

Panel for Historical Engineering Works Newsletter

Number 165

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Chairman's column By Gordon Masterton

As we emerge from our second national Covid-19 lockdown, it is really encouraging in these difficult times to have observed the efforts of engineering and heritage groups in adapting to new technology to keep their bonds of fellowship strong. This is a matter that I have been discussing with our like-minded colleagues from the American Society of Civil Engineers and the Canadian Society for Civil Engineers. As we have become more confident in the reliability and effectiveness of online video-conferencing, we are proposing to pilot a three-way ASCE/CSCE/ICE History and Heritage webinar in May that will allow sharing of ideas and initiatives across our organisations, and spark some new ideas for us to follow through. All PHEW representatives will be invited, and I hope this is the beginning of a regular forum that we can put to good use.

The "Engineering Foresight from Hindsight" Steering group continues to meet to good effect and reviews the active projects and nurtures suggestion for initiatives. We can say with confidence that Sue Threader's ideas for a virtual Rennie commemoration in 2021 are gathering pace and may well be helped by the induction of John Rennie, the elder, into the City of London Engineering Hall of Fame, launched by the Master of the Worshipful Company of Engineers (me!) in

December 2020. The next phase of this initiative will be to have webpages for the seven new inductees, including Rennie, which should assist the promotion of Rennie and his works in 2021.

It is also good to have had the presence of the editor of the Engineering History and Heritage Journal, and a representative from the Conservation and Accreditation Register for Engineers (CARE) Panel at these meetings.

For the record, the other six inaugural inductees to the City of London Engineering Hall of Fame were Sir Hugh Myddleton (of New River fame), David Kirkaldy (founder of the Kirkaldy Testing House, now a museum, with "Facts, not Opinions" as his motto), Sir Henry Bessemer, Ludwik Finkelstein, Dame Stephanie Shirley and Sir John Parker. For more information on all seven inductees see: <https://youtu.be/KXarXYU3Gy0>

Roger Davies is continuing to work with the ICE's IT support team to improve access and content of the HEW Database and Carol is continuing to upload images for those records with none.

You will see in this Issue more examples of how the community interested in learning lessons from the past is continuing to be active, whether through the celebration of under-appreciated figures such as Thomas Brassey, new research on old projects such as the Kilsby Canal Tunnel, or concern about threats to our legacy of heritage assets such as the plans to infill more than a hundred potentially useful railway bridges highlighted by the HRE Group, to which I have already added my support on behalf of PHEW.

On a more positive note, the repairs to Bennerley Viaduct are an inspiring story of how to wisely invest in heritage assets for a worthwhile, and functional purpose. And it is never a bad thing when heritage structures are listed, and our expert authority on water towers, Barry Barton, tells us of the listing of only the second reinforced concrete water tower in England, and the cautionary note that even the listing of a previous water tower did not prevent its demolition.

There are sound reasons for treating our built heritage as assets rather than burdens, not least for the contributions they can make to re-use and re-purposing, almost always a lower carbon strategy than demolition and rebuild. As COP26 approaches, this is another lever to engineer foresight from hindsight.

Commemoration of John Rennie in the 200th anniversary of his death

The work and civil engineering impact of John Rennie is little known by the general public, compared to other high profile historic civil engineers such as Brunel, Telford and even Bazalgette. This project seeks to raise awareness of the general public of Rennie's

achievements, with an emphasis on the continuing social and cultural benefits of his work and surviving structures.

The ICE Archives Panel and the Panel for Historic Engineering Works are looking to collect written pieces of 500-1000 words in length, together with 2-5 appropriate images. The audience is the interested member of the general public and not a technical audience, so we are looking for interesting magazine-like pieces, see [John Rennie in the City of London Engineering Hall of Fame](#) for inspiration.

If you are interested, find out more at [Call for contributions](#)

To register your interest or find out more about Rennie projects in your area contact carol.morgan@ice.org.uk

Lowestoft Gull Wing Bridge

By Ian Anderson

Further to PHEW Newsletter 153 March 2017, a competition was held to christen the proposed Lake Lothing Third Crossing. A trio of pupils from Somerleyton Primary School came up with the name Gull Wing Bridge, beating 21 other entries, announced in August 2020.



