North East Derbyshire Industrial Archaeology Society

NEDIAS Newsletter No. 46 – May 2012

Price: £1.00 (Free to Members)

N.E.D.I.A.S

The Barrow Hill 'Fab Four' Steam Gala

Barrow Hill was host to many thousands of visitors to see the spectacular 'Fab Four' Steam Gala and display in mid-April. The Round House was due to see the return of Flying Scotsman after 38 years; but the following statement was issued by Steve Davies, Director of the National Railway Museum *"The National Railway Museum is very disappointed to announce that it will be unable to make Flying Scotsman available for 'The Fab Four' Steam Gala at the Barrow Hill Roundhouse. There is now a need to fabricate new Horn Ties for the driving wheel horn guides and this could not be achieved in time for the Barrow Hill event without compromising the high quality of the work undertaken so far, and would risk the locomotive not meeting its future commitments at Railfest and carrying the Olympic Torch."*

To many, the main attraction amongst the 18 Steam Locomotives that were booked to appear, was obviously the world speed record-holder, A4 No. 4468 Mallard which is another NRM owned engine rarely appearing away from York or Shildon.

Mallard was joined by classmate No. 4464 Bittern, new build A1 No. 60163 Tornado, A2 No. 60532 Blue Peter, V2 No. 60800 Green Arrow, K4 2-6-0 No. 61994 The Great Marquess (which owner John Cameron made available at the 11th hour following its overhaul at Crewe), Atlantic C1 4-4-2 No. 251 and GCR 4-4-0 No. 506 Butler-Henderson.

Smaller locomotives on display were the N2 0-6-2T No. 1744, J17 0-6-0 No. 8217, J72 0-6-0T No. 69023 Joem, NER 'H' class 0-4-0T No. 1310, J94 0-6-0ST No. 68030, 'Yankee' 0-6-0T No. 30075, LMS 'Black Five' No. 45110, Midland Railway 'half-cab' 0-6-0T No. 41708, Peckett 0-6-0ST

Photo by Dave Hart

No. 2000 and Hawthorn Leslie 0-4-0ST Henry.

Gathering together such a wide and prestigious collection of locomotives from the LNER and it's pre-grouping will surpass that which appeared at the 2003 Doncaster Works open day, and it's questionable whether such a gathering will ever come together in our lifetime.

You can see a tremendous video on You Tube, http://www.youtube.com/watch?v=4h0KLgFGAOA, but I'm pleased to say that despite the reported high entry charges, Dave Hart and Doug Spencer were able to call in and took a number of photos of this **spectacular** gathering.

Photo by Doug Spencer


Photo by Dave Hart


Photo by Doug Spencer


Photo by Dave Hart

WHAT'S ON?

NEDIAS Lecture Programme

NOTE NEW VENUE

Meetings now 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, 10th September 2012	Patsie Jarman: **"The 'Wonderful' Age of Steam"**
Monday, 8th October 2012	Derek Bayliss: **"Wortley Top Forge and early ironmaking"**
Monday, 12th November 2012	Derek Grindell: **"Power to the Peak"**
Monday, 19th December 2012	**Christmas Meeting** – Members only

Other Diary Dates

On now	Chesterfield Museum: **'Links to the Past'** Exhibition tells the story of Robinson and Sons.
On now	Clay Cross library: April 30th to June 1st inclusive – Exhibition about the **Ashover Light Railway**
Saturday, 19th May 2012	**EMIAC 83 - Trent 150: Trent Station 1892-1968.** Hosted by the Railway & Canal Historical Society in Long Eaton, Derbyshire. Details at http://www.northants-iag.org.uk/emiac.html
Tuesday, 17th July 2012 @ 7:00pm	**"The Importance of Industrial Archaeology"**, a talk by Prof Marilyn Palmer. Cromford Mill. Booking required on 01629 825995
Thursday, 19th July 2012 @ 7:00pm	**"The archaeology of purpose-built cotton-workers' housing in the Derwent Valley"** , a talk by Suzanne Lilley. Cromford Mill. Booking required on 01629 825995
Tuesday, 24th July 2012 @ 7:00pm	**"The Lace Factories of Long Eaton"**, a talk by Keith Reedman and **"The Midland railway Sheet Stores"**, a talk by Ian Mitchell. Cromford Mill. Booking required on 01629 825995
Thursday, 26th July 2012 @ 7:00pm	**"The rise and demise of an early 19th century stone mill"**, talk by Les Mather and David Palmer of NEDIAS. Cromford Mill. Booking required on 01629 825995

NEDIAS VISITS *Co-ordinator: Brian Dick, 01246 205720*

➔ **Saturday 19th May: Glasshouse Common, Meet 10:00am at Revolution House.**

Many people last year missed Part 1 of Barry Bingham's walk across Glasshouse Common, an area of immense historical importance – so Barry will repeat it for us. It was in this area that Richard Dixon commenced making glass in 1710 an industry which was to continue for 140 years, and there are many features that Barry will point out relating to past industries and characters of the area.

Barry is repeating this first walk and we meet at 10:00am on Saturday 10th May at The Cock and Pynot for a walk estimated to finish at about mid-day, time for lunch at this historic place?

Please register interest by entering your name on the list at the next meeting.

