

Local History

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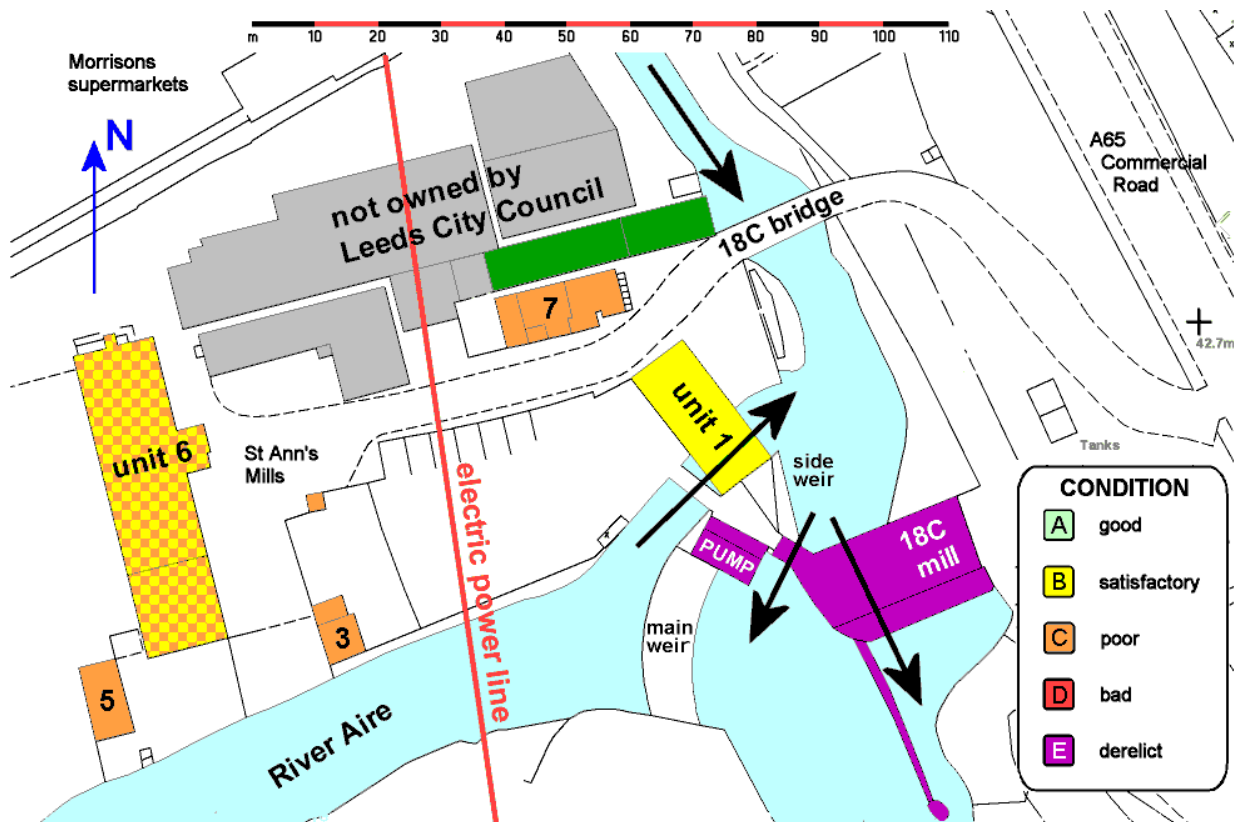
The Kirkstall Valley was an important cradle for industrial development in Leeds. An ingenious water power system was constructed below Kirkstall Abbey between 1760 and 1860, much of which survives today. Many of the remaining buildings have been listed, but an important omission is St Ann's Mills, which is currently under threat from development. St Ann's Mills was originally acquired by the council around 1970 to provide public open space for a proposed riverside park. The recent history of this site is described in separate pages on the [Kirkstall Mills](#). Despite promising to "restore these buildings to their former glory" in 2006, the council now intends to dispose of this land to the highest bidder without any restrictions as to its future use.

We applied to [English Heritage](#) for several of these buildings to be listed, or alternatively scheduled as Ancient Monuments.

Our listing application number is 166929, and the local case officer is Ms Stella Jackson, English Heritage, 37 Tanner Row, York YO1 6WP telephone: 01904 601893, email: stella.jackson@english-heritage.org.uk

We would be grateful for help with this project from local historians, and also if people could write in support.

There is no dispute about the historical importance of the site. The problem is that the council's asset management division has not maintained the buildings, and has permitted so much damage over the last 35 years that what remains may be considered "not worth saving". The council has behaved like many other greedy property developers and allowed its historic assets to deteriorate to the point where it can pretend that there is "no alternative" but to knock them down and rebuild.



The buildings that merit preservation are: (a) 18th century bridge over the Abbey mill goit, (b) main weir and side weir (probably 18th century) (c) derelict 18th century mill and pumping engine, (d) unit 6 (about 1834) and (e) unit 1 (about 1850). The unit coloured green on the plan appears on the earliest detailed maps and may also have a long history. It is currently occupied by a car repair business and is not in the council's ownership. Sadly the weaving sheds to the west of the building have already been demolished by the council, which has also been responsible for the destruction of all the other weaving sheds in the Kirkstall area.

Despite the many fine words from Leeds City Council about "restoring these buildings to their former glory" we are concerned that the council or a future private owner might clear the site to minimise their domestic rating liability. This could happen before there has been adequate opportunity to investigate these buildings and fit them into their local and national context. **We need help from volunteers with our historical research, and particularly need more assistance with local genealogy.** (See "future research" below.) We

have discovered a great amount about St Ann's Mills in the last few months, but these inquiries are still in progress. The position is changing steadily as explained below.



18th century road bridge

Although not directly relevant to their historic or architectural interest, it should be noted that these riverside buildings are in the highest risk flood plain, that the mills are an established resting place for otters, and are therefore protected under the EC Environment Directive, and that there are high voltage electricity cables above the site. These factors suggest that the land is unlikely to be worth

anything like the value that the council has placed upon it. The area has enormous recreational potential for walking, cycling and canoeing, and is a recognised location for bird watching and similar wildlife pursuits. There is an economically viable community development plan for St Ann's Mills which does not envisage demolition.



Millpond at St Ann's Mills

The listing (or scheduling) of these buildings and archaeological remains should be in the context of the complete water power system between Kirkstall Abbey and Armley Mills. It should also reflect 250 years of industrial development and the social history of Kirkstall which can be traced in parallel with the built environment.