Image © Suffolk County Council

Suffolk County Council leader Matthew Hicks said: "It will be an infrastructure project of national importance and a really significant step forward for the town of Lowestoft and the whole of the east coast region. It's only a part of the plan for the renaissance of Lowestoft, which includes the granting of £43m for the flood risk management project, and East Suffolk Council's approval of the Lowestoft Masterplan." According to cabinet member for health, James Reeder, the winning name was inspired by the shape of bridge's fins, which look like wings of a bird. Mr Reeder said the name captures "the unique visual impact of what is going to be an iconic bridge".

Lake Lothing divides Lowestoft between north and south sides. The crossing scheme arose out of the need to relieve the two existing crossings at Mutford Lock at the west end of Lake Lothing and the Bascule Bridge at the east end. Fifteen other crossing options were considered, including bridges and tunnels in three corridors, east, west and central, non-road and flood barrage options. Ten options for a bascule bridge were included, four in the east, and three in central and west. The proposed scheme is the central crossing option. The Development Consent application, running to over 25,000

pages, was made on 13 July 2018 and accepted on 9 August 2018. The contract was placed in a two stage process; the first to be completion of detailed design, and the second the construction phase. The first stage contract was awarded to BAM Nuttall, which began on 1st November 2018. The second stage (construction) contract was awarded to Farrans Construction, announced in October 2020, with construction due to start in Spring 2021 and bridge open in summer 2023. As the scheme had progressed, costs had increased from around £91m to an estimated £125m. Funding is split between Dept for Transport at £73.39m, just over £64m in borrowed funds (which includes some contingency funds) and £6.9m from existing council funds.

See <https://gullwingbridge.co.uk/> for more information

Celebrating the life and achievements of a railway hero

By the Thomas Brassey Society

The Thomas Brassey Society is delighted to announce that a new interpretation panel has been unveiled outside Chester railway station on 8th December. It celebrates the life and achievements of Chester's "unsung hero", Thomas Brassey who died 150 years ago on 8th December 1870. Brassey was born at Buerton, Aldford a few miles south of Chester in 1805. His career began as a trainee surveyor on Thomas Telford's Shrewsbury to Holyhead road through North Wales. He learned a lot about civil engineering, became a quarry manager on the Wirral and then set up his own business as a railway contractor. This coincided with the start of 'railway mania', and Brassey was at the forefront, building one third of all the railways in the UK during his lifetime. Thomas Brassey's enterprising business was not confined to Great Britain. He quite literally built railways all over the world, on almost every continent, and at the height of his career he employed an estimated 80,000 men in his global workforce. Pete Waterman, OBE, record producer, railway enthusiast and Patron of the Thomas Brassey Society said:

"At last a man that helped build a modern world gets the recognition he so rightly deserves ..."

On behalf of the Brassey family of today Rowena Feilden (ne Brassey) added:

"how delighted we are that the Brassey Society is doing so much to promote our ancestor's great achievements".

The new interpretation panel was funded by the Thomas Brassey Society with the aid of a donation from the Tyrer Charitable Trust. Its design and installation, however, is the result of a close collaboration with Cheshire West & Chester Council, Network Rail and Transport for Wales. Councillor Louise Gittins, Leader of Cheshire West and Chester Council, said:

"We are always pleased to support community initiatives and special interest groups, especially when attention is being drawn to one of Chester's most famous sons. Thomas Brassey was indeed a remarkable man; a civil engineer and entrepreneur who deserves to be as well known as Brunel, Stephenson and other great figures of the Victorian age. He built Chester Station in less than two years and it is now one of the city's most important Listed buildings." The

Thomas Brassey Society was inaugurated a year ago although some of its members have been lifelong Brassey enthusiasts. Chairman, Stephen Langtree, summed up, saying “This is by no means the end of our ambitions. There are statues of Stephenson, Brunel, Gresley and Locke around the country and we think Brassey deserves his own bronze sculpture here in Chester. Our fundraising campaign will start in earnest next month.”



