

# **The British Textile Industry**

## **Cotton Industry**

Cotton is a white fibrous substance composed of the hairs surrounding the seeds of the cotton plant. It was first imported to England in the 16th century. Initially it was mixed either with linen or worsted yarn. By 1750 some pure cotton cloths were being produced in Britain. Imports of raw cotton from the West Indies and the American Colonies gradually increased and by 1790 it had reached 31,447,605 lbs.

The Cotton Industry developed in three main districts: North West England, centered on Manchester; the Midlands, centered on Nottingham; and the Clyde Valley in Scotland, between Lanark and Paisley. By the 1780s the industry was becoming more concentrated in Lancashire, with a considerable number of mills within the Oldham, Bolton, Manchester triangle. By the end of the 18th century a large proportion of the population of Lancashire was dependent on the cotton industry.

By 1802 the industry accounted for between 4 and 5 per cent of the national income of Britain. By 1812 there were 100,000 spinners and 250,000 weavers working in the industry. Production had grown to 8 percent and had now overtaken the woolen industry. By 1830 more than half the value of British home-produced exports consisted of cotton textiles.

## **Woolen Industry**

The Woolen Industry was established in the Middle Ages using home-grown wool. Production was based on the domestic system and Leeds in Yorkshire became the market centre where the cloth was exchanged and finished. The output of broadcloth in the area rose from 30,000 pieces in the late 1720s to 60,000 pieces in the 1740s. Leeds now covered 60 acres and by 1770 the town had a population of 16,000. Thirty years later, this figure had doubled.

After the invention of the Spinning Jenny some cloth merchants became factory owners. Several were opened in the Leeds area but by 1803 only one piece of cloth in sixteen was being woven in a factory. Power-loom weaving was introduced in the 1820s. Entrepreneurs in Yorkshire were more likely to employ steam power than other areas. The Woolen Industry declined rapidly in Devon, Somerset, Wiltshire, and Gloucestershire. By 1860s steam power was more important than water in the West Country but in Scotland only 65% of the power was still obtained from water.

## Linen Industry

Flax, a slender blue-flowered plant cultivated for its strong woody fiber was used for making linen. Evidence from early Egyptian tombs suggests that flax was the first textile spun by man. The growing of flax and the making of linen was probably introduced to England by the Romans. By the Middle Ages restrictions were placed on flax growing in order to help the woolen industry. However, people in Ireland were encouraged to produce flax and by the 18th century, the country became the largest producer of linen in the world.

In the 1790s John Marshall and Matthew Murray created an efficient lax-spinning machine that produced good quality yarn. Marshall built two mills in Leeds, installed Boulton & Watt steam-engines, between 1803 and 1815 both Temple Mill (£238,000) and Castle Foregate (£82,000) made healthy profits. By 1820 Marshall was worth over £400,000.

Linen was also used as the warp thread in the production of fustian cloth. The invention of the water-frame made it possible to make cotton cloth with cotton warp and linen was then no longer needed for this. Linen was still used for sails, sacking and furnishing.

## Silk Industry

Silk filament is a fine, tough, elastic fiber produced by caterpillars called 'bombyx mori' or silkworms. The silk filament was first made into cloth in Ancient China. First the cocoons were placed into very hot water to soften the sticky gum, sericin, that holds the filament together. The ends of the filament is found and is then unwound. This process is called reeling. The silk filament, which can be as much as a mile long, is then put on to large reels, known as swifts. Unlike cotton or wool, silk is not spun but twisted. Hence the term throwing rather than spinning. Throwing involves the revolving of two sets of bobbins at different, carefully adjusted, speeds.

The art of producing silk cloth reached France, Spain and Italy in the 12th century. The weaving of silk was introduced to England by Flemish refugees in the 16th century and was greatly developed after 1685 when the Huguenots from France established themselves at Spitalfields in London.

The industry developed slowly because the shortage of raw silk and competition from the cloth being made in Italy, France and China. The main centers of the silk industry in England in the 16th century was London, Coventry and Norwich.

In 1718 Thomas Lombe obtained a patent for a "new invention of three sorts of engines never before made or used in Great Britain, one to wind the finest raw silk, another to spin, and the other to twist". His critics later claimed that his invention was based on a machine that had been used in Italy since the early part of the 17th century.

