

North East Derbyshire Industrial Archaeology Society



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Johann Gottfried Brügelmann

Peter South

At the EMIAC Industrial Heritage Day at Cromford Mill in May, Peter South talked about the spread of Arkwright's technology to Germany, where in 1784 near Dusseldorf Johann Brügelmann was to build his own textile empire, along the lines developed by RA at Cromford Mill. An early example of industrial espionage?

Comparisons

When discussing Johann Gottfried Brügelmann comparisons must inevitably be made with Sir Richard Arkwright; but there are also important differences.

Arkwright introduced automatic cotton spinning not only to the UK but also to the world; Brügelmann did the same thing for the European continent. Arkwright lived from 1732 to 1792, dying just before his 60th birthday, whereas Brügelmann lived from 1750 to 1802, dying younger than Arkwright at 52. Arkwright introduced the factory system to the world – people working round the clock to the rhythm of the machine. Brügelmann copied this.

Their backgrounds, however, were quite different. Richard Arkwright was the seventh and last surviving child of a tailor, so born in poor circumstances, whereas Brügelmann was born with much more of a silver spoon in his mouth as he was the second of four children born to the Mayor of Wuppertal-Elberfeld. Furthermore, his father was a merchant, so he started with commercial advantages; but he was not technically inclined, as was Arkwright.



Johann Gottfried Brügelmann

Germany

To understand the background, we need to look at the different circumstances in England and Germany.

England was a single country, but Germany comprised around 300 states or statelets with 1800 customs boundaries. Today there are 16 Bundeslaender in a unified country. The total population then was around 21 million (around 80 million today). The local Dukes, Princes and Electors had the right of granting what were called 'Privileges' or 'Inventors Privileges' for a certain number of years. However in England Patents were already being granted by the King and government from 1624 (the first Patent law in Germany dates from 1877).



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Patents and Privileges – export of knowledge

Arkwright's original spinning Patent for the Waterframe dates from 1769 and it ran its normal 14-year course to 1783. His later Patents for preparation machinery like the carding engine were revoked in 1785, to his bitter disappointment. Brügelmann had got to know about Arkwright's machinery and sought a Privilege from the Elector Karl-Theodor – his local potentate who was Elector of the Palatinate, Duke of Jülich-Berg and also Elector of Bavaria – to protect his efforts to set up a spinning mill on the Arkwright system, and he asked for it to run for 40 years. He was granted 12 years only. Nevertheless, he persisted.

In England under George the Third two laws had been promulgated to prevent the export of both machinery and technical know-how. The government was desperate to prevent machinery and knowledge getting out to America, for example. In 1775

'An Act to prevent the exportation to Foreign Parts of Utensils made use of in the cotton linen woollen and silk manufacturing of this Kingdom' was issued. Then in 1782 it was further decreed that 'artificers or workmen were not to go to parts beyond the seas'.

Obtaining the machinery and know-how

There is distinct lack of definite knowledge in this area, but some pointers. There had always been a large number of itinerant textile workers moving between the textile areas like Wuppertal in Germany and Nottingham in England, so undoubtedly Brügelmann got to know about Arkwright's machinery through these people. But how to get the details and the machinery with the British embargo firmly in place?

Here several names come into play.

The family Teschemacher was known to have settled in Nottingham, and one of them was partner in a knitting factory. William Hirst was well known in Shipley woollen circles; and Adam Winke was a mechanic and clockmaker who perhaps helped early efforts to copy the Waterframe. All three were known to have moved between England and Ratingen.

However the name of most interest in this context is probably Carl Albrecht Delius.

He came from a distinguished textile family, and indeed the firm of C.A. Delius still exists in Bielefeld today. It is almost certain that he managed to smuggle over an early carding engine, and he may even have managed to produce a version of the Waterframe. One way or another, Brügelmann built up his empire, starting in 1784, and eventually founded a subsidiary company in Munich – which also belonged to the territory of the Elector Karl-Theodor.

Aftermath

Sir Richard Arkwright died the richest man in England, and Brügelmann died as one of the richest men in the Rhineland. They both built large houses – Willersley Castle in the case of Arkwright, and a luxurious mansion – the Herrenhaus – surrounded by a large park in the case of Brügelmann.



In both cases they initially built five-storey mills, and in their heyday employed around 600 workers each on their original site. Sadly, though, Arkwright's empire died out in 1845 shortly after the death of his son. Brügelmann's factory in Ratingen near Düsseldorf however, continued in production until 1977. Now it is the Rheinisches Textil Museum, and proudly announces its address as "Cromford".

LEFT:

Brügelmann's "Herrenhaus" – his equivalent of Willersley Castle

WHAT'S ON?

NEDIAS Lecture Programme

Meetings are held at: St Thomas' Centre, Chatsworth Road, Brampton (opposite Vauxhall/Bristol St Motors) S40 3AW. There's plenty of parking in their own car park, including disabled spaces, as well as on-road parking in front of the Church. All meetings commence at 7:30pm.