John Whittingham and Stephen Langtree with the panel)

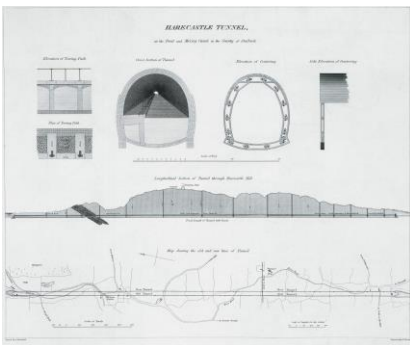


(L-R) Jane Hebblewhite (Chester & Cheshire West Council)
Mark Messham (Transport for Wales)
John Whittingham (TBS committee member)
Cllr Samantha Dixon (Chester & Cheshire West Council)
Stephen Langtree (Chair, TBS)

For more information about the Thomas Brassey Society see our website www.thomasbrasseysociety.org

Canal tunnels

By Mike Chrimes



Harecastle tunnel from *Atlas to the Life of Thomas Telford*, 1838


For the last month or so I have been researching the construction of Kilsby tunnel (c. 2224m in length) on the London and Birmingham Railway [HEW 55], well-known for the problems presented by driving the tunnel through a ‘valley’ of quicksand. In carrying out the research I have been trying to find out more about the precedents for such work, and how much ‘horsepower’ was required to carry out the work. In Kilsby’s case it was apparently 160HP and 13-15 steam engines.

While most experience of previous underground excavation and drainage stemmed from centuries of mineral exploitation, some notable transport tunnels and been built before Kilsby was attempted, including several of greater length which presented their own geological difficulties. From the start transport tunnelling was facilitated by the use of horse gins and steam (pumping) engines, but it is unclear, aside from those supplied by Boulton and Watt, who built the engines, and many of the BW engines were supplied after construction was complete.

Table of canal tunnels by length

Tunnel	Length	No. Of shafts	Steam engines
Standedge	5210m	14 /9 adits	4
Strood	3608m	12? 9 accede to Hadfield	Ordered 1819 installed 1825 BW MS 3147/5/644 B&W MS3147/5623 (1791)
Sapperton	3490m	26	
Lapal	3470m		
Dudley	2900m		
Butterley	2801m	33	1xWoodhouse
Blisworth	2794m	19	B&W MS 31475/602 20HP 1805
Harecastle 1	2676m	?15	1
Harecastle 2	2676m	15	2 B&W
Norwood	2637m		?2 Thompson
Braunston	1867m		328yards qs BW MS 3147/5/612 1809

At the start of the canal age James Brindley made his name for the drainage system of the Worsley mines. His pioneering canals included a number of tunnels of which the most challenging was Harecastle, (2880 yards) completed after his death. He originally planned to work it by the use of horse gins and [15] shafts, and the use of a windmill and waterwheels to drive the drainage pumps, but the volume of water was such that when Arthur Young visited the site in the 1760s it had been decided to use a ‘fire engine’. At the Norwood tunnel (3102 yards) on the Chesterfield Canal, a Canal largely built after Brindley’s death by his disciple Hugh Henshall, an auction of tunnelling equipment at the eastern portal in 1775 listed 3 horse gins ,and 3 waterwheels, pump trees of 8 in bore, a wind engine, frames for slide rods, and slide rod joints suggesting a flat rod system may have been used. Steam engines there were supplied by Francis Thompson, known to have developed a rotative drive with atmospheric engines. There seems to have



been little change 50 years later when Harecastle was doubled under Telford using the experienced tunnel contractors Pritchard and Hoof. There were 15 shafts largely worked by horse gins 24 hours day, with two Boulton and Watt steam engines to keep the workings dry. That at the northern end, named Nelson, had to contend with quicksand. However, progress was rapid with the 3000 yard tunnel completed, except for the towpath, in two years.

On the Leeds and Liverpool Canal, the construction of which dragged on for decades due to cashflow problems and engineering difficulties, the Foulridge tunnel alignment went through deposits of quicksand and mud to contend with which the use of a 'fire engine' was considered around 1792, but it is not certain whether one was used. The capital costs were high - over £1000. It may have been decided to continue drainage with a horse gin.