(By the way, let's hope that Barry's magic once again helps the sun to come out, as it did on 19 November, the sun shined on a dozen members who joined Barry Bingham for the second part of a walkabout in the Whittington areas. Barry many thanks!)

➔ **Thursday 21st June at 6:30pm. Cromford Village and Church. A Summer Evening at Cromford: Buffet supper, talk and village tour.**

We meet at the Gothic Warehouse on Cromford Canal wharf, plenty of parking in the Mill Yard opposite for tea/ coffee and buffet. A short talk in the Wheatcroft's canal warehouse on the wharf will be followed by guided tour to see Arkwright's village of the 1770s, where you can see the world's first organised industrial housing of 1777, even the village lock-up. Alternatively you might like to see the Church built by the Arkwrights, particularly to see the Alfred Hemmings murals, or simply to sit by the canal in the evening sunshine (let's hope!), with a beer or glass of wine from the wharf cafe.

We have booked the ground floor of the "Gothic Warehouse" on the wharf as our base, where we will have buffet supper - sandwiches/ cakes/ hot drinks, etc. - and the initial talk, and we'd like to make a

donation to the Arkwright Society towards restoration. Deposit £5 per person secures your place. Total cost £9.

➔ **Saturday 30th June. Ticknall Pottery Excavations and Village, 11:00 am**

Following the fascinating talk we had about the various potteries at Ticknall over many centuries, our speakers Sue Gorrick-Brown and Janet Spavold are hosting a gentle guided tour of the recent excavations and of Ticknall. We meet on site at 11:00 am – the tour will be approx. one - two hour duration – and don't forget that Calke Abbey is around the corner, maybe for lunch in the stables afterwards and an afternoon in the house itself, or at Staunton Harold Church. Sue has said that we can park at Ticknall Village Hall car park (DE73 7JW). If coming from Derby, go under tramway arch and it is first right up Ingleby Lane. However it fills up quickly, especially weekends in summer so people park along Ingleby Lane, and along Main Street. The road is slightly wider just past Ivy Leigh house and parking can be there as well. Ivy Leigh itself is on the junction of Main Street and Harpur Avenue, the house faces Main Street but the entrance is from Harpur Avenue (DE73 7JS), there is limited parking there - there will already be two cars there with space for about another three.

➔ **Saturday 15th September at 10:00am. Visit to the Farriery and Forge Museum, Thanet St., Clay Cross.**

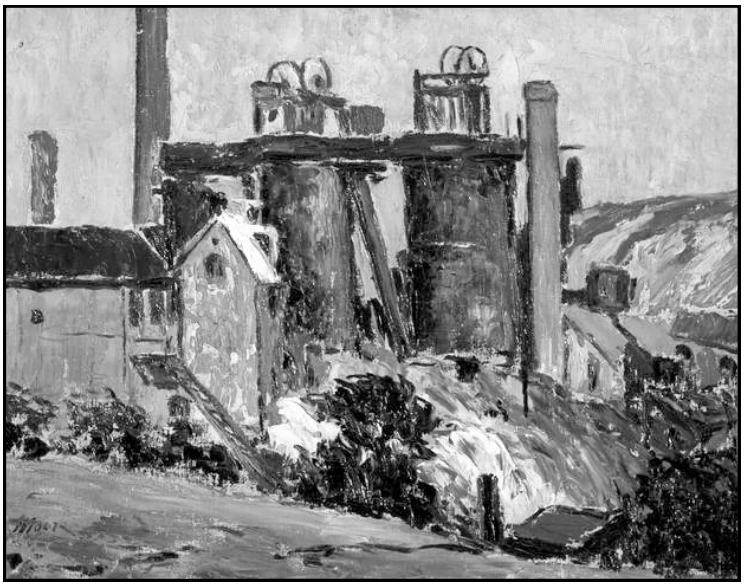
We have organised a visit to view the Museum opened and curated by ex-miner, farrier, blacksmith and liveryman Doug Bradbury.

Farriery and Forge Museum, Thanet St., Clay Cross. Meet on-site at 10:00am Saturday 5th September, for a visit expected to finish by about mid-day. Donations in lieu of entrance charge to Doug Bradbury's local hospital charity. Register your interest on the visit sheet at the next NEDIAS meeting.

Local Industry in Art

Cliff Lea

Have you seen the superb new publication from The Public Catalogue Foundation, *"Oil Paintings in Public Ownership in Derbyshire"*? It contains photographs of just about every painting in public ownership within the county – over 1000, so not only can we now see what's on the walls in our local Museums and Art Galleries, we can now also see many others which are usually hidden from public view in town halls, hospitals, court houses, schools and colleges.



Bennerley Ironworks by William D Moore (Courtesy of Erewash Museum)

Is this important to NEDIAS members? Well, yes. Many of us are familiar with the portrayal of industrial processes in David Gilchik's paintings at Chesterfield Museum, showing Staveley Works in the mid 1940s, and Peter Dunn's oils of miners and mining. But now we can see in one book the full collections from across the county – the great changes in the Derwent valley and other important landscapes before and after industrialisation started, ironworks, mills, potteries, weirs, mining, railways and locomotives, etc. Illustrated is "Bennerley Ironworks", painted by William D. Moore in 1931, and on show at the Erewash Museum along with a number of other oils by the same artist.

