

Britain Before 1750 Before 1750, most people lived in small villages. They travelled on foot or by horses through small paths. Illness was common because of inadequate food, poor hygiene, use of polluted water, and non-existence of sewage system. As a result, life expectancy was very short. About 80% people worked in small agricultural farms in rural areas and the rest 20% lived in small towns. The villagers worked from sunrise to sunset (Oxford Geography, 269). Very few people worked in manufacturing, mining and trade units. Manufacturing was small and localized. People used handmade tools powered by people or animals. About 1% citizens were aristocratic families by birth. However, this small group of people controlled about 15 per cent of Britain's wealth. They did not work; instead, they only invested much of their wealth in land (Clark, 2010; Jacob, 1997).

Factors that Paved the Path for the IR

The Agricultural Revolution: It could be safely said that the Agricultural Revolution was the basic step that led to the flourishing of the IR. The changes in the methods of farming and stock breeding that characterized this agricultural transformation led to a significant increase in food production. British agriculture could now feed more people at lower prices with less labor. Unlike the rest of Europe, even ordinary British families did not have to use most of their income to buy food, giving them the potential to purchase manufactured goods.

The enclosures and crop rotation: More than 4000 Enclosure Acts were passed by the British Parliament during the Agricultural Revolution. Wealthy landowners had bought their lands from the village farmers and enclosed their land with fences. They also cultivated the larger fields. Wealthy landowners forced small farmers to become tenant farmers or to give up farming and move to the cities to work industries. The crop rotation and farm machinery were two other factors that improved agriculture and urged former farmers to leave to new cities.

Britain's coal supplies: Britain was richly supplied with important mineral resources, such as coal and iron ore, needed in the manufacturing process.

The Capitalist spirit and individual freedom: Parliament passed laws that protected private property and enterprise. Britain was a fertile ground for people willing to try new things and take risks. The absence of political and social conflict also was a factor that encouraged the growth of business (Clark et al., 2008).

Superior banking system and capital for investment: Britain had a ready supply of capital (money) for investment in the new industrial machines and the factories that were needed to house them. In addition to profits from trade and cottage industry, Britain possessed an effective central bank and well-developed, flexible credit facilities. Supply of capital at low interests enabled the new businesses to start up. There was also enough money to pay for experiments to develop new inventions (Deane and Cole, 1962).

Naval and trading powers: Britain was an island nation that relied on skilled sailors as well as a strong navy and well experienced fleets of merchant ships. Its largest merchant trading company was the East India Company (EIC) that rivaled many smaller European powers in wealth and influence.

Traits of the Industrial Revolution: the Industrial Revolution was characterized by many changes and inventions in almost all aspects of life. Some examples are as follow:

Textile Industry: John Kay (1704–1779) invented and developed the flying shuttle in 1747 (Hawke, 1993; Simkin, 2003). James Hargreaves (1720–1778) patented spinning jenny in 1770. Sir Richard Arkwright (1732–1792) invented the water frame in 1769 which used the waterpower from rapid streams to drive spinning wheels (Gernhard, 2003; Szostak, 1991). Weavers were no longer needed as Britain imported its cotton from America to manufacture it. As a result, Britain became the world's dominant power of

textile industry. **Iron Industry:** A better quality of iron was not possible until the 1780s when Henry Cort developed a system called puddling, in which coke was used to burn away impurities in pig iron to produce an iron of high quality. A boom then ensued in the British iron industry. In 1740, Britain produced 17,000 tons of iron; in the 1780s, almost 70,000 tons; by the 1840s, over two million tons; and by 1852, almost three million tons, more than the rest of the world combined. **The steam engine:** One of the great technological advances came in 1712, with the invention of a steam engine by an English blacksmith, Thomas Newcomen (1664–1729). His invention is considered as the “atmospheric engine” (Sinclair, 1907). This engine burned coal to create motive force that could be used to pump water out of the shafts of coal mines. Scottish mechanical engineer James Watt (1736–1819), working in a Glaswegian university lab of England, improved Newcomen’s steam engine in 1776, which harnessed massive amounts of coal-powered energy efficiently and economically (Jacob, 1997; Usher, 1920). **Improvement of transportation:** James Watt’s steam engine was used in water transportation to propel boats and steamships. In England, canals and other human-made waterways were used to transport raw materials and finished goods. In 1804, Richard Trevithick (1771–1833), an English engineer, transported ten tons of iron and 70 men over nearly ten miles of track in a steam-driven locomotive. It is the first locomotive built to run on rails (Sinclair, 1907). In 1821, George Stephenson (1781– 1848), an English civil engineer and mechanical engineer, built some 20 engines for mine operators in northern England. In 1829, the railroad opened under the supervision of Stephenson whose engines can move 29 miles per hour which was called “Rocket”. **The Great Exhibition:** In 1851, the British organized the world’s first industrial fair. It was housed at Kensington in London in the Crystal Palace, an enormous structure made entirely of glass and iron, a tribute to British engineering skills. Covering nineteen acres, the Crystal Palace contained 100,000 exhibits that showed the wide variety of products created by the Industrial Revolution. Six million people visited the fair in six months. **The Impact of the Industrial Revolution** the IR brought numerous advantages to Britain. Nonetheless, it also had a darker facet that affected the British society negatively. **The growth of cities and population:** Cities were rapidly becoming places for manufacturing and industry. With the steam engine, entrepreneurs could locate their manufacturing plants in urban centers where they had ready access to transportation facilities and unemployed people from the country looking for work. During the IR child and infant mortality rate decreased and fertility rate increased due to the development of medical science, improvement of sanitary system and economic development (Murmah, 2003). In 1800, Great Britain had one major city, London, with a population of 1 million, and six cities between 50,000 and 100,000. **Pollution:** The coal that powered factories and warmed houses polluted the air dangerously. Textile dyes and other wastes poisoned river water. Industrialization and rapid urban growth produced dreadful living conditions in many nineteenth-century cities. Filled with garbage and human waste, cities often smelled terrible and were extremely unhealthy. **New Social classes:** As the income of the workers was very low, they lived in dark, dirty shelters, with whole families crowding into one bedroom. They found little improvement in their living and working conditions (Flinn, 1966). Accidents and illness were very frequent. On the other hand, factory owners, merchants, and bankers grew wealthier than the landowners and aristocrats. A larger middle class, such as government employees, doctors, lawyers, and managers of factories,

mines, and shops had grown. They enjoyed a comfortable standard of living (Rostow, 1960). Child and Women labour: children were seen as ideal employees. They were small enough to fit between the new machinery, they were cheap to employ and their families were grateful for the extra income. Education was not a big concern as it was not compulsory. Children often started work at the age of four or five in jobs that were physically demanding. To keep the children awake, mill supervisors beat them. They found half an hour for lunch and an hour for dinner (Galbi, 1994). Many children developed lung cancer, tuberculosis, cholera, and other diseases and died before the age of 25. Many died from gas explosions or crushed under the machines or burned. Some lost limbs or blinded (Rosen, 2012). Women were also an easy target as they worked for lower wages than men and did not have the power or right to negotiate their rights due to their need for sustenance.