There is more clarity about the construction of the longest of the canal tunnels, Standedge (5698 yards) also through the Pennines, on the Huddersfield Canal. There were problems in resolving the vertical and horizontal alignment - it was not until Tierney Clark utilised transit instruments in 1819 on the Strood tunnel that a recognisable modern approach was possible. Once a line was marked out shafts were sunk from the two ends at intervals of 100-180 yards, but this approach was partly abandoned when water was encountered in millstone grit formations. The geology was of the Namurian Series and in places heavily faulted. It included shale, grit, coal measures with some limestone. Nine adits were driven from the shafts near the surface to carry away excess water - these were used in combination with water engines - effectively a system using drainage water to balance spoil from the tunnel, with the water discharged through the adit into nearby streams. An attempt to use waterwheels was unsuccessful. Four steam engines were worked at the wettest shafts, although not consistently. Costs were variously 11 guineas a week, or even more at Red Brook, which had a 70 in cylinder working a 14 in pump. It was expensive and inefficient but the company could not afford Boulton and Watt engines. After a decade of unsatisfactory progress Telford was brought in and provided a report, largely followed, on how to proceed.

What is noteworthy is the number of shafts employed on these tunnels, 26 on Sapperton (3490m) and it is surprising that Stephenson did not specify more from the start at Kilsby where originally there were only 6 lobbed working shafts. In the end there were perhaps 20 working shafts and 2 major ventilation shafts, together with pumping shafts off the main alignment.

I would welcome details of the pumping arrangements at any of the canal tunnels, although I suspect Stephenson would have relied on his mining experience rather than accounts of the canal tunnels.

Objection to plans by Historic England to infill bridges

By HRE Group

Campaigners have condemned Highways England over plans to infill more than a hundred potentially useful railway bridges that have failed an assessment they are not required to pass.

The company, which manages the Historical Railways Estate of 3,200 disused structures on the Department for Transport's behalf, has been developing secret plans for the infilling of 115 bridges under permitted development powers that are only applicable in emergency situations. This circumvents the need for planning permission.

Highways England says that "urgent safety action" is now required after around 200 of its bridges carrying roads over former railways failed an engineering assessment - commonly known as BD21 - which is used to determine whether a bridge can carry up to 44-tonne lorries.

However, the HRE Group - an alliance of engineers, cycling campaigners and greenway developers - point out that 19th Century railway bridges only have to meet an old loading standard, BE4, which specifies a capacity of just 24 tonnes.

Local Highway Authorities are responsible for reviewing the anticipated traffic loading of a bridge against its assessed load-bearing capacity and putting in place any necessary mitigation measures. Highways England claims that none of the 200 bridges is subject to a weight restriction, but site visits to seven of those earmarked for infilling found 3-tonne limits at two of them.

The Group has begun an appraisal of the bridges' strategic value for future transport provision. Of the 28 structures already reviewed, three are on lines submitted to the Government's 'Restoring Your Railway Fund', one is on a line under consideration for reinstatement by the Welsh Government, seven could be needed for new heritage lines or extensions to existing ones, whilst nine span routes on which cycle paths are proposed. One of the bridges in Scotland is legally protected under a Grade C listing.

Graeme Bickerdike, a member of The HRE Group, said: "This is what happens when you ask a company responsible for motorways to act as custodian to thousands of legacy railway structures. They seem unable to understand that taking no action after evaluating the evidence can be an entirely legitimate response to the public safety issues associated with a bridge that's failed its BD21. It does not mean the bridge is unsafe.

"Network Rail will have structures that have also failed this assessment, but they manage the implications proportionately in collaboration with the Local Highway Authority. What they don't do is block the railway with a thousand tonnes of concrete.

"If Highways England's claims are correct, we need to know how its engineers allowed 115 traffic-carrying bridges to deteriorate so significantly that 'urgent safety action' is now needed to prevent an

emergency arising. But if these bridges really need weight restrictions and none has been applied, why are they not already collapsing? "There is no impending emergency here. The structures are fine; the problem is with Highways England."

