

# Panel for Historical Engineering Works Newsletter

## Number 171

January 2025

### Contents:

Chair's Column  
Award for Sandra Purves  
Lowestoft Gull Wing bridge  
Port of Lowestoft  
Berwyn station plaque  
8<sup>th</sup> Early Railway conference, 2025  
CARE conference  
John Smeaton international Symposium  
International Congress on Construction History  
Tripartite webinar series  
Modern Steel Construction journal archive  
Hews in the News  
Newsletter mailing list  
Editor's Note

## Chair's column

### By Gordon Masterton

#### Smeaton 300

The year of celebrations around John Smeaton's 300th birth Anniversary has concluded and PHEW and others have been adding further insights into the "father of civil engineering". The excellent 2024 Smeaton Lecture "John Smeaton: Mechanical Engineer, rotating machinery, history and legacy" by Professor Ric Parker can [be viewed here](#).

Our South West PHEW representative, Dr David Greenfield gave a talk on "The life and works of John Smeaton in Cornwall and Beyond" on 17 July 2024.

Throughout June 2024 ICE South West invited local primary school children to visit Smeaton's Tower on Plymouth Hoe, where they met modern civil engineers and learnt more about John Smeaton, a nice bridging of the past and the future.

The ICE Smeaton blogs have been added to with:

[A peep into Smeaton's world: the invention of the copying press](#) - Carol Morgan

[7 Things we can learn about Smeaton from his machine letters](#) - Carol Morgan

[How John Smeaton helped transform expert testimony](#) - Alexander Aizenman

This issue includes an account by Sandra Purves of the John Smeaton International Symposium on Innovations in Civil Engineering held at Heriot-Watt University on 4th September. I was invited to deliver one of four Keynote Presentations after an inaugural address by Professor Anusha Shah, President of ICE. In such a busy field of keynotes, avoiding overlap was a challenge. So, rather than talking about Smeaton's civil engineering projects, I chose my topic as "Smeaton's enduring influences: science, intellect and experimentation" featuring his early reports for the Royal Society, his seminal experimental work on wind and water mills, and his later experimental approach to improving the Newcomen engine. Researching these added to my appreciation of Smeaton's strengths and weaknesses and his influence on the way civil engineering research and practice continued to develop in the wake of his pioneering leadership.

The Smeatonian Society of Civil Engineers asked me to be interviewed at Perth Bridge for a commemorative video about Smeaton, other interviewees including fellow Smeatonians Sir John Armitt and Hugh Ferguson, and other interviews with David Sellars, on Smeaton's astronomy, Smeaton Medallist Helen Wild and the CEO of the UK Climate Change Committee, Emma Pinchbeck. The video [can be viewed here](#). It was supported financially by ICE, Scottish Canals and the Institution of Engineers in Scotland (IES).

IES also invited ICE and Smeatonian Past President Professor George Fleming to deliver a lecture on Smeaton in Scotland and this was delivered in conjunction with Chris O'Connell of Scottish Canals on 4th June. My paper drawing, with permission, on all of these 2024 contributions will appear in the IES Journal shortly: "John Smeaton – an Engineer who transformed Scotland".

The Smeatonians also held a commemorative lunch in University House, the University of Leeds, on 30th October 2024 attended by HRH The Princess Royal (past president of the Society), the Lord Lieutenant of West Yorkshire, the High Sheriff of West Yorkshire, the Lord Mayor of Leeds and some of those who have contributed to the celebrations during the 300th anniversary year of Smeaton's birth. It was a fitting tribute and thanks to the efforts of the Leeds City Council and Whitkirk Parish.

In Issue 170 I noted the "rediscovery" of an early ASCE International Historic Civil Engineering Landmark plaque intended for Smeaton's Tower, and a re-installation and re-dedication ceremony took place at the Tower on 16th October 2024. BBC Regional news covered [the event](#).



ICE South West regional director Miranda Housden and Steve Conway, collections manager, The Box

The ICE, Smeatonians, and the local Smeaton enthusiasts in Leeds, the Southwest and in Scotland can be rightly proud of having taken advantage of the 300th anniversary of Smeaton's birth to raise public

awareness of Smeaton and of civil engineering generally.

### London's Tower Bridge

In September, London Tower Bridge approached the ICE for help in its programme to celebrate new photographs being discovered through the family of George Edward Wilson Cruttwell, employed by John Wolfe Barry as the resident engineer during its construction. I was asked to visit the bridge and this resulted in a number of short videos being promoted by Tower Bridge as part of its "Launching a Landmark" series. It was a privilege to see parts of the bridge not open to the public, including the huge empty quadrant below the bascule counterweight ("empty" except when the bridge leaf is being lifted – it was important to be accompanied by the person responsible for pressing that button!)