St Ann's Mill Weirs

None of the structures at St Ann's Mills are currently listed, although many other buildings in the Kirkstall Valley have been protected in this way. This may be because the main weir at St Ann's Mill is not marked on the 1851 Ordnance Survey map, leading perhaps to the erroneous conclusion that both the weirs and their associated features are relatively modern developments.

In fact, many other local weirs were omitted from the 1851 OS map, including Burley Mill weir, which is already listed (27/931) and is of proven antiquity. St Ann's Mill weir is plainly marked in its current location on maps published in 1811, 1822, 1831, 1834 (twice), 1846 and 1892. All of these maps can be downloaded from the table below.

The north eastern revetments of the weir include the foundations of a very early steam pumping engine (see below) that was used to drive the water wheel, supplementing the action of the river. Such survivals are rare. There is an old flood bund on the river island, now overgrown with mature trees, which is clearly linked to the south western weir revetments. This bund is marked on the 1892 Ordnance Survey map and is also shown on Taylor's 1811 map of Bramley. This bund makes no sense unless the weir is also present, leading to the conclusion that the entire group dates from the first decade of the 19th century, or possibly even earlier.

St Ann's Mill weir is a beautiful historic structure set in a fine location, which has survived largely intact. It pre-dates many of the other listed buildings in the Kirkstall Valley. It is the key to the entire water power network below Kirkstall Abbey, which could not operate properly without this feature. The arguments for listing (or scheduling) St Ann's Mill weir are irresistible.



Side weir at St Ann's Mills

Our present guess is that the council will struggle to sell these assets at the present time, and we hope that it will not demolish any additional buildings while a listing / scheduling application is being processed. Providing this situation continues, we would be content to wait for a decision on the listing application until we have completed more of the historical research.

Historical context

Development of inner north west Leeds over the last 400 years is bound up with the history of the Brudenell and Savile families, who were major landowners. The Saviles were granted land around Kirkstall Abbey by Elizabeth I. They also held considerable areas elsewhere in Yorkshire and played a major part in the development of Leeds. Sir John Savile, Knight, was a royal courtier who became the first Leeds Alderman in 1626. The Brudenells were based at Deene Park in Northamptonshire, and became the Earls of Cardigan after the Restoration of the Monarchy in 1660. These two families were united in 1668 by the marriage of Francis Brudenell and Frances Savile. This marriage brought the Savile lands in Yorkshire within the orbit of the Earls of Cardigan.

Although both families owned considerable areas, both were seriously in debt. Their land was extensively leased or mortgaged, often on complex and convoluted terms. The constant needs to service debts and increase yields were some of the driving forces behind industrial development. Sub-letting broke up the great estates and made land accessible to people of lesser means. The intricate legal agreements later become a barrier to further development, since it was no longer clear who owned the land. In 1835 a private Act of Parliament was necessary to resolve these issues.

Development of St Ann's Mill probably started around 1760 when the Vicar of Headingley (Rev. John Moore) leased about 500 acres in Burley and Kirkstall from the Earl of Cardigan. We do not fully understand how the money was raised to finance this venture, and it is possible that the mill was founded as early as 1720. St Ann's seems to have operated initially as a "traditional" scribbling and fulling mill, two easily mechanised processes that could not conveniently be done at home under the domestic system of cloth manufacture.

Meanwhile, Benjamin Gott was developing his partnership with Wormald & Fountaine. Gott was apprenticed to this firm of woollen

merchants in 1780, but by 1790 the business had largely passed to him. He was working in partnership with Wormald's eldest son, Harry, who was roughly the same age. In 1792 they embarked on woollen manufacturing and erected their first factory at Bean Ing, now the site of the Yorkshire Post building.

James Graham married the Vicar of Headingley's daughter, Anne, in 1781 and gradually developed their large estate in Kirkstall. Graham commissioned Stansfeld to construct Burley Mills around 1799 and Gott leased it from him. It was mainly used for blanket manufacture. Gott became Mayor of Leeds in 1799. There is a delightful contemporary account in the Butler diaries from Kirkstall Forge of a major fire at Abbey Mills in 1799, when Gott personally led the two civic fire engines over the hill at Burley in order to extinguish the blaze.

Gott became a textile millionaire. He purchased and redeveloped Armley Mills in 1805 following a major fire and also acquired the existing mansion in Gott's Park, parts of which survive today.



Gott's Mansion

In 1809 he commissioned the famous landscape architect Humphrey Repton to design a great park incorporating both Armley Mills and the mansion. This extended across the floor of the Kirkstall Valley almost as far as Burley Mills, but much of this was subsequently obliterated by the Kirkstall Power Station. A few of these works survive today along the river banks, where Gott constructed bridges linking to the newly

constructed Kirkstall Road, and a pedestrian suspension bridge to facilitate access to Burley Mills.



River bank below St Ann's Mill

The picture shows the southern river bank near Redcote Lane. The stonework almost certainly dates from Repton's scheme. The narrow cast iron gate originally gave access to the pedestrian suspension bridge constructed over the river in the early 19th century which

Animation

The website animation (which cannot be reproduced here) shows the approximate construction sequence for the various Kirkstall mills, roads and water courses. Property conveyances for the mills shared responsibility for maintaining the water power network between the various mill owners, showing that the system was conceived and operated as a single entity.

1711 Kirkstall Road does not exist, and the Earl of Cardigan's map shows only Abbey Mills, Savins Mill and Armley Mills

1771 Jefferys' map shows St Ann's Mills and the Leeds - Liverpool Canal

1791 Tuke's map shows that the future Gott's Mansion has been constructed

1801 Burley Mills and Burley Mill goit have been completed

1811 Kirkstall Road has been completed as far as Bridge Road and Kirkstall Lane

1821 Redcote Lane (first alignment) and the third (western) goit have been completed, creating the river island

1831 Redcote Lane (second alignment) and St Stephens Church have been constructed, Abbey road extended to Horsforth

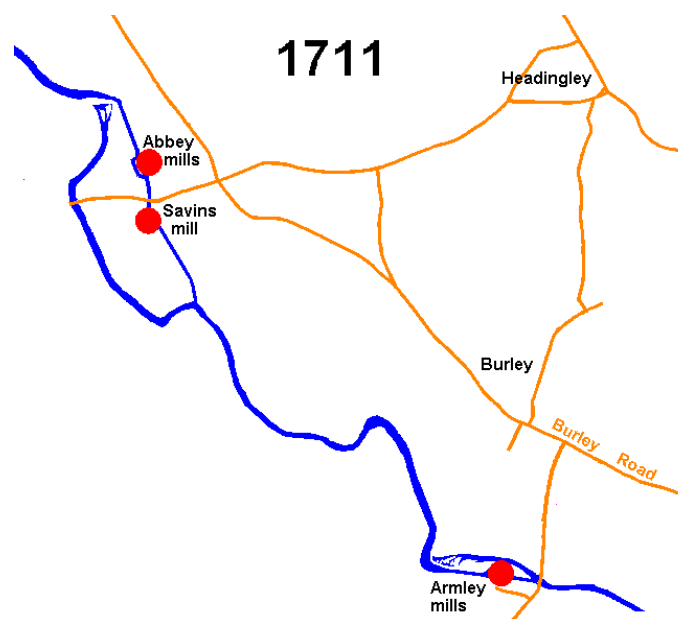
1841 Original alignment abandoned for Redcote Lane (although some structures survive).

