NEWSLETTER 94 LATE SPRING 2015

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EDITORIAL

We have reached the end of another lecture series and the last to be held at Claremont, the home of YAS since 1968. I'm sure many of us will be sad to leave the familiar surroundings of the building in spite of its lack of heat in the winter months. We look forward now to lectures in 2015-16 in the nearby Swarthmore Education Centre starting on 24 October where I am sure we will be comfortably accommodated. Dates and details of the programme are given later in the Newsletter and thanks to Jane Ellis for organising another interesting programme The Society survived its move many years ago from Park Place to Claremont and I am confident it will do so again.

At the AGM held on 18 April, the previous officers were re-elected unopposed and their contact details are given at the end of the Newsletter. I presented the Annual Report for the Section and it was noted that due to a lack of information from the previous YAS Treasurer concerning paid up YAS + Industrial History Section members which has now been resolved, it appeared that we had less of these members than we had realised. Due to great efforts by the new Finance team, there is now greater clarity but less members and therefore less income. However it was good to note that section expenses had decreased as a result of less expenditure for the lecture programme and savings on postage by using the franking machine at Claremont. A copy of the Annual Report is included with this Newsletter.

The AGM received a verbal report from Robert Vickers on progress with the Yorkshire Industrial History Online (YIHO) database. He reminded members that YIHO was launched to members in November 2014 and since then excellent progress has been made with around 1,000 records now available. A final year history student, Daniel Balmforth has been recruited on work placement from Huddersfield University to input data from Jane Hatcher's record cards deposited with the IHS and is making good progress. Both the Cleveland IA Society and South Yorkshire Industrial History Society have agreed to participate in the project and several local museums have expressed interest. The software continues to be developed by John Suter in the light of feedback from users and he was thanked for his work on the database. There are monthly YIHO project meetings at Claremont at which members are welcome. If you would like to know more about YIHO and how you could contribute the results of your own research to building a significant database of Yorkshire's industrial heritage please contact Robert Vickers at **industrialhistoryvicechair@yas.org.uk**.

I had hoped to arrange a visit to the newly restored Newcomen type engine at the Elsecar Heritage Centre, together with a walk along the Elsecar Branch of the Dearne & Dove Canal this summer; unfortunately I ran out of time due to other pressures. Fortunately my colleague Derek Bayliss, Programme Secretary of the

South Yorkshire Industrial History Society had the same idea and Section members are invited to join SYIHS members for a visit taking place on Wednesday 3 June. Full details are given on page 4 of this Newsletter. As this visit has been arranged only recently it is possible that the booking date of 27 May might have passed by the time this Newsletter has been dispatched. Members on our email contact list have already received details of the visit and how to book. Derek has also provided an item about his attendance at the re-opening ceremony of the Newcomen engine on 21 November 2014.

As reported at the AGM in spite of the increase in subscription in January 2015, once those members who have not actually been members for the past 2/3 years have been removed, actual membership has remained static. It's important for the continuing lifeblood of the section that we all do something about encouraging new members. Along with many things following the changes to the Society, our current membership leaflet is now out of date, but this shouldn't stop members spreading the word about the Section. Unfortunately there have been no new members since the last Newsletter.

The next issue of the Newsletter will be produced in early September and I look forward to receiving your news and other items for it by the end of August. I hope you all have a good summer.

Margaret Tylee

NEWS FROM CLAREMONT

I can report that Claremont has been sold subject to contract, following a number of viewings from potential purchasers. We understand that the purchaser intends to develop the building into a number of "high end" residential units. Planning permission will be needed for this to go ahead and since the building is listed, this could take some time. Local residents as well as other organisations will have to be consulted when the plans are produced and it is difficult to predict how long this process will take, possibly even into 2016. The offer is conditional on the potential purchaser getting planning permission; until that happens and contracts are exchanged, Claremont will continue to be occupied and be the registered address for the YAS. Hopefully by the time the next Newsletter is produced there will be positive news to report.

Those of you who have been to Claremont recently will have noticed that work is progressing well in preparing the move of the Library, currently due to happen in September. As a result of cross checking the books against the University catalogues, it has been found that there are many books already held by the University and therefore will be immediately available for YAS members without having to wait for our stock to be catalogued once the move happens. Plans are being prepared for the disposal of these duplicate volumes which will involve offers to other institutions, selling through dealers and book sales to members.

For those of you who are YAS members, please note that the YAS AGM will be on Saturday 25 July, 11.00 am, at the Swarthmore Education Centre, 2-7 Woodhouse Square, Leeds, LS3 1AD.

OTHER NEWS ITEMS

On 1 April **English Heritage** separated into two organisations. English Heritage is now an independent charity responsible for the sites and monuments in its care, so more akin to the National Trust in its activities. It has received £52m to help deal with a backlog of conservation work and has promised to improve the presentation and interpretation of the sites and monuments. Statutory responsibilities, including decisions on listing and scheduling, now lie with a body called Historic England which will rely on grant-in-aid from central government, confirmed for 2015-16 at £85.2m.

