ΡΙΧΗΑΡΔ ΑΡΚΩΡΙΓΗΤ ΑΝΔ ΧΡΟΜΦΟΡΔ

Richard Arkwright and his partners established a mill in Cromford in 1771 and without delay set about perfecting the machinery and production methods for water - powered cotton spinning.

The first mill was modest in size, but in 1776 a second and very much larger mill was established using the same water supply. Soon after, the mill site expanded again and massive engineering work was undertaken, to create the system of ponds and underground culverts, which maintained Arkwright's increasing need for water to drive his machinery.

The mills at Cromford became models, which were copied by Arkwright's partners and by his competitors. Mills sprang up in various parts of the UK and despite the legislation forbidding the export of technology, in other countries such as Germany and America.

By 1790 all the principal buildings on the Cromford site had been completed and with the exception of the second mill and the "bow fronted" building, all have survived.

The Arkwright family sold most of its cotton spinning interests at an early date but retains the Cromford Mill and the nearby Mason Mill. After around 1840 the value of the Cromford Mills seriously demised. A shortage of water caused by the diversion of the main source for lead drainage limited production and during the second half of the 19th century parts of the site were put to other uses. Some buildings housed a laundry, others a brewer, then during the 1920's most of the site was purchased by a company manufacturing colour pigment for paint, production of which continued until 1979.

Cromford mill is now a world heritage site. Restoration of the old mill has been carried out by the Arkwright society, which purchased the site in 1979. Most of the smaller modern day buildings have been demolished and the huge task of cleaning walls and floors, heavily contaminated with chemicals and paint from the sites more recent users are well under way. The Derbyshire county council and the Derbyshire Dales District Council support the whole restoration project. The mill is open everyday and attracts visitors from all over the world. It has a visitor's centre, shops and a cafe and plans are in hand for a major exhibition with working machinery, meeting rooms for schools and other educational groups, a library and a study centre.

Sir Richard Arkwright was an extremely significant figure in the Industrial Revolution. Born in Lancashire, England, on December 23, 1732, Arkwright was the youngest of thirteen children in a poor family. He was apprenticed to a barber and became a wigmaker in Bolton, England. He traveled the country buying women's hair for wigs, and during his journeys he came across people engaged in weaving and spinning. The gradual disuse of wigs at that time contributed to his interest in inventions.

In 1769 Arkwright patented the water frame, a machine that produced tightly woven cotton. The yarn produced was of a much finer and firmer

texture than that spun by the spinning jenny. Horses powered the first water frame, but that process was too expensive so he decided to harness power from a warm water spring. Due to the inefficiency of waterpower, Arkwright ultimately decided to use one of Watt's steam engines, which he bought from the Soho works of Bolton and Watt in 1790. Arkwright became a partner with Jedediah Strutt, a wealthy hosiery manufacturer. In 1771 the partners built a water-powered mill at Cromford, England and were employing 600 people by 1774. In 1773 Arkwright began to use the thread produced by the water frame for the manufacture of calicoes. Thus, a cloth made solely of cotton was produced for the first time in England.

Serious riots of disgruntled workers occurred in Lancashire, and a new mill that Arkwright had erected at great expense was completely destroyed in the anti-machinery riots of 1779. The lack of productivity from his workers and mechanics along with the slow sale of the yarn produced by the water frame discouraged Arkwright. The operation of Arkwright's water frame was a secret, and to keep it a secret he was careful in his actions against the infringes. In 1781 Arkwright tried and failed to renew his patent due to hostile opposition, so he took his case to court. He took action against nine firms. A Colonel Mordaunt admitted his use of Arkwright's water frame, but Mordaunt claimed that the patent on the water frame was insufficient in its specifications. Arkwright dissolved his partnership with Need and Strutt but kept his mill at Cromford. The case dragged on for several years but was settled against him in 1785, on the grounds that he had borrowed his ideas for the water frame from John Kay. The most important part of the water frame was the crank and comb, said to have been used by James Hargreaves. But according to one source Hargreaves stole it from Arkwright. The perpetually revolving cloth on the water frame called the feeder was said to have been used by John Lees, a Quaker of Manchester. But Arkwright had without a doubt used it previously at Cromford. A manufacturer named Wood claimed to have first used a cylinder in 1774, but Arkwright claimed he used it in 1772. Many people attempted to steal Arkwright's ideas, but most were reprimanded.

Though he lost his case, Arkwright did not lose his wealth. He went on to build cotton factories at Manchester, Matlock, Bath and New Lanark. Arkwright served as High Sheriff of Derbyshire in 1786 and was knighted in the same year. He died at Willersley Castle, the mansion he had built overlooking his Cromford mills, on August 3, 1792, leaving a fortune of 500,000 pounds.

When Richard Arkwright chose cromford for its natural resousrces. Arkwright was a merchant and travelled around. That means he had knowledge of cromford. Also water from bonsall brook (tributary of r.derwent), 10 % of water rest from cromford sough which was a drainage ditch from all the lead mines. This was constant and had power because it was high and fast moving. Water from the sough joined brook and supplied power to Arkwright mills.

Many copied Arkwright by building houses for workers etc Samuel Greg.

Arkwright's and Greg's factories both were 30ft wide 7 floors tall (the first at Cromford was only 4) and for 2 machines they had lots of

windows for light but Styale was a better site for a factory in transport terms than cromford.

The factories had many differences, one main one being that Greg's had a steam engine. Another difference would be that Greg had an apprentice house built (see below) to allow orphans and children from workhouses to work here. They were similar however in that in order to get workers both built houses that are close to houses and workers houses and churches etc.

The first mill was built by Richard Arkwright in 1771 and extended it horizontally in 1785. Unfortunately there was a fire in the building in the 19C. This left it with only 3 floors out of the original 5. The second factory was an unorthodox 7 floors tall and was built in 1776. This building was also subjected to the force of fire when it burnt down in 1890 leaving nothing remaining but the sunken frame of the water wheel housing. The water wheel housing was originally designed for 1 wheel but, as the one super large wheel was too powerful and caused the axel to buckle so it was replaced by two smaller ones.

These are the features added by Arkwright:

Aqua duct added in 1786

Replaced form, wood to iron in 1821

Two water supplies: cromford sough, bonsall brook

There is much evidence that Arkwright moved his water wheel, for example :

Bricks ,

Blocked windows

Algae

Shafts

Pit

scrapings on wheel

This concludes that Arkwright had an underrshot waterwheel and Greg started with a breastshot, however both changed to an over shot later in there successful careers. One main difference being that Arkwright used an aqua duct to divert the river.

Also that Arkwright attracted workers with housing, schools for there children and other luxuries for example the pig sty and pig given to each family, and the third floor designated for the spinning of wool.

To sum up, Arkwright brought the town of Cromford to a new economic and social high, expanding and improving it in a way that could not repeated.

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