An internal report suggests that as many as 480 of Highways England's disused railway bridges could be bulldozed over the next ten years. The company will receive £13M during this financial year to begin the infilling schemes, but six months ago it awarded contracts worth £254M for works on the Historical Railways Estate up to 2027, including one to a firm with a specialist demolition unit.

"Fear and ignorance are threatening the useful role these infrastructure assets could play for future generations", added Graeme Bickerdike. "The Transport Minister needs to intervene before irreparable damage is done and opportunities are lost."

The HRE Group has urged anyone concerned about the nation's heritage, a cleaner environment and sustainable transport provision to join the 5,000 people who have already signed a petition opposing Highways England's plans. It is available online via www.change.org/theHREgroup

Bennerley Viaduct receives a boost By Friends of Bennerley Viaduct

The project to restore the Bennerley Viaduct and return it to public use has received a boost from the Department of Digital, Culture, Media and Sport's £1.57 billion Culture Recovery Fund. Historic England is distributing nearly £4 million to construction and maintenance projects facing delays or increased costs as a result of the pandemic. £165 000 has been allocated to the Bennerley project to pay for essential repairs to the decaying brickwork on the parapet walls and abutment at the Awsworth end of the viaduct.

The two partners in the project, Railway Paths Ltd and the Friends of Bennerley Viaduct gave Ilkeston Life their reaction to the news. David Pemberton, Director of RPL, praised Historic England for their rapid response to the needs of heritage organisations. "RPL is enormously grateful to Historic England for the additional funding [which] is crucial in allowing the continuation of essential repairs during the pandemic and allowing their completion." Chair of the Friends of Bennerley Viaduct committee, Jeff Wynch, said "We are extremely grateful to Historic England and the Culture Recovery Fund Completing this work during a pandemic will be a towering achievement."

Bennerley Viaduct – repairs completed By Ian Weir, Blackett-Ord Conservation Engineers Ltd.



General view of trestles and primary lattice beams

The additional funding from Historic England reported by the Friends of Bennerley Viaduct came towards the end of a repairs project funded by Historic England from the Historic Assets at Risk fund and others such as the Railway Heritage Trust.

Our planned scope of works followed a detailed close quarters inspection of the wrought iron and brick structure, focused on those items of repair predominantly eligible for funding to assist in its removal from the At Risk Register. The scope of work included:

- Repairs to isolated trestle brick bases
- Removal of inappropriate asphalt and replacement with cored drainage holes between the cast iron base plates
- Repairs to isolated metalwork at low and high level
- Replacement of the failed expansion joints at the end of the deck
- Removal of the existing stone ballast from deck level
- Isolated repairs to the deck trough ends where corrosion loss was excessive
- Repairs to isolated areas of the existing balustrade
- Removal of plastic rainwater collection goods from high level
- Clearing and cleaning of high-level ledges of nesting debris and vegetation
- Remedial repairs to the west abutment masonry cracking
- Remedial repairs to the east abutment masonry and rebuilding of missing parapets

The other overall objective was to complete repairs to the structure that enabled Railway Paths Ltd (Sustrans) to move forward with their desire to create a new safe cycle way over the deck of the viaduct.



Old seized bearing pic



Purpose-made aluminium access



Removed ballast and zinc plate inserts to deck trough ends

Works also included the reconstruction of the missing abutment parapets at the east end of the viaduct. A large number of the original stone copings were found within the scrub at the base of the revetment. These were retrieved and prepared for reuse. Around half of the original copings were found to be beyond repair or missing and new stone copings to match the existing were sourced. Listed Building Consent was required and secured for the reconstruction of the parapet walls on the old footprint.



Reconstructed east abutment

Some of the original brick was also found within the scrub and this was also retrieved and sorted for reuse. Detailed dimensions of the top of the revetments revealed that a significant amount of new brick was required to reform the two parapets at the east abutment.

Structural member repairs were minimal and generally related to the replacement of lost bolts and the replacement of damaged or missing bracing members in steel.



Lost bolt head from bracing connection



Missing bolt and loose brace

Works commenced on site in February 2020 with Practical Completion of the works being achieved in two stages on 9th October 2020 and 18th December 2020. The project being delivered on time and within budget, albeit with the benefit of the additional funding and associated extension of time to complete the additional works found to be necessary to the east abutment revetments following the removal of vegetation and the erection of access scaffolding.