Members may recall a lecture given in November 2012 about the **Yorkshire Waterways Museum** and the social history of life working the Tom Pudding compartment boats. The Museum and the Sobriety Project based at the Museum have recently been under threat of closure due to lack of funds, but the good news is that recent donations by businesses and members of the public have saved the Project and Museum for the time being. The Sobriety Project is an educational charity and a community asset which has helped transform the lives of many people and plays an important role in the local area. Further donations are welcome to ensure the continuation of the Museum and Project. Admission to the Museum is free and boats trips around Goole Docks are available costing £5 for adults with reductions for children and groups. More details are available on the Museum website **www.waterwaysmuseum.org.uk** or T 01405 768730.

Network Rail is undertaking a programme to electrify the North Trans Pennine Line from Selby and York to Manchester between 2014 and 2016, which will affect several structures along the route. In advance of the work, English Heritage (as it was) has been undertaking a survey of the structures; the first phase has assessed all structures on the line between Selby, Colton Junction and Leeds and has identified 21 structures which required a full assessment for listing; the second phase will assess structures west of Leeds. As a result the decision has been made to grant a grade II listing to the **Selby Railway Swing Bridge**. The wrought iron swing bridge and associated hydraulic tower and engine house was built 1888-1891 for the North Eastern Railway and is important for both historical and architectural interest. You can find the full description of the assessment on the Historic England website **www.historicengland.org.uk** list entry no. 1419063.

Still with Historic England, it is reported on their website that one of their current research projects is a first ever survey of **Railway Good Sheds and Warehouses.** Goods traffic has been more important for the railways than passengers in the past but the buildings associated with it have tended to be neglected. Goods sheds and warehouses played a key role in the nation's economy in the 19th and early 20th centuries in the storing of goods to be transported and the survey will identify and classify existing structures. The aim will be to establish a database and publish a book with a gazetteer. The database currently has over 510 entries. John Minnis, who has previously

worked on surveys of signal boxes amongst other things, is the senior investigator. Full details can be found on the Historic England website along with other current research projects at **www.historicengland.org.uk/images-books/periodicals/historic-england-research**.

FORTHCOMING EVENTS

3 June	**Elsecar and Hemingfield.** A South Yorkshire Industrial History Society visit to the Elsecar Heritage site and a tour of the Newcomen Engine, followed by a canal walk to Hemingfield Colliery. Meet at 10am with own arrangements for lunch. Full details are given on page 4.
7 June	**Hebden Connections**. A Calderdale Heritage walk looking at the historic transport links of Hebden Bridge – its road, canal and railway and how transport and industry worked together and changed the town. Meet David Cant by the Tourist information Centre on New Road, Hebden Bridge at 2.15pm. Cost £3 per person, no need to book just turn up.
1 July	**Canal Bank and Medge Hall Peatworks Branch**. Railway Ramblers 6 mile evening walk. Meet at Crowle Station at 17.48pm on arrival of 17.23 train from Doncaster, returning to Doncaster at 21.01. Led by Gas Hill, booking required 7 days in advance T 0114 2752303.
5 July	**Wainstalls Mills.** A Calderdale Heritage walk exploring the group of textile mills around and above the village of Wainstalls. The mills cover phases of development from early water powered to the mid 20th century. Meet Iain Cameron by the bus terminus in the centre of Wainstalls at 2.15pm. Stout shoes needed. Cost £3 per person, no need to book just turn up.
9 July	**Headingley Stations, Parks and Gardens**. Railway Ramblers 3.5 mile circular walk. Meet at Arndale Centre bus stop in Headingley, junction of Otley Road and Dennistead Crescent at 16.54. Walk to Burley Park and Headingley Station, returning via Beckett Park to the start point by 20.00. Led by Peter Martin T 07717 285505.
11 July	**The Meltham Branch Line.** Railway Ramblers 4.5 mile linear walk. Meet at Huddersfield Station at 10am to take 324 bus to start point (GR SE 137163). The walk will follow the 1869 line steeply uphill taking in 3 tunnels, 23 bridges and various civil engineering features. The line closed in 1965. Bus return from Meltham to Huddersfield. Led by Richard Meddows-Taylor. Boots required and bring packed lunch. Details from Jane Ellis T 0113 265970 or 07787311913.
22 August	**Thornton Moor & Oxenhope Moor Catchwater**. Railway Ramblers 8 miles linear walk. Meet at Bradford Interchange bus station to catch 697 to Denholme Gate. The walk will follow the course of the 2ft/3ft gauge rail tracks laid for the construction of the reservoir feeder channels. Walk continues to Oxenhope or Haworth for bus and train return. Led by Mike Warrington T 01977614954 or mobile on the day 07785962243. Bring packed lunch.
6 September	**Model Engineers' Open Day at Wortley Top Forge**. 11am – 5pm. Working waterwheels, miniature railway and steam engines. Small admission charge. Wortley Top Forge, Forge Lane, Wortley S35 3DN. Details Gordon Parkinson T 0114 2817991 or Ted Young T 01226 763896.
10-13 September	**Heritage Open Days Weekend.** Various events taking place taking place over the weekend. Check the HOD website nearer the time from mid-July onwards for details of what's on locally and further afield. **www.heritageopendays.org.uk**
13 September	**Clifton's Railway**. A Calderdale Heritage Walk to examine the social and industrial history of the steam driven rope railway serving the former local coal industry, The walk will cover some of the old narrow gauge track and find other remains. Meet John Brooke at 2.15pm in the Armytage Arms car park on the A643 half a mile north east of Brighouse centre. Stout shoes needed and no dogs permitted. Cost £3 per person, no need to book just turn up.