Monday, 11 th September 2017	Pete Lawton: "The English Longbow"
Monday, 9 th October 2107	Tony Ball: "The Moriston Hydro Project"
Monday, 13 ^h November 2017	Peter Hawkins: "The Yorkshire Engine Company of Sheffield"

Other Diary Dates

Thursday, 7 th September 2017 to Sunday, 10 th September 2017	Every September some 40,000 volunteers across England organise 5,000 events to celebrate our fantastic history and culture. It's your chance to see hidden places and try out new experiences – all of which are FREE to explore: https://www.heritageopendays.org.uk/
Thursday, 21 st September 2017 to Sunday, 24 th September 2017	Barrow Hill Roundhouse Re-opening Celebrations with the visit of three icons of steam – A3 60103 Flying Scotsman, A1 60163 Tornado and Rocket. See http://www.barrowhill.org/events.html
Saturday, 23 rd September 2017	Local History Day – Chesterfield Museum. Displays and information from all the local heritage groups. (<i>NOTE: clashes with NEDIAS visit to Steeple Grange Railway</i>)
Thursday, 28 th September 2017	Southwell Workhouse Storytellers. 7:30pm at Dronfield Hall Barn, S18 1PY. More info at http://www.dronfieldhallbarn.org/events/
Friday, 29 th September 2017	Mining Heritage Walk at Monyash. 6-mile Barmote Court walk – PDMHS. Info via meets@pdmhs.com
Saturday, 30 th September 2017	Capt. Mike Bannister, General Manager at British Airways: 'Concorde - born from dreams, built with vision and operated with pride' . Registration needed for this R-R heritage Trust lecture; contact for booking via heritage.trust@rolls-royce.com
Saturday, 30 th September 2017	Silkstone Common: collieries and railways. SYIHS walk. Please book with Graham Haigh, ☎ 0114 268 6729
Saturday, 7 th October 2017 until Saturday, 3 rd February 2018	History of Chesterfield's Breweries and Mineral Water Suppliers. Chesterfield Museum
Thursday, 19 th October 2017	"A history of the East Midlands Knitting Industry" by Colin Moss. 7:00pm for 7:30pm, Gothic Warehouse, Cromford Mill. Booking via 01629 823256 or events@arkwrightsociety.org.uk
Saturday, 4 th November 2017 until Saturday, 13 th January 2018	History of Markham and Co. Ltd. – an exhibition compiled by Peter and Maeve Hawkins at Chesterfield Museum.
Saturday, 11 th November 2017	"Population and Transport" Conference – interesting aspects on history of transport. Info at www.localpopulationstudies.org.uk

NEDIAS Visits

Saturday, 23rd September 2017 – Steeple Grange Light Railway

We meet at 11:15am at the site near Wirksworth. Cost on the day will be £4 or £3 concessions. The Steeple Grange Light Railway is an 18-inch gauge. It is built on the track-bed of a branch of the Cromford and High Peak Railway, now the High Peak Trail. Motive power is provided by ex-industrial diesel, battery-electric and petrol locomotives, and passengers are carried in an old National Coal Board man-rider. You can enjoy a unique twenty minute train ride through the dramatic limestone scenery; hear about why and how the railway was built, and plans for the future; investigate some of their vintage locomotives and rolling stock. See work underway on their track extensions towards Middleton and the National Stone Centre, where you could have a follow up visit. Names on the sheet please at the next meeting, or advise Brian Dick on 01246 205720.

NEDIAS Visit to Sheffield Assay Office

On 22nd June 2017 a NEDIAS group were treated to a comprehensive tour of the operations at Sheffield Assay Office at their splendid premises in Hillsborough. The tour was preceded by a talk about the history and function of the site by their archivist.

We were told that there has been an Assay Office in Sheffield since 1773, when local silversmiths successfully petitioned Parliament for the right to assay silver in Sheffield. It's impossible to tell the precious metal content of an item just by looking at it. Gold, silver and platinum are too soft to use alone for making jewellery, cutlery and other goods. They need to be alloyed with other, baser (and cheaper) metals for manufacturing. To protect the consumer, the Assay Office test articles to make sure that too much base metal has not been used. At the same time, they ensure the manufacturer's peace of mind by providing an independent assessment of quality and content.



Sheffield Assay Office, Hillsborough

A 1773 Act of Parliament appointed 30 local men as 'Guardians of the Standard of Wrought Plate in the Town of Sheffield' to supervise the work of the Office. Even as early as 1773, Sheffield already had an established tradition of fine silverware production so it was interesting, but entirely appropriate, that the number of Guardians who were also silversmiths was restricted to just ten to ensure that the Office offered an independent and impartial service – and was run for the benefit of the consumer rather than the manufacturer. After all, the hallmark is the oldest form of consumer protection that exists.

So, almost two and a half centuries ago and right at the start of its long and fascinating history, The Sheffield Assay Office put a marker down for independence and integrity. In those early days, most of the assay business came from within a 20 mile radius and precious items were literally presented 'over the counter' to be assayed.

They are accredited for assaying not only gold and silver, but in more recent years were approved for assaying platinum and palladium too. The main method of analysis is by X-Ray Fluorescence and during the tour we were shown quite a bank of these instruments which were demonstrated by one of their staff; this was followed by demonstrations of application of the Hallmarks by both punch and laser.