The first videos can be viewed here:

[Engineering Tower Bridge](#)

[Building Tower Bridge](#)

[Tower Bridge's Design Competition](#)

City of London Engineering Hall of Fame

Not entirely unconnected (I used the September visit to sound out availability), I was back at Tower Bridge on Hallowe'en evening to host a small celebration for the induction of seven new engineers into the City of London Engineering Hall of Fame. This is an initiative I'd started in 2020 when I was Master of the Worshipful Company of Engineers. Because of the Covid-19 lockdown, the first seven inductees were announced at a virtual banquet that was attended by several hundred members of the Company and guests in their own homes, all eating the same food shipped out from a City caterer and heated up at home to instructions supplied. We were all connected through a very smart IT link called "Telepresent" that created a virtual banquet space for us to explore and chat in while we ate. We then convened for the announcements that can be viewed here: [The First Inductees](#).

This time it was so much easier! The seven founding Companies (Engineers, Ironmongers, Armourers and Brasiers, Shipwrights, Scientific Instrument Makers, Information Technologists, Water Conservators) sent out invitations and a full house of around 80 souls assembled inside the High Walkway overlooking the City of London. I acted as Master of Ceremonies. The Lord Mayor, Professor Alderman Michael Mainelli, kindly agreed to say a few words and make the announcements, Oscar style, by opening the golden envelopes. Talks followed on by the recently elected City Bridgemaister, Sue Threader, and the Director of Tower Bridge, Christopher Earlie. With generous amounts of canapes and wine, the evening went with quite a swing, and the two living inductees, Sir Robin Saxby, former CEO of Arm, and Dame Ann Dowling, former President of the Royal Academy of Engineering, graciously provided a few words of thanks.



Dame Ann Dowling, Lord Mayor of London, Alderman Michael Mainelli, Gordon Masterton

The full complement of new inductees in date order, with their nominating Companies are:

Robert Hooke (1635-1703) – Armourers and Brasiers

Sir Joseph Bazalgette (1819-1891) – Water Conservators

Sir John Wolfe Barry (1836 – 1918) – Ironmongers

Sir Harold Edgar Yarrow (1884 – 1962) – Shipwrights

Frederick Edwards (1889 – 1966) – Scientific Instrument Makers

[Sir Robin Saxby \(b 1947\) – Information Technologists](#)

[Dame Ann Dowling – Engineers](#)

The premise of the initiative is to give engineers and their achievements extra exposure beyond the engineering community, focussing on the benefits to society arising from their genius. In 2024, the criteria for induction also included as statement on the contribution to the Sustainable Development Goals. It was interesting to see just how easy it was to identify how past engineers had made material contributions to the SDGs in their time, without realising it!

### This edition

In this edition of the Newsletter, you will read about the completion and opening of another bascule bridge, Lowestoft's "Gull Wing Bridge" described by Ian

Anderson who also gives us a deep insight into the Port of Lowestoft's new "Easter Energy Facility" intended to secure Lowestoft's future as an operations and maintenance hub for the offshore renewables sector. No difficulties in demonstrating contributions to the SDGs from this commendable initiative.

Stephen Jones writes about the newest historic engineering plaque – for the Llangollen Railway – another means of celebrating engineering successes and impact on our societal wellbeing.

Mike Chrimes attended the 8th International Construction History Congress in Zurich and his account gives an insight into the highlights. The ASCE/CSCE/ICE "Atlantic Bridge" tri-partite webinars resume on 29th January with a talk on the Crystal Springs Dam. And Ian Anderson has uncovered a very useful resource for researchers in modern steel construction.

Along with our usual HEWS in the News, this is the perfect read for the New Year!

## Phew Panel member Sandra Purves recognised



### Sandra Purves is presented award by Elaine C Smith

At ICE Scotland's Annual Dinner in Glasgow last November, Sandra received the Outstanding Contribution Award for the many years she has served as a member of both the ICE Scotland Committee and the Panel for Historical Engineering Works (PHEW). It is gratifying when one of our PHEW members is recognised by the wider ICE community and ICE Scotland has recently been of great help in building up enthusiasm for demonstrating the benefits of

understanding the past for the benefit of the future and a series of blogs will soon be published to demonstrate this.

