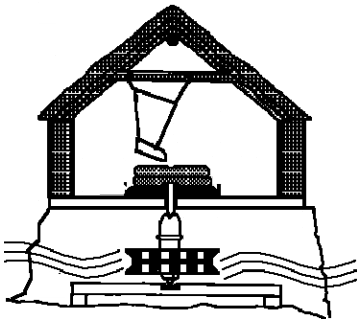
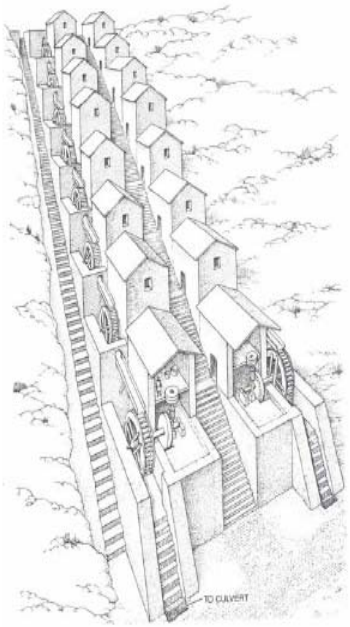
The History of the Water Wheel

The Chinese were probably the first people to use a water wheel. Understanding of this technology then travelled slowly west to Persia. The Greeks conquered Persia and the first record of a water wheel is in a poem written in 400BC. The Greeks passed the knowledge to the Romans. These early wheels would be horizontal. They are often called Norse wheels.



The Romans were very clever engineers who sent water across many miles in aqueducts for drinking and baths and irrigation. There are some very famous ones still standing. It was thought that the Romans did not use water wheels because they had animals or slaves to drive machinery for corn milling or lifting water.



A site was discovered in France where there were 16 vertical water wheels, all in a line, driving corn mills. This was like a factory and it could produce 4 tons of flour a day, enough to feed many people.

Gradually waterwheels became more common and were found on every river. In England the Domesday Book of 1086 records 5,624 water wheels but there were probably many more.

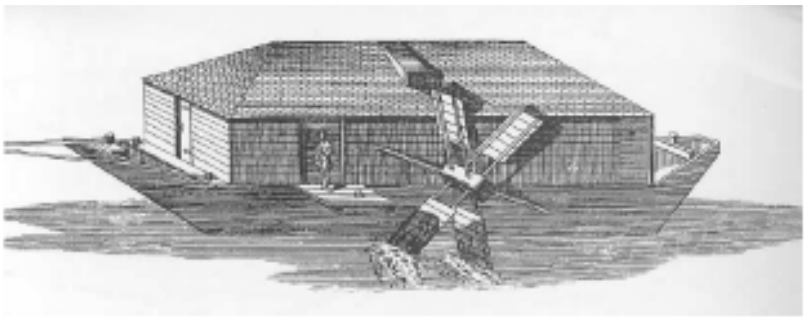
This is what a Saxon waterwheel would have looked like. The remains were discovered at Acmylen near Tamworth.

These wheels were to be found all over the then known world, in Africa, China, the Middle East and Europe. They were used for doing many different things. Lifting water for irrigation, driving bellows in forges and grinding corn were some of the uses.

The horizontal wheel carried on being used because it was the simplest to build and you could drive a mill stone directly from its shaft. Its main problem was that there had to be lots of water that flowed quickly.

In the 12 century the monks of Europe were the most technologically advanced. They had developed the control and use of water and so these engineering ideas spread throughout Europe. Their monasteries were always by a river and they used the water for washing and cooking and getting rid of the sewage. They also had wheels that powered wood cutting, corn milling and forging.

These monks began to use and improve the vertical wheel. It still needed lots of fast flowing water so people began to put wheels on boats so that they could be tied to the middle of a river where the water flowed faster and deeper. This only worked in big rivers.



They also fixed wheels to bridges where the water ran faster where it went through an arch. There were some on the original London Bridge.

In England, where most rivers were small, people began to dig channels and make dams so that they could control the water and make sure that it ran fast enough most of the time.

The horizontal wheel and the first vertical wheels relied on the power of the running water. If it did not run fast enough then the machinery had to stop.

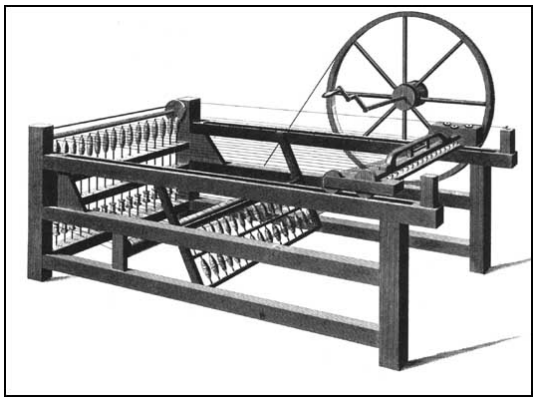
My need is rags for my good mill,
The wheel with water shreds them still,
Next press the pulp into a sheet,
On frame to place and dry to beat,
Then high I hang it, paper white
And smooth, a joy to printers' sight.

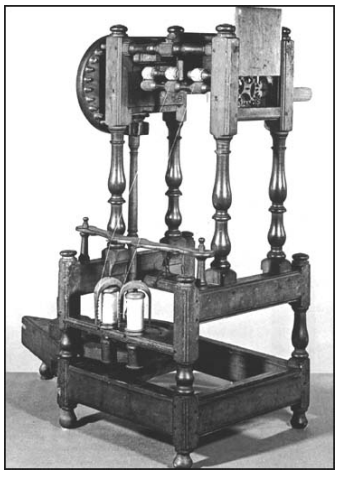
Then the overshot wheel began to be popular. It did not rely on the power of the water but on the weight of the water dropping into buckets. Over the years improvements were made and a great deal of industry used water power to work their machines.

There were lots of paper mills in and near the Calder Valley.

The textile industry was still a hand making process. People worked in their own homes or in groups in workshops.

In 1764 Joseph Hargreaves invented a cotton spinning machine called a jenny, but it could only be turned by hand but it could spin 8 threads at once. Lots of people copied his idea.





Richard Arkwright had been working on an improved machine called a spinning frame but it was too large to be turned by hand. They tried to use horses first but then turned to water.

In 1771 he opened a factory in Derbyshire which was powered by water and filled with cotton spinning frames. This was the very first textile factory and soon many others followed – all powered by water.

Spinning wool and worsted was a much more difficult job so these trades lagged behind in building factories. Spinning cotton was also very profitable so in the Hebden Bridge area new mills were either for cotton or worsted. The first water powered mill was built in 1789 and others followed in the next few years.

Soon every stream in every small valley had been channelled and dammed and a small mill with a wheel built on its banks. The environment had been changed for ever.

Polly’s map

You can still see the remains of this work today. The mill might have gone but the evidence is there.

Go for a walk up your nearest stream. Look for weirs, walls, goits, sluice gates, stones laid in the river bed, little stone arches. These were built by men needing to control the water to make their wheel work at its best.