19 September **Thwaite Mills industrial Museum**. Railway Ramblers 3 mile linear walk. IHS members welcome. Details given on page 4.

Association for Industrial Archaeology Conference Sussex 4-9 September 2015

This year's annual AIA Conference will be held at the University of Sussex, Brighton, 4-9 September, and is organised by the Sussex Industrial Archaeology Society. The conference will follow the usual format with a day seminar preceding the conference on 3 September entitled "Valuing and Sustaining Britain's Industrial Heritage". The Rolt lecture on the Sunday morning will be given by John Minnis, author of recent books on motoring heritage and railways. From the Sunday afternoon to Wednesday afternoon there will a series of coach trips and evening talks. An outline of the visits is as follows:

- Sunday 6 September (1/2 day) - Trip around Brighton on an open top bus or a visit to the Jack & Jill windmills, Clayton Tunnel, Stanmer Park.
- Monday 7 September - Ricardo, Shoreham, Shoreham Airport, Goodwood Motor Circuit and Chichester Canal or Coultershaw Heritage Site and Pitsham Brickworks.
- Tuesday 8 September - Gatwick's Beehive Airport Terminal and Bluebell Railway or Brede Water Pumping station, Bexhill Museum and the De La Warr Pavilion and then the Fisherman's Museum in Hastings.
- Wednesday 9 September - Volks Electric Railway and Amberley Museum and Heritage Centre.

Prices for the Conference are modular based e.g. residential cost for the main conference (Friday 5pm – Sunday 2pm) £235 + £23 for one of the Sunday trips + £66 for Sunday dinner and B&B. The cost of each trip varies between £15 - £54.

Places are allocated on a first come first served basis, so early booking is advised. Booking forms can be downloaded from the AIA website **www.industrial-archaeology,org.uk** where more details about the conference can be found or contact Stephen Miles T 01823 412713 email: **thunderer@live.co.uk**.

The 2016 AIA Conference will be held in Telford.

FORTHCOMING INDUSTRIAL HISTORY SECTION EVENTS

Visit to Elsecar and Hemingfield 3 June 2015

Members are invited to join the South Yorkshire Industrial History Society visit to Elsecar and Hemingfield on Wednesday 3rd June**.** Meet 10.00 at main entrance to the Elsecar Heritage Centre, Wath Road, Barnsley, S74 8HJ for guided tour of the Centre and the surrounding area, including a demonstration of the 1795 Newcomen atmospheric engine in motion with its new hydraulic drive. A of £3 charge for the tour is payable on the day; free car parking opposite Elsecar Park. Make own arrangements for lunch – there is a cafe in the Heritage Centre. After lunch, walk along canal towpath (may be muddy) to Hemingfield Colliery, where

there are two 1840s engine houses and a canal basin, to see progress of conservation work by volunteers, and walk back – about a mile each way. Book with Derek Bayliss T 0114 2397693 or email **v.bayliss@btinternet**.com by Wednesday 27th May.

Excursion Weekend 19/20 September 2015

On Saturday 19 September, members are invited to join a Railway Ramblers 3 mile walk to Thwaite Mills Industrial Museum along the Aire and Calder Navigation led by Jane Ellis. Meet at 9.45am by W.H.Smith near to the ticket barriers, in Leeds Railway Station where orders will be taken for the pub lunch before setting off at 10am. The walk will be at a leisurely pace looking at features on the way, arriving at the Crooked Clock pub at 12 for lunch. After lunch a 15 minute walk will reach Thwaite Mills - there will be a guided tour of the working machinery. Current group rate admission is £2.90; after the visit there are frequent buses back to the centre of Leeds.

On the following day Sunday 20 September, Bill Jagger will be leading a walk to look at railways on the west side of Leeds. Members are invited to meet for Sunday "brunch" at Wetherspoons in the North Concourse of Leeds Railway station at 11am, with the walk starting at noon. It will be approx. two and a half miles looking at the past and present railway infrastructure to the west of Leeds and will include some non- railway industrial sites along the route. Depending on the weather and numbers attending, it should take about 3 hours, finishing back at the station. No need to book for either event, just turn up.

2015-16 Lecture Programme

Lectures will be held at the Swarthmore Education Centre starting at 11am. The Swarthmore does have a small café, though at the time of writing it is not certain whether it will be open on the lecture dates. This will be clarified by the time full details of the Lecture Programme are published later in the year. The dates and brief details are given below to note in your diary now.