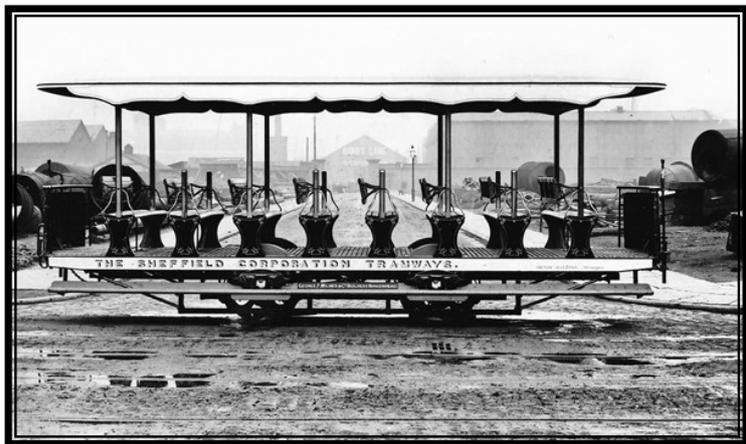
Sheffield Hallmark

Today, The Sheffield Assay Office attracts customers from all over the world and the business has evolved to meet the demands of society and industry. Jewellery and items of precious metal are still assayed in their millions each year and bear the distinctive Sheffield 'Town' mark, but Sheffield Assay office now has a world-wide reputation in other arenas too, particularly in cutting-edge analytical services.

Chairman's Chat

Cliff Lea

This year we have had some superb talks and lectures, and our last speaker brought an amazing archive of rail photographs of West and South Yorkshire. This was his own collection of photographs that he had taken himself spanning the 1940s, through 1950s, 1960s and right up to the present day. He had started when a boy at school, as many of us had, starting with his box Brownie and moving on as funds and technology allowed. His collection is a record of rail history, but also of industrial history and social history. His photographs are a unique record, and much in demand by historians around the country.



As he left, he brought me two prints I'd like to share with you. The first print (not his own) that Les passed to me is of a Sheffield Corporation Tramways horse drawn vehicle. But look at the background; does this look like a loco and boilermaker's yard? Christine very cleverly spotted that it's on the River Mersey, the "Bibby Line" building of the famous shipping line can be seen in the central background. The tram chassis plate (just visible below "Sheffield Corporation") tells us that the car builder is George F. Milnes & Co. of Birkenhead. Since this photo is clearly on Merseyside it's clearly at a Milnes' site (they had a

later site in Shropshire), it must be dated sometime between 1886 and 1902. At Doug Spencer's recommendation, I wrote to the National Tramway Museum at Crich, and Hannah Bales did some great research and sent me the following mail:

"Hi Cliff,

"Thank you for sending the photo of the tram, it is very intriguing! I had not seen a Sheffield tram like that before, only Blackpool. The Workshop was also surprised by it. But I have managed to find a bit of information about the tram in one of our books on the Sheffield Trams.

"The image itself is an official photograph taken by Milnes, who built the tram, at Birkenhead, possibly before it was sent to Sheffield. The tram is one of the first cross bench toast-rack trams and was ordered by Sheffield Corporation Tramways after they took over Sheffield Tramway Company in 1896. Much of the rolling stock it inherited was at the end of its usefulness and needed to be replaced. Improvements were also needed for the routes and the services provided were insufficient. Initially, more trams – which could be easily converted to electric – were needed. A search was made for existing tram, but none could be found, and so a tender was accepted from G. F. Milnes to build some new cars. After initial designs and amendments had been made, Milnes produced a number of horse cars, rather than cars which could be converted to electric. At the same time three 32 seat toast-rack cars were also purchased at £95 each.

"These were pulled by two horses, one behind the other, and were finished and sent to Sheffield in June 1897. They were numbered 27, 57 and 58 and ran at Attercliffe, Hillsborough and Nether Edge Road respectively. They were not very popular with the public, particularly in the noisier areas of the city. But the Corporation found them useful, cheap rolling stock and ordered a further nine, which were finished by September and ran for a couple of months before it became too cold to use them. The new cars had an additional seat to carry more passengers and were numbered 59-67. They ran in Attercliffe, Hillsborough and Heeley, each place receiving three each.

"While the Corporation switched over to electric the horse trams continued to run to ease the change and particularly on Sundays when the power stations were not working. I assume the toast-racks ran in the Spring and Summer months when it was warm and dry enough to do so; they ran until 1901 which is when all 12 were disposed of. The horse trams were sold and two went to Chesterfield, but they did not take any of the toast-racks.

"We don't have a Sheffield toast-rack in our collection. We have electric toast-racks from Blackpool, Blackpool and Fleetwood and the Isle of Man, and the latter two are covered, but are not otherwise very similar."

Hannah Bale. Curatorial Assistant, The National Tramway Museum, Crich.

I had some follow up information from Paul Beard and Tom Robinson to say that the photo is indeed one of Milne's official photos, and that the tramcar in question would have been supplied in 1897, but became redundant in 1901 as electric tramcars took over.

The second print that Les passed to me is of a traction engine in 1968 in the Rivelin Valley.