## Lowestoft Gull Wing Bridge

By Ian Anderson



© Adrian S Pye / Geograph

Lowestoft's Third Crossing, now known as the Gull Wing Bridge, previously covered in PHEW Newsletters 153 and 165, is now complete and open. The Suffolk coastal town of Lowestoft is split in two by Lake Lothing, a salt-water lake, forming the inner harbour. There are bridges at each end crossing the lake available to motorists, the Bascule Bridge at the eastern (seaward) end and Mutford Bridge at the western end. Both are double leaf bascule bridges, lifting both sides to allow shipping through. Their low height above water means having to open frequently, leading to congestion, particularly at the Bascule Bridge. The Gull Wing Bridge, between the other two bridges, is a single leaf rolling bascule bridge in the last stages of testing before opening later this year, to ease congestion in the town. The scheme involves an eight span viaduct with the lifting bascule section spanning between two piers in Lake Lothing, with roundabouts each end linking Rotterdam Road, Peto Road and Denmark Road on the north side, and Waveney Drive and Tom Crisp Way (A12) on the south side. The viaduct comprises four spans on the south side (South abutment, Piers 1, 2, 3 & 4 - 27+30+41+53m - 151m total), the bascule span of 39.5m (Piers 4 to 5), and three spans on the north side (Piers 5, 6 & 7, North abutment -51+51+50 - 152m total),

including the northern span (Pier7-North Abutment) across the East Suffolk railway line, giving a total length of 342m. The spans comprise twin main steel beams of varying depth with steel cross girders and outriggers topped with a composite reinforced concrete deck, allowing two vehicle lanes and shared use footway/cycleway on each side, of maximum width 22m.

The rolling bascule bridge is claimed to be the largest in the world powered by hydraulic cylinders. The bascule J-beams are 35m tall and weigh 1120 tonnes in position, comprising 750 tonnes of steelwork plus 370 tonnes of temporary ballast during installation. When closed the bascule span gives a 32m wide shipping channel with 12m vertical clearance at highest tide, allowing many more vessels to pass under without opening than at each end of Lake Lothing. The bascule is anchored over Pier 4 on the south side of the channel, with a control tower positioned behind on the Pier 3.

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 Arup/BAM Nuttall, which began on 1st November 2018, but the costs came in too high, and the second stage (construction) contract was awarded to Farrans Construction. The £146m cost of the scheme was split £72.6m by Suffolk County Council and £73.4m Department for Transport.

Farrans began construction in April 2021 with site clearance on both sides of Lake Lothing, utility diversions, and site setup. In May unexploded ordinance investigations were conducted in Lake Lothing in advance of marine piling, with nothing found. In June the site compound was fully established and Continuous Flight Auger (CFA) piling for Piers 2 & 3 on the south side was begun, completed in July. Pier 3 has the Control Tower building and Plant Room and a large base was needed with 64 piles. In all 129 1.2m diameter CFA land piles were installed with depths of up to 28m. The excavated material was reused as road base in Colin Law Way, an adjacent business park. In July a retaining wall on one side of the south approach

embankment next to Lings, a car dealership, was begun, and the marine jack-up barge 'Red 7' and crane barge 'Claude Monique' were mobilised in Lake Lothing. 'Red 7' barge carried the marine-based piling rig used to install the dolphin piles in a U-shape around each Lake Lothing Pier, Nos 4 and 5. 'Claude Monique' barge carried a crane, initially used to transfer dolphin piles from shore to 'Red 7', and then used to install cofferdams at each pier, inside which piles and pile cap foundations would be installed. By September the marine dolphin fender piles were complete on the NE & SE sides and work had begun on Pier 4 cofferdam. Pier 3 pilecap needed two concrete pours, 574m<sup>3</sup> on 16 November and 614m<sup>3</sup> on the 30th, with Pier 2 pilecap complete. November also saw Pier 5 cofferdam being constructed in Lake Lothing on the north side, both Piers' cofferdams being ready by January 2022. The rotary bored piles required on Pier 4 supporting the bascule section were up to 60m depth.

January 2022 saw completion of the concrete slab on the north side required to support NAV1 (Northern Approach Viaduct 1), the first fabricated bare steel deck section, to span the East Suffolk rail line eventually. Also, the North Abutment pilecap was completed. 250m<sup>3</sup> of concrete was needed for Pier 3, marking the first pier of the seven to be poured, following which the plant room/control tower basement walls and superstructure were constructed.

The 1st of March 2022 saw the arrival of NAV1 the first fabricated steel deck section, 59m in length including the 52m required to span the rail line, plus an extension over Pier 7. The 380-tonne unit was delivered on a 32 hour journey by barge towed by tugs across from the fabricators, Victor Buyck Steel Construction of Eeklo near Ghent, Belgium. Having passed through the Bascule Bridge with inches to spare, it was then manoeuvred off the barge by SPMTs (Self Propelled Modular Transport) across to the special concrete slab, for further work before erection over the railway.