1851 Kirkstall viaduct has been opened, and railway development is practically complete

allowed workers from Armley to walk to Burley Mills. The bridge survived into the 1950's when it was destroyed by fire, but the pillars and parts of the cable work remain.

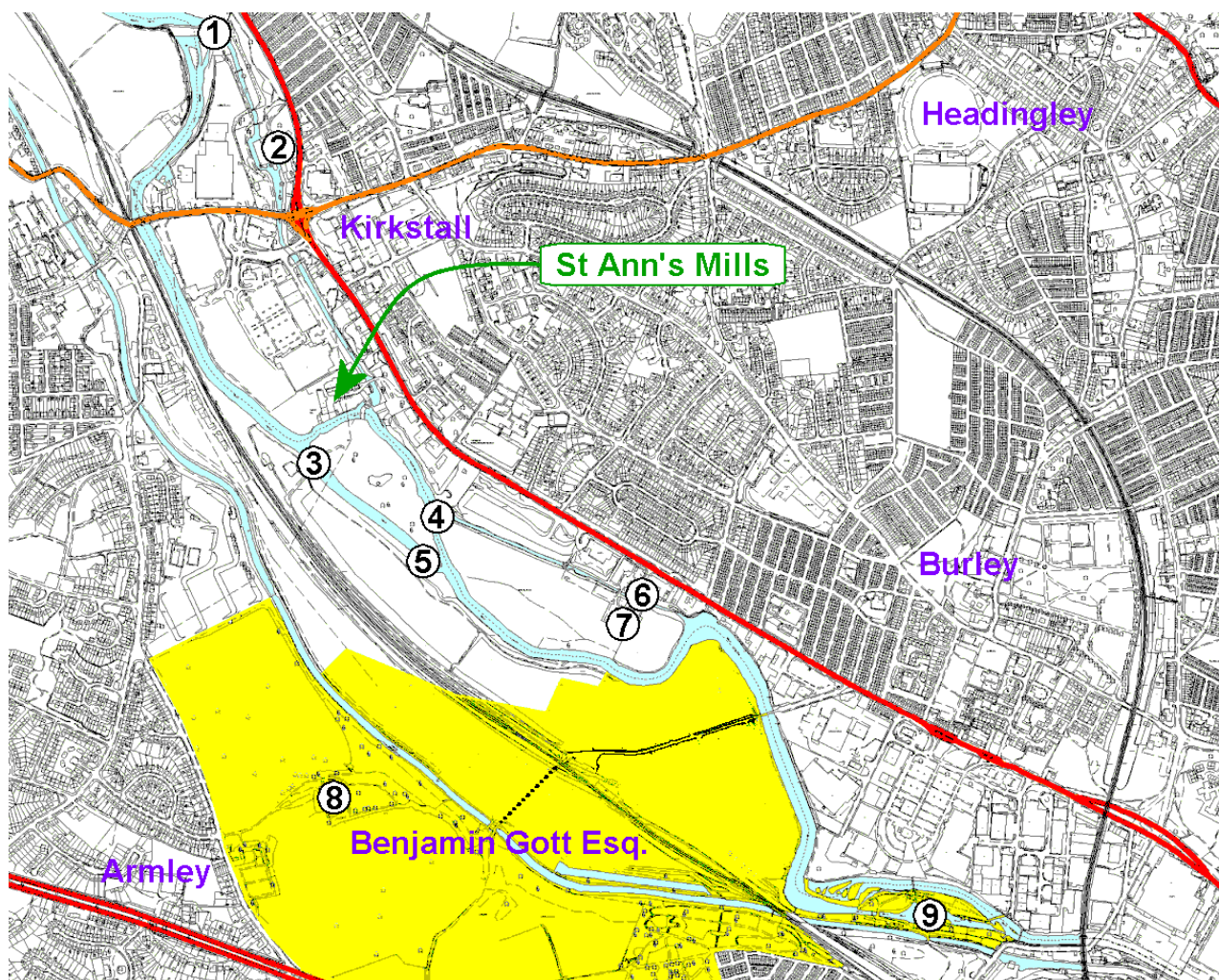
Considerable mystery surrounds the third mill goit and weir to the south west of St Ann's Mills that created the river island. These were constructed around 1820, but there is no trace of any corresponding water mill. It is not certain whether these features were built only as flood relief measures, or whether the falling cost of steam power ultimately made water mills uneconomic.

These developments took place against a background of the French Revolution, the Napoleonic Wars and the Luddite and Chartist disturbances. Trading conditions were highly variable. At the same time the population was expanding rapidly, new schools and churches were being built, and for all the bad publicity, factory production resulted in a considerable increase in wealth.



Existing grade II listed mill buildings in the Kirkstall Valley

Ref.	Brief description	Map	Date	Comments
22/894	Kirkstall Abbey Kennels Abbey Road LS5	1		includes sluice gates, cottage & Kirkstall Abbey weir
22/885	Abbey Mills Abbey Road including 13 Abbey Road LS5	2	1827	rebuilt after major fire, includes Abbey Villa
22/925	Ford & weir on River Aire, Commercial Road, LS5	3	1822	part of the third goit, creating the river island
27/931	Weir & sluice gates Burley Mills Kirkstall Road, LS4	4	1799	sluice gates destroyed by Leeds City Council
27/933	Weir River Aire Kirkstall Road, LS4	5	1822	southern end of the third goit
27/926	Main range Burley Mills, Kirkstall Road, LS4	6	1799	(4 entries) now government offices
27/930	Weaving shed Burley Mills Kirkstall Road, LS4	7	1850?	demolished with Leeds City Council agreement
27/1197	Gott's Mansion, Armley Ridge Road, LS12	8	1780	residential building, not a mill
28/916	Armley Mills, Canal Road, LS12	9	1806	(8 entries) Leeds Industrial Museum



The yellow shaded area on the map shows the approximate extent of Gott's land ownership in 1822. He may have owned additional land beyond that identified on this map. The Leeds - Skipton railway and the coal loading berths on the canal did not exist when the park was planned.