2015

24 October	The Lime burning Industry in the Central Pennines – David Johnson
14 November	History and Investigation of the Wortley Tin Mill – Barry Tylee
12 December	Bringing the Calderdale Industrial Museum Back to Life – Tim Kirker

2016

23 January	York- its Transport and Industry – John Meredith
20 February	Co-operation Failures in the Yorkshire Water Industry and Hull's Planned Reservoir at Farndale in the 1930s – Bernie Eccleston
19 March	The restoration of historic canal and railway related properties in Goole – Julie Duckworth

REPORTS OF LECTURES, EVENTS ETC

Reports from the 2014-15 Lecture Programme

Hartwith's Industrial Heritage – Ann & Jim Stark
25 October 2014

Ann and Jim Stark are members of the Hartwith Heritage Group, which since 2008 has researched the industrial history of Hartwith. Hartwith includes Brimham Rocks, Low Laithe, Summerbridge and the river Nidd. Today it is hard to believe that there was industry here; their talk certainly showed otherwise.

They outlined the range of industries that have flourished in Nidderdale. First were corn milling and the related production of mill stones. Quarries near Brimham produced a fine gained grit stone for querns and mill stones. From here stones were sent widely across Yorkshire for milling corn and malt and grinding oak bark for tanning. Water-powered mills are known to have existed at Hartwith, Dacre Banks, Braisty Woods and elsewhere. Many corn mills later became joint corn and flax spinning mills, a common combination in Nidderdale; some became saw mills.

Nidderdale's textile industry began in the 1770s with hand spinning and weaving of flax and linen. The Kirby family established a flax mill at Smelthouses c1798. Nearby they built Little Mill, c1810, their second flax mill. New Mill, later Knox Mill, was another Kirby enterprise. The Kirby family also built Low Laithe Manufactory c1820, renamed High Mill when owned by the Thorpes. The last Kirby mill was Low Laithe Mill opened c1850 for bobbin making. The Thorpe family also opened textile mills, starting in 1814 with Braisty Woods mill, later renamed New York Mill, producing linen, including bleaching and dyeing. Flax spinning in Nidderdale ended c1840 when the market collapsed. Flax mills, like Smelthouses and Low Laithe, switched to rope and twine making, the latter becoming Nidd Valley Twine Works. Under the Gill family New York Mill was modernised in the 1930s and got Government contracts for parachute cord in World War 2. Closed in the 1980s, the mill buildings are now light industrial units.

By the 16th century iron making had been established in Nidderdale. Near Brimham remains of slag have been found and an iron working site has been identified near Warsill. Nearby, Thomas Procter established a blast furnace in 1580, producing iron that was beaten into bars at the "Great Hammer" at Summerbridge. The source of the iron ore is not known, though some was worked in Nidderdale. In 1861 Joseph Todd and Thomas Gill established a foundry at Summerbridge making metal work for water wheels and mill stream sluice gates. The foundry is still working.

In the 1930s a quarry near Smelthouses opened to work silica for glass production in the Midlands. In World War 2 it replaced silica that could not be imported from Belgium. The quarry operated on a large scale until 1957. At Low Laithe was a ganister quarry producing sand for the steel works on Teesside. The silica and sand was transported by rail from Dacre Station.

Improved transport links were important for the development of trade in the 19th century. The first main road up Nidderdale ran from Burnt Yates over Brimham to Pateley Bridge. The current main road, through Summerbridge,

dating from 1825, was funded by local mill owners. The railway came in 1862 with the opening of the North Eastern Railway's Nidd Valley Branch.

The project, supported by the Heritage Lottery Fund, is ongoing. It has shown the value of local historical research and sources, both oral and original documents, where there is no visible evidence of industry. Physical remains have survived; some mills have been converted to houses, water courses and mill weirs remain in the Nidd. Ann Stark has written a booklet *Echoes of Hartwith's industrial past*, published by the Hartwith Heritage Group in 2012 and information about the Group's work may be found at www.hartwith.org.uk

Robert Vickers

The Malham Mines - Mike Gill and Mike Squirrell
15 November 2014

The authors' research into the mining activities in the area around Malham has been published in a recent volume of ***British Mining*** and both are members of the Northern Mine Research Society who produce this series. A number of sources were used as a basis for their study, including the bulk of Lord Ribblesdale's papers bought by Harry Bradfer-Lawrence in 1946 and subsequently deposited with the YAS. The research also carried forward the information contained within Arthur Raistrick's book ***Mines and Miners on Malham Moor*** published in 1983.

Historically Malham was divided on either side of the Malham Beck into East and West Malham and in the first part of the talk the presenters described the various families who owned the land. There is a record of John Lambert owning a smelt mill at Janet's Foss which was leased to Lord Lowther in 1697. There were also historical records showing that copper workers lived in a cave nearby. Water from Janet's Foss drove bellows for the hearth of the smelt mill. Thomas Lister who became Baron Ribblesdale in 1797 owned the estate of West Malham and when the estate was offered for sale in 1831, the sale catalogue included reference to a calamine works and mines of coal, lead and calamine.

