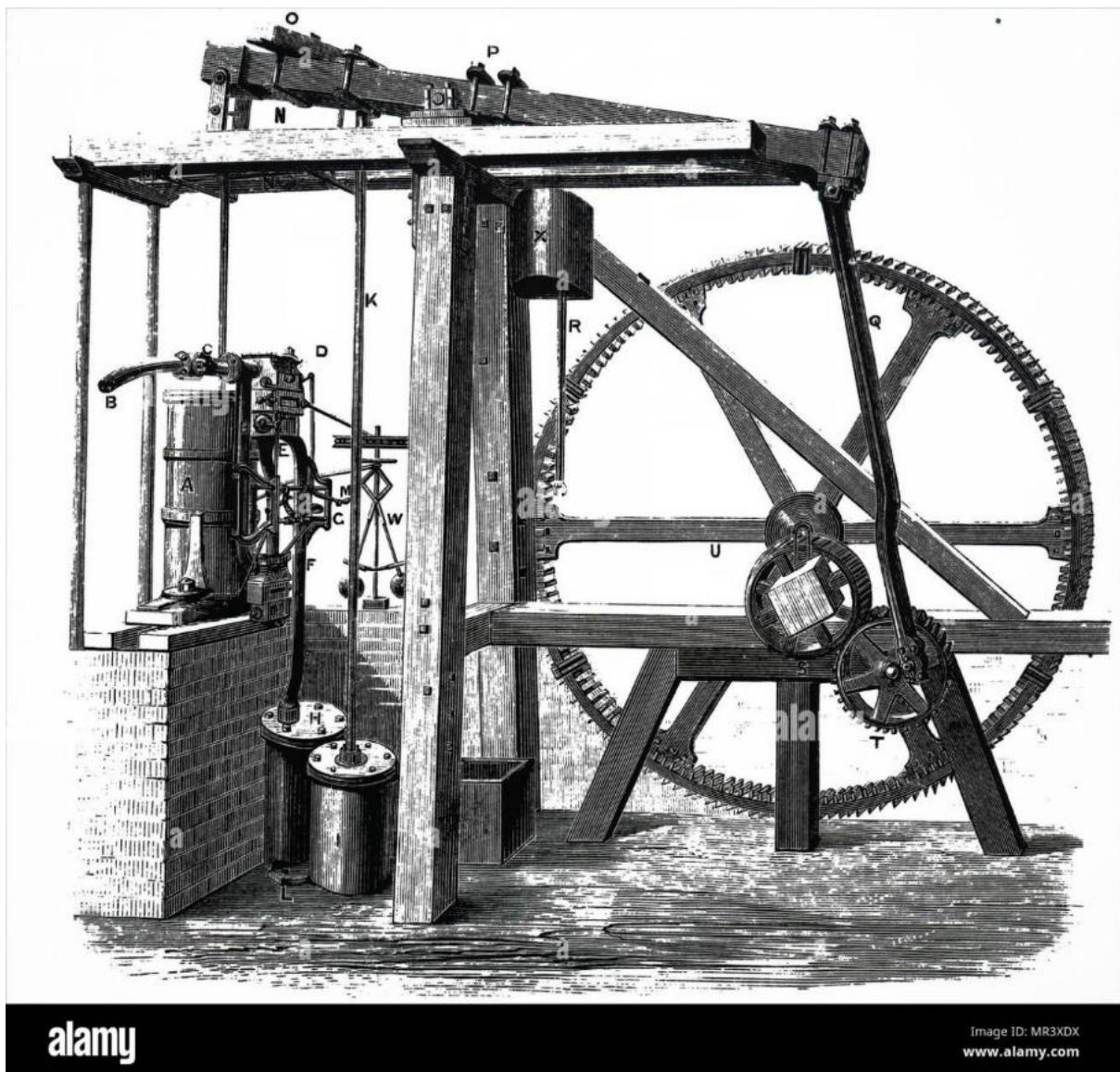


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2.3. The Textile Industry

The woollen industry was the most important one; the British woollen cloth was spread all over the world. The old woollen industry was under a domestic system. Merchants bought the raw material from farmers and took it to small cottages where the country workers worked on it. They started by sorting the long strands from the small ones, then washing it to get the dirt out, combing it so that all the fibbers lay the same way, then spinning it on a simple wheel. This work was done in small cottages and there were no factories. Not all jobs were done in the same cottage; there were workshops and mills under the control of

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merchants where dyers used plants to dye which gave each cloth a special colour. There were plenty of workers within cottages and machinery was less needed than in cotton industry.