Leeds PhD Theses relevant to St Ann's Mills

- J.L. Cruickshank (2003) [Headingley-cum-Burley c1540 to c1784](#)
- M.F. Ward (1972) [Industrial development in north Leeds 1775 to 1914](#)
- R.G. Wilson (1964) [Leeds Woollen Merchants 1700 - 1830](#)

See also Daniels, S, (1981) *Landscaping for a manufacturer: Humphrey Repton's commission for Benjamin Gott at Armley in 1809-10* Journal of Historical Geography 7(4), 379-396.

Download the Historical Evidence

In addition to the visible remains on site, some of the key historical documents are tabulated below. Please click the links on the right or the left to download copies. We are adding these items one by one, trying to achieve an acceptable compromise between file size and image quality. Many of the

original scanned documents are much larger than the fragments available here. If anybody would like to receive full size, full-resolution versions, or is aware of additional unlisted papers that are relevant to St Ann's Mills or Abbey Mills, then we would like to hear from you. email: john.illingworth@leeds.gov.uk

date	resource	copy location	comments	download
1711	map of the Earl of Cardigan's estate	Sheepscar archive, Leeds	St Ann's mill is not shown	933KB
1771	Jefferys' map of Yorkshire	LCC library	St Ann's mill first shown at small scale	1.0MB
1781	Tuke's map of Leeds	LCC library	mill goit survey may be inaccurate	354 KB
1797	Butterworth's map 10 miles near Leeds	LCC library	Kirkstall Road & Burley mills not yet built	203KB
1799	Butler diary (Kirkstall Forge)	Thoresby Society	describes the fire at Abbey Mills	
1806	James Graham MP	Leeds University Library	evidence to Select Committee on the woollen trade	1.05MB
1809	Butterworth's map 10 miles near Leeds	LCC library	earliest known map showing Kirkstall Road	204KB
1811	Taylor's map of Bramley	LCC library	earliest known map showing St Ann's Mill weir	185KB
1819	Marriage settlements	Wakefield deeds registry?	Sandford Graham & Caroline Langston	
1822	Thorp's map	LCC library	first record of the third goit to the west of the island	466KB
1822	Trade Directory [Baines]	LCC library	mill operators and merchants	967KB
1824	Wm Lindley's notebook	Leeds University	lists all the Leeds steam engines	705KB

date	resource	copy location	comments	download
		Library	working in 1824	
1825	Brooke & Hargrave's patent 5224	Patent Office	improvements in scribbling and carding wool	1.26MB
1825	James Graham's will	National Archives	estate left to Sandford Graham	1.1MB
1830	Parson & White Directory	LCC library	mill operators and merchants	967KB
1831	Thorp's map	LCC library	shows road development	372KB
1833	Newton's London Journal of Arts and Sciences	Google Books	Law report: Brooke & Hargrave v. Ripley & Ogle	see left
1834	Headingley / Burley Enclosure Award	Sheepscar archive, Leeds	accurate map showing land ownership	235KB
1834	Baines & Newsome Directory	LCC library	mill operators and merchants	967KB
1834	Baines & Newsome map	LCC library	shows road development	1.1MB
1834	Parson's Miscellaneous History of Leeds	Google Books	Rev. John Moore and his daughter Anne	see left
1835	Private Act of Parliament	House of Lords Archive	this legalized the Graham leases	too large
1837	White's West Riding history & gazetteer	Google Books	Records the destruction of Abbey Mills by fire in 1827.	See left
1837	George Haward's list of landowners	Thoresby Society	the corresponding map is lost	
1839	Debrett's Baronetage	Google Books	Graham family history	see left
1846	Kirkstall Tithe Award	Sheepscar archive, Leeds	accurate map showing land ownership	417KB
1851	Ordnance Survey	Leeds local history library	omits various weirs, including St Ann's Mill	65KB
1861	Chancery Case Reports	Google Books	Law Report: Boughton v. Jervis	see left
1892	Ordnance Survey	Leeds local history library	shows maximum development at St Ann's Mill	161KB
1931	W.B.Crump: The Leeds Woollen Industry	Thoresby Society	Major account of industrial development from 1780 to 1820	too large
1960	The Grahams of Kirkstall	not yet located	brief family history (30 pages)	
1992	WYAS report on St Ann's Mills	West Yorks Archaeology	one section from an extensive study of the Kirkstall mill goits	2.69MB
2007	Janet Douglas: The Brudenells & Headingley	Headingley Community web site	History of the Earls of Cardigan in Headingley & Kirkstall	see left
2009	The Long Lease Estate	J.L. Cruickshank	St Ann's Mills and the Long Lease Estate	165KB

Detailed History

Abbey Mill goit was constructed in medieval times, but the 1711 maps of the Earl of Cardigan's estate shows only Abbey Mills and Savins Mills without any buildings at the St Ann's Mill site, where the goit re-joins the main river.

Edward Parson's "Miscellaneous History" of Leeds recorded in 1834 that in the 1760's the Rev. John Moore, Vicar of Headingley, leased about 500 acres of land in Kirkstall from the Earl of Cardigan. This land passed to his daughter, Anne, and would have included the site of St Ann's Mill.

St Ann's Mill was constructed before 1771 (when it first appears on Jefferys map) and operated as a "traditional" fulling and scribbling mill serving family weavers working under the domestic system. It passed to James Graham through his marriage to Anne Moore in 1781, but Graham did little to change its function. Graham was the Recorder of Appleby, MP for Cockermouth 1802-5, for Wigton Burghs 1805-6, for Cockermouth again 1807-12 and for Carlisle 1812-25. His family held land and property in Carlisle and London, in addition to the Kirkstall valley.

No less than four James Grahams served in the British parliament around this time, some of them were related to each other, some represented the same constituencies, and there is considerable confusion between them. It is difficult to be certain that secondary sources have not muddled or amalgamated them. Some of the best known James Grahams are tabulated below:

James Graham from Kirkstall was a national figure who was made a baronet in 1808. He was an important member of the select committee that inquired into the woollen industry in 1806. His evidence to the committee makes it clear that he favoured the domestic system for social reasons and that his construction of Burley Mills around 1798 as a purpose-built factory for Benjamin Gott was not intended to disturb the arrangements for his existing tenants. The legislation that followed the select committee's report allowed the mechanisation and concentration of the woollen trade, and paved the way for numerous technological improvements during the early part of the 19th century. St Ann's Mill played a part in this, and some of the evidence is still visible today.