The next section of the talk focussed on the geology and mineralisation of the area and the development of the mines. The area lies predominately on the Lower Carboniferous overlain with thinner limestones. Mineralisation is mainly barytes, lead, zinc and copper ores – calamine is zinc carbonate. On Malham Moor the first recorded mining was at the Dew Bottoms mine leased to John Lambert in the 1670s and it is also the first recorded mine in Yorkshire where underground blasting took place. Plans in the Bradfer-Lawrence collection show several shafts for copper and calamine working in the late 18th and early 19th century. Calamine was mined from a natural cavern at Pikedaw, the presenters showing various plans and aerial photographs of the area. Thomas Lister had plans to develop a local paint industry using calamine and ochre which was later used in the textile industry; however the main use of calamine was in the manufacture of brass. It was transported as calcined calamine having been roasted for easier transport. One of the roasting hearths was near a structure called the Calamine House, shown on an 1806 plan, although this was more likely to have been used for a workman's shelter and storeroom rather than for

roasting. Most of the supplies were sent to the Cheadle Brass Wire Company via the Leeds & Liverpool Canal. It could also be shipped via the Humber, Trent and Staffordshire canals. The main period of working was between the 1790s and 1815; however the tonnages were fairly small.

Coal was also mined on Malham Moor and several fenced shafts can still be found on Fountains Fell where the remains of a coke oven can also be found, possibly dating from the 1830s. The seams were of poor quality and mostly used for lime burning. There were small amounts of lead mined with a smelt mill at Malham near the Tarn. There is a prominent chimney which has been restored but no evidence of other structures in estate maps. The mining in the Malham area was on a small scale compared with farming, calamine was the largest product. The figures from accounts show over a two thousand tons was mined up to 1807 and the same amount during the period 1808 – 1833 with a small amount during the 1840s when the industry declined.

After the lecture there was an opportunity to examine fascinating items from the Bradfer-Lawrence collection relating to the mining, including account books and plans, which had been retrieved from the YAS archives. It was an interesting and extensive talk about a little known mining area given by very knowledgeable presenters. More details can be found in the authors' book **The Malham Mines**, *British Mining vol. 97* published by the Northern Mine Research Society in 2014 and reviewed in Newsletter 91.

Margaret Tylee

The life and work of Sir Barnes Wallis – Chris Henderson
20 December 2014

Barnes Wallis is most famous for the bouncing bomb. Chris Henderson aimed to show that this was only one aspect of Wallis's long working life during which he worked on a wide range of projects. Barnes Wallis was born in 1887 at Ripley, Derbyshire, later moving to London. On leaving school he decided on a career in engineering and joined the Thames Engineering Company as an apprentice. By 1913 Wallis had joined Vickers Ltd, remaining until retirement.

At the end of 1913, with the impending outbreak of war, the British Government ordered HM Airship no.9 from Vickers. Wallis was involved in the design of this airship, his first involvement with aircraft. After the war, airships were seen to have a commercial future, and the Government ordered R80 airship which with a revolutionary streamlined design by Barnes Wallis. The Government then commissioned two larger airships for flights across the British Empire. The R100, designed by Barnes Wallis, was built by Vickers at Howden, Yorkshire. To achieve a light structure Wallis reduced the number of components and built the aluminium frame from 15 16-sided transverse sections – another significant innovation. Accommodation for 100 passengers and 42 crew included cabins and a dining room with an electric cooking galley. R100's first flight took place in December 1929 and in July/August 1930 it flew to Canada and back. The R101, built by the Royal Airship Works at Cardington, Bedfordshire, was to be ready to fly to India during the 1930 Imperial Conference. Following completion in 1929, it needed considerable modifications to improve performance. Despite

insufficient testing, R101 took off for India on 4 October 1930. In bad weather the airship crashed over Beauvais early on 5 October, killing 48 of the 54 people on board. British airship flights and development ended immediately.

Vickers now concentrated on aeroplanes and Barnes Wallis developed the design of strong, lightweight air frames. His geodetic structure, first used in the Vickers Wellesley in 1933, was revolutionary. This was followed by the highly successful Wellington bomber, of which over 11,000 built, and the Vickers Warwick. With the outbreak of war in 1939 Wallis began to consider how engineering could end the war. German industry and arms production in the Ruhr could be destroyed by breaching the Möhne and Eder Dams. Use of conventional 10 ton bombs would require aircraft which could fly at 40,000 feet; none was available. Hence Wallis conceived the bouncing bomb which could be dropped from a lower height. These bombs were successful and the dams were breached, resulting in considerable destruction. Next, Wallis designed the Highball, a smaller version of the bouncing bomb to destroy battleships. However, it was not used in action. The Tallboy bomb followed. This had offset rear fins that made it spin and achieve supersonic speeds. Tallboys destroyed railways in northern France, hampering movement of German tanks north. Finally came the Grand Slam 10 ton bomb which, carried by Lancasters at 20,000 feet, destroyed the Bielefeld Viaduct and other rail bridges, V2 sites and U-boat pens in early 1945.