This invaluable pan-Derbyshire record will be of interest to all, and can be purchased at Chesterfield Library (*"Oil Paintings in Public Ownership in Derbyshire"*, The Public Catalogue Foundation, ISBN 978-1-904931-50-8, £20)

Humber Keel *DAYBREAK* and Super Sloop *SPIDER T* - A Royal Appointment

Derek Grindell

The Thames Jubilee Pageant, scheduled for Sunday June 3rd, will involve 1,000 vessels, which have been selected from 4,500 applicants. The Humber Keel *DAYBREAK* and Super Sloop *SPIDER T*, two survivors of the age of sail, will represent the Humber estuary, its associated navigation systems and, by association, the large population, both afloat and at the water's edge, which once owed their very existence to these commercial arteries. The coordinator of the event, the Marquess of Salisbury, has claimed that the pageant will be the largest one-day event in human history with 30,000 people involved in piloting the flotilla, which will muster between Hammersmith and Battersea Bridges at high water and move in stately procession downstream, arriving at Tower Bridge an hour and a half later. Billed as the most extravagant display seen on the river since the reign of Charles II in 1662, this celebration of the nation's maritime heritage will feature fanfares on each bridge, waterborne bands and nautical choirs. Every county in the U.K. will be represented and every country from the Commonwealth. Leading what has been dubbed a "watercade" will be a huge floating bell tower of eight newly cast bells, each named after members of the royal family. Following at a distance, carefully calculated not to impair the Queen's hearing, will be the 88ft. gilded royal barge, *Gloriana*, powered by 18 oarsmen. The flotilla will be divided into 10 sections, each headed by its own music barge carrying variously, orchestras, military bands and choirs. The 3,500 unlucky boat owners, whose applications to participate were rejected, will have been invited to view the spectacle from Albert Bridge.

SPIDER T's presence on the Thames is due entirely to Mal Nicholson, Proprietor of *Trentside Classic & Sports Cars* of Burringham, North Lincs. He intervened to save what remained of *SPIDER T* from imminent consignment to a scrapyard and he has subsequently invested heavily in its restoration, modification and re-commissioning. It was originally owned by John Joseph Tomlinson of 28 South Parade, Thorne, who in the mid-1920s, over a period of less than two years, took delivery of seven new keels. Shipping Registers, held in Hull City Archives, record that *CLARENCE T* (June 1925), *ZENITHA* (October 1925), *SPIDER T* (March 1926) and *PAUL HT* (June 1926) were all built at W. H. Warren's New Holland Yard whilst *EARL T* (January 1927) and *PARADE T* (January 1927) were built on Tomlinson's doorstep at Richard Dunston's Thorne Yard and *EDITH T* (December 1925) was built at Henry Scarr's Hessle Yard. *SPIDER T's* restoration will not only preserve the memory of the Tomlinson fleet but will also be a reminder of the three small shipyards involved in its construction, which all had their origins in the 19th century.

'Spider' was the nickname of Tomlinson's nephew, who had every right to feel proud to be associated with the pride of his uncle's fleet, which proved to be one of only two super sloops built for commercial use. They were designed at the end of the sail powered era with a heavy flat-bottomed hull to maximise capacity and constructed with ½ inch plates below the water line and 3/8 inch above. *Spider T* (L 61.6 x B 15.6W x D 4.6) ft. was fitted with a mainsail, foresail, jib and topsail and proved her worth when she came second in the Humber Regatta within weeks of her launching. Typically she would have carried bricks, phosphates or coal but at the outbreak of WW2 in 1939 she was de-rigged, fitted with an engine and re-registered as a motor vessel. Utilised for transporting munitions, her working life extended through to 1970 when she was sold at auction following the death of her owner. It is believed that Captain Tomlinson's widow purchased her back again, but she eventually became derelict and sank. She was then raised and repaired sufficiently to serve the Rotherham Police Force as the focal point of a community project

Super Sloop Spider T

involving young people, which earned its organiser the B. E. M. Later falling into disrepair, she became derelict once more, was stripped of all fittings and was about to be cut up when the current owner purchased her in 1994 from the Sobriety Centre, Goole.

Over a period of 12 years *SPIDER T* has been restored to her original condition externally, save for the creation of port-holes and window lights, but internally she has been provided with a kitchen/lounge area and a master bedroom. A traditional sail maker has re-created 1920s style sails of tan sailcloth and with an expert crew she now sails in the waters for which she was designed and even farther afield. Her engine has been retained to provide operational flexibility since she is now available for charter but the wheelhouse structure has been made demountable to permit tiller steering as in the original specification. Modern navigational aids and passenger comforts have been installed, but these have been carefully located to make the least impact on the vessel's overall appearance. She always attracts much favourable comment on her travels, particularly when she ventures into the North Sea as she did in 2007 when she was the first vessel from the National Historic Fleet to attend the World Port Festival in Scarborough. She later sailed to Arbroath and in 2009 was the first Humber sloop to cross the North Sea since the 1930s when she visited a festival in Rotterdam.