John Rowland has helped me in the identification, he comments:

"It's a compound (1 small, 1 large cylinder) and it could be ploughing. I think I can make out the cable drum and its large driving gear under the boiler. If it is, there would have been the other half of the 'ploughing set' (i.e. another engine) at the other side of the field. This pretty much identifies it as a Fowler. (See video at: <http://www.leedsengine.info/leeds/histjf.asp>) Still valued well into the 20th C for ploughing large fields without the compressing effect of tractor wheels on the topsoil. ('The answer loyes (lies) in the soil'. Catchphrase from a 1960s radio comedy programme. Anybody remember it?!) There were even conversions to Gardner diesel engines!"

Isn't it amazing how much information can be culled by asking the right people the right questions – many thanks to those who have helped.



The Elusive Hopton-Wood Stone – Part Two

Derek Grindell

Hopton-Wood Stone at Chatsworth House?

Having searched in vain for confirmation of Chatsworth House having examples of Hopton-Wood stone, I sought the assistance of the Duke's Archivist, who kindly responded as follows....*"The answer is yes, Hopton Wood Stone was used extensively in the new North Wing. All the main passage floors are paved with Hopton-Wood. The stone (and its qualities) was not discovered until c1760, its first recorded large scale use was in the rebuilding of Kedleston Hall in 1760/70 where it seemed particularly suited for flooring. By the time that the 6th Duke of Devonshire was making alterations to the old house and the construction of the new North Wing the use of the stone had been tried and tested. Its light cream colour, fine grain and hard wearing nature made it eminently suitable for the new building, even though it was only going to be used in the service areas"*.

Of particular interest to NEDIAS members will be the following copy of a paper, prepared by a past member of the Archive team, which was forwarded along with the note on Hopton-Wood stone. It details the varieties of stone used for Chatsworth House and their respective applications and sources:

The 1st Duke of Devonshire and The Redevelopment of Chatsworth House

The current 'Masterplan', originally conceived in 2007 as a 10 year programme of essential repairs, conservation and restoration, is aimed at safeguarding Chatsworth's heritage and maintaining its history of innovation and progress. It is presently in its final phase, although the Stable Block awaits similar treatment. No less than 23 roofs have been re-leaded and vents installed together with thermal insulation. The Orangery roof, part of the 6th Duke's northern extension, has been restored to its original design and made water tight. This ambitious project has included the removal of asbestos, the repair and improvement of fire compartmentation, the renewal of mechanical and electrical services, the provision of lightning protection, the replacement of time expired lead and, where possible, the adoption of more efficient technologies. The conservation and restoration of all external stone surfaces has been a major feature of the programme since some of the masonry is more than 300 years old and has deteriorated due to a combination of adverse weather and pollution. The cleansing of the stone has been particularly time consuming since conventional blasting techniques cannot be used. To ensure the replacement stone matched the existing stone, permission was obtained from the Peak Park Joint Planning Board to temporarily reopen Burnt Wood Quarry, above Beeley.

When William Cavendish (1640-1707) inherited the title of Fourth Earl of Devonshire in 1684 at the age of

43, he cannot have inspired confidence, in those who knew him well, that the family's future was in safe hands. Bishop Burnet's description of him as *'one of the finest and handsomest gentlemen of his time'* was tempered by the punchline ...*'and of a nice honour in everything but the paying of his tradesmen'*. As Lord Cavendish, he had already earned a reputation as something of a rake. No less a reprobate than King Charles 11 is said to have forbidden Nell Gwyn from having any contact with him.

He was a prolific womaniser to his dying day, arrogant, aggressive, extravagant and irritable to the extent that he even sought involvement in duels. He is remembered, however, as one who promoted the concept of English liberty, was committed to the Protestant religion and was second only to Bess of Hardwick in his contribution to the House of Cavendish. Brought up under Cromwell he was one of a family, who had been allowed to prosper as long as they remained inactive in politics.

Aged only 17 he made the customary grand tour of France and Italy accompanied by the playwright-parson Henry Killigrew. For the remainder of his life, the young Devonshire was a budding poet with an affinity for European taste and culture. Although his taste outshone his poetic ability, he followed current fashion and was one of four young noblemen who held the King's train at his Coronation.

In 1662 he married Mary Butler, the fifteen year-old daughter of the Duke of Ormonde, in Kilkenny Castle, but soon returned to Charles II's Court and then joined the Duke of York, who was campaigning in the Battle of Lowestoft. A decade later Lord Cavendish had become a more responsible and wary politician and he was gradually drawn into opposition to the Stuart King, who had attempted to secretly acquire financial support from the King of France in return for supporting him against the Dutch. With personal experience of the manner in which the French aristocracy had forfeited their influence to the 'Sun King' at Versailles and become nothing more than his attendants he foresaw a similar trend developing with the House of Stuart. The Cavendishes, like other important families, had supported the Royalist cause during the Civil War and as a result had retained their rights in Parliament and kept their influence in the counties but the drift of King Charles's government towards instigating revolution was plain to see. Cavendish wisely avoided any connection with the treasonable plotting to assassinate King Charles but spoke in defence of William Russell at his trial for treason.