After World War 2, attention turned to achieving supersonic flight. Wallis began project Wild Goose, developing swept wing aircraft and variable geometry wings. Devastated by the loss of air crew in the Dam raids, Wallis flight tested unmanned models rather than using test pilots - pilots had been killed by loss of control or errors at supersonic speeds. By 1953 came Swallow, a swing-wing aircraft designed for long distance flight. Several successful aircraft using variable geometry subsequently appeared. At the same time Wallis developed the design for the radio telescope at Parkes Observatory, Australia, having already contributed to the design of the Jodrell Bank telescope. He also designed lighter callipers for polio victims, pioneered work on the de-icing of trawlers to prevent them capsizing, improved design of cooling towers for power stations, and cargo-carrying submarines. Barnes Wallis was knighted in 1968, retired in 1971 aged 83(!) and died in 1979.

The questions and discussion that followed the talk demonstrated that Chris had indeed shown us the considerable extent of Barnes Wallis's engineering genius.

Robert Vickers

Give us our daily bread – Rob Shorland-Ball
24 January 2015

Rob Shorland-Ball's interest in flour milling, particularly roller milling, was promoted by his appointment as the first manager of Worsbrough Mill near Barnsley in the latter part of the 1970s. Bread was a significant foodstuff and demand for it increased greatly during the 19th century. From the1820s to 1900 UK grain milling developed and the introduction of roller milling later in the century was a revolution that has not been much written about. Using the Mills

Archive Trust in Reading Rob is researching mills and the roller milling revolution.

Rob began by defining "mill". Mills may process cotton, wool, putty, flour. OS maps often identify a building as a "mill" but sometimes, helpfully, give greater detail such as "corn", "woollen" or "worsted". Mills often changed what was processed e.g. from fulling to corn milling or wood sawing. The motive power also changed - wind to steam, water to steam, steam to electricity. York had several windmills, one of which, Holgate mill, has been restored to working condition. The process also changed, from stone to roller milling. At Worsbrough the 17th century water mill was supplemented by an 1840s steam mill; Pocklington White Corn Mill had changed to roller milling by 1892.

Why was roller milling introduced? From the 1830s the population of British towns grew at an increasing rate. Stone grinding could not produce enough flour for the amount of bread needed and white flour became preferred. Stone grinding makes good brown flour and bread as all the wheat berry is ground - a "sudden death" process. Stone milled flour must be sieved to produce white flour. Roller milling is gradual reduction process which removes the brown content. In 1881 the National Association of British and Irish Flour Millers (NABIM), the millers' trade body, presented an exhibition of Hungarian milling machinery at the Agricultural Hall. Hungarian millers had developed milling processes faster than Britain and led the world in the roller milling of flour. Soon large mills opened, such as Henry Leetham & Sons Anglo-Hungarian Roller Flour Mills in York or Joseph Rank in Hull. Leethams became one of the biggest in Europe with warehouses and silos for grain storage. Elsewhere, Vernon & Sons built mills in Liverpool and London, McDougall Bros in Manchester and Spiller & Co in Gloucester, Cardiff and Newcastle. During the 19th century the nature of the milling industry changed; wind and water mills were small local businesses, roller mills were larger, fewer and company owned.

However, not everyone wanted white bread. S Fitton & Sons of, Macclesfield, developed Hovis brown bread c1890. They achieved this by putting back the wheat germ removed by roller milling to make brown wheat germ flour. The name "Hovis" was derived from the Latin phrase" hominis vis" – "the strength of man"; Fittons promoted this in their advertising.

For bread dough to rise to produce a light loaf, high gluten content wheat flour is required, but wheat grown in the UK is not so high in gluten as that from elsewhere. Until fairly recently most wheat milled in the UK was imported from Hungary and the USA as this has a high gluten content. This meant that mills near ports prospered at the expense of those inland. Thus Leethams sold out to Spillers in 1931 and their mill soon closed. Rowntrees later bought the warehouse and Leetham's Mill is now virtually unknown in York. Grain is shipped in bulk to the east or west coasts ports where there are large silos and conditioning bins where different types of flour are blended. Most flour is then sent to bakers e.g. Warburtons. Recent developments have meant that roller flour mills can now use up to c80% of wheat in the flour they produce. Further changes have meant that modern mills can be controlled by one person from a computer; a big change from the larger numbers employed not that many years ago.

Rob's talk generated discussion in the audience. It was suggested that the Austro-Hungarian demand for fine flour was stimulated by the cakes served in Austrian coffee houses – they needed fine flour. Water power was replaced by steam in the 19th century as it was not sufficient to drive the big roller mills; only steam could do that. Later, electric motors powered individual machines. This was more efficient and it also meant that one machine could be stopped without stopping the whole mill. Rob concluded by mentioning examples of earlier technologies that may still be seen: Worsbrough Water Mill produces stone-ground flour for sale; the steam engine at Carr's biscuit factory, Carlisle, remains in situ; Caudwell's Mill, at Rowsley, Derbyshire, is the UK's only surviving water-powered roller mill.

