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The Industrial Revolution in the UK

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At the end of the XVIII century England became the largest maritime and colonial power in the world. Huge profits, which were provided by dominance in world trade, the use of the untold wealth of North America, India and other colonial possessions, were invested in British industry.

Extremely favorable for the industrial revolution were the geographical location of Great Britain and the natural and economic conditions of the country - water communications, convenient harbors, large deposits of iron ore and coal, the availability of raw materials for the textile industry.

Mechanic John Kay in 1733 improved the loom with a "flying shuttle". In 1765, the weaver James Hargreaves invented the "Jenny" mechanical spinning wheel, which could be worked with 16-18 spindles. In the last third of the 18th century, S. Crompton created a "mule machine", which was based on the principles of the Jenny spinning wheel, but made thin and durable cotton yarn. It spread in production and became the technical basis for mechanized spinning.

Weaving processes for some time lagged behind mechanized spinning, but this discrepancy was eliminated by the invention of the mechanical loom by E. Cartwright in 1785. It replaced the work of 40 weavers. Thus, the first machines and factories appeared in English industry. In the 60-80s of the XVIII century they appeared in other industries.

However, changes in steam technology began to dramatically change the situation. As early as 1712, Thomas Newcomen first introduced his steam piston engine, which

made it possible to pump out deep mines more efficiently. Steam engines improved rapidly over the course of the century and found ever-increasing use. More economical and powerful engines were used in coal mines, textile factories and dozens of other heavy industries. By 1800 there were about 2,000 steam engines in Britain.

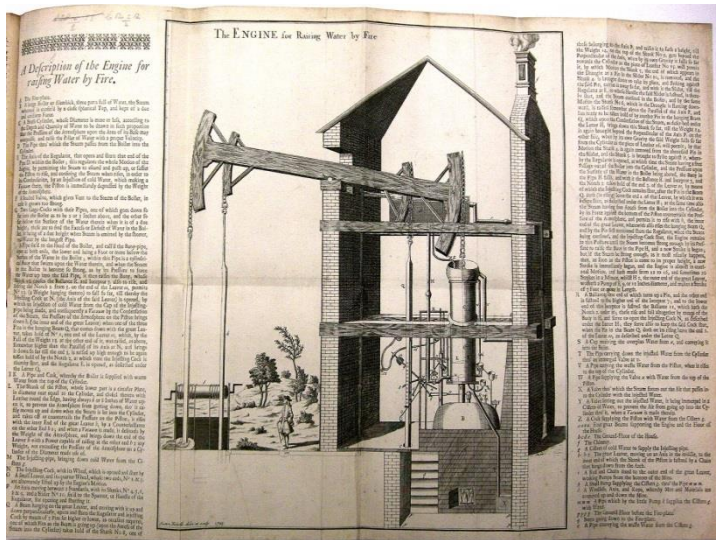


Fig. 1 – Early 18th Century Depiction of a Steam Engine

The spinning of cotton into thread to weave cloth has traditionally taken place in the homes of textile workers. However, in 1769 Richard Arkwright patented his "water frame" which allowed large-scale spinning to be done on just one machine. This was soon followed by James Hargreaves' spinning jenny, which further revolutionized the cotton spinning process.

The weaving process has also been improved with advances in technology. Edmund Cartwright's loom, developed in the 1780s, allowed for the mass production of cheap and lightweight fabric that was in demand both in Britain and

throughout the Empire. Steam technology would make even more changes. Constant power was now available to drive a dazzling array of industrial machines in the textile and other industries that were installed throughout the country.

The new "manufactories" (an early word for "factory") were the result of all these new technologies. Large industrial buildings typically used one central power source to drive a network of machines. For example, Richard Arkwright's cotton mills in Nottingham and Cromford employed about 600 people by the 1770s, including many small children whose dexterous hands spun with ease. Other industries flourished under the factory system. In Birmingham, James Watt and Matthew Boulton established their huge foundries and ironworks in Soho, employing some 1,000 people in the 1770s, making buckles, boxes, and buttons, as well as parts for new steam engines.