The Humber Keel *DAYBREAK* was built at Richard Dunston's Thorne yard for Thos. Hanley Ltd., Millers of Low Fishergate, Doncaster and registered in January 1934. With a steel hull (L 61-2.5 x B 15.65 x D 7.35) ft. she was initially rigged as a Humber Keel and transported grain from Hull to the firm's Doncaster Mill. At the outbreak of WW2 she was fitted with a 2 cylinder engine and stripped of her sailing gear but forty years later was purchased by Tony and Sally Woodward and returned to sail as a Humber Keel but fitted with a Gardner Model 5W 5cylinder 76 H.P. engine. Below deck provision was made for modern living accommodation and, although she has visited the Humber, she is based on the Thames, sailing for the most part between Teddington and Oxford but with occasional forays onto the tidal Thames as far as Faversham.

In 1858, Richard Dunston sold his Lincolnshire boatyard at Torksey and moved to a site on the Stainforth & Keadby Canal at Thorne where he established a flourishing business, which not only built wooden ships but traded as a wholesale chandler within the region. In 1902, under the guidance of his grandson, who found himself as head of the firm at the age of 20, the yard was reorganised to meet a growing demand for iron and steel ships. Since the length of vessels that could be launched at Thorne was constrained by the size of the canal locks, the Hessle yard of Henry Scarr, Ltd. was acquired in 1932. It was radically reorganised with all nine berths upgraded and two placed under cover. During WW2 the firm became pioneers of all-welded ships and 159 all-welded tugs were supplied to the Admiralty. Adopting tight production control techniques it proved possible to deliver one tug every six days. The firm's strong business links with London were established post war when 4 all-welded tugs were built for service on the Thames and further cemented when, by the end of 1953, some 218 London swim barges had been delivered. Dunston's became a part of an American group in 1974 and, in 1986, was acquired by the Dutch Damen Group. The last vessel built at Thorne was completed in October 1984 and the Hessle yard was closed in 1994; the firm had built 1358 vessels at Thorne and 636 at Hessle.

In 1847 at the age of 14, Bethel Bowser Scarr, the son of an innkeeper, was apprenticed to my great great grandfather, John Harrison, who ran a small ship's carpenter's yard at Beverley, East Yorkshire. John's father, Henry had started his apprenticeship at a nearby yard on the river Hull in 1796. B. B. Scarr was but the first of six shipbuilders and engineers in his family, who had yards at various periods in Hull, Beverley, Howden Dyke and Hessle. The family's last mention in the Hull Shipping Register was in 1941.

William Henry Warren, born in Falmouth in 1860, worked as an apprentice shipwright at Barton-on-Humber between 1877 and 1880 but later moved to Cochrane, Hamilton & Cooper's yard at Grovehill, Beverley where he held the post of Foreman Shipwright. My great grandfather, Joseph Hunter, a ship's carpenter, was persuaded by Warren to cross the Humber c1896 to make a fresh start as manager of a small shipyard on Beverley Beck, which he had leased from Beverley Borough Council whilst still employed at the Grovehill Shipyard. In about 1898 Warren heard of a vacant shipyard at New Holland and despatched Joseph Hunter to undertake a brief appraisal of the site. Undeterred by his report that the slipways were in a poor state of repair Warren took over the yard and, having delivered ten vessels to customers from his yard at The Lock (1897 - 18990}, he transferred two unfinished London barges to the New Holland yard for completion in 1899.

W. H. Warren's yard list shows that at the outbreak of WWI some 107 vessels had been launched at New Holland and orders from the Admiralty and the India Office during the period of hostilities accounted for a further 50 orders, which included two Horse Boats (36ft. x 11ft. x 4ft.9in.). In 1919 the business was

incorporated as a limited liability company. During WW2 the company delivered a range of lighters, again for the Admiralty and by 1956, trading as Warren's New Holland Shipyard Ltd. the firm had 5 berths, giving a maximum annual output of 2,500 tons. The company was dissolved in 1970 but in 2009, Peter Warren, whose father and grandfather built *SPIDER T* to a design of his uncle, Frederick Warren, contacted Mal Nicholson thereby renewing the family's link with a vessel that they were amazed to see in such a fine state of restoration. If you catch a fleeting glimpse of *SPIDER T* and *DAYBREAK* on June 3rd do spare a thought for the vessels that were prematurely laid up in favour of fleets of HGVs and what might have been if our inland waterways had been treated as a national asset worthy of investment and development.

Chairman's Chat — *Cliff Lea*

Over the last few months, NEDIAS happenings have gained national recognition: the winter 2012, No 102, edition of "Local History News", the magazine for the British Association for Local History, quoted from an article in one of our own NEDIAS publications and from a report of one of our meetings. They drew attention to the sorely neglected pottery history of the Chesterfield area following the talk by David Siddon (at which we had an audience of over 100 at the Library Theatre) and the superb article by Lesley Phillips in the NEDIAS Journal. Quite by coincidence, I hear that CBC will shortly be receiving a proposal for redevelopment of the Walton Works site between Chatsworth Road and Goytside. The developer has given early indication that they're making an application which would comprise a mixed development, residential, commercial and retail. Yes, it sounds like they're going to include a supermarket in their proposal, ***but whether they get away with it is anyone's guess!***

But what any developer of the area however should consider is the local Brampton heritage; the site contains the listed Walton Bump Mill, Cannon Mill isn't far away, and any proposal needs to reflect and respect the earlier activities of the Robinsons, the Smiths, J J Blow and others. Could this site be suitable for developing some recognition for Brampton Pottery – if not a Museum, then by interpretation boards, signs, local walk. The River Hipper and Goytside was central to the early industrial endeavours, and the River Hipper once again could become a focus of the area.