On 9th May 2022 Colin Law Way was opened, giving access to Riverside Business Park on the SE corner, allowing work to begin on the southern roundabout for

Waveney Drive and Tom Crisp Way, plus access for construction of the south approach embankment, south abutment piling works and Pier 1. By June work had begun with deep soil mixing on the North approach, to strengthen and stabilise the soil with hundreds of soil cement piles, to support the Northern Approach embankment. By mid-summer Pier 6 pilecap had been cast, and the wet plug concrete layer placed in Pier 5 cofferdam to provide a seal at the base allowing water to be pumped out for pier construction.

Over the summer of 2022 NAV1 had its Omnia concrete planks fitted as permanent formwork before the concrete deck was cast and parapets fitted. Over the weekend of 22/23 October 2022 NAV1, by now weighing 1400 tonnes, was lifted on to SPMTs and rotated into correct orientation before being moved into place over the railway between the North Abutment and Pier 7. December 2022 saw the opening of the southern roundabout on Waveney Drive, with work proceeding on the southern approach embankment. By January 2023 the Southern Approach Roundabout/Waveney Drive was completed and reopened. Also in January, Piers 5 and 6 had been made ready to receive the final two Northern Approach Viaduct steel sections, NAV2 & NAV3, which arrived in March. NAV2 at 42m length, weighing 221T, spanned between Pier 7 and Pier 6, linking with NAV1. NAV3 at 50m length, weighing 182T, spanned between Pier 6 and Pier 5 on the north bank. With less reach required, a smaller crane than the south side was used to lift NAV2 & NAV3 into place in March 2023. The Liebherr LR1600 has a 600T capacity and took 18 articulated lorries and 3 days to erect.

On 23 April 2023 the first Southern Approach Viaduct (SAV) structures were delivered from Belgium. Due to their size and weights of steel, they were stacked in twos and brought over on two separate barges. First to arrive were SAV1, 35m long weighing 105T and SAV3, 41m long weighing 213T. They were lifted and moved by one of the largest cranes in the world, the Demag CC8800-1, with a maximum lift capacity of 1600T, which came from Denmark directly, saving 100 HGV trips, and took two weeks to erect and test. SAV1 was erected first, with SAV3 stored on the quay, to allow the barge to return to Rotterdam for SAV2 and SAV4, which came

a week later. SAV2 at 30m length weighed 90T, while SAV4 was 45m long, weighing 381T. During the first week in May the final 3 steel spans were installed.

During June and July 2023, the Omnia permanent formwork planks were placed on to the steelwork, reinforcement placed ready for concreting. August to September saw the Southern Approach deck pours, ten in a specific sequence for proper curing. The team would then move over to the North side to finish those decks. Meanwhile the Control Tower and Plant Room at Pier 3 were completed and begun fitting out. On the North side a new roundabout, slip roads and footpaths had appeared, opening in October 2023.

The last section of the bridge, the main bascule, weighing 1120T, 39.5m long, 22m wide and 35m tall, arrived by barge on 4 March 2024. It is reputedly the largest hydraulically-powered bascule bridge in the world, and was installed with 370T of temporary ballast on 9 March, connecting the two halves for the first time. The 386T high density permanent counterweight concrete was poured into the twin steel structures, known as J-beams, beside the roadway, in mid-March, following which the hydraulic rams that lift the bridge were connected.

The bridge's hydraulic rams are contained within Pier 4 supporting the bascule section, while the hydraulic pumps are housed in the Plant Room on the south quay at Pier 3. The rams raise the deck by pushing upwards against it. The opening and closing of the bridge is helped by curved tracks known as J-tracks attached to the curved undersides of each of the longitudinal J-beams. These mesh with flat racks cast into the deck to help to keep the bascule in line when it is raised and lowered. Farrans project director Neil Rogers explains: "When the hydraulic rams are extended the racks interlock and the bascule bridge rotates on the racks". When the bascule span is fully open, the tip of the bridge deck will be almost 62m above water. Adding to the complexity was the need to accommodate the client's demand for a rapid opening and closing time. The bridge has been designed to open within 116

seconds and close in 106 seconds, 10 times a day, 365 days a year for its 120 year design life.

From April 2024 the safety and control systems were tested, and the bridges final commissioning stages undertaken, including installation and testing of bridge safety and control systems, operator training and completion of highway works and landscaping.

The Gull Wing Bridge opened to the public on 7th September 2024, when the bridge was open exclusively to pedestrians in the morning, with vehicles including vintage buses crossing from noon. The following day, 8th September, a rolling road closure was in operation while the cycling Tour of Britain crossed the bridge during their rideout before the final stage from Lowestoft to Felixstowe. The bridge will be formally named and officially opened by Princess Anne, the Princess Royal on Tuesday 19th November.

