

# AGRICULTURAL & INDUSTRIAL REVOLUTIONS

## THE AGRICULTURAL REVOLUTION.

This refers to a period in the history of Britain from 1750 – 1850 when the country's population grew quickly. More people were born and the death rate fell. This created a number of problems.

- ❑ More food was needed to feed all the extra people.
- ❑ The old methods of farming, which had been unchanged for centuries, were no longer good enough to supply the food that was needed.
- ❑ New and better methods were urgently needed.

The great landowners and farmers of 18-century Britain approached these problems from a number of angles.

- ❑ Advances in food production.
- ❑ Advances in animal breeding methods.
- ❑ Advances in farm machinery.

### **Advances in Food Production;**

For almost ten centuries the **Open-Field System** had been used to produce food in Britain. This gave a farmer one-acre strips of land in three large, open fields. Each year two of the fields were cultivated while the third was allowed to rest.

There were a few disadvantages with this system-

- ❑ It was time wasteful as the farmer spent much time travelling from strip to strip.
- ❑ It was land wasteful as there was always land not in use.
- ❑ It could not meet the increased demand for food that arose as the population grew.

During the 1750's farmers began an **Enclosure Movement**. This meant they enclosed fields with hedges and abolished the idea of strips of land. **Acts of Enclosure** in Parliament achieved these enclosures. This new method had a number of advantages-

- ❑ It was more efficient.
- ❑ It reduced disease in crops.
- ❑ It meant more land could now be used because so much time was being saved.

Charles "Turnip" Townsend developed a second advance in food production. For many centuries a system of land use called **Three field Crop Rotation** had been used. However it produced no winter fodder and this meant that every winter animals had to be slaughtered. Townsend replaced this with a **Four-Field System of Crop Rotation**. Turnips and Clover were planted with Wheat and Barley over a four-year period. The first two made the soil more fertile and provided winter fodder for the animals. This meant that animals could be kept alive until their meat was needed and for the first time ever, fresh meat was available throughout the winter.

### **Advances in Animal Breeding Methods;**

**Robert Bakewell**, a farmer developed a system called **Selective Breeding**. This involved breeding sheep to become meatier or woollier. Cattle could be bred to produce more milk or meat while horses could be bred to be faster. The system was so successful that within fifty years livestock had more than doubled in weight producing more food for the market and more profit for the farmer.

### **Advances in Farm Machinery;**

**Jethro Thull** developed two machines, which made sowing and maintaining crops much easier and more productive. **Seed-Drill**, helped produce more abundant crops. **Horse-Hoe**, Removed weeds from fields giving crops more space to develop and thus become more abundant.

## **THE INDUSTRIAL REVOLUTION.**

In 1750, 70% of Britain's population lived on the land. Any manufacturing was done by hand, in people's homes. This was called **Domestic Industry**. By 1850, a massive change had taken place. Now only 40% of the population lived on the land, while the rest lived in the new towns and cities, which had grown up. Manufacturing was now done large factories powered by steam and water. This was called **The Factory System**.

This change is called the Industrial Revolution and there are reasons why it happened in Britain;

- **Increased Population** – Britain's population doubled in less than 100 years.
- **Coal and Iron Ore** – The raw materials needed to power the Industrial Revolution, Britain had huge reserves of these.
- **Colonies** – Britain had extensive Colonies throughout the world, providing a market where her goods could be sold.
- **The Agricultural Revolution** – More food was produced to feed the growing population.
- **The Transport Revolution** – Better roads and more efficient ways of moving Goods and people were developed.
- **New Inventions** – These enabled goods to be produced more quickly and more cheaply.

### **The Textile Industry;**

In Medieval times clothes were produced as follows. Raw wool was bought from farmers, passed on to spinners to be spun into thread, then passed on to weavers to be woven into cloth and finally passed on to tailors who turned it into individual garments. This was very time consuming and with the growing population out of date and too slow. New methods of production were needed.

In 1733, **John Kay** invented the **Flying Shuttle**, which speeded up the weaving process.

In 1764, **James Hargreaves** invented the **Spinning Jenny**, which could spin as much thread as 80 Spinners!

In 1769, **Richard Arkwright** invented the **Water Frame**, a spinning machine powered by water.

In 1779, **Samuel Crompton** invented the **Mule**, a cross between the Spinning Jenny and the Water Frame, which could do the work of 100 spinners.

In 1785, **Edmund Cartwright** invented the **Power Loom**, which again speeded up the weaving process.

Huge new buildings called factories had to be built to contain these machines.