In the 18th Century the production of textiles was the most important industry in Britain. Most of the work was carried out in the home and was often combined with farming.

There are three main stages to making cloth: Carding, Spinning and Weaving.

## Carding

Carding was usually done by children. This involved using a hand-card that removed and untangled the short fibers from the mass. Hand cards were essentially wooden blocks fitted with handles and covered with short metal spikes. The spikes were angled and set in leather. The fibers were worked between the spikes and, by reversing the cards, scrapped off in rolls (cardings) about 12 inches long and just under an inch thick. The mother, operating a spinning wheel, turned these cardings into a continuous thread (yarn). Finally, the father used a handloom to weave the yarn into cloth.



This drawing of a woman using a spinning-wheel appeared in 1835. Her hand-cards are on the floor.

## Spinning

The spinning of wool, cotton or flax was originally done by the spindle and distaff. The distaff, a stick about 3 ft long, was held under the left arm, and the fibers of wool drawn from it were twisted spirally by the forefinger and thumb of the right hand. As the thread was spun, it was wound on the spindle. The spinning-wheel was invented in Nuremberg in the 1530s. It consisted of a revolving wheel operated by treadle and a driving spindle. The machine was unchanged until James Hargreaves invented the spinning-jenny in 1764.



George Walker, *Woman Spinning* (1814)

## The Spinning Jenny

James Hargreaves was a weaver living in the village of Stanhill in Lancashire. It is claimed that one day his daughter Jenny, accidentally knocked over the family spinning wheel. The spindle continued to revolve and it gave Hargreaves the idea that a whole line of spindles could be worked off one wheel.

In 1764 Hargreaves built what became known as the Spinning-Jenny. The machine used eight spindles onto which the thread was spun from a corresponding set of rovings. By turning a single wheel, the operator could now spin eight threads at once. Later, improvements were made that enabled the number to be increased to eighty. The thread that the machine produced was coarse and lacked strength, making it suitable only for the filling of weft, the threads woven across the warp.

Hargreaves did not apply for a patent for his Spinning Jenny until 1770 and therefore others copied his ideas without paying him any money. It is estimated that by the time James Hargreaves died in 1778, over 20,000 Spinning-Jenny machines were being used in Britain.



An engraving of a Spinning Jenny by T. E. Nicholson (1835)

## Weaving

The handloom weaver was devised about 2,000 years ago and was brought to England by the Romans. The process consisted of interlacing one set of threads of yarn (the warp) with another (the weft). The warp threads are stretched lengthwise in the weaving loom. The weft, the cross-threads, are woven into the warp to make the cloth.

Weaving remained unchanged for hundreds of years until John Kay devised the flying shuttle, which enabled a weaver to knock the shuttle across the loom and back again using one hand only. The speed of weaving was doubled; and a single weaver could make cloths of any width, whereas previously two men had sat together at a loom to make broad cloth.



Handloom Weavers by A. W. Bayes

By 1800 it was estimated that there were 250,000 handlooms in Britain

## John Kay

John Kay, the twelfth child of a Yeoman farmer, was born near Bury in Lancashire in about 1704. Little is known about his early life but he was living in Bury in 1730 when he patented a machine for twisting and cording mohair and worsted.

For centuries handloom weaving had been carried out on the basis of the shuttle bearing the yarn being passed slowly and awkwardly from one hand to the other. In 1733 Kay patented his flying shuttle that dramatically increased the speed of this process. Kay placed shuttle boxes at each side of the loom connected by a long board, known as a shuttle race. By means of cords attached to a picking peg, a single weaver, using one hand, could cause the shuttle to be knocked back and forth across the loom from one shuttle box to the other.



A section of a mural produced by William Bell Scott that shows John Kay escaping from his home in 1753 after being attacked by local textile workers.

A weaver using Kay's flying shuttle could produce much wider cloth at faster speeds than before. Some woolen manufacturers used Kay's flying shuttle but were reluctant to pay him royalties. The costs of using the courts to obtain the money owed to him nearly ruined Kay.

In 1753 Kay's house in Bury was ransacked by a mob of textile workers who feared that his machines would destroy their livelihood. Deeply depressed about these events, John Kay left England for France where he is believed to have died a pauper in about 1780.