

GSCE Coursework: History Around us

The site

Cromford Village and Mills, Derbyshire

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Introduction

During the period between 1771 and 1800 Cromford Mills were built and Cromford Village was considerably enlarged. It was built by Sir Richard Arkwright, who had invented the waterframe in 1769. The invention of the waterframe and the development of other mechanised machines turned the cotton industry from a domestic “cottage” industry into a factory driven one. The mill proved to be a great success and subsequently historians have studied a number of issues concerning both the mill and village at Cromford, which played an important part in British economic history. Unfortunately these studies have not proved to be fully conclusive as a large part of the mill was burnt down in 1890 and this has meant that certain issues have been left open to debate.

This study intends to consider the same issues historians study and by using primary and secondary sources, will try to draw a balanced conclusion about the structure of both the Cromford Mill and Cromford Village during the period between 1771 and 1800. In particular this investigation will try to establish why Arkwright chose Cromford as a site for his mill?

Why Cromford

There were three reasons that we can consider important to the answer this question. These were:

1. The water supply;
2. the remoteness of Cromford; and
3. the readiness and willingness of the workforce that Cromford offered together with the skills developed in particular in the local lead industry.

In addition to these specific factors there was an element of luck, which, combined to make Cromford an important milestone in the country's economic development.

Sources

Source 1 states that Arkwright chose Cromford because of the three main reasons we have mentioned. The water supply at Cromford is good and is plentiful all year round. The Cromford Sough was situated underground so it could not freeze during the winter.

Source 1 says that Arkwright used Cromford to protect his ideas from other inventors and other entrepreneurs. Originally Arkwright had come from Lancashire, where in the 1770s there had been riots against the industrialisation of the cotton industry. Cromford on the other hand was quiet and secluded and was a place where Arkwright could experiment with his ideas without fear of sabotage or interference. If his venture at Cromford had been a failure he could have kept the experiment low profile and avoid damaging his reputation.

The geographical isolation meant that it was hard to travel to and transport essential raw materials. It was equally difficult for Arkwright to transport his product out of Cromford. Despite these factors Arkwright firmly believe the sites advantages outweighed its disadvantages.

Source 1 also suggests that Cromford although not very large had a suitable labour force based predominantly on the wives and children of the local lead miners. It was advantageous that women and children were cheap labour and would prove economical for Arkwright. Whilst this position was beneficial Source 2 shows that the workers Arkwright chose wanted to work for him. The variety of jobs available at the mill meant that in addition to the local population workers also travelled in from the vicinity in order to fill the vacancies.

Source 1 is a secondary source written for a school textbook in 1973 by R.L. Hills. It can be described as reliable because it was written for the purpose of educating. One only has to look at a map and find Cromford to see how remote it is and it is likely that Arkwright wanted to escape from the riots in Lancashire. The water supply is excellent at Cromford and Source 2 proves that there was a skilled workforce near and around Cromford. Source 2 is a primary source advertising jobs in the mills. It can be

described as reliable and accurate since only jobs that were needed would be advertised. Source 2 could be fake, but the jobs advertised appear to be those that would have been required in a mill.

Although I agree with Source 1 about the three main reasons why Arkwright chose Cromford the Source does not state how Arkwright stumbled across Cromford. We already know that Cromford is remote so how did he find it? He might have found it on his travels as he used to be a wig maker and travelled around England. The other theory is that Arkwright when trying to buy a site with potential waterpower could only buy Cromford, as it was the only one available. Source 1 suggests the latter but it not definite or completely reliable.

Before Arkwright arrived in Cromford to establish the mill there is proof that it was a quiet, small town with the main industries being lead mining and smelting. The Cromford Sough and The Sough Dam were in place and they were used in the lead smelting process. Sources 3 and 4 both show similar images to what Cromford looked like before the arrival of Arkwright. The predominantly peaceful rural setting of the countryside with what looks like quiet surroundings. Source 4 shows more people working in it and also what might be the lead smelting buildings in the background.

Sources 3 and 4 are both primary sources and were painted in the eighteenth century. Although they show a fairly accurate view of Cromford prior to the arrival of Arkwright, it is fair to say that the artist may have exaggerated the surroundings. Cromford is situated in the countryside it is unlikely that the near perfect picturesque images shown in both paintings are accurate, as the artists would have exaggerated the rural view to ensure the best affect for their work. We though can assume that Cromford was smaller and quieter before the arrival of Arkwright.

The impact on Cromford

Arkwright made a number of changes to the village in Cromford. Before he arrived there were only sixteen houses in the village and few people lived there, but by 1789 eight hundred people worked in the mills and these people needed space for living.

Arkwright believed he had a responsibility for the welfare of his workforce and built them houses, shops, a church and a school. The housing was of a very high quality. Source 5 shows a photograph of North Street that was built for the workers. One just has to look at the stonework to see the expense and durability of the housing. If you look at Source 5 you can see that the top floor of the houses have windows. This is because on the top floor the weavers would work, as they would not have to go to the mill. This made the houses ideal for working families. While the women and children worked in the mills the men would stay at home and do the weaving. Other entrepreneurs imitated his idea of quality housing for workers. Source 6 below shows housing at Styal. These houses were made out of brickwork opposed to stone but apart from that were similar. Arkwright's idea had changed the face of housing for workers. The workers were happier with their housing and they worked better. As the houses were situated near the mill travel time was minimum. The situation was profitable for both Arkwright and the workers.