2.4. The Spinning Sector

Most of the early inventions were in the spinning sector. James Hargreaves' Spinning Jenny (1764) could work a number of spindles at once (120 spindles by 1775). These Jennies were at first simple machines which could be used in cottages. Richard Arkwright's Water Frame was able to produce stronger thread than that produced by its predecessors. Because it was too heavy, it was of no use to cottages, but had to be installed in a factory close to running water. Arkwright was able to make profit from his own invention by running his own mills. He won the title of 'father of the factory system'

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3.The Agricultural Revolution

The British Agricultural Revolution occurred over a period of several centuries (more akin to an evolution than a revolution) .Farm workers using more productive tools and machinery produced more crops with fewer workers. Without increasing amounts of food to feed the increasing city populations the Industrial and Scientific Revolutions could not have proceeded. Each so called "Revolution" supported and advanced the other revolutions—they were (and still are) intricately linked together.

It appeared mainly because of:

-The increased demand for food for the increasing population.

*The falling in the prices thanks to good harvests, so the farmers had to produce more to cut the costs.

-Many of the landowners sold off their estates to successful businessmen who wanted country estates. They made their money in commerce, and they brought the habit of money making to agriculture.

-The emergence of new ideas about farming; some of which were brought from other countries such as Holland (stock breeding).

-The growth in scientific knowledge. The Agricultural Revolution would not have been possible unless farmers learned, for instance, how to maintain and restore the fertility of the soil.

3.1. The Open Field and Commons

In 1700, throughout the midlands and eastern England, each farmer and tenant farmer had a number of strips in scattered fields (pieces of lands).In this way, every one shared in the land be it good or bad; but the system was wasteful:

-They used to plant only one kind of crop so every farmer had to follow and was not allowed to experiment with a new crop.

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-There were no hedges between the strips; and the animals could wonder freely and eat the crops.

-Because of the lack in fertilisers, 1/3 of the land was unproductive.

But the most serious and important defect of this farming system was ‘the commons’. Each village had its common (40000 acres) in which there were woods, forests, and the grazing land for animals. For businessmen, these commons were huge areas which could be ploughed up and made to produce benefits.

3.2. The Enclosures

From 1760 onwards, a movement grew up; it supported the ideas of turning the separate strips into compact holdings. Those who led the movement believed that it would save land and time. They also wanted to divide up the commons. Sometimes, such enclosures were carried out by agreements between the people concerned and when arrangements were not possible, they had to go to parliament and get an Enclosure Act. Before this act would be passed, certain steps had to be taken:

-3/4 of the owners of the land involved had to agree to the enclosure.

- For 3 Sundays, a notice had to be put on church doors telling the other farmers about the proposals. Sometimes, people who feared the change pulled down the notice.

- The proposals in a form of parliament bill were presented to a committee in the House of Commons. This committee heard evidence for and against the proposals. The poor could not go to London to give evidence so the committee heard only the rich.

- When the committee was satisfied, the bill went to the House of Commons to become an act.

-The Parliament appointed a number of commissioners to go to villages to map out the land dividing it and settling all the arrangements about farming.

As a result of enclosures, some of the farmers could not prove to the commissioners that they had any legal claim to their strips, because they had inherited them from their

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families. Some who got a compact holding could be offered their share, but the cost of hedging was very high, so they sold their farms if they were the owners, and if they were tenants, they had to hand it back to the owners. Some less efficient farmers found that they could not produce food charged by more efficient and rich farmers. The loss of commons affected everyone except the most prosperous farmers.

3.3. The New Farming

Most enclosures took place in eastern England; it was there that new system of farming was seen. For this reason, it was known as the Norfolk System .It consisted of:

- Granting tenants a long lease (21 years) so they might be encouraged to do the draining, hedging and other works.
- Allowing farmers to experiment different crops each year.
- Building new roads in order to transport the crops to markets.
- Using a number of new machines produced in the 18th century, however, they were limited to richer farmers.
- There was a royal encouragement for such New Farming with king George III who had been given the title of 'Farmer George'.

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4.The Transportation Revolution

The main means of transportation were roads and water. However, transportation by canals proved to be safer and cheaper than roads. The roads then in existence were quite inadequate to bear the weight and bulk of iron and coal shipments. The great pioneer of canal building in England was the duke of Bridgwater, with his engineers, John Gilbert and James Brindley. He devised a water way from his coal fields at Worsley to Manchester. There came a time where no town of any size in England was more than 15 miles from a canal. Thomas Telford who worked on canals played an important role in road improvement. From the time of the Romans, it had been taken for granted that a highway carrying regular heavy traffic must have deep solid foundations. John Mc Adam introduced a surfacing of hard stone shipping which were weather resistant, and could bear its load better than the less resistant solid construction, and was strengthened rather than weakened by the constant pressure of wheels and horse hoofs.

The most adventurous development in transport, however, was that of the iron road. In his later years, James Watt considered the feasibility of using steam as a method of propulsion as well as powering static engines, but he did not follow it up. Robert Trevithick was the first to construct a steam locomotive and displayed its running round a circular track at Easton in 1809. In 1829 George Stephenson and his son won a competition sponsored by the Liverpool and Manchester Railway, with their rocket capable of travelling at almost 30 miles an hour.

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