We have a new venue for our meetings! This area has until recently lacked a larger venue which can accommodate maybe up to 100, and which also can offer projection facilities, car parking including for disabled, kitchen for refreshments, and still accessible for our membership. With the opening of the new St Thomas' Church Centre on Chatsworth Road, Brampton, Chesterfield, this has all changed. A brand new venue is now available with all modern facilities.

As all our members will know, the regular NEDIAS meetings are absolutely bursting at the seams, and we usually see 50-60 people present, and very often now we achieve between 70 and 80. This has been stretching us at the Friends' Meeting House – but the Meeting House has been a very happy venue for us, and it is with mixed feelings that the Committee have decided that it's time to move on – assuming our May meeting goes without hitch.

Our great thanks however go to the management of the Friends' Meeting House, you have served us so well for so many years, but with our current membership size, regrettably it's time to move on.

Harry Brearley (1871-1948) — *Derek Grindell*

Those who braved the squally weather to attend our Christmas meeting on 12th December 2011 were richly rewarded with a presentation entitled *The History of Steelmaking in Sheffield* by Robin Fielder, a mainstay of the volunteer staff at the Kelham Island Museum. In his introduction, Robin circulated copies of a booklet, which he and his colleague Steve Pounder had devised as a guide to the area around the Museum, which can justly claim to be the birthplace of Sheffield's steel industry. Entitled the *Furnace Trail*, it manages, within a mere twenty pages, to provide not only a potted history of the industry but a description of the associated products and processes with fine illustrations and a centrefold map of the Kelham Island area as it is today, marked with the key locations of historical interest. In responding to questions from the floor about Harry Brearley, the inventor of stainless steel, it was clear that Robin had not appreciated that he was regarded by some as an honorary Cestrefeldian, having resided in the town by choice for some years. The extent of his attachment to the town has hitherto not been fully researched but at the time of writing it is being assiduously chronicled by NEDIAS member Darrell Clark and his findings will appear in a future

Newsletter for 2013 will see the centenary of his discovery of stainless steel.

Born in 1871, Harry Brearley was the eighth of nine children born to parents, who had forsaken their rural roots to seek a better living in Sheffield's growing steel industries. Their home was Ramsden's Yard, located off Spital Street; it comprised eight houses, four on each of two opposite sides of a square, which were served by a midden and two pairs of conveniences. Close by the centre of the unsurfaced yard was a communal water tap, which served twelve families. The living accommodation consisted of one 10ft. x 10ft. downstairs room with a bedroom and attic above. In his autobiography *Knotted String* Brearley observed that most of the parents were originally country bred; they had uprooted to seek better wages in Sheffield hence their children *were first generation kids, with the cuteness of the town allied to a rural constitution.*

Harry Brearley

Brearley grew up in the shadow of his brother Arthur and developed an early aversion to school and what he later called the *bludgeoning of teachers*. He was acutely observant as a child and his early memories of his mother's constant struggle to care for her family were etched forever in his memory. She never wavered from her faith in the essential goodness of the employer, who she believed made financial sacrifices to pay his workers. Brearley, however, came to view him through a different prism as a *stage-figure…wearing the halo of divinity*, and later typified him as *a fraud, a cheap and nasty delusion, which will leave a sickening picture in my mind as long as I live*.

Reflecting on his childhood in later life, Brearley recalled his fascination with things being made and an innate curiosity and imagination, which made him a 'looker' and a 'toucher'. He was strongly opposed to compulsory schooling, which he typified as requiring children to be quiet and sit on hard seats listening to lessons they disliked and misunderstood. Although he derived no pleasure from his participation in the Victorian education system, the time he spent on his journeys to and from school transported him into another world and provided fascinating insights into the various trades, which then proliferated in Sheffield. When a number of such enterprises were operating within the same building they were often called 'wheels' since a single wheel distributed power from a steam engine via a shaft and pulleys to a variety of tenants, including grinders, buffers, hand-forgers and file-cutters. Each workplace had its own characteristics and operated independent of its neighbours much like tenants in a block of flats. Young Harry soon realised that, whilst the ground-floor units could readily be viewed by any passers-by, access to those on the floors above was best gained by establishing a relationship with the occupier, usually by offering to run errands.