Robert Vickers

The History of Thomas Green & Sons, Leeds Engineers – John Pease
21 February 2015

Section member John Pease had previously spoken to us about his researches into the Leeds engineering firms of J & H Mclaren and Manns Patent Steam Cart and Wagon Company following the publication of his books on the firms. He had recently published a third book, this time on Thomas Green & Sons and returned to speak about the company. John disputed the view held by some that Thomas Green's company was regarded as second rate compared to other engineering firms in Leeds; in his view they have been underestimated and were certainly great innovators in the early days with the development of lawn mowers and a leading manufacturer of road rollers. He did accept that due to management failings, the company had gone through bad patches at times.

The first part of the talk concentrated on the history of the family business. The founder of the firm, Thomas Green was born in 1810 in Palethorpe, Nottinghamshire. He moved to Sheffield and was apprenticed as a joiner before moving to Leeds in 1835 setting up his own business. John described the family history, including his stepson William Penrose Green, who was Chairman of the Company from 1899 until his death in 1941. Thomas Green died in 1892. By the 1840s the business had moved to premises off North Street in Leeds later called the Smithfield Ironworks. In 1850 his own foundry was built to manufacture a wide range of goods including wrought iron hurdles, gates, stable fittings, iron bedsteads, washing machines and iron pub tables from the Smithfield Ironworks. John showed an illustration of a gate post he had discovered on a walk near Pannal which was inscribed as being made by Thomas Green and the George pub in Great George Street, Leeds still has Thomas Green pub tables – something for us all to look out for! By 1861 he had opened a London office primarily for the sale of lawn mowers, in 1881 he purchased the Surrey Works on Blackfriars Road, London which was used to assemble and service lawn mowers. The New Surrey Works in Southwark Street was opened in 1902 and formed the base for overseas orders.

However it was the manufacture of lawnmowers which is most associated with Thomas Green and the second part of the talk examined the development of this and the firm's other products. In 1856 he patented his first lawnmower and this was followed over the next few years by other patents as refinements were

made to the design and manufacture. All types of machines associated with the care of grass were manufactured including gang mowers, verge trimmers and steam mowers. The latter innovation led to the manufacture of boilers for greenhouses and later central heating boilers for churches and hospitals. The stationary boiler business grew and was soon producing gas engines and fairground engines and in 1870s, Greens were manufacturing steam road rollers and later steam tramway engines. The latter development led to the production of steam railway locomotives. The principal designer of Green's tramway engines was George William Blackburn who had previously worked at Kitson & Company, locomotive engineers of Hunslet. From 1900 to his death in 1915 he was Managing Director of the Leeds office. Between 1883 and 1920 nearly forty locomotives were built, mainly small saddle tanks, examples could be seen on the Harrogate Reservoir railways and the docks in Peru. George William Blackburn's son Robert was an apprentice at Greens and in 1908 founded Blackburn Aeroplanes eventually with premises at the Olympia Works on Roundhay Road, Leeds and later becoming the Blackburn & General Aircraft Ltd. Robert became a Director of Thomas Green in 1934 and the Blackburn & General Aircraft Ltd took over Thomas Green &Son Ltd in 1951. This company in turn was taken over by Hawker Siddeley in 1960, Robert Blackburn having died in 1955. Various takeovers of parts of the company followed and in 1975 the company closed with component parts of the business being sold to other companies, roadrollers went to Atkinson's of Clitheroe and lawn mowers went to Reekie Engineering of Arbroath. Ironically Robert Hudson who had been responsible for the export of Greens' railway locomotives took over the vacant Smithfield Ironworks site in 1976. The company title of Thomas Green & Son Ltd remained as a non trading business and was finally dissolved in 1994.

The talk was well illustrated with examples of Green's products and I can recommend John Pease's book *The History of Thomas Green & Son Ltd* published by the Lightmoor Press in 2014 which contains a wealth of information about the firm and its products. See Newsletter 91 for my review which gives publishing details.

Margaret Tylee.

Experiences of a Ship Surveyor – Geoff Ellin
21 March 2015

We were pleased to welcome back Geoff Ellin who spoke to us in November 2013 about his experiences as a ship builder; his presentation now focused on the next stage of his career as a ship surveyor when he joined the Marine and Coastguard Agency (MCA), an executive agency of the Department of Transport, which amongst other roles was responsible for shipbuilding standards. He ended his career as a Principal Ship Surveyor, having the authority to board and carry out inspections on any British ship anywhere in the world as well as foreign ships in UK ports to ensure that international regulations were being met. There was also a responsibility to inspect plans from shipbuilders, check on the building as it took place and sign off the process by issuing the appropriate certificates. He explained that many regulations arose as a result of accidents e.g. sinking of the Titanic, the Torrey Canyon and the Herald of Free Enterprise. He described his visit to Hyundai in Korea in 1982 – the largest ship yard in the world which was building 40 ships a year. The largest ship he had surveyed was VLCC Tonbridge

a 268.000 tonne very large crude carrier and contrasted this with surveying a luxury Italian yacht. Interestingly during the Gulf War ships were surveyed and approved to sail under a British flag to protect them from attack by UK destroyers.