Lord Cavendish succeeded to the Earldom on the death of his father in November 1684. Two months later Charles II died and was succeeded by the Catholic King James, which soon triggered a rebellion. Despite wisely avoiding any accusation of disloyalty to the new monarch he became involved in an altercation with a certain Colonel Culpepper, who was trying to recover land holdings in Derbyshire, which he claimed had been part of his wife's dowry. On meeting the new Earl in Whitehall he insulted him and queried his loyalty to the Crown. Devonshire ignored him but when the slur was repeated he called the Colonel a liar. Culpepper responded with a blow to the ear whereupon Devonshire knocked his assailant to the floor. The Colonel was consigned to the Marshalsea Jail for eight months, whilst the Earl thought it prudent to return to Derbyshire, since the fisticuffs had taken place outside the King's bedroom and there was no love lost between the two.

Early in 1687 Devonshire again met Culpepper and unwisely challenged him to a fight. When the Colonel declined, the Earl grabbed him by the nose, took him out of the room and assaulted him with his cane. Rashly, the Earl had chosen the royal drawing room for the assault and he was hurriedly despatched to the King's Bench Prison. His plea of parliamentary privilege was dismissed, no doubt by royal command, and the King's Bench Judge fined him £30,000, ordering him to be detained until the fine was settled.

In retaliation the Earl refused to acknowledge the authority of a mere royal magistrate to fine him. His mother, the Dowager, visited Whitehall to present the King with bonds to the value of £60,000, bearing the signature of Charles I, which the Cavendish family had spent on the Stuart cause but had never been repaid. Her demand for her son's immediate release was ignored and she was dismissed by the King. Matching the King's arrogant approach, the Earl advised the Marshall of the King's Bench Prison that he had stayed too long in prison and was returning to Derbyshire. Within a few days he was back in Chatsworth, incensed by his treatment at the hands of a member of the House of Stuart. The Lord Chancellor sent a warrant for the Earl's arrest to the High Sheriff of Derbyshire, Sir Paul Jenkinson, but accounts differ as to the outcome. Later, on reflection, he composed a letter, which he sent to the King's confidant, Lord Middleton of Wollaton Hall, Nottingham. It did not seek to justify his behaviour but sought to explain the privileges of the English peerage and the value of good manners.

The King could not arrest the Earl in Derbyshire and the IOU he received for £30,000 was of no more use than the bonds the Earl had received from Charles I. For a year at least he would be secure at Chatsworth where he could bring a fresh mind to bear on the future of the Elizabethan Chatsworth House, which was in

urgent need of attention. His allegiance to London had been called into question when the house he rented there from Lord Montagu was burned down in 1686, thereby forcing him to spend much of his time in Derbyshire. The house he had inherited was in such a parlous state that as early as 1687 he had instructed his labourers to remove 'an oulde sealing' from the Elizabethan south front. When he forwarded his bond for £30k to the King the demolition of the south front was already under way and, whilst secretly corresponding with King William in The Hague, he was liaising with William Talman, his chosen architect. Talman, relatively unknown, has been credited with the classical style of Thoresby Hall for the Earl of Kingston. His low public profile suited Devonshire, who reasoned that he would be more inclined to comply with his client's requirements. Initially, Devonshire's ambitions for the Tudor house were limited to adding a classical façade but rebellion and restoration became all-consuming passions. In fact despite a degree of renovation by the Third Earl, his overseer, James Whildon reporting to his successor, the Fourth Earl, was said to have claimed that 'the whole edifice was still 'decaying and weak'.

Early in 1688, the Queen of James II gave birth to a son, thereby dashing all hope that Protestants William and Mary would ascend to the throne after the demise of James II. The King despatched the Second Duke of Newcastle, a loyal Stuart, to persuade Devonshire to return to the court.

The attempt was rebuffed and, in the spring of 1688, Devonshire met with Lord Delamere and the Earl of Danby, a former Minister of Charles I, in Whittington to discuss the installation of William and Mary on the English throne. According to legend, heavy rain forced them to seek shelter in a local hostelry, 'The Cock & Pynot', where they agreed to secure the north for William before heading south against the King. Devonshire was charged with the responsibility of leading Derbyshire and taking Nottingham. Soon afterwards Devonshire signed the coded letter from the revolutionaries inviting William of Orange to take the Crown of England.

Devonshire failed to assume the key role he had planned due to the intervention of the weather. Having reached Derby he received news that The Dutch fleet carrying William had been blown away from the Yorkshire coast and had eventually landed in Torbay. Proceeding to Nottingham, he raised a regiment of horse and received the Protestant daughter of James II with all due honour in the Castle vacated by his cousin Newcastle. News then reached him that James had sought refuge in France, ensuring that the so called 'Glorious Revolution' of 1688 was bloodless.

Devonshire played a key part in settling the potential problem of the Dutch King's status. He refused to accept the role of Regent but Devonshire's intervention as leader of the Whigs in the debates in the House of Lords persuaded members to establish William and Mary as co-equal King and Queen. The involvement of Cavendish in what came to be known as the 'Glorious Revolution' ensured that extensive land holdings, the political influence and indeed the affluence of the aristocracy would be maintained in future years. It also elevated the Devonshire family to a commanding position in society.