Gawthorpe water tower

By Barry Barton



Gawthorpe reinforced concrete water tower (built 1928) has recently been granted Listed Building (Grade 2) status. The only other r.c. water tower in England with Listed Building status is Tonwell (Herts). England's first r.c. WT, Meyrick Park in Bournemouth, used to be listed but that did not stop it being demolished some years ago. Numerous ornate Victorian WTs in England and Wales are listed but clearly for their architectural rather than their technical significance. I suspect Gawthorpe's listing is aesthetic rather than technical, but it is a classic example of the exuberant phase of r.c. design in the 1920s before design codes became more restrictive.

Scotland is more enlightened, with four r.c. WTs listed – Leverburgh, Craigend, Garthamlock – the latter two both in Glasgow - and, of course, Garmouth, which now has a strong claim to be Britain's first (and oldest surviving) r.c. water tower.

The Engineer sculpture

By Stephen K Jones



The Engineer is a new sculpture installed during the COVID lockdown at the end of last year but because of COVID there was no ceremony. It is part of a series of sculptures highlighting the working history and maritime heritage of the Gwent Levels to be installed across the region. Three figures representing land, sea and engineering workers have been commissioned by the Living Levels Partnership. 'The Engineer' celebrates all the men and women who built the tunnel and the two road bridges that cross the Severn and the sea wall that protects the Levels. Inspired by the 19th century civil engineering contractor; Thomas A. Walker, who undertook the completion of the Severn Tunnel for Sir John Hawkshaw and built Sudbrook village for the tunnel workers. The Engineer stands at the top of the old slipway at Black Rock picnic area, staring out across the water towards the Prince of Wales Bridge. The 2.4m tall figure is fabricated from 4mm thick weathering (Corten) steel, which gives the sculpture a suitably industrial look. The figure is hollow with no back, allowing sunlight to pass through the laser cut panels and cast shadows onto the ground. The Engineer was designed by local sculptor Rubin Eynon.
<https://www.livinglevels.org.uk/the-engineer>

Book Reviews

Spanning the centuries-an anthology of essays reflecting the The Stanhope & Tyne Railroad Company by Rob Langham (2020) Amberley , ISBN 9781445697666

In many ways the story of the Stanhope and Tyne Railway is a remarkable one and Rob Langham's book gives a welcome insight into its development, operation and eventual demise.

In 10 extensively illustrated chapters the history of the railway is recorded through the detailing of much of the innovative and diverse engineering and machinery involved.

Entrepreneurs and engineers such as Robert Stephenson (who faced bankruptcy at one stage through his involvement in the railway) and Thomas Elliott Harrison (Engineer for S&TR) are highlighted but also so are the individuals involved in the day to day running of the railway as well as the often tragic and sad circumstances surrounding frequent accidents.

The book mainly concentrates on the early development of the railway through the middle of the nineteenth century but also adequately covers the continued development throughout the twentieth century.

The meticulous research undertaken has enabled the author to give detailed information on most all aspects of the running of the railway including traffic volumes, financial data and locomotive manufacture details. The extensive illustrations are mainly from the Beamish Museum photograph archive.

A most interesting book not only for outlining the history of this important railway but also for giving some of the social history for the area. The Author is to be congratulated on writing a fine book.

J Michael Taylor

Engineering America: The Life and Times of John A. Roebling, Richard Haw, (2020), Oxford University Press. ISBN:9780190663902, 0190663901