The next section of his talk concentrated on examples of where the MCA team, which consisted of ship surveyors, nautical surveyors and engineers, had boarded ships and found serious deficiencies. These included vessels which had holes in the structure, serious corrosion, poor crew conditions and lack of crew training e.g. no knowledge of how to carry out a lifeboat drill. All the examples were illustrated in graphic detail. He also reminded us of the potential dangers of carrying out the work, particularly when investigating in the hold and other confined spaces due to lack of oxygen. The final example was of a Turkish cruise ship carrying 540 passengers which was checked in June 1981, it held a passenger certificate issued by the Turkish authorities in March 1981. Several serious discrepancies were found – no embarkation drill, water tight doors didn't close, fire detectors didn't work, there were no children's lifebelts and fire hoses didn't work due a lack of pressure in the fire main. The ship was not allowed to sail and the passengers were sent home, the resulting repairs cost in the region of £1million.

At the end of the presentation, Geoff demonstrated with the aid of a Lego boat and a washing up bowl filled with water how ship stability is determined by the breadth of the ship. A talk full of interesting reminiscences and horror stories which made the audience feel grateful for the work carried out by the MCA next time they went on a cruise.

Margaret Tylee

The Newcomen engine at Elsecar : Moving again after more than 60 years

I was late for the big event, and getting later. "It was a dark and stormy night. The rain came down in torrents" (Lord Lytton). Sheffield's evening rush-hour traffic was more congested than ever. It was Friday 21st November, and I was on my way to the "unveiling and activation" of the 1795 Newcomen atmospheric engine at Elsecar.

This is one of the most important monuments of the Industrial Revolution. Perhaps it should be part of a World Heritage Site. It is the only remaining Newcomen engine, anywhere, in its original engine house. Newcomen opened the way to all the later uses of steam as a source of power, from the work of James Watt to the latest steam turbines. Just as important, he opened a new era in mining. Instead of drainage by low capacity pumps worked by animals, men, or water power, or by digging laborious adits where the terrain permitted, water could be raised in much larger quantities by the new engines. Deeper and more extensive mines became possible, and untouched new seams could be worked. At Elsecar, the engine was an essential part of Earl Fitzwilliam's New Colliery. By 1795 Watt's more efficient engines were available, but the atmospheric engine was robust, ran on the abundant low grade coal, and involved no royalty payments.

Over the years, it was repaired and altered. A larger cylinder was fitted in 1801, and in 1836 the timber beam was replaced by an iron one with parallel motion. But it kept on working, doing the job it was designed for, until it was replaced by electric pumps in 1923. Henry Ford's representative came to look at it in the 1930s as a candidate for his museum at Dearborn, but a similar engine from near Ashton under Lyne, known as Fairbottom Bobs, was chosen instead. It was steamed again in 1953, for a visit by the Newcomen Society, but something went wrong and it was badly damaged.

In 1973 it was scheduled as an Ancient Monument. Barnsley Council bought it in 1988 from the National Coal Board, along with the Elsecar Workshops, which were built from around 1850 to serve the adjoining iron works and the Fitzwilliam collieries. It was opened up from time to time, for visiting groups or special events. Alan Bates, a retired miner, and then steam enthusiast Richard Lamb, used to outline its history and how it worked, while the visitors puzzled over the dusty and rusty mechanism. Meanwhile there were long if intermittent debates over whether to restore it to working order, and if so, how; and over how to accommodate visitors and provide interpretation in the cramped spaces of the engine house.

At one point the prevailing view seemed to be that it should be restored to run on low pressure steam, as during its working life. But in the end the problems outweighed the merits, and it is now worked by hydraulic power, concealed in the pumping shaft – a solution first suggested by National Coal Board engineers in 1981. Interpretation has been provided in Building 32, one of the oldest and largest in the Workshops. The work has been generously supported by the Heritage Lottery Fund. The Project Lead Engineer for the work was Geoff Wallis, appropriately during his term as President of the Newcomen Society.

I arrived late after all, and joined the crowd in Building 32 during the last of the speeches, so I cannot report on them. Then many of us followed the Mayor of Barnsley outside to turn on the Workshops' Christmas lights. After a wait, we were led over to the engine house, where there were increasing signs of activity. There were fireworks, despite the continuing rain. Steam locos ran up and down on the adjoining Cortonwood and Elsecar Railway. The expectation and tension grew. The new power had worked successfully during trials – it had its first run on Friday October 24th, and by chance I was at Barnsley's country house museum, Cannon Hall, when the news came through. Would there now be a hitch before this audience? But no, at last the pump rod moved slowly up and down in the shaft, and raised and lowered the beam. The Elsecar Newcomen engine was moving again. We relaxed and brushed off the rain, and there was a well deserved round of applause.

For details of opening days and times, consult the websites **www.experience-barnsley.com** or **www.elsecar-heritage.com** . The Newcomen engine will only run on a few days each year; advance booking is essential T 01226 740203 and there is a charge of £3 per person.

Derek Bayliss

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