## Port of Lowestoft-LEEF East

### By Ian Anderson

The Port of Lowestoft has plans to increase its presence in the North Sea operations. Lowestoft Eastern Energy Facility (LEEF) is part of that expansion. The Port of Lowestoft is strategically located near one of the UK's largest clusters of offshore wind farms, serving as a vital marine hub for maintaining, repowering, and constructing offshore wind sites. Handling around 30,000 tonnes of cargo annually, the port contributes £30 million to the economy and supports 580 jobs. As a key centre for the offshore energy industry, the LEEF project is a crucial part of a new masterplan aimed at further developing the port as a hub for the southern North Sea (SNS) energy sector and the wider East Anglia region.

In 2021 Associated British Ports (ABP) appointed Ayesa as the lead engineering consultant for the design phase of the Lowestoft Eastern Energy Facility (LEEF). Ayesa's role included developing a comprehensive concept

design for the outer harbour, ready for a design and build tender, involving geotechnical and structural analysis for a new 350m quay wall on the Outer Harbour, eastern quay wall, designing service arrangements for fuel, power, and surface drainage, and developing foundations and heavy lift paving areas.

In November 2022 ABP awarded the £25m design and build contract for LEEF East to McLaughlin & Harvey, for the facility suitable for Operations & Maintenance (O&M) activities and construction support for the offshore energy industry. This included the addition of extra capacity to accommodate the next generation of larger offshore support vessels. The Port of Lowestoft has a long history of servicing the offshore energy sector, as a home to O&M bases for Scottish Power Renewables and Scottish & Southern Energy (SSE). It also benefits from its strategic location and close proximity to Orbis Energy and PowerPark, where key offshore energy developers, operators and service providers are located.

On Monday 29 April 2024 McLaughlin & Harvey started dredging of the Outer Harbour and channel approaches at the Lowestoft Eastern Energy Facility (LEEF) using the Boskalis Suction Dredger, Sospan Dau, supported by small survey craft 'Sea Eagle'. Coming after initial marine piling works had been carried out by grab dredger UKD Cherry Sand, the dredging operation was complete in August/September with around 170,000m<sup>3</sup> of material to be removed, allowing for minimum depth berth pockets of 7.5m. ABP said that depth would enable Lowestoft to accommodate next-generation offshore support vessels. Now complete it has 350m of berthing space for simultaneous use by three service operation vessels alongside up to 3.2ha of flexible storage and marshalling area.

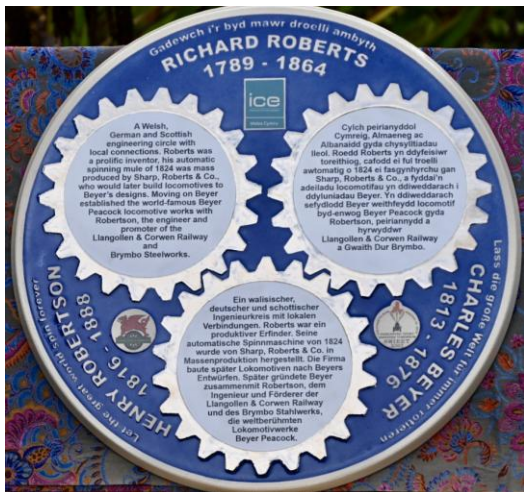
In May, a spokesperson for East Suffolk Council had said "In 2021, Lowestoft secured £24.9M through the Government's Towns Fund to invest in the regeneration of the town, driving economic growth and acting as a catalyst for future investment. The Towns Fund has been allocated to five transformational regeneration projects, including the Port Gateway project which will

support the development of the Lowestoft Eastern Energy Facility (LEEF) to secure Lowestoft's future as an operations and maintenance hub for the offshore renewables sector."

The £35M LEEF facility was opened officially by Secretary of State for Energy Security and Net Zero the Rt Hon Ed Miliband, MP on 23 January this year, with 345m/1131ft of quay allowing for three 7.5m/24ft deep deep water berths. During the visit Ed Miliband boarded the North Star Grampian Tweed, the latest addition to North Star's fleet. The vessel, which arrived in Lowestoft on 14 January 2025, is a hybrid electric service operation vessel.

## Richard Roberts, Charles Bayer and Henry Robertson: celebrating three engineers at Berwyn near Llangollen

By Stephen K Jones



On the 18 November 2024 Lilli Cramer, the chair of ICE Wales Cymru, met with the Llangollen Railway chair Phil Coles to celebrate a Welsh, German and Scottish engineering circle with local connections and unveil a plaque. The setting was Berwyn station (opened 1865) where we were met by Station Master Ben Jackson on

arrival, being conveyed by special train from Llangollen station.



Lilli Cramer ICE Wales Cymru chair with Berwyn station master Ben Jackson and Llangollen Railway chair Phil Coles.