One of the most informative books read during lockdown was Richard Haw's book on John Augustus Roebling (1806 – 1869), a fascinating insight into the man and his works and one that provides a different perspective to the previous image we have of John A. Roebling. All based on scholarly examination and some 13 years of research. A recent book on his son Washington A. Roebling painted a different picture of his father, depicting a harsh and even cruel individual, a picture that was not entirely untrue but here we have a more holistic account of the father. In the book John A. Roebling's works are detailed including the base product of Roebling industries; wire rope, which established Trenton, New Jersey, as an industrial centre with the motto; 'Trenton Makes, the World Takes'. The John A. Roebling's Sons Company sold the works in 1953 with operations ceasing in 1974. He was also a canal contractor and railroad surveyor, he planned communities and founded new industries. Engineering works that Roebling is

remembered for today include his canal suspension aqueducts, the Wheeling suspension bridge, Niagara railway suspension bridge and securing the contract to build the Brooklyn Bridge contract as well the works he was not successful in winning. Haw has written previously on the Brooklyn Bridge and building on his previous research now concentrates on the man responsible for its origination. The story begins in Germany and tells an American immigrant success story but, as the author notes, was one of a life spent reaching toward a goal that was always just out of reach; another land, a new form of construction, a way to organise society or the afterlife. Some of which could be considered as crazy and were aggravated by his sometimes cruel and even violent behaviour all of which presents a somewhat unpleasant personality. Haw, however, weaves those elements in relatively short bursts in the book, between sections on the art and science of suspension bridge building, not only by Roebing, but also by his engineering rivals. Based on his extensive research this is a definitive biography and an important facet of civil engineering, the complete John A. Roebing.

Stephen K Jones

International Virtual Early Railways Conference 10-13 June 2021

Bookings are now invited for delegates to participate in this virtual conference which will take place on 'Teams'.

The conference, conducted in English, will be in a similar format to the successful Early Railways and Early Main Line Railways Conferences. Topics will cover the earliest waggonway systems through to the main line and industrial systems, throughout the world, in the development era up to the 1870s.

The charge for participating in the conference, which will cover the costs of the event and the exclusive use of the YouTube on-line recordings will be:

- £50 per delegate.
- £25 per delegate for students in full time courses.

For more information and to book your place please visit the early railways conference website <https://rchs.org.uk/early-railways-conference-combined/>

or email: er7bookings@rchs.org.uk

Coffee/lunch/tea breaks will be provided to allow for both physical needs and screen time restraint.

PHEW Talks – Historical engineering in Wales and the wider world

In this series of online talks for ICE Wales Cymru Stephen K. Jones, the Wales representative for the Panel for Historical Engineering Works (PHEW), has taken the theme of historical

engineering works in Wales and the wider world with his interest in Isambard Kingdom Brunel and Captain Sir Samuel Brown. The first two talks concern Brunel's works in south Wales and the last two on the history of the suspension bridge in a worldwide context whilst illustrating the pioneering work of Samuel Brown and the Brown Lenox chainworks he established in south Wales. The impact of the railway on its development and decline is also covered in the last talk.

PHEW 1 - Brunel in South Wales (1) - from Trevithick's tracks to lines of communication.

ICE Wales Cymru, West Wales and Swansea City Club Webinar
1pm on 17 May 2021.

'Brunel in South Wales Part 1'. Isambard Kingdom Brunel's first visit to South Wales was in connection with chain links for his first independent commission, returning to build the first locomotive railway here and then what was to be the longest railway authorised to date by Parliament; the South Wales Railway. In the course of completing these railways many innovative engineering solutions in iron, masonry and timber would be developed. However, before the line reached Swansea a nationwide crisis presented a different kind of obstacle to the engineer.

<https://www.ice.org.uk/events/brunel-in-wales-part-1-webinar>

PHEW 2 - Brunel in South Wales (2) - coal, communications, and links to leviathans.

ICE Wales Cymru, West Wales and Swansea City Club Webinar. 1pm on 18 June 2021.

'Brunel in South Wales Part 2'. In post crisis south Wales Brunel was engaged in the completion of the South Wales Railway and determining a new terminus. There were also numerous mineral lines, all on his seven foot broad gauge. On the Vale of Neath Railway an early form of containerisation was developed for coal traffic and Brunel designed Briton Ferry docks to handle some of the output. His three great ships also had connections with south Wales particularly his great leviathan; the PSS Great Eastern steamship which was laid up at Milford Haven.

<https://www.ice.org.uk/events/brunel-in-wales-part-2-webinar>

PHEW 3 – Web of Iron

ICE Wales Cymru, West Wales and Swansea City Club Webinar. 1pm on 15 July 2021.

