Industrial Revolution

Introduction to Industrial Revolution.

- In the 1700s, a new kind of revolution began in Great Britain.
- It was a time when people invented many machines that made work faster and more efficient.
- The changes were so great that they led to a revolution in the way work was done and people call it Industrial Revolution.

Introduction to Industrial Revolution.

- The **Industrial Revolution** was a period from the 18th to the 19th century where major changes in agriculture, manufacturing, mining, and transport had a profound effect on the socioeconomic and cultural conditions
- It started in the United Kingdom, then subsequently spread throughout Europe, North America, and eventually the world.
- The onset of the Industrial Revolution marked a major turning point in human history; almost every aspect of daily life was eventually influenced in some way.

Causes of industrial revolution

- Starting in the later part of the 18th century there began a transition in parts of Great Britain's previously manual labour and draft-animal–based economy towards machine-based manufacturing.
- It started with the mechanisation of the textile industries, the development of iron-making techniques and the increased use of refined coal.
- Trade expansion was enabled by the introduction of canals, improved roads and railways.
- The introduction of steam power fuelled primarily by coal, wider utilisation of water wheels and powered machinery (mainly in textile manufacturing) underpinned the dramatic increases in production capacity.
- The development of all-metal machine tools in the first two decades of the 19th century facilitated the manufacture of more production machines for manufacturing in other industries.

Causes of Industrial Revolution

- Outgrowth of social and institutional changes brought by the end of feudalism.
- As national border controls became more effective, the spread of disease was lessened, thereby preventing the epidemics common in previous times.
- The percentage of children who lived past infancy rose significantly, leading to a larger workforce.
- British Agricultural Revolution made food production more efficient and less labour-intensive, forcing the surplus population who could no longer find employment in agriculture into cottage industry, for example weaving, and in the longer term into the cities and the newly developed factories.
- The colonial expansion of the 17th century with the accompanying development of international trade, creation of financial markets and accumulation of capital are also cited as factors, as is the scientific revolution of the 17th century.

Causes of Industrial Revolution

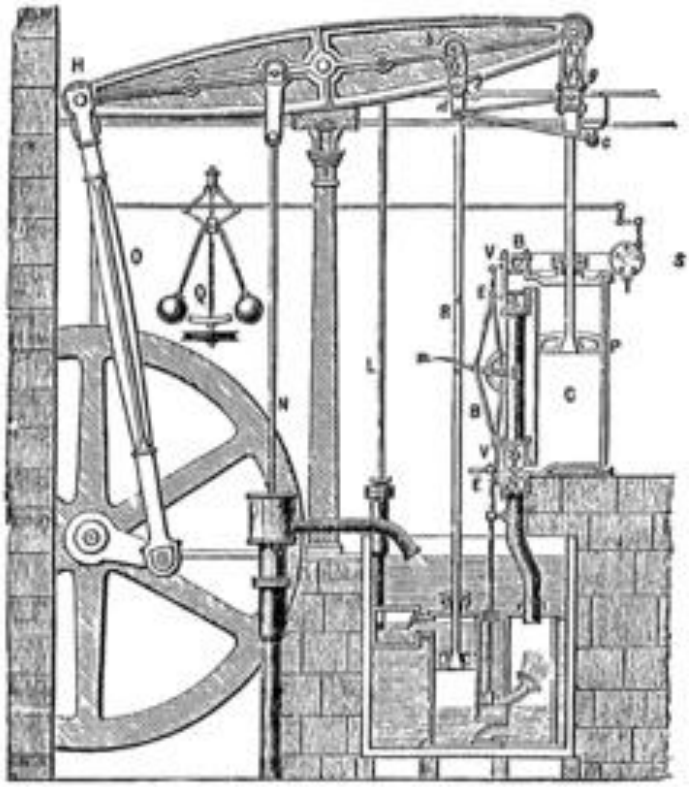
- End of feudalism
- Border controls
- Printing press
- Global colonial markets
- Agricultural reforms
- Advent of coal and petroleum
- Improved transportation
- Machines

Principal Inventions

- Wooden ploughs were replaced by iron ones
- In 1769 water powered spinning machine was invented but expensive enough to used by common weavers.
- In1769, James Watt a young Scottish tool maker invented steam engine which could pump water out of mines and run machines.
- By 1780s, steam engines were spinning cotton, making flour, sawing lumber, printing, and rolling metal.
- An English engineer Richard Trevithick made a steam engine locomotive, it hauled coal along nine miles of track.
- Before long miles of railroad tracks crisscrossed England.
- People and goods traveled at astonishing speeds for very little money.
- By 1850 some trains roared down the track at 50 miles an hour.
- Until the 1980s, it was universally believed by academic historians that technological innovation was the heart of the Industrial Revolution and the key enabling technology was the invention and improvement of the steam engine.