The King expressed his gratitude for the service Devonshire had rendered. He was made a member of the Privy Council, awarded the Most Noble Order of the Garter, the Lord Lieutenancy of Derbyshire, and the Lord Stewardship of the Royal Household. At the Coronation he carried the Crown and his daughter, Elizabeth carried the Queen's train. Financially, his rewards overshadowed his various promotions. In 1690 the Devonshires were granted in perpetuity the Crown rights to the High Peak Hundred in Derbyshire, together with the valuable lead deposits in the neighbourhood of Castleton.

My request to Chatsworth's Archivist for information on the location of Hopton-Wood Stone, the subject of an article in the last issue of the NEDIAS Newsletter, elicited more information than anticipated. A previous employee, now retired, had compiled a list of the variety of building stone used in the new Chatsworth House, which the Archivist kindly forwarded. I reproduce it below as I am sure it's variety and disparate locations will be of interest to readers.

Bibliography

Stags & Serpents The Story of The House of Cavendish and The Dukes of Devonshire by John Pearson. First published 1983 by Macmillan London Ltd.

Sources of Building Stone Used in the New Chatsworth House.

The main source of stone for the house was quarried from Bakewell and Whicksop Edge (close to Ball Cross). It is a fine-grained gritstone (sandstone) from the beds known as Ashover Grit. This was then worked up by the masons into ashlar blocks on site.

Stone was also quarried in the north park around Dobb Edge for lesser work such as garden walls. There is an interesting reference in the building accounts for 'fire stone' obtained from near the Gibbett (close to Dobb

Edge). This was a gritstone capable of withstanding heat and was used in the kitchens for bread ovens and in the laundry for the 'coppers' where the water was boiled.

Paving stone was supplied by the quarry at Stoke near Grindleford and white gravel for the paths and walks in the gardens came from Calver. This was probably the waste product of the lead mines and would have consisted of calcite and possibly fluorspar. Similarly the lime used for mortar came from the kilns of Stoney Middleton.

Lead for roofs and plumbing was supplied from the smelter at Great Shacklow, near Ashford in the Water. It would have been cast on site into sheet and pipes.

Stone for decorative work within the building

The majority of the decorative stone within the house was supplied from quarries located in different parts of the estate.

Alabaster. From Castlehays near Tutbury in the Trent valley and from Gotham in Nottinghamshire. The Castlehays alabaster was used extensively for the altarpiece in the chapel.

'Blackstone' (Black Marble). From the quarries on Sheldon Moor (near Ashford in the Water) and used for the columns in the chapel as well as other decorative work around the house e.g. the floor of the Painted Hall. (Not a true marble in the geological sense but a limestone capable of taking a high Polish).

'Grey Marble'. Another limestone capable of taking a high polish. Characterised by its highly fossiliferous nature, being composed mainly of a fossil coral known as crinoids but often referred to as 'Derbyshire Screws'. This is probably the most common decorative stone in the house. Sources include Calver, Haddon Field (on Rutland property), Sheldon Moor and the area around Monyash. The building accounts record a payment for 'going beyond Calver for Grey Marble'.

Roche Abbey Stone. From quarries in the Maltby area, South Yorkshire (then West Riding). A fine grained Magnesian Limestone used principally for statuary particularly in the Grotto and also for the statue of 'Flora' (amongst others) in the garden.

Italian Marble. Bought in London and shipped to Bawtry on the River Idle then carted by road to Chatsworth. Specifically used for statuary.

Building work of the 6th Duke (1790-1858)

The main source of stone for the new North Wing and alterations to the 'old' house came from quarries on Beeley Moor and Burnt Wood above Rowsley. Decorative stone came from many of the same sources as those in the 'old' house but with the addition of a whole suite of Italian marbles used in columns particularly in and around the Dome Room and the State Dining Room. However use was also made of more recently discovered local 'marbles' such as Rosewood, Birdseye and Duke's Red.

Rosewood and Birdseye Marble. These were sourced from Nettle Dale near Ashford in the Water where they were conveniently placed for transport to the Ashford Marble Mill which cut and polished most of the locally produced 'marble'. Rosewood was only found in relatively small blocks and the free standing columns in the library are some of the largest pieces ever produced.

Duke's Red Marble. A brick red limestone (the result of iron staining) discovered in small quantity near Newhaven (SW of Youlgrave) in 1823. Used very sparingly usually for inlay work. Following a spate of pilfering from the workings in the late 19th century, the 7th Duke caused the remaining supply to be worked out and brought to Chatsworth where the residue is housed in the cellar.

IA News and Notes

NEDIAS Industrial Heritage Day

It was NEDIAS' turn to host the East Midlands Industrial Archaeology Conference this spring, and we organized it at Cromford Mill. The theme covered some of the less well known aspects of Arkwright and Cromford, with speakers including Darrell Clark, Prof Stanley Chapman, Peter South and Dr Lynn Willies. During the afternoon, delegates had guided tours of the church, Arkwright's Cromford Village, and the Arkwright Experience hologram show in the new Visitor Centre. The day was much enjoyed – it was a sell-out, we had a "full house".