### **Coal, Iron and Steel;**

The Industrial Revolution would not have been possible without Coal -

- It provided power for factories, railways and ships.
- It provided raw materials for chemicals and dyes.
- It provided Coke, for smelting Iron Ore

Between 1750 and 1850 the use of Coal increased by 1,000%.

Iron was also important. Iron Ore was smelted by Charcoal {Baked Timber} but wood was becoming scarce and new methods of smelting had to be found.

- In 1709, **Abraham Darby** discovered a way to smelt using **Coke** {Coal without gasses}, that was cheaper than using Charcoal.
- In 1784, **Henry Cort** developed “**Puddling and Rolling**”, a way of turning Pig Iron into **Wrought Iron**, which was much stronger.
- In 1856, **Henry Bessemer** developed “**The Bessemer Converter**”, a vassal for making steel, which was lighter and stronger than Iron. It only cost 33% of the price of Iron and could be produced in less than an hour, whereas Iron took a week to produce.

### **Steam Power;**

In 1705, **Thomas Newcomen** designed a **Steam engine** to pump water out of mines. This allowed miners to mine deeper then ever before. One draw back of this invention was that it could not turn wheels.

In 1763, **James Watt** developed the **Rotary Steam Engine**, which could turn wheels and meant that his Steam Engine could be adapted for other uses than pumping water. Steam Power had a huge impact on the Industrial Revolution;

- It increased the need for Coal.
- It increased the need for Iron, from which the Steam engines were made.
- It increased the need for factories, which were the only buildings large enough to contain them.
- It led to the development of trains and influenced the Transport revolution

## **THE TRANSPORT REVOLUTION.**

For centuries Goods had been moved by Horse and Cart or by ship. These two methods had many disadvantages.

- They were slow and expensive.
- Only small loads could be moved.
- Due to bad roads breakdowns were frequent.
- As ships were wind powered they were weather dependent.

All of these were improved in the following ways;

### **Roads;**

**John Macadam** and **Thomas Telford** designed roads with **Tarmac** surfaces, which did not turn to mud in winter. These new roads allowed excess water to run off into ditches at the side and due to their small stone foundations could take much heavier loads.

**Turnpike Trusts** were a kind of Toll Road. Private companies who used the tolls to maintain the surface of the road built the road.

### **Canals and Ships;**

Canals were safe, quick ways of moving heavy loads like Coal. The first Canal was opened in 1741 in **Newry Co. Down**. It was such a success that soon factory owners all over Britain were building canals. Within less than 100 years 4,000 miles of canals had been built. However the arrival of the railways destroyed the significance of canals almost overnight.

The invention of the Rotary Steam Engine quickly led to the first Steam Powered ship made of Iron in 1784. Ships were no longer dependent on the weather and were faster and more powerful than ever before. Crossing the Atlantic for example now took less than two weeks, whereas before it could only happen in summer and took six to eight weeks.

### **Railways;**

The first railway opened in 1825, linking Stockton and Darlington. In 1829 the first fast train, "**Stephensons Rocket**" was introduced. By 1860 there were 11,000 miles of railways in Britain. They were faster, cheaper and more comfortable than any other form of transport available. They helped the growth of Industry, the growth of towns and cities and led to the development of Seaside Resorts.

## **WORKING AND LIVING CONDITIONS.**

The Industrial Revolution made some people very rich indeed. However most factory workers and their families lived in dreadful poverty.

Because wages were so low children as young as five were sent to work in factories and mines for 12 or 14 hour days. In textile factories their small hands were used to tie broken threads together, while in the mines their small bodies were sent to places too tiny for an adult to enter. Life expectancy for these children was very low, their backs were deformed and their lungs were badly damaged by the age of 12 due to gasses and particles, which they constantly inhaled.

For adults things were even worse. The working week lasted six days from five in the morning to eight at night all year round. The factory owners had so many rules and charged such heavy fines when they were broken that many workers were frequently in arrears with their pay. Conditions within the factories were appalling also with little ventilation or heating and poor lighting. Accidents were common and injured workers received no compensation or time off or sometimes not even medical attention.

### **Reformers and Reform Movements;**

In 1817, workers began to fight for a better deal. A group called **Luddites** demanded better conditions. When the owners refused the Luddites smashed the machinery in the factories. Govt. dealt harshly with these men by executing them. However the ideas for reform had been sown and others came afterwards to demand better conditions for workers and their families.

**Robert Owen**, a mill owner treated his workers well. He paid good wages and built them quality housing, provided schools and hospitals. He even helped his workers set up a Trade Union and workers Co-operatives.