Introduction to Rail Transport

First Steam Engine



Towns of Industrial Revolution

- Before the revolution, most people lived in small villages scattered across the countryside.
- More and more people moved to cities to work in factories.
- Factory towns such as Manchester and Liverpool doubled and tripled in size.
- By 1850, over two million people were living in London . Just 20 years before it had population of less than a million.
- Good housing in these cities was almost impossible to find.
- Single family houses were divided and redivided to get the most people into smallest possible space.
- Sometimes a dozen people lived in single room.

Manchester and Sheffield

Industrial Towns

Railway Towns

- the spread of railways greatly affected the fate of many small towns.
- Peterborough and Swindon became successful due to their status as railway towns; in contrast towns such as Frome or Kendall remained small after being bypassed by main lines.
- Some entirely new towns grew up around railway works. Middlesbrough was the first new town to be developed due to the railways, growing from a hamlet of 40 into an industrial port after the Stockton and Darlington Railway was extended in 1830.
- Wolverton was fields before 1838 and had a population of 1,500 by 1844.
- Other examples of early railway towns include Ashford, Darlington, Doncaster and Neasden.

Living Conditions

- Housing demand was high but neither town councils nor employers saw it as their responsibility to build the necessary dwellings. It was left to speculative builders whose objective was maximum utilisation of land and minimum expenditure on material and services.
- Dwellings of brick with slate roofs were run up in long rows along unlit and unpaved street after street, with a little regarded to orientation or day lighting, with no internal water supply or sanitary facilities and hardly a tree or a blade of grass in sight.

Living Conditions

- Degrading and disgusting conditions of swellings made decency impossible and inevitably undermine the health and moral of the tenants.
- Mid century London had 200,000 undrained cesspools and the Thames was virtually a foul sewer.
- Similar conditions obtained in large towns all over the country and it is not surprising that water borne diseases, cholera and typhoid, claimed many victims.
- Cholera claimed 5000 deaths in 1832 and 14000 in 1849 in London.
- Infant mortality rate during the years 1838 – 54 was of 135 per 1000 and now a days it is less than 20 per 1000.
- Urban life was made more unpleasant from 1839 when fourteen hectic years of fervor for railway construction brought steam trains into the hearts of towns.
- Dense smoke and fumes fouled the atmosphere and roar of engines and rumble of rolling stock grated ceaselessly upon the inhabitants.

Creation of Suburbs

- Middle class began to move out to the purer air of surrounding countryside and aided by cheap fares settled in neat suburbs at four to eight houses to the acre.
- Their vacated town houses sometimes in good squares deteriorated in multi- occupation by poorer families.
- Thus began the sharpening of segregation between classes and erosion of sense of community in towns.

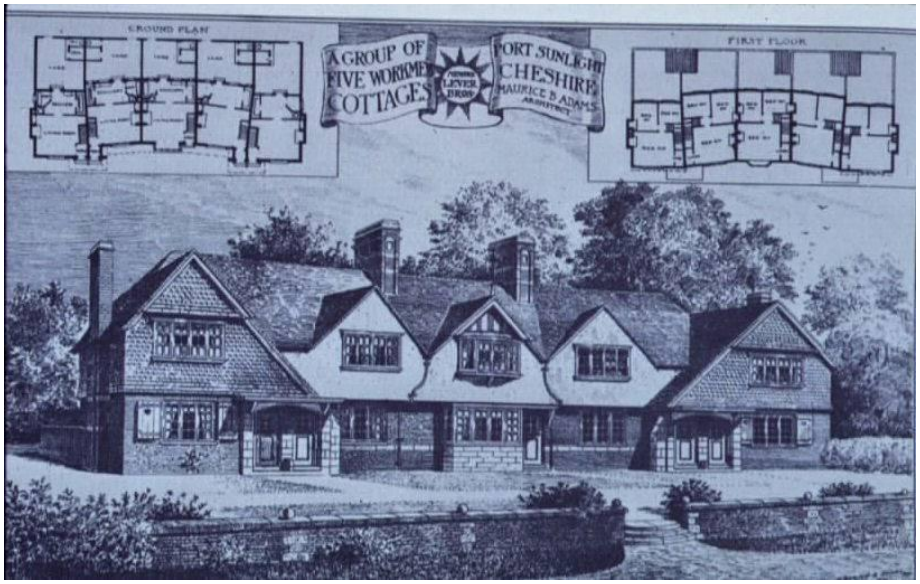
Times of Improvement

- There were succession of committees and commissions inquiring into the lamentable sanitary state of large towns, the toll of diseases and deplorable conditions in swellings and workplaces.
- A significant step towards municipal self, the Municipal Reform Act of 1835, transferred much of the power of local administration from old monopolies of lawyers, professional men and land owners to the hands of local shopkeepers and tradesmen but the new councils were slow both to comprehend the vast causes of damage caused by years of urban growth
- The great public health act 1875 imposed many sanitary conditions on house builders. Their bylaws dealt with level, width and construction of new streets and drainage, the structure details of the buildings and closing buildings that were unfit for habitation.
- Improvement schemes were executed in central areas of big cities and decreased congestion by shifting of central buildings and traffic improvements.