Lilli opened the proceedings and warned the audience that her address could potentially be three times as long as normal as she was talking about three engineers celebrated on ICE Wales Cymru's first trilingual plaque!



Three engineers - a Welshman, a Scotsman and a German, who would become partners at some point in their careers, were connected to the locality and railways and locomotives. Richard Roberts (1789 – 1864) was born at Llanymynech, Powys, close to the English border, some twenty miles away from Berwyn. During



his early working life he worked as a patternmaker and is remembered today as an engineer in the field of high-precision machine tools who made a major contribution to production engineering and mass production. A prolific inventor, his automatic spinning mule of 1824 was mass produced by his company; Sharp, Roberts & Co., which would later build locomotives designed by Charles Frederick Beyer or Carl Friedrich Beyer, as he was christened, (1813 – 1876). Beyer was a celebrated German-British locomotive designer and builder, and co-founder of the Institution of Mechanical Engineers. He is buried just a stone's throw away, in Llantysilio churchyard. His house; Llanysilio Hall, was completed a few years before his death in 1874. He co-founded and was head designer and engineer of Beyer, Peacock & Co., the famous locomotive works in Manchester.

Initially this partnership, with Richard Peacock, ran into funding problems bringing the famous contractor Thomas Brassey into the picture. Brassey persuaded Henry Robertson (1816–1888) to become a sleeping partner in the venture. Henry Robertson was born at Banff, Scotland, he went to Aberdeen University taking up mining engineering but later concentrating on railway engineering. Sent in 1842 to report on mineral properties at Brymbo, he revived the Brymbo Iron Works and promoted the North Wales Mineral Railway which he would engineer with Thomas Brassey as contractor. Then the Chester to Shrewsbury line, with the Dee and Ceiriog viaducts, followed by the line from Ruabon to Llangollen, Corwen and Bala. At Brymbo he oversaw the changeover to steel production in 1884 as well as being MP for Shrewsbury, later Merioneth. In 1871, he built Palé Hall, a grand house eighteen miles away, where he passed away in 1888. The Llangollen Railway has a function room named in his honour at Llangollen Station.

Just a few years before the 1860 Act for this railway was obtained, the poet laureate; Alfred Lord Tennyson, was staying at Llangollen. It therefore seemed appropriate to incorporate part of a line from Locksley Hall as a railway motif and to acknowledge the Richard Robert's automatic spinning mule; 'Let the great world spin for ever ...'

## Eighth Early Railways conference 23-26<sup>th</sup> September 2025

Booking has opened for the 8<sup>th</sup> International Early Railways conference in Darlington this year. Topics will cover the earliest waggonway systems through to the earliest main line and industrial systems around the world up to the 1870s.

Details of expected papers and booking details are available on the Railway and Canal Historical Society [website](#)

## CARE conference 20 March 2025

The Conservation Accreditation Register for Engineers (CARE) conference will take place in Bath.

There will be a full program of site visits, and specialist talks from those working in the conservation engineering field. Jamie Standing, Professor of Ground Engineering at Imperial College London, will give a keynote address on 'The historical underpinning of Winchester Cathedral – Heroic or horrific?'

Topics include Climate Change Hazards and Adaptation, Bath Assembly Rooms project, Clore Learning Centre at the Roman Baths, Bath Abbey Footprint project and Clendon Park, National Trust project.

For more information and booking see [ICE website](#)

## John Smeaton International Symposium on Innovations

The International Symposium took place at Heriot Watt University on 4 September. ICE President Professor Anusha Shah gave an address on Smeaton's innovations which was followed by keynote presentations by Professors Roland Paxton, Gordon Masterton and Paul Jowett, Roderick MacDonald and Professor Mike Forde.

These were followed by 20 thought-provoking papers on themes including Smeaton's legacy, analysis and artificial intelligence (AI) applications, railway engineering, materials and structural assessment, see

[smeaton legacy of an innovator](#). For fuller details of the symposium see [here](#)

The event also included an exhibition of 60 items from contemporary sources including Smeaton's epoch-making 'Edystone Lighthouse Narrative ...1791', which he said proved more difficult and took longer to produce than actually building the lighthouse!

Before the symposium, ICE President Anusha Shah visited the [ICE Scotland Museum](#), where Professor Paxton presented her with a copy of his book, *Dynasty of Engineers - The Stevensons*. in appreciation of her symposium, ICE Scotland Museum visits and much-valued contributions.



## Eighth International Congress on Construction History, Zurich June 2024

By Mike Chrimes

June saw the 8th International Congress on Construction History extend over a week in Zurich, a reminder of how the discipline now has a sustainable academic presence across the globe. While the [First Congress in Madrid](#) to an extent derived content from pent up demand seeking an outlet, the latest Congress showcases ongoing research programmes, in many cases embracing several academic institutions collaborating across international borders.