Around the time Harry left school, aged eleven and in his own words 'unharmed, unexhausted, undisciplined but growing stronger', his family moved into Carlisle Street at a time when the puddling of iron was still part of the process for manufacturing armour plate. The air was thick with smoke and dust and he recalls his parents as being overweight and prematurely aged by hard work and respiratory problems. Prior to the establishment of a steelworks, a carting contractor had stabled his horses there and each house had a pig-sty. The tradition of pig rearing lingered on at some addresses in Brearley's youth and he not only earned coppers by helping local dealers but acquired a grasp of the basics of trading. All this paled into insignificance, however, when compared with the opportunity to enter the large works under the watchful eye of the gate-keeper. This was best achieved by boys delivering their father's dinner and crucially, once their faces had become familiar, access could be gained by carrying anything wrapped in a cloth or paper and a breakfast can although an element of stage craft was desirable to demonstrate that the latter contained a hot drink. Fortunately the gatekeeper was preoccupied with arrivals rather than departures and when Harry

became a regular deliverer of dinners and suppers he would sit on a coal heap watching the various processes safe in the knowledge that the time he spent watching his father and his mates would go unremarked. Later in his career when studying written accounts of iron-making he already knew what was involved in kneading clay with hands and feet and needed no literary hyperbole to envision the changes of furnace colour, from intense white to glowing red, which were a feature of steel produced in a crucible.

His first experiences as a wage-earner were brief. As a shop assistant he detested the work and was bored after three days, his employment in a stove factory contravened factory regulations and was terminated whilst he lasted only six weeks in the household of a GP. On his own admission, his lack of manners and social awareness made him a hopeless candidate for the post but then his father took him to work as a cellar lad in a crucible steel-melting furnace. Despite spending months rather than years at that lowly level, his immersion in the ways and experiences of the men in the furnace team, acquired unofficially as a 'dinner taker' and in the company of his three brothers, all in the same trade, endowed him with a breadth of awareness of the process of metal melting. As he wryly observed much later in life, when it came to writing books it was not easy to distinguish between first-hand experience and second-hand knowledge.

Brearley was unshakeable in his belief that, of all the favours bestowed on him by fate, none could compare with his meeting with a bearded old man, who appeared one day in search of a bottle- washer in the chemical laboratory. He was selected, he claimed, because of his clean face, and his subsequent association with James Taylor, the Chief Chemist of Thomas Firth & Sons, was to set him on a course of academic study which was to change the course of his life. Taylor, himself the son of Lancashire weavers, must have empathised with the twelve year old Brearley's situation. Through night school, Taylor had gained qualifications and eventually a Whitworth Scholarship. He worked at the Royal School of Mines, as a private assistant to Sir Henry Roscoe at Owens College in Manchester and he had visited Heidelberg where he worked under Robert Wilhelm Bunsen (1811 - 99), the chemist and physicist, who had become professor of Chemistry there in 1852. Bunsen shared with Kirchhoff the credit for the discovery of spectrum analysis, which led to the discovery of new elements. The partial loss of the sight in one eye caused him to ban the study of organic chemistry in his laboratories but he invented the Bunsen burner, the grease-spot photometer, a galvanic battery, and an ice calorimeter. Before arriving in Sheffield, Taylor had gained further experience working in Bolivia and Serbia, where he was engaged in the Bessemer process in the copper industry.

On his own admission, in his understanding of laboratories and their role in industry, Brearley started at rock bottom; even the name was unfamiliar and he was bored by the routines of his new environment. It was his mother, who persuaded him to stay the course, no doubt realising that it was light work with moderate hours and knowing that her son had insufficient stamina to survive on the melting furnace floor. Taylor, or JT as Brearley referred to him, introduced him to mathematics by insisting that he spend ninepence of his own money on a book of arithmetical exercises. He eventually worked his way to the end, guided by JT, and he was then instructed to start on Todhunter's Algebra, which cost 7/6 but this time it was a present. Over the course of a year Brearley was inculcated in the basics of arithmetic and algebra and, against his mother's wishes, he attended night school on several evenings per week.

JT moved to Australia in 1892 and, though initially depressed at the thought of being cast adrift on his own resources, Brearley came to realise that his mentor had taken him as far as he could. His key lessons, that hard work could be pleasurable and the difficult jobs were the ones he wished to avoid, stayed with him for life. At the age of twenty he scraped together £50 and paid the customary premium to become a laboratory assistant. He borrowed money from a friend and repayment by instalments was complicated by the death of his mother, the break-up of his home and an enforced stay in lodgings. At the age of twenty four he decided to abandon studying, married Helen Crank and set up home by the edge of the Derbyshire moors in a cottage for which he paid an inclusive rent of 3/6 per week.

Brearley's interest in the analysis of steelworks materials led him to become adept at drafting technical papers and a realisation that many of the historic practices were not only unjustifiably complex but in some cases were impediments to achieving accurate results. In 1898 he was offered a post with an Australian Assay Laboratory, which dealt with gold, silver and white metals. The one stipulation was that he was required to study analytical and assay methods at Sheffield University before his departure. He found the pace of work in the university laboratory both slow and encumbered with what he called *wearisome fancy work, which I ventured to cut out*. Unable to find anyone able or willing to reveal how white metals could be analysed, he began his own study of industrial alloys, which attracted the attention of type-founders, who were pleased to pay for his services.