The Pumphouse

James Grahams serving in the UK Parliament 1800 – 1830

ID	full name	born	died	constituencies	public offices
1	Sir James Graham, 1st Baronet (Kirkstall)	1753	1825	Cockermouth (1802-5 & 1807-12) Carlisle (1812-25)	Recorder of Appleby
2	Sir James Robert George Graham, 2nd Baronet	1792	1861	[Whig] Hull, Carlisle (1826), Cumberland [Tory] Pembroke, Dorchester	Home Secretary (under Robert Peel) First Lord of the Admiralty (twice)
3	James Graham, 3rd Duke of Montrose	1755	1836	Richmond, Great Bedwyn	Lord Chamberlain and many others
4	James Graham, 4th Duke of Montrose	1799	1874	Cambridge	Lord Lieutenant of Stirlingshire Postmaster General and others
5	James Graham MP	1753	1825	Wigtown Burghs 1805-1806	

We currently believe that (1) and (5) above were the same person.

St Ann's was the site for an early steam pumping engine used to feed a water wheel. Such survivals are quite rare, and in this case it may be possible to identify the owner of the engine. In 1824 Wm Lindley prepared a catalogue of all the steam engines in Leeds, from which the two most likely owners appear to be James Hargreave or John Wood. In their 1992 report, the West Yorkshire Archaeological Service allocated this engine to John Wood.



Remains of the pumphouse looking NW from the derelict 18C mill.

We support this assignment because: (1) trade directories suggest that Wood was operating in Kirkstall when Lindley prepared his list of steam engines, although he later moved to Farsley; (2) Wood's engine was smaller than Hargreaves' engine and would fit more easily into the confined space; and (3) although the spelling is hugely inconsistent, many of the early Kirkstall and Burley references are to Hargreaves rather than Hargreaves.

Water levels

There is an issue about the water levels in the millpond. The arches of the 18th century road bridge are very low in the water, and there is little opportunity to increase the water level, which is also constrained by the heights of the main weir on the main river and the side weir within the mill complex itself. This level is insufficient to overtop the iron wheel breast which is still located in the main water channel, and the rivets on the top of the remaining breast suggest that it was formerly higher than it is today.



Water level view of the wheelbreast from the side weir.

The Wheelbreast

There is a slot in the base of the wheelbreast, indicating an undershot design, so why was it necessary to fit a wheelbreast far higher than the maximum achievable water level?



The wheelbreast looking up the main water channel.

It is possible that St Ann's waterwheel had two independent water supplies, and could operate both as an ordinary undershot wheel fed from below, but could in addition receive a separate high level input, via the pumping engine, above the level of the rising breast. This arrangement could explain the otherwise mysterious "slit" cut into the archway above the side weir, which attracted the attention of the West Yorkshire Archaeology Service in 1992 (WYAS report, page 19). This feature could have been necessary for a high level open water channel between the pumping engine and the water wheel.

In 1824, burning coal to pump large volumes of water to a higher level must have been a hideously expensive pastime. A low volume, high level feed could have given the water wheel a greatly improved starting torque, which would rapidly decline as it picked up speed. It was in any case difficult to couple early steam engines directly to machinery because these engines did not revolve at a constant speed. This task became much easier after double acting pistons with a separate condenser were introduced by James Watt, and copied by other manufacturers. Was this elaborate Kirkstall system mainly used for starting, or maybe as a supplementary power source when water levels were low?

Nowadays it is easy to control torque through gearing or electrical means, but this must have been a real headache in the early 19th century, before the invention of the Bessemer process and the arrival of cheap steel. Lifting some of the input water to a higher level may have been a viable "low tech" alternative to a complex power transmission system.

St Ann's Mill was a site for technical innovation, evidenced by the patent 5224 granted on 26 July 1825 to J.E. Brooke of Headingley, near Leeds and J. Hargrave, of Kirkstall; for improvements in or additions to machinery used in scribbling and carding wool, or other fibrous substances. It involved the use of steam heaters and a modified "doffer" to align the fibres correctly on the carding machine. Other local manufacturers copied the technique, leading to an action for damages in 1833 by Brooke and Hargrave, clothiers, of Kirkstall near Leeds, as Patentees

of an improved machine for scribbling and carding wool, against Ripley and Ogle, of Leeds, clothiers, for using their improved process and imitating their machine for scribbling and carding wool.

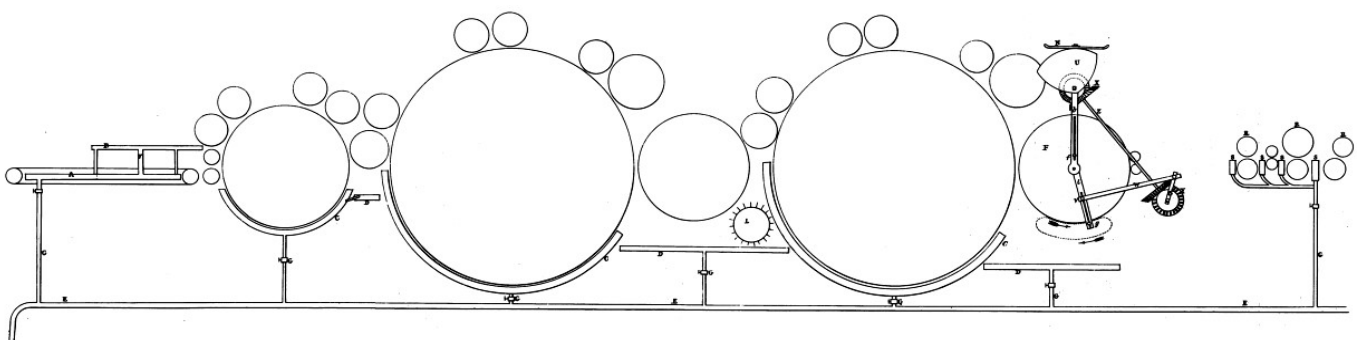
We still do not understand the function of the second much smaller channel (WYAS report, page 18) running through the 18C water mill.