ETH Zurich were the hosts, led by Prof. Dr. Silke Langenberg and Prof. Dr. Stefan Holzer. On most days aside from the keynotes there were four strands of sessions.

- A: Construction History of the 20th and 21st centuries;
- B: 19th and early 20th century topics;
- C: a variety of Construction History topics relating to Antiquity, the Middle Ages, and the Early Modern period;
- D: Papers on diachronic and more general topics.

There were four thought provoking keynotes: Tullia Iori's 'Learning from lies in the History of Construction (and How to Defend Against Them)'; Ine Wouters 'The architectural and structural works of S.A. John Cockerill (1842-1955): balancing between craftsmanship and mass production', Maximine L'Heritier's 'Notre-Dame de Paris and beyond. Challenges and technical evolutions in gothic construction in the 12th and 13th c.', and Alexander von Kienlin's 'Wide spanning trusses in Greek and Roman Antiquity', demonstrating the vast chronological spread of the subject from ancient civilisations to modern historiography. The latter included sessions on Africa and Asia, unthinkable 20 years ago. While perennial topics such as vaults and arches remain, the techniques used to analyse and explore these structures have changed dramatically with advances in the power of computers and drone technology. Computer power has also revolutionised biographical studies, from investigation of leading actors to the ability to manipulate large quantities of data to revolutionise prosopography, or collective biography. One can imagine that such studies will enable the stereotypes of socio-economic history over the next decade.

Conferences provide an ideal vehicle for the exchange of ideas and for younger researchers to meet their contemporaries, but the time constraints on presentations and associated limits upon paper length mean that specialist journals offer the best means of developing ideas and reporting research findings in full.

Further details of the programme can be found here: <https://8icch.ethz.ch/> and the abstracts and papers here <https://8icch.ethz.ch/proceedings.html>

It is intended the proceedings will be published in paper form in due course once Stefan has returned from his well-earned sabbatical tour of Spain. The next Congress will be held in Turin in 2027; it will be interesting to see what new themes and research techniques are showcased there

<https://www.polito.it/en> Email: [valentina.burgassi@polito.it](mailto:valentina.burgassi@polito.it)

## ASCE, CSCE and ICE Tripartite historical webinar series

**FREE WEBINAR!** LIVE STREAMING

**Crystal Springs Dam:  
The oldest mass  
concrete dam in  
the world**

**WEDNESDAY  
29 JANUARY 2025  
1:00 P.M. EST**

**ASCE** **ice** **CSCE**

**LAWRENCE M. (LARRY) MAGURA**  
P.E., BC, WRE, F. ASCE

After an extended break the series will continue, starting 29 January when Lawrence M. Magura will present “The Crystal Springs Dam: The oldest mass concrete dam in the world” at 6:00pm UK time. The presentation will be based on an article that appeared in the March/April 2024 issue of ASCE’s Civil Engineering magazine.

When completed to its full 145-foot (44.2m) height by the Spring Valley Water Company in 1890, the Crystal Springs Dam in San Mateo California was the highest mass concrete gravity dam in the world. It provided, for the first time, a reliable water supply to the City of San Francisco.

It was the first large dam built in North America exclusively using large quantities of unreinforced mass concrete instead of the masonry and earthen embankments. Construction pioneered several “firsts” that later became standard practice for the construction of the Hoover, Grand Coulee and other large dams.

These innovations include: on-site mechanical mixing of concrete; prewashing all crushed aggregate before mixing with the Portland cement; casting the dam as a series of interlocking blocks; placing concrete in shallow forms to minimize heat-induced cracking during curing; and covering fresh concrete with boards and periodically spraying it with water to slow the curing.

Hermann Schussler, a classically trained civil engineer from Germany, oversaw the design, procurement, and construction in his capacity as chief engineer for the Spring Valley Water Company of San Francisco. The presentation will focus on Schussler’s incredible attention to detail and problem-solving skills in advancing the design and construction of the dam at a time when there were no design standards to guide him and very few other engineers in California to assist him in the project.

[Registration](#) is open on the CSCE website.

## AISC Modern Steel Construction journal online archive

### By Ian Anderson

The American Institute of Steel Construction (AISC) produces a monthly magazine called Modern Steel Construction, containing interesting articles on bridges, buildings, stadia, as well as technical articles on steel design and detailing including connections, and computer modelling. While hunting for back papers on aircraft hangars, I chanced upon their website archive of back issues, going back to 1961 see:

<https://www.aisc.org/modernsteel/archives/>

The early issues have articles that are individually downloadable, whereas for the more recent editions one has to download the entire issue. Unfortunately though, apart from the early editions, which were quarterly, there is no index, so one needs to download each issue to review the contents.