Coal Mining Museum for Mansfield?

The Nottinghamshire Local History Association have reported that Nottinghamshire NUM is hoping to raise £250,000 to buy a building capable of housing a museum. The building would also feature a virtual-reality room, education space for school groups, storage and offices. A charity is being set up, called Nottinghamshire Mining Museum, to apply for grants from both the Heritage Lottery Fund and the Big Lottery grants.

The museum would reflect how the Nottinghamshire coalfield was one of the most successful in Europe – at its peak, it had 42 collieries and 40,000 miners. They're seeking to collect artefacts for the museum – these at the moment are being preserved at Mansfield Railway Station.

Chesterfield area history “blog”

Have you found the free blog written by local historian Dawn about many aspects of the Chesterfield and north Derbyshire history? It has a great compilation of many subjects including the area's pottery heritage. More recently information about Scarsdale Brewery has been added – and the author has now placed details on a CD as well – this is available in the Local Studies section of Chesterfield Library. See www.achesterfieldblogger.co.uk for more info and on some of the other subjects covered on this generous site.

Dog Kennels

A second site which members may find of interest contains much information about the history of many businesses and buildings in the “Dog Kennels” area of Chesterfield. It's a mine of information – see www.thedogkennels.co.uk

National Lottery Awards, 2017

Following the public vote this summer – maybe you took part – in September, the National Lottery will be announcing which finalist this year are to win the coveted “Good Cause” award. There are seven finalists, but the one that perhaps should succeed is the Ironbridge Gorge Trust. Celebrating its 50th anniversary this year, Ironbridge Gorge Museum Trust is an independent education and heritage conservation charity operating 10 museums and caring for 36 historic monuments within the World heritage Site. These include former factories, foundries and warehouses, two chapels and Quaker Burial Grounds, historic woodlands and a re-created Victorian town. At the heart is the Old Furnace where Abraham Darby first smelted iron using coke.



Abraham Darby's 1709 coke-fired iron furnace, Coalbrookdale

The Trust needs cash for restoration of key buildings and to provide educational workshops for its tens of thousands of students per annum. However, I suspect that the applications that will get most votes are those projects that have the much larger “pull”, those with much larger local population.

Congratulations to the Chesterfield Canal Trust's many volunteers

Did you know that on 2nd June, volunteers of the Chesterfield CT were awarded “the Queen's Award for Voluntary Service” – the highest award given to volunteer groups across the UK.

It's equivalent to an MBE and is specifically awarded to groups of volunteers for their unstinting service – congratulations to all.

Jacky Currell

Jacky's brother has let me know that following the clearing of her house, some of her paintings and prints are available for knock down sale via the web site www.jacquelinecurrell.co.uk. Have a look. The proceeds will be donated to Ashgate Hospice and the Motor Neurone Disease Association. The industrially inspired Christmas card which she had designed for our December meeting last year will be used as basis for a Christmas card which members will be able to purchase at NEDIAS meetings later this year – again, proceeds to the same charities.

And finally

.... Glasdir Copper Mine in Snowdonia, and the technology invented there which revolutionised coal processing.