The Australian job fell through but Brearley, by his thirtieth birthday, was making a name for himself as someone capable of solving analytical problems and adept at simplifying analytical methods. He joined Kayser Ellison & Co. in 1901 as a chemist and, over two and a half years, not only formed a fruitful working relationship with C. W. Kayser but became familiar with the analysis of a range of alloy and tool steel, including the new high-speed steels from the USA. During this period he attended Sheffield University College on Saturday afternoons to enable his revised teaching methods of analysis to be verified by Fred Ibbotson, a lecturer in metallurgical chemistry. Fred would prepare unknown test samples and ask him to determine the amount of the specified element they contained within the time frames he had claimed were sufficient. On Sundays he would meet his brother, who had hated his time at night school, and take him to his laboratory where he trained him in the fundamentals of steel analysis until he was able to identify the usual kinds of steel quickly and accurately. Well aware that his brother would never aspire to become an analyst he was pleased to forfeit some of his valuable leisure time to satisfy his ambition to know more about his trade.

During his time at Kayser Ellison & Co. he wrote technical papers, which supplemented his income and, in conjunction with Fred Ibbotson, he wrote *The Analysis of Steelworks Materials*, over a period of two months and it remained a standard work of reference for many years. Its publication proved to be a turning point in Brearley's career since it marked the end of his career as a laboratory based analyst. In 1904 he was appointed Chemist of Thomas Firth & Sons' Salamander Works in Riga then a part of Russia. Prior to departure he came into conflict with members of the School Board and court proceedings were in the offing since he adamantly refused to allow his seven years old son to be educated in the state system. As a compromise the Board suggested that his son be examined periodically but Brearley refused and it was only his move to Riga that avoided an appearance in court.

The works in Russia were located six miles from Riga in a rural location and his laboratory, though bright and spacious was devoid of gas, water, heating and chemicals. He managed to stock it with chemicals but water was delivered in buckets from an outside pump and spirit lamps took the place of Bunsen burners. He worked in an overcoat, a dressing gown and a long pair of rubber snow-shoes. The only compensation was the rural surroundings and he even played cricket occasionally with the crews of visiting ships. The outbreak of war between Russia and Japan saw his factory directed to concentrate on the production of naval armour piercing shells, which were made from imported Sheffield blooms. With neither suitable equipment nor experienced workers, a so-called specialist was sent from England but his shells failed at firing trials in St. Petersburg and responsibility for perfecting their manufacture fell on the shoulders of Harry Brearley and his brother Arthur, whose expertise with fractures proved invaluable. Their success resulted in Brearley spending his last three years in Riga as Works Manager.

The war with Japan went badly for the Russians. In January 1905, their forces, besieged by Japan in Port Arthur both by land and sea, surrendered to the Japanese, who thereby acquired 546 artillery pieces, 35,000 rifles, 4 battleships, 2 cruisers and 14 gunboats and torpedo boats. The Russian public were shocked at this humiliation and within days 80,000 went on strike in St. Petersburg. On 9th January thousands advanced on the Tsar's Winter Palace and when the Cossacks were unable to repel them with whips, sabres and blank cartridges the order was given to use ball. Hundreds of men, women and children were injured and an estimated two hundred were killed. On the next day there were strikes throughout Russia and seventy were killed in Riga on the 13th January when troops attacked demonstrators. Meanwhile Russian forces were engaged with the Japanese in Manchuria but the country's final humiliation came when their Baltic Fleet, having left its home port in October 1904, engaged with Japanese naval forces in the Tsushima Strait on 27th May 1905. Within less than one hour, of the Russian fleet of thirty-six vessels, twenty-two were sunk, six captured and six were interned.

The impact of these early stirrings of revolution started to disrupt Brearley's production line; numerous strikes, although of short duration, played havoc with the operation of melting furnaces, which could not readily be shut off and restarted. The work force would absent themselves from work for a few days but expect to be paid and did not take kindly to admonition. The situation deteriorated further and, with the police powerless, the Salamander Works had to be guarded by Cossacks, who were billeted on the premises. It was common place for bodies to be found on the roads with bullet wounds, the foreman blacksmith was murdered by hired gunmen and the M.D. and three engineers fled the country. Brearley occupied the managing director's chair for six months and he noted that the local foremen worked better than ever without their previous superiors. After six months the work force returned to their posts although short stoppages remained a frequent occurrence.

In 1907 Brearley returned to Sheffield as head of the newly formed Brown-Firth Research Laboratory, an impressive title that belied its modest accommodation, which initially consisted of a hut mounted above the crane tracks in Firth's melting shop. In fact this proved to be an early manifestation of a collaboration between Thomas Firth & Sons and John Brown & Co., which would later blossom into a merger. Implicit in the offer of the new post was a recognition of Brearley's standing in the field of research but he knew that he could earn a comfortable living independently, not least as a consultant and he secured a written agreement that he would have joint and equal ownership of rights to any discoveries, inventions or patents arising from his work. In his autobiography, Brearley wrote *From 1907 to 1914 there was no man living better pleased with his job* but events with their origin in May 1912 were to cast a cloud over his professional career.