Schemes of Community Planning

- Among successful schemes for community planning were the model villages built by industrialists for their employees.
- Bessbrook(1846) in northern Ireland established for linen mills
- Port sunlight (1880s)by W.H. Lever (soap manufacturers)
- Bourneville (1890s) by George Cadbury (chocolate company)
- Copley and Ironville.
- These and many other villages showed benevolent regard for community welfare and emphasis on well-spaced homes in good gardens.

Port Sunlight

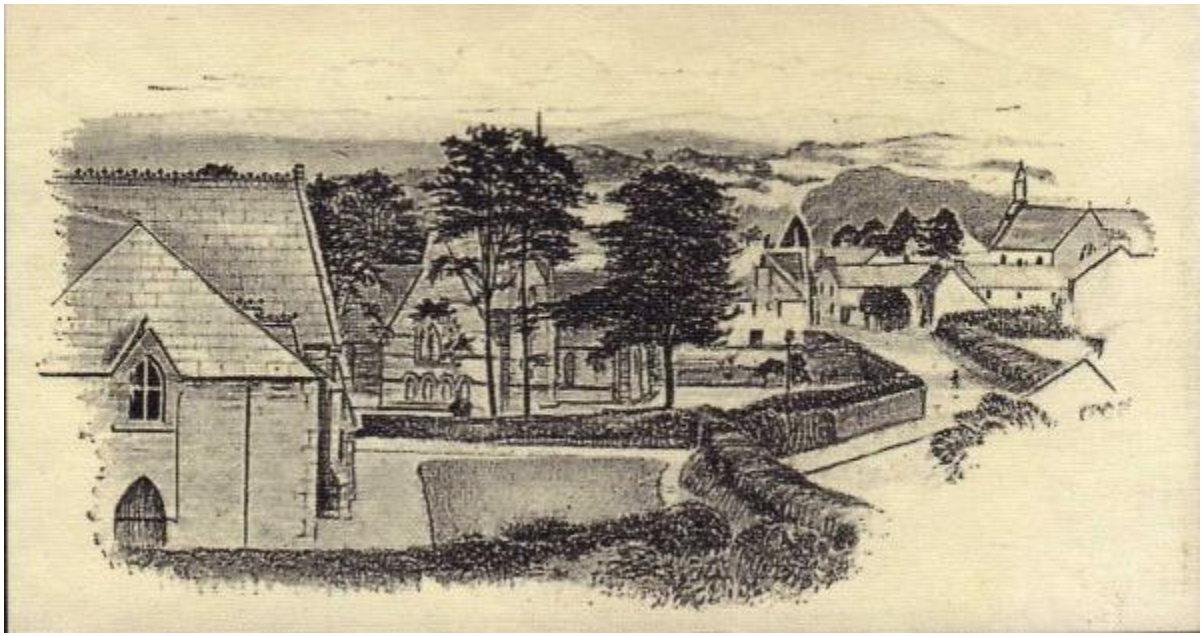


Bourneville

Village of Bessbrook

- Large areas were allocated to open spaces in the form of village greens, playing fields, and allotments.
- Care for community was evident in the provision of places of worship, schools with evening classes for adults, community halls, dispensary and medical attendance, numerous shops run on cooperative lines and saving bank.
- Houses of three to five rooms soundly built of local granite were lighted by gas supplied by the firm.
- It was described as a most happy and prosperous place for workmen.

Bessbrook Village



The Spread of Industrial Revolution

- By 1850, Britain was producing two thirds of the worlds coal and over half of its iron and cotton cloth.
- Most of the ships on the worlds oceans were British.
- At first, the British tried to keep the new machines to themselves.
- Until 1825, it was against the law for engineers, mechanics and tool makers to leave the country.
- In spite of such laws the ideas of industrial revolution spread to other countries.
- Before long British gave up trying to keep their inventions a secret. Instead they sold ideas and machines to countries around the world.
- Soon many of these countries were challenging British lead. By 1870 the united States was second only to the Britain in industry. Germany and Belgium were not far behind.
- Japanese also built factories in ate 1800s. They did so with amazing speed and only in 35 years it became one of the most industrialized countries of the world.