'Web of Iron' covers the development of the suspension bridge, from earliest origins through James Finley's pioneering works in the United States to the work of Thomas Telford and Samuel Brown on chain suspension bridges for road traffic. The great advances made in ironmaking technology saw a strong British influence worldwide and the suspension bridge, with its potential for inbuilt symmetry, would become a well appreciated feature of the landscape. It was a short but golden age that apart from a few later examples, was to be cut short by railways as the dominant carrier for passengers and goods.

<https://www.ice.org.uk/events/web-of-iron-webinar>

PHEW 4 – Rise and Fall: steam and the suspension bridge.

ICE Wales Cymru, West Wales and Swansea City Club Webinar. 1pm on 8 September 2021. 'Rise and Fall'. The suspension bridge was considered as a potential long span bridging solution for the early main line railway, but the first example built for railway use demonstrated that the unstiffened suspension bridge was inherently unsuitable for the live loading of the steam locomotive. Further attempts would be made with a successful, if largely unrepeatable, example constructed in North America. Surprisingly, two examples of this lonely breed survived until 2016 and 2018 in Chile and a cable stayed hybrid design still carries a light rail electric system in the French Alps.

<https://www.ice.org.uk/events/rise-and-fall-steam-and-suspension-bridge-webinar>

Hews in the News

Whorlton Bridge, near Barnard Castle, a Grade II listed structure, opened in 1831 was closed in December 2020. Thought to be Britain's second oldest chain suspension bridge, it was closed to motorised vehicles in August 2019 after one of its hangers failed. It has now been closed to all users following further assessments.

<https://www.ciht.org.uk/news/county-durham-bridge-closed-due-to-safety-risk/>

Middlesbrough Council is considering options for the future of the iconic Middlesbrough Transporter Bridge. The bridge, built by Sir William Arrol & Co., opened in 1911 and closed in the summer of 2019 after stretched cables were discovered on the gondola. One unpopular option involves a £4m plan to retire the bridge from carrying traffic and converting it into a visitor attraction.

<https://www.thenorthernecho.co.uk/news/18935555.transporter-bridge-council-considering-plan-retire-middlesbroughs-iconic-bridge/>

Urgent action is also needed to secure the future of the Newport Transporter bridge which will be closed for the next two and a half years for restoration. Repairs will be made to the Grade I listed bridge's electrically powered suspended 'gondola' – which carries vehicles and pedestrians across the River Usk – as well as the 197m main span and suspension cables. A new visitor centre and lighting system will also be delivered.

CIHT's 'Transportation Professional' magazine, November / December 2020

In an update, the project was awarded £8.75m from the Heritage Lottery Fund in January, the third largest investment it had made in Wales. Restoration is expected to begin early this year with the bridge expected to reopen in spring 2023.

<https://www.bbc.co.uk/news/uk-wales-55738554>

A further update in February announced the original contractor, Cleveland Bridge, has been awarded the contract to carry out the £10m renovation project. As well as the restoration works mentioned above, the company will also restore lost architectural features and see the repair of the bridge's cross beams and anchorage housing, as well as replacing rotting timbers and worn anchor pins and cables on the main booms. Finally, the company will replace cables and sockets, and provide the necessary steel work repairs and complete corrosion prevention and painting.

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The Friends of the Union Chain Bridge newsletter gave an update on the refurbishment works. The decking, hangers and railings will be removed by the end of March. To follow the progress, see the Friends website <https://www.unionbridgefriends.com/>

Readers of this newsletter are asked, whenever they read of something which they think might deserve mention here, to send it, or a copy, to Carol Morgan, contact details below.

Editor's Note

By Dermot O'Dwyer

May I repeat the regular appeal for Newsletter contributions which may include diagrams, photographs and / or illustrations. Those which are both informative and appeal for further information, or publicise forthcoming conferences or the availability of recent books, etc., are particularly welcome.

Contributions should be sent to the ICE as soon as possible after receipt of this newsletter by post to:

**Mrs Carol Morgan
Library and Information Services
Institution of Civil Engineers
One Great George Street
Westminster, LONDON SW1P 3AA**

by email to: carol.morgan@ice.org.uk

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