Source 7 shows The Greyhound Hotel, which opened in 1778, was used for accommodating visitors and guests. Arkwright liked to use his mill as a showcase to gain attention from the rich. Source 8 shows the church that Arkwright built for the people of Cromford. Building a church suggests he was trying to build a settled community. He added a Sunday school for the children as well. A market was run on every Saturday to supply the needs of the community.

Arkwright changed Cromford from a quiet village to a busy and noisy industrial settlement. This view is shared in Source 9 written by Viscount Torrington who visited Cromford in June 1790. Torrington says that “... Every rural sound is sunk in the clamours of cotton works”. The pleasant countryside which had been associated with Cromford, had disappeared, Torrington blamed Arkwright for this. He agrees that although Cromford has become economically prosperous it has lost its old past, of a quiet countryside village.

The photographic sources were taken in 2001. The buildings were built between 1771 and 1800. So building adjustments would have probably occurred during that period of time. The original structures remain in place today so they reflect a reasonable picture of how certain building would have looked during the time of Arkwright. Source 9 written by Viscount Torrington may be considered slightly biased. Arkwright wanted to gain social acceptance but those already socially accepted looked down on him. Viscount Torrington may not have approved of Arkwright. His description of Cromford may have overlooked the fact that Arkwright dramatically changed the fortunes of Cromford. It is clear from the source that he focused on the negative points rather than the positive points of which there were many.

The Mill

When Arkwright built the mill in 1771 waterpower was the most efficient form of power. Arkwright utilised the watercourses already at Cromford and added to them to use for his mill. The likely changes that Arkwright made to the watercourses are shown Source 10 below.

The Greyhound Pond shown in the top left-hand corner of Source 10 is one of five ponds that Arkwright made. It was made by putting a dam on the Bonsall Brook. Before Arkwright adjusted the watercourses, only the Bonsall Brook went directly to the mill site. Arkwright linked the Greyhound Pond to the Cromford Sough, from the Cromford Sough Dam he made a new watercourse went over a aqueduct and powered the first waterwheel at the mill. On the other side of The Greyhound Pond he built a sluice, which controlled the amount of water allowed through. The new watercourse was underground and powered a second waterwheel on the first mill. The underground water sources allowed the water to be used throughout the year, as it would not freeze. Source 10 shows the watercourses and is an accurate and reliable source; we have no evidence to doubt it. Source 11 shows The Greyhound Pond and the linking channel to the Cromford Sough.

The linking channel is on the left side of the photograph, under the cars shown.

When the first mill was built in 1771 there was only one waterwheel. The position of this waterwheel is subject to debate. I believe that the first waterwheel was originally situated in the area that the extension was built in. In Source 12 below you can see the difference in brickwork between the two sections. This proves that the extension was built. The Bonsall Brook flows underneath the extension. When Arkwright first started developing his mill at Cromford, the Bonsall Brook was the only watercourse that ran through the mill. It is likely that Arkwright used the Bonsall Brook to power his first waterwheel. But at the same time he was adjusting and creating other watercourses so he could have two waterwheels working at the first mill. The Cromford Mill guidebook states that, "...the extension would have been built between 1785-1786". This is evidence that the first water wheel may not have been situated under the aqueduct since it had not been built by 1771. It is more likely that the waterwheel would be situated underneath where the extension stands today because of the position of the Bonsall Brook.

The first mill had five floors, although in Source 13 the mill appears to have only three storeys. Two storeys had to be removed after the fire in 1890. But there is still plenty of evidence that the first mill had five floors. Source 14 is a photograph of the mill at Styal. Styal was built by Samuel Gregg in 1784. Gregg paid for the rights to copy and use the same equipment that Arkwright used at Cromford. So it would make sense after paying large amounts of money to copy the layout of Arkwright's mill. Mills throughout the world have copied the Arkwright's standard mill design of five storeys. Mills in Germany and across Europe have been found with the same design as the one at Cromford.

The first mill was a great success, so after a few years it made sense to extend the mill to allow for two waterwheels and therefore to create more power. So between 1785 and 1786 the extension was created. After the extension had finished a second wheel was put in place. The first waterwheel was originally situated where the extension had been built so it was moved underneath the aqueduct. The new position of the first waterwheel is shown in Source 15. The waterwheel appears to be an overshot wheel because of the position of the aqueduct above the waterwheel. The Cromford Sough now powered the waterwheel.