After the French Revolution, Governments began to see the wisdom of passing laws to improve the lot of workers;

- **1819** – An Act made it illegal to employ children under seven and to force children under 16 to work more than 12 hours a day.
- **1833, Factory Act** – Inspectors were employed to enforce laws concerning children.
- **1842, Mines Act** – It was illegal to send women or children underground to work.
- **1844, Children’s Act** – A six and a half hour day was enforced for children between 6 and 13.
- **1847, Workers Act** – A ten-hour day was introduced for under 18’s and for all women.

### **Disease;**

Because of the filthy conditions in which people lived and worked disease was a constant threat at this time. **Typhus, Typhoid** and **Cholera** were the most feared.

### **Entertainments;**

**Drinking** was the most popular pastime, with pubs opening from six in the morning to Midnight. Pubs served all people regardless of age.

**Bull baiting** was also popular as a sport with people betting sums of money on the outcome.

**Cock fighting** was also popular for the same reason. Later soccer and other ball games became popular.

## **IRELAND AND THE GREAT FAMINE.**

### **Life in Ireland;**

All of the land in Ireland was owned by just a few thousand landlords, all of who were Protestant. They lived on huge estates in a mansion, known locally as “**The Big House**”. The Landlord and his family lived a very privileged life, waited upon by teams of servants. Meals were formal occasions, with the family dressing in special outfits. Some landlords were interested in their estates and in the tenants who lived on them. Most however were away from their estates for long periods of time and used an Agent to run them for them.

Almost all Catholics rented their land from one of these landlords. These tenant farmers were divided into three groups.

### **Large Tenant Farmers;**

Rented over 30 acres of land and had a good standard of living. Known as Leaseholders. As long as they paid their rent they could not be evicted and often held the same land for many generations. They lived in large cottages built of stone with bedrooms and furniture.

### **Small Tenant Farmers;**

These made up the majority of the population. They rented between five and thirty acres and could be evicted from their land at any time. Their main food was the potato and they only ate meat at Christmas. They held their land for short periods of time. They lived in one roomed mud cabins with no windows and almost no furniture.

### **Labourers;**

These were landless and even poorer than the small tenant farmers. They worked for larger farmers to earn money to survive. They were dependent on the farmers they worked for to give them lodgings.

### **Customs, Traditions and Pastimes;**

- ❑ **Fairs and Markets** – People travelled from miles around to attend these. Music and Dancing and Drinking were popular forms of entertainment at them.
- ❑ **Weddings and Wakes** – Were great social occasions. The local Matchmaker often arranged marriages. Wakes involved drinking dancing and card playing.
- ❑ **Sports and Games** – Horseracing, Currach racing and Hurling were the most popular sports.

### **The Great Famine;**

In 1841, Ireland had a population of 8 million people, with many of them dependent on the potato crop for survival. If for any reason this crop failed it could lead to a disaster. This is exactly what happened in 1845.

A fungus known as **the Blight** struck the potato crop, so that the potatoes rotted in the ground. Because of their dependency on the potato people were facing a whole year without food. The Blight struck again in 1846 and again in 1847. A million people died, while another million left the country in search of a life.

The British Government, who bought in **Indian Maize** from the U.S.A. and sold it at cost price to the starving people, set up relief schemes. **A Board of Works** was established to build roads to give work and wages to farmers who had lost everything. In 1847, the worst year of the famine [“Black ‘47”] **Soup Kitchens** were set up to give out free food. The need for these measures can be seen from the fact that they were feeding 300,000 families a day.

Those who could afford to do so fled the country. Most left on ships which were so poorly maintained that they became known as “**Coffin Ships**”. In some cases these ships sailed across the Atlantic with no food or toilet facilities for the passengers. It is not surprising that so many died before they reached their destination.

### **Results of The Great Famine;**

- ❑ One million people died.
- ❑ One million fled the country.
- ❑ Many went to America, bringing with them a hatred for the British, who they blamed for the Famine
- ❑ The loss of population meant that small farms disappeared and landlords now rented out larger plots of land. This meant an improved standard of living for those who survived.
- ❑ The Famine hit Western Ireland hardest and this had a massive effect on the Irish Language, which declined as a result.
- ❑ Farms were no longer divided among the whole family when the parents died. But instead left to the eldest son. All other children were forced to emigrate to earn a living. This led to a continued decline in population, which continued to recent times.
- ❑ The Famine bankrupted most of the landlords who were forced to sell their estates.