Whilst studying the erosion and fouling of rifle barrels at the invitation of a small arms company Brearley discovered, through microscopic observation, that low carbon/high chromium steels had non-corrosive properties, which might have a variety of applications, including the manufacture of cutlery. His superiors failed to recognise the potential of the discovery and, in retrospect, Brearley summed up their lack of vision in fine prose, stating *After claiming, in 1907, a monopoly exploitation of the children of my dreams they despised the first of them because he came in shining raiment*. He continued to make the case for the steel's use for cutlery but his employers were unimpressed by its commercial prospects. In July 1914 Ernest Stuart, representing the cutlers R. F. Mosley, cooperated with Brearley in gradually resolving problems relating to the mechanical properties of the steel. A quantity of similar Firth steel was then bought by the Amalgams Co., which Brearley had set up years earlier, and the Mosley factory produced the first stainless steel cutlery, adopting the trade mark *'Rusnorstain'*. Despite this success Firth's refused to market stainless products and so angered Brearley by excluding him from the company's commercial deliberations that he resigned. Early in 1915 he joined Brown Bayley's Steel Works as Works Manager and was advised by John Maddocks to apply for Canadian and American patents. The former was granted in August 1915 and the latter, following support and testimony from Sir Robert Hadfield, in September 1916. His intervention was influential in persuading Firth's to pay Brearley £10,000 for a half-share in the patent rights and the Firth-Brearley Stainless Steel Syndicate Ltd. was created to maximise exploitation of the new product. Ellsworth Haynes, formerly a competitor for the American patent, became associated with the Syndicate and stainless steel was then produced in the USA by the American Stainless Steel Co., whose shares were held the Syndicate, Haynes and an assortment of other American firms.

Brearley's animosity towards certain Firth nominees on the Syndicate's Board was apparent in its minutes and even in February 1924 he was prepared to relate the details of the dispute in the *Sheffield Daily Independent*. His time with Brown Bayley's, however, was altogether more productive since he was joined there by Harry Moneypenny, who also worked on the development of stainless steel, allowing Brearley to investigate other steel products such as axles and springs. His brother Arthur served the company for 34 years and contributed to the development of high quality alloy steels. Harry Brearley retired from Brown Bayley's in 1925 but retained a seat on the Board. He toured Australia and South Africa in 1929-30 and visited Russia in 1935. A few months prior to the outbreak of WW2 he received the Freedom of the City of Sheffield alongside Sir Robert Hadfield FRS. He died in 1948 at the same age as his brother Arthur, who predeceased him in 1946.

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Steel-Makers and Knotted String by Harry Brearley. Edited by P R Beeley and P J Beeley; published by The Institute of Materials 1995.

I.A. News and Notes

EM Industrial Archaeology Conference "Trent Station" at Long Eaton – Sat 19th May 2012

Please note that as well as Barry Bingham's walk across Glasshouse Common on Saturday 19th May, you have the alternate choice of attendance at the next EMIAC conference which will be at Long Eaton. It's hosted by the Railway & Canal Historical Society, and is titled **"Trent 150: Trent Station 1892-1968"**. There will be talks and site visits covering the railways and waterways around Trent Lock and the Trent Triangle. Details at http://www.northants-iag.org.uk/emiac.html or from Paul Hudson, 64 Millers Way, Milford, Belper DE56 0RZ.

Festival of Archaeology

Each year the Council for British Archaeology coordinates a Festival to showcase the very best of British archaeology, by presenting hundreds of special events organised and held by museums, local societies, national and countryside parks, universities, and heritage organisations across the UK. This year it will run during the last two weeks of July.

The Arkwright Society are running a number of events at Cromford, and have honoured NEDIAS by inviting us to give a lecture on the excavation which we've carried out at the site of the Wingerworth stone saw mill. Les Mather and David Palmer will give the talk, "The rise and demise of an early 19th century stone mill". You can attend this lecture – and we'd certainly like a good showing from NEDIAS, but booking is required on 01629 825995. 7pm, Thursday 26 July at Cromford Mill.

You can see details of the other Festival of Archaeology talks at Cromford in "What's On" on page 3.

New NEDIAS Web Site – www.nedias.co.uk

There are a host of items available for you to download from our new website, including membership renewal forms for those who haven't yet renewed for 2012. In particular, do look at the "Members Only" page, where members will be able to read and download all our previous Newsletters. You will also have access to an up-to-the-minute Index which will enable you to locate all sorts of previous articles in our Newsletters and Journals. Password to enter the members-only pages is chesterfield

And Finally .... Brampton pottery tantalisingly revealed!

Dave Siddon gave us a superb account of the history of the Brampton potteries last autumn at the meeting in Chesterfield Library Theatre on the occasion of our joint meeting with the Civic Society. He recently contacted me to say that whilst walking along Barker Lane, there was clearance of garages on a site almost opposite the GK Service centre, and that it was revealing tantalising glimpses of hundreds of pottery sherds on the surface.

The developer had planning permission approved in mid-2011 for a small housing development on the site – I've been in touch with them and they have agreed that NEDIAS may have a watching brief, to view the operation as initial footings are dug and to see and photograph what pots or features emerge. It's likely to be sometime end-May/ early-June – please let Cliff know if you'd like to help for the odd hour or day.

The site is not directly on one of the pottery sites, but is close to the location of Barker Pottery, and across the road from Welshpool Pottery. Beehive is a little further away.

NEDIAS Committee:

Chairman and publications – Cliff Lea; **Vice-Chairman** – Derek Grindell; **Secretary** – Patricia Pick; **Treasurer** – Pamela Alton; **Membership Secretary** – Jean Heathcote; **Lecture Meetings and Visits Co-ordinator** – Brian Dick; **Committee Members** – Diana Wilmot, David Hart, Les Mather, David Palmer, Doug Spencer.

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