Small water channel at St Ann's Mill

We can trace the cashmere business at St Ann's Mills through the trade directories: 1822 [Baines] J.E. Brooke is listed as a woollen manufacturer based in Kirkstall, and Jas Hargrave is the overlooker at St Ann's Mills. 1830 [Parson & White] J.E. Brooke & Co. are listed as merchants and Indiana cloth & fine yarn manufacturers, and Jas Hargrave is a merchant, all at St Ann's Mill. 1834 [Baines & Newsome] James Hargrave and sons are merchants and manufacturers of Indianas, Anglo-Cashmeres, Anglo-Merinos and muslin delaine at St Ann's Mill.

Sandford Graham (second baronet) married Caroline Langston in 1819 and James Graham



Low resolution copy of the drawings for Brooke & Hargraves 1825 patent specification.

died in 1825. Stansfelds (who by this stage were tenants at Burley Mills) went bankrupt during the depression in the mid 1820's. One or other of these events seems to have resulted in the realisation that James Graham MP never had sufficient legal authority to lease his land in Kirkstall, thereby undermining the growing textile industry in the Kirkstall valley, and necessitating a Private Act of the House of Lords in 1835 to regularise the position.

The Private Act separately identifies Brooke and Wood as two of James Graham's leaseholders in Kirkstall. Brooke appears to have been the older, richer man, and Hargrave was his eventual successor. Trade directories identify Wood as a Kirkstall miller throughout the 1820's (matching Lindley's 1824 catalogue of Leeds steam engines) and only later is he listed as operating a mill in Farsley.

The Main Mill Building

The main building (unit 6) at St Ann's Mill appears to date from the 1830's. The fourth storey and roof were destroyed in a fire in 1975 but we have photographs of the building intact.



A photograph of St Ann's Mill in the 1950's

Unit 6 appears on the 1846 tithe map in substantially modern form, but the map for the 1834 enclosure award may show an earlier structure. The survey dates for both these maps are likely to be a few years prior to their publication, and some details may even have been copied from earlier drawings. The precise form of these buildings was not

relevant to the map maker, so there was little impetus to maintain accuracy.



The main mill looking west.

Unit 6 was designed and built as a steam powered textile mill. There is a three-storey engine room within the southern end of the building, with massive foundations for a substantial beam engine and flywheel. The separate boiler house and chimney have been partly demolished.



Interior of unit 6

Unit 6 was built with inside [flush?] toilets on each floor, anticipating the widespread use of this technology. Weaving sheds were added to the west of the building (and are shown on the 1851 map) but were needlessly demolished about 12 years ago by the council's asset management division.

Unit One



The short goit flows beneath unit one.

We still do not know the function of unit one, or why it was built partially on girders over the goit. There must be a good reason for this, because the Victorian builders had vacant land available which was much less likely to flood. We are constructing a floating remote

controlled camera system to photograph the underside of this building from the goit. This may give better clues about its function. We are also arranging for a ground-penetrating radar survey of the area, which could be used to calibrate the older maps. Ongoing research would be severely impeded if any remaining buildings were demolished.

In 1852 Sir Sandford Graham was succeeded by his son (also called Sandford Graham) who seems to have squandered much of the family fortune on horse racing. Sandford junior borrowed money at 10% interest to feed his addiction, leading to a case in the Chancery Division in 1861, where other mortgagees unsuccessfully tried to argue that this loan was usurious. Sandford junior died in 1875 aged 54. He was succeeded by the 4th Baronet Sir Lumley Graham, and a 5th Baronet Sir Cyril Clerke Graham, but the title died out in 1895.



Much of the area south of St Ann's Mills was changed beyond recognition by the Kirkstall Power Station development, but this painting from Armley Park ca. 1850 shows Gott's Mansion, Redcote Farm, the river island and St Ann's Mills after the construction of the Leeds – Skipton railway.

Future research

So far we have only been able to scratch the surface of this fascinating site. It is clear from exposed foundations and historic maps that there is much more below ground. We have located only a fraction of the written records, and have yet to do any work on the 1834 Enclosure Award, insurance records or the Wakefield Deeds Registry. We know there was dyeing, silk and cotton as well as woollen manufacture at St Ann's Mills. Kirkstall in the 1820's was a hotbed for technical innovation, with an expanding population, new companies established and shifting alliances between the various players as the industrial revolution got under way.

In addition to defining the sequence of events, it is important to understand the patterns of development. Dr Cruickshank has suggested that many of the key players were related, either through descent or marriage. Mapping out these relationships could shed light on what took place. Property normally passed to the eldest son, but other family members clearly had an interest in keeping the estate together, and actively cooperated to achieve this end. It would be interesting to establish how many of the loans and mortgages were extended family transactions, and how many involved total strangers. We guess this latter group will prove to be quite small.

It is interesting that these families managed to finance significant development although they were already in debt. The Saviles appear to have lost money during the Civil War, and were obliged to lease much of their land, while retaining titular ownership. James Graham was a rich but landless lawyer who married into the tenants of this "long lease estate". He may have paid off existing mortgages (by selling land in Armley) before financing new development.

The Brudenells were a Catholic family until the 1715 rebellion, who suffered massive fines for recusancy (failing to attend Church of England services) but nevertheless amassed a huge estate. They enjoyed a lavish lifestyle in Northamptonshire and London. Growing debts forced the sale of the Yorkshire

property between 1884 - 1893, providing much of the residential building land in Headingley, Burley and Kirkstall.

Mill owners suffered significant losses, not all of which were covered by insurance. Abbey Mills housed an explosive combination of flour dust, woollen fleeces and linseed oil, and burned down at least twice in 1799 and 1827, while Armley Mills, Burley Mills and St Ann's Mills also suffered major fires. These industries were prone to cycles of "boom and bust". Stansfelds (who seem to have done much of the construction work) were bankrupt in 1825. The disruption and loss of income attendant on these events must have been a considerable burden.

Attempts to protect the family estates by complex leasehold settlements plainly backfired during the 1820's when uncertainty about the validity of the Graham leases eventually required a private Act of Parliament for its resolution in 1835. This may well have delayed development at St Ann's Mills, and might explain the seemingly pointless construction of the third mill goit without any corresponding water mill. Alternatively, this channel may have been a flood relief measure. Contemporary accounts are full of references to floods, and water mills are unable to work when the tailrace is under water.

We know from Rogerson (a Bramley mill owner, whose diary was transcribed by W.B. Crump and published by the Thoresby Society) that local mills were often short of water. Modern dry weather flows include the considerable output from upstream sewage works, but during 18th century summers the river may have dwindled to a trickle. The steam pumping engine may have been fitted to remedy this problem by recirculating water after its passage through the mill. At present we do not know the locations of either the inlet or the outlet from this pump. These should be discoverable, if further demolition can be prevented.