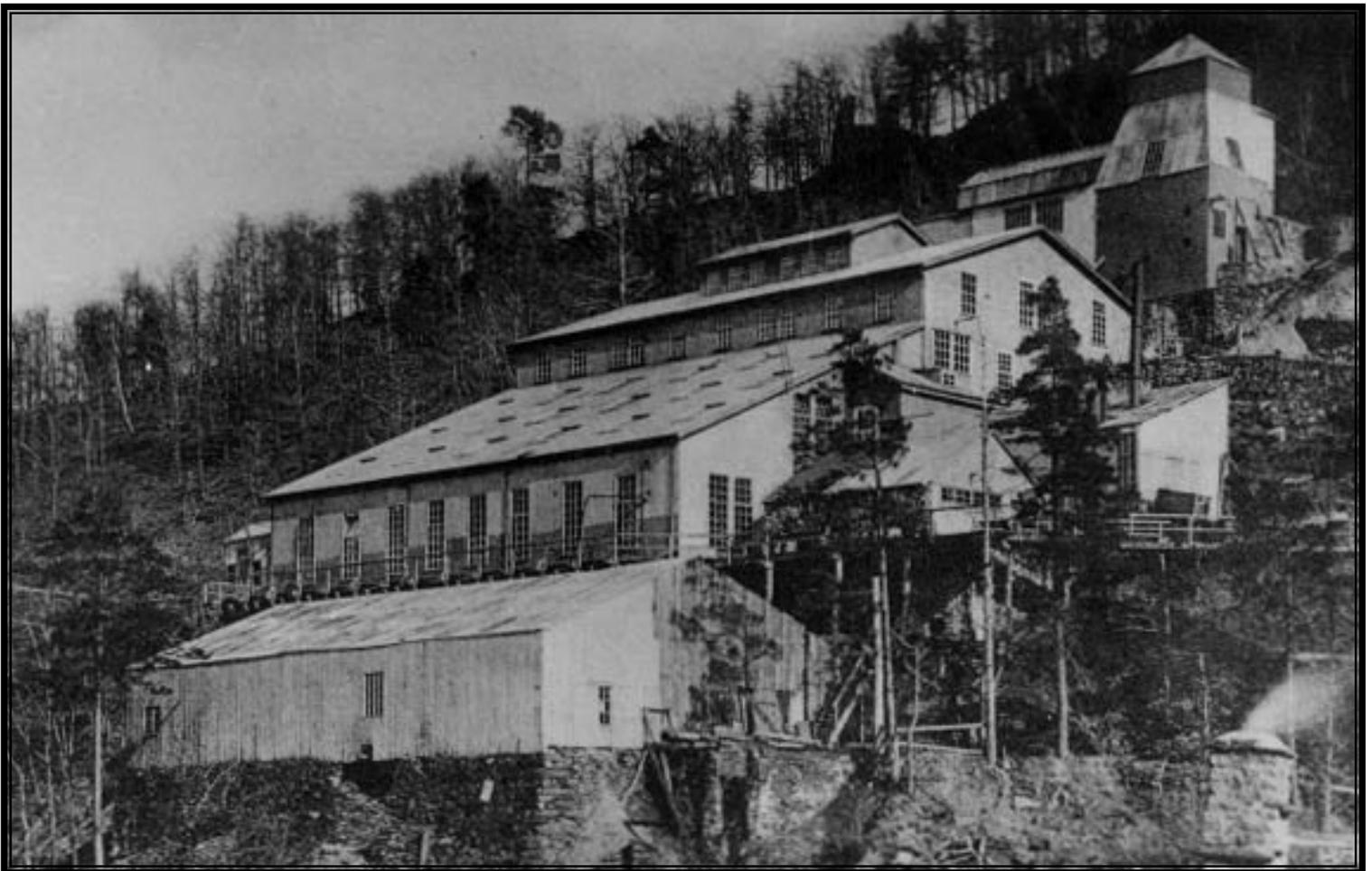
Cliff Lea

Christine and I were walking in southern Snowdonia this summer, and found the remains of the once quite important Glasdir copper mine, as well as many adits and relics of the gold mining industry.

The Glasdir mine opened in 1852, primarily to extract copper ore, and it's recorded that over 13,000 tons of the metal were removed from the hillside between 1872 and 1913. The last owners were German, and you can understand why the mine was to close a year or so later!

Its greatest moments came when in the 1890s the mine manager George Robson developed a method of flotation in great weiring water tanks to carry the ore to the water surface, separating it from other crushed rock debris. The method was later refined and patented under the Elmore family who became owners of the mine in 1896.

At its height, about 200 men worked at the site, the quarried ore was crushed and washed with water for continuous refinement. Robson's early experimentation showed that an oily emulsion could attract the ore to the oil droplets which floated to the surface. And so it was, that in 1897, the Elmore family were to install the world's very first industrial size commercial flotation process for mineral refining at this Glasdir mine, based on these early experiments.



*Glasdir Mine Processing Plant. (Gwynedd County Archives).
The ore crushers are on the top levels, with the flotation ore "concentrators" at the lower levels.*

In a few years, the company realised that the separation of the ore particles could be made considerably more efficient by introducing air bubbles, and the first “froth flotation” plant came into being. Over the next few decades others were to refine the process not just in the UK but around the world.



The archaeology as it appears now with buildings long cleared, looking at the site from above (Cliff Lea)

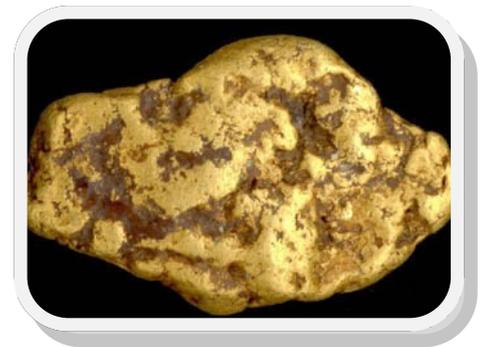


Engine block peeping above the foliage. (Cliff Lea)

It was to be particularly used for coal, one of Britain’s largest industries in the 1900s employing one million men at one time; froth flotation plants became common at most major coal mines not only in Britain but elsewhere around the world. The combination of chemicals used grew in complexity as the science became better understood. The prime developers of the technology in Britain were Century Oils (now FUCHS) of Stoke-on-Trent, and although the UK coal industry has suffered its decline, Century Oils branded flotation aids are still used now right around the world in all the major coal producing countries in ever increasing volumes.

The casual walker at Glasdir these days probably climbs the rocky and remote paths around the area with little thought as to the world-beating technology which was spawned from this mineral mine. A technology first developed in a remote part of Snowdonia but which led to a vital process used by every major coal mine around the world.

And finally – despite there being many gold mine adits and relicts that Christine and I also passed during our walks in that area this year – ***I can report sadly that we found none of the shiny yellow stuff!***



Contributions, no matter how short (maybe about a visit you have made), and preferably by email to cliff@nedias.co.uk, for inclusion in future editions of this newsletter are most welcome.

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