

THE TEXTILE INDUSTRY

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Abstract:

There is archaeological evidence of textile production in Britain from the late-prehistoric period onwards. For many thousands of years wool was the staple textile product of Britain. The dominance of wool in the British textile industry changed rapidly during the eighteenth century with the development of mechanised silk production and then mechanised cotton production. By the mid-nineteenth century all four major branches of the textile industry (cotton, wool, flax, hemp and jute and silk) had been mechanised and the British landscape was dominated by over 10,000 mill buildings with their distinctive chimneys. Overseas competition led to a decline in the textile industry in the mid-twentieth century. Today woollen production is once again the dominant part of the sector together with artificial and manmade fibres, although output is much reduced from historic levels.

Keywords: wool, mechanised silk production, hemp and jute and silk, mill, branches, revolutionized, spinning, hand-powered, steam, industrialization, woollen fibres, scutching mills, integrated textile mills, fulling mills.

Innovation. Thomas Lombe's silk mill, built in 1721, is regarded as the first factory-based textile mill in Britain. However, it was not until the handloom was developed following the introduction of John Kay's flying shuttle in 1733 that other branches of the textile industry (notably cotton and wool) became increasingly mechanized. In the second half of the eighteenth century, a succession of major innovations including James Hargreaves's spinning jenny (1764), Richard Arkwright's water frame (1769), his carding engine (1775), and Samuel Crompton's mule (1779), revolutionised the preparation and spinning of cotton and wool and led to the establishment of textile factories where several machines were housed under one roof. Although the spinning jenny remained largely hand-powered, many forms of the new machinery were driven by horse or water-power and later by steam. The term 'mill' was used to describe textile factories because so many, like the earlier corn mills, were water-powered. The textile industry pioneered the use of the factory system.

The textile industry in the mideighteenth century. During the initial stages of industrialisation, water was used to power a range of processes usually housed in separate buildings. These early attempts at mechanisation ran alongside domestic-based weaving in small dwellings. The first purpose-built textile buildings were water-

powered fulling mills, established as early as the thirteenth century to wash and pound woollen cloth. Scribbling, the process of disentangling the woollen fibres was followed by carding, a process by which the fibres were separated using wooden bats into which wires had been inserted.

Carding was first mechanised for the cotton industry in 1775 by Arkwright's carding engine, a development which led to a boom in carding mill structures during the 1780s and 1790s. Jenny shops began to appear from the 1760s, housing hand-, horse- and waterpowered jennies spinning both cotton and wool. Hargreaves's spinning jenny could spin multiple ends of yarn on one machine and held between 80 and 120 spindles worked by a single large wheel. These machines did not require purpose-built structures and were often installed in barns or weaver's cottages. Increasingly jennies were housed together with carding machines in a single building which came before the integrated cotton or woollen mill. Flax for linen required a different preparation process from cotton and wool. Flax stems were soaked or 'retted' to soften them, then beaten to break them up. This process often took place in water-powered 'scutching' mills. The carding process for flax was called 'heckling' or 'hackling'.

Spinning mills. Although industrial-scale mills were first introduced in the silk industry, it was the cotton industry that popularised the spinning mill. The earliest cotton spinning mills were those built to house Arkwright's water frame. Arkwright's first water-powered mill opened at Cromford, Derbyshire, in 1771. From the 1770s to the early decades of the nineteenth century, the Derbyshire cotton industry was at the forefront of textile manufacturing technology, both in the development of the powered process and in the construction and design of the mill building. The isolated location of these mills also led to the development of the factory colony. These cotton spinning mills were generally 30ft (10m) wide, up to 100ft (33m) long and between three and six storeys high. The ground and first floors housed the preparatory cotton production processes such as carding, drawing and roving whilst the middle floors housed the water frames, and the top floors were used for reeling and storage. The first use of steam-power in cotton spinning took place in 1786 at Papplewick Mill in Nottinghamshire. In 1789, a Boulton and Watt steam engine was successfully installed in Piccadilly Mill in Manchester. During the 1790s Crompton's mule was adapted for steam-power in the city so that by 1800 there were more than 40 cotton spinning mills in the Manchester area, of which over half were steam-powered. The dust from the cotton spinning process created conditions likely to lead to fires and so from the end of the eighteenth century 'fireproof' mills using cast iron columns and brick arches were developed. An early experiment was Ditherington Flax Mill in Shrewsbury. Built between 1796-97 to a design by Charles Bage, it was the world's first wholly iron framed building. This mill set the pattern for many of the fireproof mills of

the early-nineteenth century. William Strutt's correspondence with Bage led to a similar system being adopted for his North Mill in Belper (1803-4), replacing the mills on his site that had burned down. Mill fireproofing in the first half of the nineteenth century was led by the mill engineer William Fairbairn who worked with the scientist Eaton Hodgkinson to develop a distinctive brick arched system supported by cast iron beams on circular section cast iron columns. The last traditional cotton spinning mill to have been built in Lancashire is considered to be Elk Mill, Oldham, erected 1925-28, and demolished in 1999. With the decline of the industry the building of traditionally designed flax, silk and wool spinning mills ended in the mid-twentieth century.

Integrated textile mills. The preparatory processes of the textile industry began to be housed in the same mill building from the mid- to late-eighteenth century. The integrated textile mill - where raw materials entered the mill and grey, unbleached cloth left - developed due to the introduction of steam-powered weaving in the 1820's. Many mills achieved integration through the addition of a process to an earlier specialised mill. In the cotton and flax industries this often meant the addition of a weaving shed to an existing spinning mill. In the woollen industry, powered spinning and later weaving might be added to existing scribbling and fulling mills. Purpose-built integrated mills were widespread in the Lancashire cotton industry of the late 1830s to 1850s, but could also be found in other areas such as Yorkshire (wool) and the South West (wool and flax).

Child labour in the textile industry. Many of those working in textile mills in the eighteenth and nineteenth centuries were children who often came from workhouses. Child apprentices began work at the age of nine and were given food, lodgings and one hour of schooling a week. Samuel Downe, who was born in Shrewsbury in 1804, worked in Ditherington Flax Mill from the age of 10. He described working conditions in the factory during a Parliamentary Enquiry in 1832: 'we used to generally begin at five o'clock in the morning till eight at night'. When asked had he received punishment he replied 'yes, I was strapped most severely till I could not bear to sit upon a chair without pillows, and I was forced to lie upon my face at night. I was put upon a man's back and then strapped by the overlooker'. When asked why he was punished he replied... 'I had never been in a mill where there was machinery, and it was winter time, and we worked by gaslight, and I could not catch the revolutions of the machinery to take the tow out of the hackles; it requires some practice and I was timid at it.' Improvements followed, and in 1834 the 92 children working at Ditherington Flax Mill only worked part-time and had some schooling between nine-eleven am and three-five pm.

The future of historic textile mills. In the twentieth century thousands of derelict textile mills were demolished in all the industrial areas of Britain as the traditional industries became smaller and the appearance of historic mill towns was dramatically altered. The mill chimneys which were once a distinctive feature of mill towns almost disappeared completely. By the 1970s it was beginning to be recognised that textile mills and related buildings were historically important. As more people became interested in industrial heritage, the more significant mills were protected by listing or the designation of conservation areas and many are often now preserved alongside other types of historic buildings in a town. Former mills have been converted into a wide variety of new uses including flats, offices, shops or adapted for new types of industry. Other features that were associated with mills, such as warehouses and canals, are also being conserved, so the restoration of historic mills has become an important part of the regeneration of many former industrial towns

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