One finds gems, probably unknown on this side of the pond, including an article in the October 2012 edition on a design flaw found in the Citicorp Centre, Manhattan discovered by Diane Hartley, a student who chose the recently completed building (completed in 1977) as an undergraduate design thesis at Princeton University. The 915ft tall building sits on four 114ft tall columns positioned at the centre of each side rather than at the corners. She had discovered a wind design condition not previously considered by the design team that lowered

the overall factor of safety to nearer 1 than 2. She had been liaising with the engineers and once they realised the error in 1978, two inch thick plates were welded over the bolted joints over the whole building.

The UK has an equivalent magazine called New Steel Construction, which has similar coverage on buildings and bridges together with advice on design issues, see: <https://www.newsteelconstruction.com/wp/>

## Hews in the News

Kingston Bridge, Glasgow (HEW 2487) is to be investigated after concrete debris fell from it during a recent storm . [BBC News 14 January](#)

The Victorian-era Branksome East viaduct in Bournemouth has been earmarked for demolition by the local authority in its infrastructure delivery plan. Bournemouth, Christchurch and Poole (BCP) Council's draft infrastructure delivery plan for 2024-2039 has an

itemised list of schemes to be carried out in the next 15 years including demolition of the viaduct.

The Branksome East viaduct is one of a pair of 10-arch brick structures that cross the Bourne Valley. It was constructed in 1888 by the London & South West Railway to connect Bournemouth East and Bournemouth West station. Rail services stopped using it in 1965. [New Civil Engineer 7 Nov](#)

A local group are fighting to save the viaduct [Bournemouth Echo 12 November](#)

Tummel Bridge power station, Perthshire was officially reopened by First Minister (HEW 2581) John Swinney MSP after a £50million refurbishment. The station which forms part of the Tummel Valley hydroelectric scheme has had two new HEP turbines installed. [Perthshire Advertiser 20 September](#)

The 15<sup>th</sup> Century Old Powick Bridge (HEW 2162), near Worcester, site of the first battle of the English Civil War in 1642, suffered a partial collapse in January due to scour. Repair work has begun and is due to be completed early in 2025.

[Collapse forces closure of Worcester's Old Powick Bridge - BBC News](#)

[Historic Powick Old Bridge repair work begins - BBC News](#)

[Worcester News 18 Sept](#)

The Anderton boat lift (HEW 0286) will celebrate its 150th anniversary in July 2025. Canal and River Trust was awarded a Heritage Lottery grant last year and will begin refurbishing the lift and improving the visitor facilities starting autumn 2025. [Canal and River Trust](#)

Weston-Super-Mare's 160-year-old Birnbeck pier (HEW 0434) has received £10 million from the Heritage Lottery Fund. Work had already begun to restore the pier which has been closed for 20 years, and this money will enable more listed buildings on the pier to be restored and a new lifeboat station to be built [BBC News 28 October](#)

A major breach of the Bridgewater Canal (HEW Number 0976/02) occurred on 1st January 2025. There was an escape of water from the canal, where it crosses the valley of the River Bollin near Dunham Massey in Cheshire. A considerable amount of water was lost and much of the embankment was scored away by the escaping water. No boats were lost, though many moored nearby were left on the bottom of the canal. Temporary dams were quickly installed on each side of the breach to limit the amount of water lost. They are being moved towards the breach to allow sections of canal to be refilled and boats refloated.

The works necessary to reopen the canal will be considerable, time consuming and expensive. It cannot be expected that the canal will reopen this year.

A similar breach had occurred close by in August 1971, but the canal was reopened in 1973 after the Bollin Aqueduct had been repaired, the embankment rebuilt, and a new sheet piled canal channel constructed.

Read progress reports on the Bridgewater canal [website](#)

Photograph of damage on Guardian [website](#)

---

## PHEW newsletter mailing list

We hope you enjoy reading this newsletter. Since moving to digital, we realise some people may miss some issues. We are setting up a mailing list so we can circulate a link to the latest newsletter when it is posted on the ICE website.

If you would like to join the list, please send your email address to [PHEW@ice.org.uk](mailto:PHEW@ice.org.uk)

[Past copies](#) are all available to download from the ICE Library catalogue.

## Editor's Note

By Dermot O'Dwyer

Readers of this newsletter are asked, whenever they read of something which they think might deserve mention to pass it on for inclusion in the next issue.

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](mailto:carol.morgan@ice.org.uk)

Copyright © Institution of Civil Engineers, 2025  
Registered charity number 210252  
Registered in Scotland number SC038629