With the extension in place a second waterwheel could be built. Source 16 shows the position of the second waterwheel. In Source 16 a bar is shown. The waterwheel would rest on the bar. Arkwright was able to control the amount of water that powered both the first and second. From the Greyhound Pond there was a sluice that controlled the amount of water let through the linking channel to the second water wheel. He could control the amount of water that flowed to the first water wheel from the Sough Dam. Although we are sure of the position of the second waterwheel, we are unsure about the type of waterwheel that was in place. Whilst there is some debate it is probable that the waterwheel was an undershot wheel. This is because there are no visible signs from Source 16 that the water flowed down from the hill behind the waterwheel. The course that flows from the Greyhound Pond remains underground

throughout the whole course. This suggests that the waterwheel was an undershot wheel because the water was running at a low ground level.

This artist impression shows the layout of the first mill after the extension was put in place. Many people, including the Cromford Mill Guide who has been studying Cromford for a long period of time, share this idea of the first mill.

As The Cromford mills success grew, the need for more mills grew as well. Arkwright started building the second mill in 1776 and it was finished in 1777. But the second mill was completely destroyed by the fire in 1890. Source 17 shows the remnants of the second mill at Cromford today. But when it was fully operational it was considerably larger than the first mill, as it had seven storeys. But such a large building needed a lot of power and it is unclear how many waterwheels powered the second mill. The waterwheel(s) were situated in the middle of the building and were sunk in a pit shown in Source 18. Whilst this trench is large enough to hold two waterwheels I believe that it held only one large waterwheel. The wheel was sunk into the pit so this suggests that the waterwheel would have been an overshot or a breast shot wheel. Evidence that supports the theory that the second mill at Cromford only had one wheel can be found at Styal. Source 19 shows a cross section of the mill at Styal. The cross section is similar to the second mill at Cromford. The mill at Styal has a large waterwheel underneath the mill similar to the one at Cromford. The mill at Styal was built seven years after the second mill at Cromford was opened. We already

know that Gregg paid money to copy Arkwright's mill so it is logical that he would use the same layout. The mill at Styal though only has five floors compared to the seven floors the second mill had at Cromford. This may be because Gregg was building his first mill and wanted to use the orthodox, five floors layout in case his mill was a failure. A seven-storey mill was an ambitious project for Arkwright. Other entrepreneurs might not be able to afford a seven-storey mill, as it was a grand project. But the mill at Style is still standing today and it is likely that Gregg did imitate the position of the waterwheel inside the second mill at Cromford.

We have already looked at how Arkwright diverted the Cromford Sough and Bonsall Brook to power his mill. But once the water was delivered to the mill, it had to be redirected again. At the centre of the mill site Arkwright built a basin, which is shown in Source 20. The basin diverted the water from the Bonsall Brook and the Cromford Sough in three different ways. Arkwright placed a sluice in the basin to control the levels of the water and the amounts allowed through on certain routes. One way the water was diverted, was to power the second mill. From the second mill the water travelled to the River Derwent, passing through the Cromford meadows. Another way the water was diverted was under the road and along a feeder channel to supply the Cromford canal. Surplus water was diverted to the river Derwent. All of the watercourses are shown in Source 21. Source 20 and Source 21 both show the three courses water was diverted within the mill. Inspection of the source clearly shows that the water above ground flowing towards the position of the second mill. Other water fell down into the basin.

In Source 20 we can clearly see the course surplus water would take. The surplus water would travel through the grating shown and then towards the river Derwent. The other course is not shown in this source because of the angle of the photograph, but this course can be seen in Source 21. Source 20 is useful in telling us how the water was diverted from within the mill because the sluice and basin can be clearly seen. But the source does not show the routes of the watercourses and it is necessary to refer to Source 21, which clearly does show the direction they followed. In summary whilst both Source 20 and Source 21 can both be described as useful if we study them separately, when these are considered together they are extremely useful.

Summary

The Cromford Mill played not only an important part in the Industrial Revolution but also in British culture. When the cotton spinning diminished at Cromford around 1840 the mill site was already dated. The water supply, which the mill had relied upon throughout its success, was reduced as a result of a lead mine drainage. Other factories across Britain were using steam power, which was more efficient than waterpower. Also the remoteness of Cromford was proving a larger problem as more mills better equipped than Cromford had been set up across Britain. But even though it demised after 70 years it is still considered a massive success and was a pioneer for industrial practice. The impact that the Cromford mill had on industry in the eighteenth century is a similar one of the impacts the computer had on industry in the twentieth century. The technology that the mill used changed the face of industry.

On the social side the housing that Arkwright built for his workers changed housing around Britain and provided a template to other entrepreneurs who wished to build good quality homes for their workers. The housing built for workers, who in the past lived in poor accommodation was excellent and North Street remains standing today as a testament to the original builders. Across Britain one will find many streets with a similar design to North Street.

The mill at Cromford was part of the first stage of the Industrial Revolution. Technology was rapidly changing and it was always likely that the mill would be outdated after a period of time, just like computers today. The Cromford mill could not compare to a mill that was built 50 years afterwards the same as a computer built 10 years ago could not compare with a computer today. The Industrial Revolution moved at a fast pace and left Cromford behind. But Cromford is remembered as the pioneer in the Industrial Revolution as it was the worlds first successful cotton mill and it had superb housing for the workers. Arkwright when he was alive wanted to gain social acceptance and wanted to be remembered, the mill and village have assured that he will always be remembered as an integral part of British history.