Kirkstall Chronology in a wider context

Date	National / International events	Local events in Leeds & Yorkshire
1626		Charles I granted 1st Charter of Incorporation to the Borough of Leeds, Sir John Savile, Knight, was the first "Alderman"
1632	Galileo Galilei: <i>Dialogue Concerning the Two Chief World Systems</i>	
1642	(1) English Civil War (1642-1651) (2) Rembrandt: <i>The Night Watch</i>	
1661	The Brudenells were created Earls of Cardigan by Charles II after the restoration of the monarchy in 1660	Charles II granted 2nd Charter of Incorporation to the Borough of Leeds, Thomas Danby was the new Mayor
1666	Great Fire of London	
1668	Molière: <i>The Miser</i>	Francis Brudenell married Lady Frances Savile, thereby adding the Savile land in Yorkshire to the Brudenell estates
1687	Isaac Newton: <i>Philosophiæ Naturalis Principia Mathematica</i>	
1688	Glorious Revolution - James II replaced by William & Mary	
1704		Opening of the Aire & Calder Navigation
1711	Abraham Darby successfully using coke to smelt iron	John Dickenson mapped the Brudenell estates in Leeds
1712	Newcomen steam engine invented	
1715	First Jacobite rebellion	
1723	Antonio Vivaldi: <i>The Four Seasons</i>	
1727		Daniel Defoe described the Leeds cloth market
1741	(1) Johann Sebastian Bach: <i>Goldberg Variations</i> (2) George Frideric Handel: <i>Messiah</i>	
1745	Second Jacobite rebellion	
1753		James Graham was born [presumably in Cumberland?]
1758	Middleton railway [in Leeds] first modern railway	
1759	John Smeaton: <i>An Experimental Enquiry Concerning the Natural Powers of Water and Wind to Turn Mills and Other Machines Depending on Circular Motion</i>	
1762		Benjamin Gott was born

Date	National / International events	Local events in Leeds & Yorkshire
1764		Rev Moore in Headingley leased 500 acres from the Earl of Cardigan (approximate date)
1765	Matthew Boulton's Soho Manufactory completed in Birmingham	
1769	James Watt patented separate condensers for steam engines	
1770	(1) Leeds - Liverpool Canal Act. (2) James Hargreaves attempted to patent the "Spinning Jenny"	
1771	Arkwright began the first cotton spinning mill at Cromford	Thomas Jefferys' map of Yorkshire shows St Ann's Mill for the first time
1772	Captain Cook's second voyage to Australia	
1775		Major flooding on the River Aire
1776	American Declaration of Independence	
1777	Leeds - Liverpool Canal opened as far as Gargrave	
1779	First iron bridge constructed at Ironbridge	
1781	Antoine-Laurent de Lavoisier working on oxygen, nitrogen, chemical nomenclature and the conservation of mass	(1) Marriage of Anne Moore & James Graham. (2) John Tuke published a dubious map showing the Kirkstall goits
1782	Pierre-Simon Laplace: first publication on Laplace transforms	
1785	William Withering: Medical uses of the Foxglove	
1786	Wolfgang Amadeus Mozart: <i>Marriage of Figaro</i>	
1788	Boulton & Watt: first centrifugal governor	Sandford Graham 1st born
1789	French Revolution: storming of the Bastille	Richard Oastler born
1790		River Aire flooded
1791	(1) Thomas Paine: <i>The Rights of Man</i> (2) Robert Burns: <i>Tam o'Shanter</i>	
1792		Construction of Bean Ing Mill by Benjamin Gott
1793		Armley Inclosure Act
1795	Joseph Haydn: <i>Symphony 104</i>	River Aire flooded – three men drowned in Leeds dam.
1796	Edward Jenner experimented with smallpox vaccination	
1797		Butterworth map of Leeds and its environs

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1798	Samuel Taylor Coleridge: <i>The Rime of the Ancient Mariner</i>	James Graham started work on Burley Mills, but was delayed by flooding. The completed mill building was subsequently leased by Benjamin Gott
1799		(1) Armley Inclosure Award. (2) Bramley Enclosure Award. (3) Major fire at Abbey Mills. (4) River Aire flooded.
1800	(1) Alessandro Volta invented the first electric battery (2) Boulton & Watt steam engine patent expired	
1801	Philip James de Louthembourg: <i>Coalbrookdale by Night</i>	
1805	Battle of Trafalgar	Armley Mills destroyed by fire, redeveloped by Benjamin Gott
1806	Report of the Parliamentary Select Committee appointed to consider the state of woollen manufacturing in England in 1806.	(1) Kirkstall Road was constructed as a new turnpike road. (2) River Aire flooded
1807		River Aire flooded
1808	James Graham was made a baronet	William Thompson's mill first imported Australian merino wool
1809		(1) Butterworth map of Leeds shows the new Kirkstall Road turnpike. (2) Benjamin Gott commissioned Humphrey Repton to design the landscape in Armley and the Kirkstall Valley.
1811	Armedo Avogadro: <i>Essai d'une manière de déterminer les masses relatives des molécules élémentaires des corps, et les proportions selon lesquelles elles entrent dans ces combinaisons.</i>	Taylor maps of Bramley show St Ann's Mill weir in its current position, with a flood bund and washland to the south west, but no sign yet of the third mill goit which created the river island.
1812	(1) Anglo-American war (1812 - 1815) (2) First commercial gas works in London	(1) First Mathew Murray steam locomotive. (2) Luddite riots in Leeds.
1813	Jane Austen: <i>Pride & Prejudice</i>	
1815	Battle of Waterloo	
1816	(1) Gioachino Rossini: <i>The Barber of Seville</i> (2) Widespread crop failures and famine after the Tambora eruption in 1815	(1) Practical completion of the Leeds - Liverpool Canal. (2) River Aire flooded
1818		Wellington Bridge constructed in Leeds
1819	Peterloo massacre	Sandford Graham married Caroline Langston. The marriage settlement included leases in Kirkstall of 32 acres to Benjamin Gott for £1,383 per year (Burley Mills), 13 acres to J

Date	National / International events	Local events in Leeds & Yorkshire
		and C Brooke for £1,300 per year (probably St Ann's Mills) and 13 acres to J and C Wood for £1,320 per year (unidentified mills in Kirkstall).
1821		Sandford Graham 2nd born
1822	Franz Schubert: <i>"Wanderer" Fantasia</i>	(1) Thorpe map of the West Riding shows the completion of the third goit, creating a river island below St Ann's Mills. (2) Baines Directory of the County of York lists Jas Hargrave as an "overlooker" at St Ann's Mills and J.E. Brook and Co as woollen manufacturers. (3) Foundation of St Stephen's School, Kirkstall (4) River Aire flooded.
1824	(1) Ludwig van Beethoven: <i>Ninth Symphony</i> (2) Joseph Aspdin patented Portland cement in Leeds. (3) JMW Turner: <i>Kirkstall Abbey</i>	(1) Wm Lindley catalogued all the steam engines in Leeds, and listed John Wood and Sons using a 20hp engine built by Hird Dawson [based at Low Moor Iron Works in Bradford from 1791] for woollen cloth manufacture (2) River Aire flooded
1825	Opening of the Stockton - Darlington railway.	(1) Major slump throughout Leeds caused financial problems in Kirkstall. (2) Patent number 5224 granted on 26 July 1825 to J.E. Brooke of Headingley, near Leeds and J. Hargrave, of Kirkstall; for improvements in or additions to machinery used in scribbling and carding wool, or other fibrous substances. (3) James Graham died.
1826	Completion of the suspension bridge designed by Thomas Telford across the Menai Straits	(1) Parson's Leeds Directory lists James Hargreave as "manager" of St Ann's Mills, Baines Leeds Directory lists Jas Hargreave as "superintendent" and John Wood as a scribbling and fulling miller (2) Stansfelds [now tenants at Burley Mills] were made bankrupt.
1827		(1) Leeds Market Hall constructed. (2) Abbey Mills destroyed by fire (again!)
1829	(1) Metropolitan Police Act. (2) first recorded use of Portland cement	Consecration of St Stephen's Church, Kirkstall (2.25 acres donated by the Earl of Cardigan; £500 gift from Sir Sandford Graham)
1830	Charles Lyell: <i>Principles of Geology</i>	Jas Hargrave described as a "merchant" at St Ann's Mill (Parson & White, Clothing District Directory, which also lists John Edward Brooke and Co as "merchants and Indiana

Date	National / International events	Local events in Leeds & Yorkshire
		cloths & fine yarn manufacturers, St Ann's Mill and Hunslet Lane")
1831	(1) Voyage of the Beagle with Charles Darwin (1831 – 1836), (2) Michael Faraday began work on electromagnetic induction	Thorpe map of the West Riding
1832	Parliamentary Reform	Cholera epidemic in Leeds
1833	(1) Abolition of Slavery Act (2) Factory Act.	Law Report from The London Journal of Arts and Sciences Published by Sherwood, Neely, and Jones, 1833 page 35 Court of Exchequer, Westminster. Brooke and Hargrave v. Ripley and Ogle. (Before the Chief Baron Lyndhurst.) This was an action for damages brought by Brooke and Hargrave, clothiers, of Kirkstall near Leeds, as Patentees of an improved machine for scribbling and carding wool, against Ripley and Ogle, of Leeds, clothiers, for using their improved process and imitating their machine for scribbling and carding wool.
1834		(1) Leeds - Selby railway opened. (2) Enclosure Award for Headingley cum Burley with map. (3) Hargrave James & Sons described as "merchants & manufacturers of Indianas, Anglo Cashmeres, Anglo Merinos, and muslin delaine, St Ann's mill" (Baines & Newsome, Leeds Directory) (4) Parson's "...Miscellaneous History of Leeds..." was published.
1835	Municipal Corporations Act	A Private Act of Parliament (5 & 6 William IV c. 17) confirmed the leases granted by James Graham in Kirkstall
1837	(1) Charles Dickens: <i>Oliver Twist</i> (serial publication) (2) Frédéric Chopin: <i>Nocturne No. 10 in A flat major, Op. 32, No. 2</i> (3) Gaetano Donizetti: <i>Lucia di Lammermoor</i>	(1) History, Directory and Gazetteer of the West Riding published in Leeds by William White. (2) Book of reference to a Map of Headingley cum Burley by George Hayward listed local land owners, but the map is lost.
1838	Coronation of Queen Victoria	Construction work started on Temple Mill in Holbeck
1839	(1) Leeds - Manchester railway completed. (2) first large scale use of Portland cement in Bristol	
1840	early photographic processes	Richard Oastler imprisoned for debt
1841		Benjamin Gott died
1842	Giuseppe Verdi: <i>Nabucco</i>	Chartist insurrection in Leeds

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1843	Isambard Kingdom Brunel: SS Great Britain	
1844	(1) Samuel Morse: Electric telegraph (2) Factory Act	Richard Oastler released from debtors prison.
1845	Felix Mendelssohn: <i>Violin concerto</i>	
1846	(1) potato famine in Ireland and elsewhere (2) nitroglycerine & nitrocellulose invented (3) repeal of the Corn Laws	(1) Leeds central station opened. (2) Tithe redemption map of Kirkstall shows that James Hargreave & Son are tenants of Sir Sandford Graham at St Ann's Mill and also shows St Ann's Mill unit 6 in a recognisably "modern" form.
1847	(1) anaesthesia with chloroform and ether (2) Bronte sisters published their first novels (3) rotary printing press invented. (4) "Ten Hour Act" regulated factory work	
1848	Karl Marx & Friedrich Engels: <i>Communist Manifesto</i>	Cholera epidemic in Leeds
1849	improved cement manufacture 1842-8	Kirkstall railway viaduct opened
1851	Great Exhibition in London	
1852		Sandford Graham 1st died
1853	Crimean War (1853 – 1856) James Thomas Brudenell, 7th Earl of Cardigan led the Charge of the Light Brigade in 1854	
1854	Dr John Snow first identified the source of a cholera epidemic by removing the handle from the Broad Street pump	
1856	Bessemer converter - cheap steel	
1858		Leeds Town Hall opened by Queen Victoria
1859	(1) Charles Darwin: <i>Origin of Species</i> (2) John Stuart Mill: <i>On Liberty</i> (3) First oil well in Pennsylvania	
1861	American Civil War (1861 – 1865)	(1) Richard Oastler died (2) Boughton v. Jervis in the High Court of Chancery – creditors caught up with Sir Sandford Graham 2nd
1864	James Clerk Maxwell: Electromagnetic theory of light	
1866		The 'Great Flood of Leeds', November 1866 – the worst recorded flooding event to hit the area which resulted in twenty deaths